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Fédération Internationale des Associations de Bibliothécaires et des Bibliothèques
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الاتحاد الدولي لجمعيات ومؤسسات المكتبات

Volume 186

Libraries Driving Education for Sustainable Development

Edited by
Petra Hauke, Antonia Mocatta and Priscilla Nga Ian Pun

DE GRUYTER
SAUR

ISBN 978-3-11-133570-4
e-ISBN (PDF) 978-3-11-133646-6
e-ISBN (EPUB) 978-3-11-133682-4
ISSN 0344-6891
DOI https://doi.org/10.1515/9783111336466



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Library of Congress Control Number: 2025932311

Bibliographic information published by the Deutsche Nationalbibliothek
The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data is available on the Internet at http://dnb.dnb.de.

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Cover Image: IFLA ENSULIB, Ljubljana City Library, Canva
Typesetting: Dr Rainer Ostermann, München
Printing and binding: CPI books GmbH, Leck

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About IFLA

www.ifla.org

IFLA (The International Federation of Library Associations and Institutions) 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 provides information specialists throughout the world with a forum for exchanging ideas and promoting international cooperation, research, and development in all fields of library activity and information service. IFLA is one of the means through which libraries, information centres, and information professionals worldwide can formulate their goals, exert their influence as a group, protect their interests, and find solutions to global problems.

IFLA's mission to inspire, engage, enable and connect the global library field can only be fulfilled with the co-operation and active involvement of its members and affiliates. Currently, approximately 1,600 associations, institutions and individuals, from widely divergent cultural backgrounds are working together to further this mission Through its formal membership, IFLA directly or indirectly represents some 500,000 library and information professionals worldwide.

IFLA pursues its vision of a strong and united library field powering literate, informed and participatory societies through a variety of channels, including the publication of a major journal, as well as guidelines, reports and monographs on a wide range of topics. IFLA organizes webinars and workshops around the world to enhance professional practice and increase awareness of the growing importance of libraries in the digital age. All this is done in collaboration with a number of other non-governmental organizations, funding bodies and international agencies such as UNESCO and WIPO. The Federation's website is the key source of information about IFLA, its policies and activities: www.ifla.org.

Library and information professionals gather annually at the IFLA World Library and Information Congress, held in August each year in cities around the world. IFLA was founded in Edinburgh, Scotland, in 1927 at an international conference of national library directors. IFLA was registered in the Netherlands in 1971. The National Library of the Netherlands (Koninklijke Bibliotheek) in The Hague, generously provides the facilities for our headquarters. Regional offices are located in Argentina, South Africa and Singapore.

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https://doi.org/10.1515/978-3-11-133646-6-201

Preface

The world is facing urgent and dramatic environmental, social and economic challenges. Sustainability and climate action are global issues of concern. The focus for ensuring a thriving society in the future is through the United Nations (UN) Seventeen Sustainable Development Goals (SDGs) adopted by all UN Member States in 2015. *Transforming our World: the 2030 Agenda for Sustainable Development* is a "plan of action for people, planet and prosperity" (United Nations n.d.).

Education for Sustainable Development (ESD) is UNESCO's response to fostering personal and societal transformation for the new narratives and coping mechanisms required for a successful future (UNESCO 2018). *Education for Sustainable Development: A Roadmap: ESD for 2030* was launched in 2020 (UNESCO). The Berlin Declaration on Education for Sustainable Development in 2021 emphasised the urgency of taking action to address the issues facing the world, particularly given the COVID-19 pandemic, and highlighted the importance of education in changing "mindsets and worldviews". ESD was perceived "as an enabler for all 17 SDGs…the foundation for the required transformation, providing everyone with the knowledge, skills, values and attitudes to become change agents for sustainable development" (UNESCO 2022, 3). The role of education in securing a harmonious and healthy future was also highlighted:

> Harness the power of ESD for the redesign of our societies, encouraging … access to scientific knowledge and data sharing to facilitate research, evidence-based policies, democratic decision-making and the recognition of indigenous knowledge, to promote sustainable and transformative economies centered on respect for the well-being of people as well as for the planet, and to enhance resilience and preparedness for future global crises (UNESCO 2022, 4).

The United Nations Summit of the Future was held in New York in September 2024 to adopt a Pact for the Future which included a Global Digital Compact and a Declaration on Future Generations. It covered a wide range of topics encompassing peace and security, sustainable development, science, technology and innovation, and youth and future generations. The Declaration on Future Generations reaffirmed commitments to the 2030 Agenda for Sustainable Development. One of the actions adopted by the Pact was:

> Ensuring inclusive and equitable access to knowledge, science and information, while promoting innovation, critical thinking and life skills to create generations of citizens that are agents of positive change and transformation (United Nations 2024, 55).

Libraries and librarians are well positioned to drive change and successful ESD processes in the communities they serve, and in the past decades, have demonstrated

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https://doi.org/10.1515/978-3-11-133646-6-001

a commitment through extensive contributions to a wide range of achievements in relation to the SDGs, although their efforts have not always been recognised (IFLA 2022, 4). Libraries, especially green and sustainable libraries, have the capacity to influence change and provide direction as learning institutions in their own right and as active partners with other community organisations for ESD. The International Federation of Library Associations and Institutions (IFLA) has over many years presented on the international stage the contributions libraries can make to sustainable development (IFLA 2023).

Libraries adopt as core values and actions equitable access to information and the promotion of critical thinking. IFLA has long espoused the educational role of libraries: "The core mission of librarians and other information workers is to ensure access to information for all for personal development, education, cultural enrichment, leisure, economic activity and informed participation in and enhancement of democracy" (IFLA 2012) and championed the role libraries can play in the attainment of the SDGs and the United Nations Agenda for 2030 (IFLA 2021).

This book brings together successful initiatives on ESD from libraries across the world to provide exemplars and inspiration for others. It provides details of tools available from various international organisations. It showcases successful innovative approaches, activities and projects. Large green libraries to small green corners in libraries are presented. Green libraries not only focus on design and facilities which maximise the natural environment in which they are located and minimise impact on it, but also educate their communities through library collections, services and programmes. Some activities are conducted on a grand scale but others require little by way of resources. Projects presented in the book demonstrate imagination and commitment. Collaborative projects are portrayed as libraries work with other organisations in their communities.

There are three major parts to this book. The first provides an introduction to the relevant topics and ESD programmes in general from various aspects. The second provides case studies demonstrating innovative approaches to ESD in public libraries and school libraries worldwide. The third part provides examples and practices from the global academic libraries sector and library and information science education. A list of contributors of the book is provided.

The first part of the book introduces readers to the roles, contributions, challenges and paradigm shifts in ESD made by libraries in recent decades from an overall perspective. Petra Hauke from Germany introduces the topic with an overview of basic concepts and library activities and services in relation to sustainability, and the potential contributions libraries can make to sustainable education. Syed Inshaallah Tahir and Tasleema Jan from India call for a paradigm shift with libraries taking a more dynamic role to foster sustainability and act as catalysts for change within the community. Rossana Morriello from Italy addresses the sig-

nificance of data information literacy as an essential prerequisite for sustainable development actions to be taken by both librarians and library users. Martha Lerski from the United States reports on a project undertaken in Malawi in which arts-based research has been used as a pathway to enhancing environmental knowledge and awareness, and Markus Putnings and Michael Zweier examine how open science and awards have encouraged the development of sustainable education practices by librarians, researchers and others in the community, reflecting on German experiences.

The second part includes case studies and collaborative projects in public and school libraries in Australia, Colombia, Hungary, India, Slovenia and Spain and showcases activities undertaken by libraries in transforming their communities through citizen science, green library developments, environmental education for communities, and fine arts, drawing attention to alliances between libraries and with other organisations. Bridie Schultz, Helen Weston and Jacqueline Lucas explore the transformative potential of integrating citizen science corners into school libraries to enhance STEM education, empower students, and foster collaboration between young learners and scientists. Vivian Puerta Guerra, Ana Maria Parente-Laverde and Andrés Felipe Corrales Jaramillo examine how the Biblioteca Empresas Públicas de Medellín in Colombia integrates UNESCO's ESD programme into its services. Fruzsina Pataki and Ágnes Hajdu Barát highlight the role of Hungarian public and county libraries in advancing UNESCO's ESD agenda by promoting environmental literacy and facilitating access to information. Mariam Bhanu and V.K. Dhanyasree present a case study of the Valapattanam Grama Panchayat Library in Kerala, India, highlighting its initiatives to educate the community about the SDGs and its recognition in the IFLA Library Map of the World. Ana Zdravje explores the development of green libraries in Slovenia, detailing the origin of the green library concept and the impact of green literacy programmes on local communities in promoting sustainable development. Víctor Benlloch Tamborero, Josep Melero Bellmunt, Marga Muñoz Moreno, Ana Pardo Cereijo, Roberto Ramos de León and Rosario Toril Moreno discuss arts-related activities from green libraries in Spain, showcasing how they promote environmental awareness and sustainability.

The third part of the book contains case studies from academic libraries in Australia, East Africa, Germany, Spain, the United States, and Switzerland, as well as library and information science education in the Philippines. The cases discuss how academic libraries drive change through sustainable development and implement a sustainability agenda both for the libraries themselves and for their communities. The role of libraries in the creation of open educational resources, open pedagogy and the promotion of open access to information in support of ESD and the SDGs are highlighted. Roxanne Missingham from Australia examines how academic libraries contribute to the SDGs through information literacy activities and

open access programmes. Arnold Mwanzu and and Joseph Mwangi discuss the initiatives of academic libraries in East Africa to support the SDGs by advancing policies, transforming learning environments, and empowering communities. Merle Schatz, Claudia Hake, Frank Klaproth, Julika Mimkes, Rafael Maria Raschkowski and Michelle Weidling highlight the Göttingen State and University Library's role in implementing UNESCO's ESD programme by promoting sustainability awareness and improving environmental performance through community initiatives. David Mercadal Cuesta evaluates the role of Spanish public university libraries in advancing the SDGs and promoting environmental education. In the US Neyda Gilman, Jennifer Embree and Jacqueline Jergensen explore student-run sustainability projects in academic libraries, highlighting a grant-funded *Equitable Sustainability Literacy Guide* and the experiences of a Sustainability Hub Student Interest Group. Nicole Krüger, Roger Flühler, Yvonne Klein and Stefanie Walther discuss the role of open educational resources in promoting sustainable development and education at the Zurich University of Applied Sciences, highlighting student-driven projects. And finally Kathleen Lourdes B. Obille and Elijah John F. Dar Juan examine how Philippine library and information science education aligns with the UNESCO ESD framework.

We thank everyone involved in this book for their efforts and hard work which have made the book possible, particularly the authors of the chapters who committed their time and energy to describe their projects and to share their knowledge and experiences with others. We are grateful for the support of the IFLA Environment, Sustainability and Libraries Section (ENSULIB), particularly the Standing Committee Chair, Harri Sahavirta, and members of the Standing Committee who acted as advisors to the book: Vivienne Byrd, Arnold Mwanzu, Rosario Toril Moreno and Ana Zdravje, along with Karen Latimer. We thank them for their willing involvement, advice and suggestions for the content and production of the book.

A big thank you goes to Claudia Heyer and the publishing house De Gruyter Saur for assistance in the publishing process. Last but not least, we thank IFLA, especially the Professional Council for supporting publication of *Libraries Driving Education for Sustainable Development* and for making it available in open access, and the IFLA Publication Series Editor, Janine Schmidt, for encouragement and checking of the text.

Clarity of purpose, commitment to change, cooperative approaches and a clear focus on the greater good are essential components in educating both library and information professionals, and library users, in finding ways to a more sustainable future. This book charts the way forward. It is hoped that it will provide inspiration and guidance for others to follow.

> Transformative learning for people and the planet is a necessity for our survival and that of future generations. The time to learn and act for our planet is now (UNESCO 2022, 5).

Petra Hauke, Antonia Mocatta and Priscilla Nga Ian Pun
November 2024

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Part I: **General**

Petra Hauke

1 Empowering Communities, Sustaining the Planet: The Role of Libraries

Abstract: This chapter comprises a study examining the role of libraries in the UNESCO Education for Sustainable Development (ESD) programme, highlighting their contributions to sustainability education. Employing critical discourse analysis of academic and professional literature, and a multiple case study approach, the perception and visibility of libraries in this context are scrutinised. An analysis of websites, platforms, literature and multiple case studies confirms the assumption that libraries' contribution to the UNESCO Education for Sustainable Development programme, promoted by the International Federation of Library Associations and Institutions (IFLA), should be a paradigm of librarianship, but is seldom recognised by libraries or national library associations. Worldwide, libraries actively contribute to achieving the goals of the 2030 Agenda for Sustainable Development within their communities through educational initiatives aligned with the UNESCO ESD programme, often without being consciously aware of their contributions. The importance of enhancing the visibility and recognition of the socially significant role of libraries as key partners at the local, national and international levels is emphasised. In addition to the investigation of national and international websites, a spontaneous, non-representative survey, addressed to international library mailing lists, was conducted regarding the implementation of UNESCO ESD programmes in libraries. The chapter explains basic concepts and defines sustainability education in libraries in terms of library activities and services. Although sustainable development should no longer be treated as a new paradigm of librarianship, the Whole Institution Approach should be adopted as a new research field of library and information science (LIS).

Keywords: Whole institution approach; Green libraries; United Nations agenda 2030; Sustainable development goals

Introduction

The discussion about the role of libraries as leaders in ecological sustainability began in the 1970s (Armstrong 1971). The idea that libraries should play a leading role in education for environmental sustainability developed slowly (Boyden and Weiner 2000). Finally in 2008 a green library movement (Antonelli 2008) was recognised, although focused mostly on library buildings, which is still the case today

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https://doi.org/10.1515/978-3-11-133646-6-002

(New World Encyclopedia 2024). Despite the historical absence of sustainable strategies and the lack of sustainable education in library and information science (LIS) curricula, operations, services and building designs, as well as massive energy consumption due to large buildings and long service hours, more and more libraries have taken on the challenge of becoming exemplars of sustainability (Khalid, Malik, and Mahmood 2021; Mathiasson and Jochumsen 2022). Finally, commitment to sustainable development and implementation of forward-looking practices has reached not only libraries but also archives and museums (Jochumsen, Johnston, and Vårheim 2022).

Public libraries are often rather reluctant to position themselves as green libraries with corresponding programmes like the Bibliothek Tiergarten-Süd/Tiergarten-Süd Library, in Berlin (Bibliothek Tiergarten-Süd n.d.) or the Anglia Ruskin University (ARU) University Library in the United Kingdom (ARU University Library 2024). In some countries the library community finds it difficult to label, or even align, itself with the green library movement. One reason for this seeming reluctance of libraries and of library associations is potentially a concern that a declared green commitment or focus, at least in countries with green political parties, would mean they are no longer neutral. But since the delivery of Richard David Lankes' *Manifesto for Global Librarianship* in 2018 at the Next Library Conference in Berlin, where he stated that "librarians must be constant advocates for what should be", this position should at least be reconsidered (Lankes 2018).

As early as 2018, the American Library Association (ALA) positioned itself on the issue of neutrality in its President's Program: "Are Libraries Neutral? President's Program Tackles Heavy Subject from Multiple Angles" and Kelvin Watson, Director of Broward County Libraries Division in Florida, is quoted as saying:

> ...neutrality is a non-stance, allowing information professionals to avoid accountability by abdicating ethical responsibility. Librarians can't be neutral on social issues that impact their customers because those issues impact librarians as well. 'Claiming neutrality endangers us as an institution' he said (quoted from Carlton 2018).

The following are examples of library associations that have taken a stance on environmental sustainability:

- The Australian Library and Information Association (ALIA) has declared its commitment to green libraries and environmental sustainability and has established a Sustainable Libraries Group (ALIA n.d.)
- The Hrvatskoga knjižničarskog društva/Croatian Library Association (HKD/CLA) runs a Working Group for Green Libraries, which in cooperation with the National and University Library Zagreb organised the 1st International Conference on Green Libraries – Lets Go Green! in 2018, and another one in 2021 on

Libraries and the UN 2030 Agenda: the Role of Libraries in Promoting Sustainable Development (Zagrebačko knjižničarsko društvo/Zagreb Library Association 2021).

- The American Library Association (ALA) Sustainability Round Table (SustainRT) has a website which supports sustainability within libraries and has no fear of invoking the term green: "It's not easy being green… But isn't environmental consciousness in line with the true mission of public libraries?" (ALA Sustainability Round Table 2024). Observations have shown that library users are grateful when libraries take action to create awareness about environmental sustainability (Albertyn and Zinn 2022; Sahavirta 2013).

When the Environment, Sustainability and Libraries Section (ENSULIB) of the International Federation of Library Associations and Institutions (IFLA) (IFLA ENSULIB n.d.) was established in 2021, one of its first projects was to define what constituted a green library and to clarify that the term green refers not only to trees and butterflies; that buildings are only one aspect of green libraries; and that other aspects of green include office management, sustainable economy, sustainable library services, social sustainability, environmental management and the commitment to general environmental goals and programmes. "A green and sustainable library is a library which takes into account environmental, economic and social sustainability. Green and sustainable libraries may be of any size, but they should have a clear sustainability agenda" (IFLA ENSULIB 2022).

Libraries' Response to the UN Sustainable Development Goals

IFLA was involved with the creation of the UN 2030 Agenda, with its Sustainable Development Goals (SDGs), adopted by all UN member states in 2015. The SDGs are a set of seventeen global goals to address various social, economic and environmental challenges by 2030 (United Nations [2015]).

IFLA's contribution led to the inclusion of access to information, universal literacy and access to information and communication technologies (ICT) in SDG 16.A:

> Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
> Target 16.A: Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements (United Nations n.d.a).

IFLA committed to:

> work with our members, including library associations and institutions in 150 countries, to ensure their readiness to support implementation of the SDGs in their country and locally through library services and programmes, including public access to ICT (United Nations. Department of Economic and Social Affairs 2016).

IFLA made a clear, unequivocal statement, intended as an appeal and call to action to libraries and public stakeholders:

> Exemplars, Educators, Enablers: Libraries and Sustainability
> Sustainability is Libraries' Business. [...] Libraries are well placed to contribute. As a network of at least 2.3 million institutions, they have both global reach, and the possibility to understand and respond to local needs and priorities. They also exist in very different contexts, from major national or university libraries to small public, school or mobile ones (IFLA 2018).

It is evident that libraries worldwide play a significant role in supporting the SDGs: "library staff, whether through strategic planning or through their everyday activities, are doing much to further the SDGs" (Connaway et al. 2023, 283).

Libraries contribute to the achievement of many SDGs.

- "Goal 3. Ensure healthy lives and promote well-being for all at all ages."
  Libraries support health and well-being by providing information on healthcare, healthy lifestyles and mental health and may host events and workshops promoting well-being.
- "Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all."
  Libraries serve as reliable educational resources, providing access to books, online materials and other educational resources. They support literacy programmes, workshops and other initiatives that contribute to achieving the goal of quality education for all.
- "Goal 5. Achieve gender equality and empower all women and girls."
  Libraries often promote gender equality by providing resources that empower women and girls. They host events, discussions and initiatives to raise awareness of gender issues.
- "Goal 9. Build resilient infrastructure, promote sustainable industrialization and foster innovation."
  Libraries play a crucial role in providing access to information and technology, contributing to the development of infrastructure and fostering innovation and industry.

- "Goal 10. Reduce inequality within and among countries."
  Libraries are inclusive spaces that help reduce inequality by providing equal access to information, education and resources for people from all backgrounds.
- "Goal 11. Make cities inclusive, safe, resilient and sustainable."
  Libraries contribute to building sustainable communities by providing information on environmental issues, hosting community events and promoting sustainable practices.
- "Goal 13. Take urgent action to combat climate change and its impacts."
  Libraries can raise awareness about climate change, sustainable practices and environmental conservation and host events, provide resources and support initiatives related to climate action, and
- "Goal 17. Revitalise the global partnership for sustainable development."
  Libraries can serve as hubs for fostering partnerships and collaborations. They bring together communities, governments, NGOs and businesses to work towards achieving the SDGs collectively.

Libraries act as catalysts for positive change by promoting access to information, fostering community engagement and supporting lifelong learning. Their role in advancing the SDGs is significant, as they contribute to creating informed, empowered and resilient communities.

Since 2015 libraries and library associations all over the world have taken up the challenges presented by the UN SDGs. ALA formed a Task Force on United Nations 2030 Sustainable Development Goals that provides resources and materials for libraries helping communities meet the United Nations SDGs (ALA n.d.). ALIA undertook a research project to underpin the association's focus on sustainability, in line with its commitment to the UN SDGs. The research report highlights examples of Australian best practice and aims to create a toolkit for libraries to help them support sustainability practices that are consistent with the SDGs (Garner et al. 2022). The report also underlines that sustainability does not relate only to resources "but also to community well-being and acknowledgement of cultural heritage and diversity, including Indigenous knowledges" (Garner et al. 2022, 7).

In Africa, libraries are contributing to the SDGs in their countries in various ways. Their focus is often on SDG 3, Good health and well-being, to support healthy living, or SDG 4, Quality education, by imparting skills for lifelong learning. The IFLA SDG Stories on the Library Map of the World (LMW) (IFLA n.d.) provide examples from Kenya, Nigeria, South Africa and Tunisia to demonstrate the engagement of libraries in achieving the SDGs (Lynch et al. 2021; Osuigwe 2023).

The IFLA Strategy for 2019–2024 included Strategic Direction 1, Strengthen the Global Voice of Libraries, and Key Initiative 1.1 states: "Show the power of libraries

in achieving the Sustainable Development Goals" (IFLA 2019). The IFLA Asia-Oceania Regional Division published a booklet in 2021 to showcase how libraries of the Asia and Oceania region are supporting the SDGs. The stories presented are the result of a call made to section members, to share SDG stories from their respective countries within the six subregions of Asia and Oceania: West Asia, Central Asia, South Asia, South East Asia, North East Asia and Oceania (IFLA 2021; Gamage et al. 2021).

In 2022 the European Bureau of Library, Information and Documentation Associations (EBLIDA) published the *Second European Report on SDGs and Libraries* which reported on a survey focusing on library associations and the community of EBLIDA experts conducted in 2021 on perceptions of the SDGs. The first two of its conclusions were:

> 1. Overall, the progress of SDG implementation in European libraries is quite heterogeneous: in some countries, libraries are fully integrated into the national SDG policy; in others, SDG attainment in libraries is done in a practical way, with no involvement of national authorities.
> 2. The crucial point for the successful implementation of SDGs is librarians' awareness. Their level of awareness has certainly increased, but activities in libraries are still lagging behind (EBLIDA 2022, 24).

The report makes clear that the visibility of libraries' commitment to the SDGs is not taken for granted and that:

> 10. …More active library participation, boosting evaluation tools, raising libraries' awareness of the EU Structural and Investment Funds as well as other EU opportunities, are fundamental tasks for national library associations as well as library organisations active at European level (EBLIDA 2022, 24).

As already noted, libraries that contribute to the achievement of the SDGs are presented through SDG Stories on the IFLA Library Map of the World (LMW). As of June 2024, there were 58 stories from 36 countries on the website. Considering that, according to the LMW, there are approximately 2.8 million libraries worldwide, including national libraries, academic libraries, public libraries, community libraries, and school libraries, only a very small sample is presented. Can such a small list convince the world of libraries' commitment to the achievement of the SDGs?

SDG stories from Germany, Austria, Switzerland, Tyrol (northern Italy) are provided on the portal *Bibliotheken und ihr Beitrag zur Agenda 2030 der UN/Libraries and their contribution to the UN Agenda 2030* (Deutscher Bibliotheksverband (DBV) n.d.a; Portugal 2021). Libraries are explicitly invited to submit their examples for publication on the platform. As of June 2024 there were 73 examples on the website. It is probable that only a small portion of the examples available is presented. Can

such a list convince stakeholders, politicians, and the public in general of libraries' contribution to the achievement of the SDGs? There are approximately 8,850 public and academic libraries in Germany alone (Statista 2024). Of these, 2,093 libraries reported sustainability measures in 2022 (Wimmer 2023, 609). Why are libraries not presenting their sustainability projects on the website? As Beutelsbacher and Meschede state "there is still more potential to promote environmental sustainability. Often, the lack of budget and personnel poses a challenge" (Beutelsbacher and Meschede 2020, 347).

While most library commitment comes from the public library sector, there are noteworthy initiatives from academic libraries. For example, Missingham (2021) assesses Australian academic libraries using the UN SDGs. Nevertheless, there is an urgent call to action for a "response to the twenty-first century climate emergency and the wider opportunity and challenge to embed environmental sustainability into our practice of academic librarianship" (Appleton and Woolley 2023).

Libraries that contribute to the achievement of the SDGs in many ways are well documented in statements and on websites within the library world. However, are they recognised outside the library world? Do libraries themselves and national library associations do enough to present their sustainability commitment to the public outside the sector?

The UNESCO Education for Sustainable Development Programme

The UNESCO Global Action Programme (GAP) on Education for Sustainable Development (ESD) is a worldwide initiative that aims to promote sustainable development through education. The programme was launched in 2014 and is part of the United Nations 2030 Agenda for Sustainable Development (UNESCO 2018). The programme is UNESCO's education sector response to the dramatic and urgent challenges faced by the planet. It aims to bring about the personal and societal transformation that is necessary to change course (UNESCO n.d.a). The programme aims to create a sustainable future by empowering people to make sustainable choices and promote sustainable practices in all areas of life:

> Building on the UN Decade on ESD (2005–2014) and the Global Action Programme on ESD (2015–2019), a new framework, ESD for 2030 was adopted by the 206th UNESCO Executive Board and the 40th UNESCO General Conference and acknowledged by the 74th UN General Assembly (UNESCO 2020, iii).

Education for Sustainable Development for 2030 is a framework that contributes directly to SDG 4, Quality and inclusive education, in particular Target 4.7:

> By 2030, ensure that all learners acquire the 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 (UNESCO 2020, 14).

ESD can enable the achievement of the 17 SDGs:
- ESD raises the awareness of the 17 goals in education settings
- ESD promotes critical and contextualized understanding of the SDGs
- ESD mobilizes action towards the achievement of the SDGs (UNESCO 2020, 16).

Roadmap for Implementing the Global Action Programme on Education for Sustainable Development

The roadmap developed for implementing the Global Action Programme on ESD explains the programme's goals, objectives and five priority action areas:
- Advancing policy
- Transforming learning environments
- Building capacities of educators
- Empowering and mobilizing youth, and
- Accelerating local level actions (UNESCO 2020, 25–34).

UNESCO Member States, regional and global stakeholders are called upon to develop activities for the five areas. The main actors indicated for the fifth priority area, accelerating local level actions, emphasise the importance of actions in communities, as they are where meaningful transformative actions are most likely to occur
- Local public authorities, including municipal governments, city councils and education offices, as well as policy makers at national and regional level
- Civil-society organisations, private companies, and media in the community
- Formal and non-formal education stakeholders in the community, including community learning centres and higher education institutions
- All people in the local community, and
- UNESCO and its partners (UNESCO 2020, 34).

Suggested actions for the fifth priority action area include:

> Formal and non-formal education providers in the community should coordinate their programmes so that together they address all SDGs and related local sustainability challenges in a coherent way. Community learning centres can serve as a hub for lifelong learning on ESD in their communities (UNESCO 2020, 34).

Even if libraries are not explicitly mentioned, as non-formal education providers in the community they can also be called upon to address all SDGs and related local sustainability challenges in a coherent manner.

The Whole Institution Approach

A key component of the UNESCO Global Action Programme on ESD is the Whole Institution Approach (WIA), which aims to integrate ESD into all levels of education and learning. The concept was first introduced in the earlier UNESCO *Roadmap for Implementing the Global Action Programme on ESD* (UNESCO 2014, 35) and explored in other documents (United Nations Economic Commission for Europe (UNECE) n.d.).

WIA is an integrated approach for mainstreaming sustainability holistically in institutional activities. All stakeholders are involved in developing jointly a vision and plan to implement ESD across the whole institution:

> The promotion of whole-institution approaches requires in particular the following:
> (a) An institution-wide process is organised in a manner that enables all stakeholders – leadership, teachers, learners, administration – to develop a vision and plan jointly to implement ESD in the whole institution.
> (b) Technical and, where possible and appropriate, financial support is provided to the institution to support its reorientation. This can include the provision of relevant good practice examples, training for leadership and administration, the development of guidelines, as well as associated research.
> (c) Existing relevant inter-institutional networks are mobilised and enhanced in order to facilitate mutual support such as peer-to-peer learning on a whole-institution approach, and to increase the visibility of the approach to promote it as a model for adaptation (UNESCO 2014, 35).

The approach has been adopted by several institutions around the world, including schools (UNESCO 2024), universities (Riekmann and Bormann 2020) and other educational organisations or projects like SUSEDI (SUStainability EDucational Institutions), a joint transformation and certification journey for educational institutions

to adopt the WIA to sustainable development through a systematic framework (SUSEDI 2022).

Library Responses to the UNESCO Education for Sustainable Development Programme

UNESCO in its learning objectives for ESD goals has identified that: "Schools and universities should see themselves as places of learning and experience for sustainable development and should therefore orient all their processes towards principles of sustainability" (UNESCO 2017, 53). The UN Department of Economic and Social Affairs notes the contribution of libraries to the SDGs, referring to IFLA as a partner (United Nations. Department of Economic and Social Affairs 2016).

Libraries are not formal education providers in the traditional sense as they do not offer degrees or certifications like schools and universities. However, libraries are learning institutions which provide a wealth of information, resources and programmes that can be used for educational purposes. They are open to everyone and provide resources and support for lifelong learning and personal growth. Research has shown that libraries have considerable potential for environmental education (Fedorowicz-Kruszewska 2020).

Library or library association initiatives dedicated to the issue of learning and ESD are recognised worldwide. For some time there has been discussion on how public libraries can use green building technologies and practices as sustainability education tools (Barnes 2012). Since 2004, the Народна библиотека Ужице/Narodna biblioteka Užice/Public Library Užice, Serbia, has organised educational workshops for children to learn about their natural environment and to develop their ability to live responsibly (Vučkovič 2018). The Львівська обласна бібліотека для дітей/L'vivs'ka oblasna biblioteka dlya ditey/Lviv Regional Children's Library in Ukraine ran an eco-education project Library ECOstyle, where ecological education for preschool and primary school children is centred around a system of activities in the library and beyond (Patron and Rusakova 2018). Despite the war in Ukraine, the library continues its commitment to environmental education with a Facebook posting (Львівська обласна бібліотека для дітей/L'vivs'ka oblasna biblioteka dlya ditey/Lviv Regional Children's Library 2024).

The Deutscher Bibliotheksverband/German Library Association (DBV) provides a series of online lectures on libraries and sustainability including best-practice examples for ESD in libraries (Breidlid 2022a). The Georgia Library Association (GLA), US, reported findings from a survey on their members' attitudes toward environmental education services in libraries, which identified a gap between

librarians' attitudes and actual environmentally sustainable practices and education services due to the lack of money, time and public interest (Ren 2022). Another study found that libraries in Nigeria were not well grounded in green library requirements, due to insufficient staffing and resources. The study recommended that librarians face the challenge of finding solutions that adequately address the issues as they are in an excellent position to be ecological operators and promoters of environmental awareness (Dada 2021).

Rural libraries play a leading role in the Virtual Citizen Science Expo Hall, a project for sustainability education in Stillwater, Oklahoma, United States (Asino et al. 2022). Libraries that contribute to the achievement of the SDGs by providing access to information, promoting literacy and digital skills, serving as community spaces and implementing ESD in school and community libraries (Sartori 2021), are educators for sustainable development as identified by IFLA:

> Education for Sustainable Development (ESD) represents a particularly interesting area for engagement by libraries. Referring to efforts to promote a more active, values-based mindset among citizens, it is arguably close to what many libraries are already doing through their programming on different topics – from culture, to inclusivity, climate action and more (IFLA 2022).

Libraries can play a crucial role in promoting ESD by adopting WIA. Actions which can be taken are:

- Incorporate ESD into library services, offer educational resources and programmes that promote ESD, such as workshops, lectures and book clubs, and provide access to materials that support ESD, such as books, journals and multimedia resources
- Collaborate with other institutions, such as schools and universities, to promote ESD, share resources, collaborate on programmes and develop joint initiatives that promote sustainability
- Adopt sustainable practices in operations, such as reducing energy consumption, minimising waste and using eco-friendly materials; promote sustainable practices among library users, encourage recycling and reduce paper usage, and
- Engage with the local community to promote ESD, organise events, such as community cleanups and tree-planting initiatives that promote sustainability; partner with local organisations to promote ESD and raise awareness about sustainability issues.

When universities adopt WIA, libraries are primarily involved as providers of SDG- and ESD-relevant information sources, as in Cork, Ireland (Kirrane et al. 2019;

University College Cork 2023), or in Tübingen, Germany (Schopp, Bornemann, and Potthast 2020).

National Commissions are central to the work of UNESCO (UNESCO 2021). As members of the ESD for 2030 global network (UNESCO n.d.b), several countries including Germany provide national ESD portals (Germany. Bundesministerium für Bildung und Forschung n.d.). The Deutsche UNESCO-Kommission/German UNESCO Commission (n.d.b) for example is responsible for implementing the UNESCO ESD programmes on behalf of the German government (Deutsche UNESCO-Kommission n.d.c). The German UNESCO Commission refers to WIA as a holistic approach to ESD that aims to establish sustainability as a guiding principle in all areas of an institution. As already noted, WIA is implemented by institutions committed to promoting ESD (UNESCO. Economic Commission for Europe n.d.; Deutsche UNESCO-Kommission n.d.a). The institutions include kindergartens, schools, educational institutions of all types, companies, businesses, associations, universities, networks or local authorities. Libraries could be included in this list of institutions if they are committed to education and actively promote sustainable development. The national German ESD Awards (Deutsche UNESCO-Kommission n.d.d) offer outstanding ESD players and initiatives a platform and visibility for the transfer of ESD generally to learners of all generations at the local level.

The German UNESCO Commission provides a map of ESD players, run by the Bildung für Nachhaltige Entwicklung/BNE-Kompetenzzentrum/ESD Competence Centre (BNE-Kompetenzzentrum n.d.). In June 2024 there were eight libraries out of a total of 1,372 German ESD players (Deutsche UNESCO-Kommission n.d.e). The examples are diverse:

- Göttinger Saatgut-Bibliothek/Göttingen Seed Library (Deutsche UNESCO-Kommission n.d.j) is a private initiative, realised in February 2023 in the Staats- und Universitätsbibliothek Göttingen/Göttingen State and University Library (SUB Göttingen). The SUB Göttingen pursues a sustainability agenda and supports the Göttingen Seed Library. Details of how the sustainability agenda was implemented at Göttingen are described in Chapter 14 of this book. According to its motto: "Borrow – Sow – Harvest – Pass on", anyone with a balcony or garden can take part and borrow single-variety seeds free of charge and without registration.
- Leipziger Städtische Bibliotheken/Leipzig Public Libraries (Leipziger Städtische Bibliotheken n.d.) is recognised as a UNESCO education centre and is committed to promoting sustainable development through its services and programmes. The library system's services and programmes align explicitly with the United Nations' SDGs (Deutsche UNESCO-Kommission n.d.f)
- Bremer Informationszentrum für Menschenrechte und Entwicklung/Bremen Information Centre for Human Rights and Development (Bremer Informationszentrum für Menschenrechte und Entwicklung n.d.) is an information,

advice and event centre for sustainable development and human rights. Its educational offerings include educational materials and thematic kits, speakers, advice for students and teachers, teacher training and recommendations for out-of-school learning locations (Deutsche UNESCO-Kommission n.d.g)

- Brunold-Bibliothek Joachimsthal/Brunold Library Joachimsthal (Brunold-Bibliothek Joachimsthal n.d.) is a small library that offers nursery and school group services on the topics of nature, bees, plants, animals and biodiversity. In addition, visitors can see a permanent exhibition on the Geopark Ice Age with models of the glacial series and fossils as evidence of the earth's history. In the apiary there are old fruit trees, and a meadow of wildflowers has been created. Children are provided with current information about the coexistence of humans and bees and access to sustainable development is facilitated (Deutsche UNESCO-Kommission n.d.h)
- Büchereizentrale Schleswig-Holstein/Library Headquarters Schleswig-Holstein (Büchereizentrale Schleswig-Holstein n.d.) runs a programme Zukunftsbibliotheken-sh: Gemeinsam für nachhaltige Entwicklung/Future Libraries-sh: Together for Sustainable Development which has a particular focus on language and reading support. Projects such as "Growing with Words", "The White Leaf", "Mobile Seed Library", "Narrative Paths" and "We Share Stories" use ecological, artistic and linguistic diversity to enliven world perception, questioning, discovery and shaping of understanding (Deutsche UNESCO-Kommission n.d.i)

It must be questioned why are there so few libraries listed, when there are 73 libraries as SDG examples on the German-speaking platform *Bibliotheken und ihr Beitrag zur Agenda 2030 der UN/Libraries and their contribution to the UN Agenda 2030* (DBV n.d.a).

Visibility of Libraries' Commitment to the SDGs

The 2030 Agenda for Sustainable Development was adopted by all 193 UN member states in 2015 (United Nations n.d.b). The Agenda encourages member states to "conduct regular and inclusive reviews of progress at the national and sub-national levels, which are country-led and country-driven" (United Nations [2015], paragraph 79).

> The voluntary national reviews (VNRs) aim to facilitate the sharing of experiences, including successes, challenges and lessons learned, with a view to accelerating the implementation of the 2030 Agenda. The VNRs also seek to strengthen policies and institutions of governments and to mobilize multi-stakeholder support and partnerships for the implementation of the SDGs (United Nations. High-Level Political Forum on Sustainable Development 2023b).

Of 193 member states, 39 countries and the European Union submitted a VNR in 2023. The VNRs can include how libraries are contributing to development, and also indicated what is needed. IFLA is already in touch with libraries in almost all the countries to support their involvement (IFLA 2023a). Table 1.1 indicates the 19 of the 39 VNRs which discuss libraries' contributions to the SDGs and also lists those which have contributed to the Library Map of the World and/or gained distinction in the IFLA Green Library Award.

Table 1.1: Countries' VNRs mentioning libraries

Country	VNR	LMW	IFLA Green Library Award							
			2016	2017	2018	2019	2020	2021	2022	2023
Bahrain	2023									
Belgium	2023								x	
Canada	2023	x						x		x
Croatia	2023	xx			x		x			
Fiji	2023									
France	2023					x			xx	
Iceland	2023									
Ireland	2023	xx				x				
Liechtenstein	2023									
Lithuania	2023									
Maldives	2023									
Poland	2023									
Portugal	2023									
Saudi Arabia	2023									
Singapore	2023	xx							x	
Slovakia	2023									
Timor Leste	2023									
Turkmenistan	2023									
Zambia	2023									

Of the 19, only Canada, Croatia, Ireland and Singapore are presented as SDG Stories in the LMW (IFLA n.d.). Some libraries from the countries listed have been awarded the IFLA Green Library Award (IFLA ENSULIB 2023). However, France, although gaining an award in the IFLA Green Library Award competition in 2019 and 2022, is not represented with an SDG Story in the LMW, although their libraries' commitment to the SDGs is well recognised in the French VNR (France. Gouvernement 2023).

IFLA comments on the VNRs submitted in 2023:

> Ireland is clearly an exceptionally strong example here, with a comprehensive chapter exploring the range of different contributions libraries make to development. It offers a great model for other countries. Beyond this, Canada, Poland and the Maldives have also produced very welcome reports that we can hope will inspire others (IFLA 2023b).

Ten VNRs that talk in any way about libraries' contributions to the SDGs come from Europe: Belgium, Croatia, France, Iceland, Ireland, Liechtenstein, Lithuania, Poland, Portugal and Slovakia, and six VNRs are from Asia: Bahrain, Maldives, Saudi Arabia, Singapore, Timor Leste and Turkmenistan. One VNR, Zambia, comes from Africa; Canada represents the Americas and Fiji Oceania (Table 1.1).

A different picture emerges from the LMW (Table 1.2). In South America, the LMW lists nine SDG Stories from four countries, Argentina, Chile, Colombia and Ecuador, while there no VNR from these countries includes library contributions to the SDGs. Africa is listed with seven SDG Stories from five countries (Table 1.2):

Table 1.2: Countries with one or more SDG-relevant library projects in the LMW but no VNR

Country	VNR	LMW	IFLA Green Library Award							
			2016	2017	2018	2019	2020	2021	2022	2023
Argentina		xxxxx								
Australia		xxxxx	x					x		
Austria		x								
Chile		x								
China		x		x	x		x	x		
Colombia		xx	x			x			xx	x
Costa Rica		x								
Cuba		x						x		
Czechia		xx								
Ecuador		x								
Germany		xx		x						
Ghana		x								
India		xxx								
Iraq		x								
Jordan		x								
Kazakhstan		xxx								
Kenya		xx		x	x					
Malaysia		x								
Moldova, Rep.		x								
Myanmar		x								
Netherlands		xxx								
Nigeria		x								
Philippines		x								
Romania		xx			x					
Russ. Federation		xx								
South Africa		xx								
Spain		xx						x	x	
Sri Lanka		x					x			
Sweden		x								
Tunisia		x								
Turkey		x								
Ukraine		xx		x						

Ghana, Kenya, Nigeria, South Africa and Tunisia but no VNR from these countries discusses library contributions to the SDGs. To bridge the gap between African libraries' contributions to the SDGs and perceptions by stakeholders outside the library world, research was undertaken to ask how libraries might gain visibility as partners (Lynch et al. 2021).

It can be assumed, however, that there are libraries that are committed to the SDGs in a variety of ways, even if not reflected in VNRs. Table 1.2 shows countries without a VNR that have up to five SDG-relevant library projects presented in the LMW. Some have also won awards in the IFLA Green Library competition: Australia, China, Colombia, Germany, Kenya, Romania, Spain, Sri Lanka and Ukraine (IFLA ENSULIB 2023).

Since 2016, ENSULIB has received more than 300 applications for the IFLA Green Library Award, with three to six awards made each year. Table 1.3 shows countries without a VNR, or a mention on the LMW that have won an IFLA Green Library Award. The list of winners and runners-up of the IFLA Green Library Award 2016–2023 presents a range of libraries from all over the world that used the SDGs as a guideline for their projects (IFLA ENSULIB 2023). Every year there are 30–50 applications for the Award. There are many more green and sustainable libraries across the world and they should showcase their commitment by applying for the Award.

Table 1.3: Countries with IFLA Green Library Awards with no VNR or mention in the LMW

Country	VNR	LMW	IFLA Green Library Award							
			2016	2017	2018	2019	2020	2021	2022	2023
Bulgaria									x	
Finland								x		
Hong Kong				x						
Hungary					x	x	x			x
Iran					x					
Italy										x
Korea, Rep.										x
Mexico			x							
Norway									x	
Senegal							x			
Serbia				x						
Slovenia						x		x		
Thailand							x			
USA						x		x	x	
Vietnam										x

Some countries with significant SDG-related library commitment are represented in their country's VNR, the LMW and the IFLA Green Library Award competition

(Table 1.1) but some countries have no representation in any of them. Comparing the results in the tables raises the following questions:

- Why, in 2023, are only 39 VNRs submitted from 193 UN member states? (United Nations. High Level Political Forum 2023a)
- Why do only 19 of the 39 VNRs have any kind of library contribution?
- Why do countries with significant SDG-related library commitment like Argentina, Australia, Colombia, Czechia, Finland, Hungary, India, Netherlands, Slovenia, and the US not submit a VNR?
- Why do libraries give so little visibility to their SDG commitments?
- Are libraries still primarily perceived only as suppliers and managers of information and cultural heritage? Are libraries not aware of their potential? Are they too shy to promote their SDG contributions? and
- Are national library associations not doing enough to promote the visibility and appreciation of libraries in government publications; or do the initiatives, programmes and statements of library associations not find their way into government publications?

Answers to some of these questions can be found by taking a closer look at the example of Germany. Germany has not submitted a VNR since 2021. The 2021 VNR mentions libraries only once, in the context of SDG 11, Sustainable cities and communities, where one of the relevant indicators and exemplary trends is listed as: "Access to cultural heritage: Number of objects in the German Digital Library" (Germany. Bundesregierung 2021a, 85). A relevant statement is found in the German sustainability strategy:

> The preservation of cultural heritage and access to evidence of history and the diversity of literary book production in archives and libraries is also an ongoing task and challenge for the Federal Government in order to preserve and sustain available knowledge (Germany. Bundesregierung 2021b, 172. Translated from German by the author).

Both sources minimise libraries' commitment to the SDGs to "preservation of cultural heritage". They ignore German libraries' broader commitment to sustainability which is well documented on the DBV's website (DBV n.d.b) and on the platform *Bibliotheken und ihr Beitrag zur Agenda 2030 der UN/Libraries and their contribution to the UN Agenda 2030* (DBV n.d.a).

Several statements provided by the DBV call for libraries to be included in the German sustainability strategy and have been ignored (DBV 2016, 2018, 2020a, 2020b). It seems that it is not enough to publish statements, and that direct dialogue with governmental decision makers is needed. The new German government that came to power in December 2021 plans to develop the National Sustainable

Development Strategy further and to review its governance structures. The government also plans to anchor and strengthen the National Action Plan on ESD in all educational phases and areas and to develop a Green Culture desk, which assists cultural institutions in regard to their green transformation. "These plans provide some hope that libraries will be able to get a foot in the door of national discussions on sustainability and hence help them demonstrate their invaluable societal role" (Breidlid 2022b).

A poster presented at the virtual IFLA World Library and Information Congress 2021 entitled *German Libraries and Agenda 2030: How Libraries Contribute to the Sustainable Development Goals (SDGs)* by Nathalice Bezerra Cardoso discusses the role of German libraries in promoting sustainable development. The research described addresses German librarians' awareness of the SDGs, which SDGs are most pursued, and whether German libraries have any partnerships with other institutions to carry out projects or programmes. The results from a survey of 691 respondents from different library types in Germany showed that while 53 % of librarians working in German libraries were aware of the SDGs, 47 % had no awareness of them at all (Cardoso 2021).

Five years after the adoption of the SDGs, almost half of German librarians were unaware of the goals of the 2030 Agenda. How could this be? Cardoso observed in a later interview:

> I believe that three factors are responsible for low levels of awareness regarding the SDGs. The first one is the lack of continuing education. Another factor is that many colleges do not include the theme in their undergraduate Library Science courses. And a third point is the lack of communication… We know that many institutions do not have sufficient financial resources for their staff's continuing training or to pay for the costs of participations in events or congresses. Quite often, only one employee is chosen to attend, and that is usually the head of the library. And, unfortunately, there are still people who attend important events and courses but do not share the knowledge with the other members of the institution – the knowledge is not passed on to others and remains stagnant (Cardoso 2022).

Cardoso's analysis corresponds to that of EBLIDA:

> The crucial point for the successful implementation of SDGs is librarians' awareness. Their level of awareness has certainly increased, but activities in libraries are still lagging behind (EBLIDA 2022, 24).

The DBV has adopted various initiatives since 2015 to position libraries as socially relevant partners in achieving the SDGs (DBV n.d.b) and it is difficult to understand why the most recent official publication *Libraries in Germany 2023* does not include a single word on the contribution of libraries to the SDGs (DBV 2023).

Spontaneous Survey on Education for Sustainable Development (ESD) Projects in Libraries

To provide context to this chapter, a voluntary survey on ESD was undertaken by the author in January 2024. It was addressed to the international mailing lists relating to IFLA and ENSULIB including Standing Committee members. The questions asked were:

- Does your library have a UNESCO ESD project in place?
- If yes, what is the focus of the project?
- Is your project documented on the web?
- Does your country have a website on the UNESCO ESD programme, documenting the efforts on ESD by libraries? and
- Are there any awarded ESD projects run by libraries in your country?

Feedback was received from 37 libraries/library institutions in 20 countries:

- Africa: Botswana, Nigeria (2), Uganda
- Asia: Bhutan, China, India (2), Iraq, Malaysia, Pakistan (2), Philippines, Sri Lanka
- Europe: Germany, Greece, Italy, Norway, Portugal, Serbia, Spain (11), Turkey
- North America: Mexico, and
- South America: Colombia

Few answers showed evidence of ESD projects:

- Does your library have a UNESCO ESD project in place? Yes: 11 out of 37 (China, Germany, Pakistan, Portugal, Spain (7)
- Is your project documented on the web? Yes: 10 out of 37 (China, Germany, Portugal, Spain (7)
- Does your country have a website on the UNESCO ESD programme, documenting the efforts on ESD by libraries? Yes: 4 out of 20 countries (China, Germany, Portugal, Spain), and
- Are there any awarded ESD projects, run by libraries, in your country? Yes: 4 out of 20 countries (China, Germany, Portugal, Spain)

The results show relatively strong interest in the subject of the survey. Few were able however to report ESD initiatives and programmes. Some asked for further information on the subject in the future.

Although the UNESCO ESD programme was not addressed directly, the survey brought to light examples of library projects aligned with ESD. Projects in China, Germany, Portugal and Spain were highlighted:

- China, Hangzhou Library Environmental Branch: a social cooperation model and a series of green-themed activities, such as "Travelling with Garbage," educate and raise awareness among citizens about climate change, environmental protection, garbage classification and global warming (中国图书馆学会/Zhōngguó túshū guǎn xuéhuì/Library Society of China 2022)
- Germany, Universitätsbibliothek/University Library Freie Universität Berlin: ESD in the dual training programme for library employees (Wagner 2023)
- Portugal, Biblioteca Municipal Camilo Castelo Branco/Municipal Library Camilo Castelo Branco: Projeto ODS: Juntos Mudamos o Mundo (SDG Project: Together We Change the World); digital books with the winning stories of the creative writing contest – tODoS por um mundo melhor (All for a better world) (Biblioteca Municipal Camilo Castelo Branco 2024)
- Spain, Centro de Extensión Universitaria y Divulgación Ambiental de Galicia/Domingo Quiroga Environmental Documentation Center (CEIDA): SDGs are addressed in all actions, including a broad programme of environmental education activities and promotion of green reading (CEIDA 2024)
- Spain, Diputació Barcelona/Barcelona Provincial Government, documentation centres of the network of project Parcs i biblioteques... naturalment!/*Parks and Libraries*, to explore the natural and cultural heritage of the area through documentaries, lectures, workshops and guided tours provided by the public libraries of the municipalities (Barcelona Diputació 2024)
- Spain, Red de Centros de Información y Documentación Ambiental del Estado español (RECIDA)/Spanish Network of Documentary and Environmental Information which involves more than 150 documentary centres, environmental libraries, and natural areas and focuses on the 2030 Agenda for Sustainable Development (RECIDA 2024)
- Spain, Biblioteca de la Universidad de Zaragoza/University of Zaragoza Library (BUZ). BUZ aligns with the plans of IFLA and with the University of Zaragoza to achieve SDGs, which are reflected in various initiatives (Universidad de Zaragoza n.d.) and
- Spain, Centro de Investigación y Tecnología Agroalimentaria de Aragón/Agro-Food Research and Technology Centre of Aragon (CITA): *Mensajeros de la Salud Global/Messengers of Global Health* is an educational project within the context of global health and with the main objective of awakening interest among primary school students (CITA 2024).

When comparing the survey's responses with the earlier analysis of VNRs, the LMW and the IFLA Green Library Award, it is evident that Portugal responded to the survey, its VNR refers to library contributions to the SDGs but Portugal did not submit an SDG story to the LMW. On the other hand, China, Germany and Spain

responded to the survey, submitted SDG stories from China, Germany and Spain to the LMW and participated successfully in the IFLA Green Library Award competition.

The paucity of survey results and the limited country involvement makes it clear that libraries and library associations still need to be encouraged "to draw on the examples shared in their own engagement with governments, both around VNRs and wider sustainable development planning and implementation" (IFLA 2023b, 10).

Conclusion

In conclusion, libraries serve as pivotal contributors to the United Nations' Sustainable Development Goals (SDGs) and address a multitude of sustainability challenges through their provision of information access, literacy support, and community engagement. Functioning as exemplars, educators, and enablers, libraries manifest their commitment to sustainability in three fundamental ways:

- Showcase sustainable building techniques and services, embodying ecofriendly practices in their physical infrastructure and operations
- Actively promote understanding and action around sustainability within their communities, fostering awareness and engagement among patrons, and
- Support innovative research endeavours focused on sustainability, thereby contributing to the generation of new knowledge and solutions.

Although libraries are not formal education providers in the traditional sense, their importance for lifelong learning, independent decision-making and cultural development is recognised in the *IFLA-UNESCO Public Library Manifesto*: "The public library, the local gateway to knowledge, provides a basic condition for lifelong learning, independent decision-making and cultural development of the individual and social groups" (2022, 1). The fact that libraries play a vital role in improving outcomes across the SDGs, is increasingly recognised and appreciated outside the library sector:

> A common mission among libraries is to ensure that all people have access to education and lifelong learning opportunities. Libraries provide free access to books, internet and WiFi, research materials, test preparation resources for those seeking a GED or college admission, libraries of things that include everything from musical instruments to museum passes, makerspaces, computer training and more (Ross 2021).

It can no longer be ignored that libraries have long since outgrown their traditional role solely as repositories of books and other materials and providers of the world's culture and heritage. With the growing awareness of the importance of environmental sustainability and as institutions with a societal mission, it is natural for libraries and librarians to address the urgent societal challenges of today (IFLA 2018).

However, libraries in many countries must become aware of their own potential (Wyber 2021) and communicate their roles as socially relevant partners in education for sustainable development more strongly. As non-formal education providers in the community, libraries are explicitly invited to contribute to education for sustainable development.

> Non-formal education and informal learning, including intergenerational lifelong learning taking place in the community, provide learners with critical opportunities to relate them to the realities that concern them and to be influenced to take the necessary actions (UNESCO 2020, 58).

A systematic examination of a larger number of case studies would provide a more complete picture of this area of activity in libraries. A next research step could be the development of guidelines in the field of education for sustainable development in libraries, followed by methods and techniques for assessing library activity in the area and the societal impact of libraries' responses to the UNESCO Education for Sustainable Development programme. Sustainable development should be viewed as a core component of Library and Information Science (LIS). Environmental education should be a new area of research in LIS, with the Whole Institution Approach considered as a specific research field.

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2 Library-led Education for Sustainable Development: A Paradigm Shift

Abstract: In an era characterised by the urgent need for sustainable development, libraries have undergone a profound transformation from passive repositories of information to dynamic hubs for education and community engagement. This chapter explores the multifaceted role of libraries in driving sustainable development education, emphasising the changing paradigm in their approach. The authors begin by elucidating the concept of sustainable development and its relevance in today's world, setting the stage for the pivotal role libraries play. Libraries have evolved into inclusive educational centres that provide access to diverse resources and offer information literacy training to empower individuals in navigating sustainability-related information. Through collaborative partnerships, libraries extend their reach and impact, ensuring that sustainability education is accessible to all, regardless of socio-economic status or cultural background. Despite challenges such as limited resources and the digital divide, libraries are resilient in their pursuit of sustainable development goals. Even though they actively advocate for funding, bridge the digital divide through digital inclusion initiatives, invest in staff development, and engage communities to raise awareness about their sustainability programmes, there is still much to be done. Through practical recommendations and best practices, librarians, educators, and policymakers can harness the full potential of libraries as catalysts for sustainable development education. Libraries emerge as dynamic agents of change, fostering inclusivity, equity and a collective commitment to a more sustainable future. This chapter showcases the evolving role of libraries as vibrant contributors to the pursuit of sustainable development, shedding light on their transformative journey from repositories of information to engines of societal change.

Keywords: Sustainable development; Information literacy; Sustainability; Digital divide

Introduction

The world is witnessing a substantial wave of technological progress, especially in information and communication technologies (ICTs), genomics and advanced materials. These technology clusters are positioned to herald a fresh era emphasising the conservation of resources (Jeremić and Sachs 2014). In an era characterised by

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https://doi.org/10.1515/978-3-11-133646-6-003

unprecedented environmental challenges, economic disparities and social inequalities, the pursuit of sustainable development has emerged as a paramount global goal. Education for sustainable development (ESD) empowers learners to meet life and career demands, contribute to sustainability, and make informed decisions. Achieving the United Nations Sustainable Development Goals (SDGs) requires commitment from educational leaders to adapt curricula and engage teaching staff in transformative changes (Garcia et al. 2017; Oe, Yamaoka, and Ochiai 2022; UNESCO 2020). Therefore, the UNESCO ESD programme is designed to emphasise the importance of achieving a balance among the social, economic, and environmental (SEE) aspects of sustainable development, often referred to as the "triple bottom line" (Kopnina and Meijers 2014).

ESD also seeks to transform the entirety of activities constituting the ecosystem within educational institutions, be it schools, universities, or beyond. This entails addressing learning modules, research, operations and communication concurrently, with the goal of extending ESD to realms beyond traditional educational structures (Ssosse, Wagner and Hopper 2021). In recent years, sustainable development has emerged as a prominent global agenda. It involves the process of structuring society in a way that ensures its long-term existence. Education has played a crucial role in advancing sustainable development, evident in the various initiatives and strategies implemented by world leaders (Abera 2023). ESD is an interdisciplinary field that delves into the intricate interconnections and cycles within the world. It underscores the wealth and beauty found in the diversity present in the world, as evidenced by sustainability in both nature and society (Oe, Yamaoka, and Ochiai 2022). Sustainable development, as defined by the United Nations, encompasses the harmonious integration of economic prosperity, social equity and environmental stewardship to ensure a better quality of life for present and future generations (United Nations n.d.).

Bini Okiy (2003) argued that achieving sustainable development is contingent upon establishing a knowledge-based society where information is deemed essential, comparable to lifeblood. Information plays a crucial role at every juncture of development. Achieving this ambitious vision requires not only a fundamental re-evaluation of our societal norms but also a transformation in the way individual are educated and empowered to contribute meaningfully to a sustainable future. In the face of transformations in the educational landscape, even within emerging nations, the essential role played by libraries and their instructional resources has not waned (Oyetola and Adio 2020, 154).

Libraries play an essential role in helping people reach their full potential and expand their horizons in terms of awareness, interests and abilities (Shukla, Singh, and Mishra 2013). Academic libraries operate within a rapidly evolving environment and actively contribute to it. Identifying and adapting to ongoing changes

is a significant and constant challenge, to which libraries in the higher education context must continually respond (Pinfield, Cox, and Rutter 2017). The fact that academic libraries and librarians operate in various environments, catering to different target groups, clearly indicates the broad opportunities for them to support diverse SDGs. The scope of academic libraries' encompasses a wide range of players and targets, emphasising the versatile role they play in promoting sustainability (Unegbu, Immaculata, and Emuchay 2023). Libraries commonly function as central hubs for multiple academic departments, facilitating connections across various fields of study. Furthermore, the wellbeing of libraries is closely tied to peace, as they originated in societies characterised by stability and tranquillity. Any disturbance of this peace poses a threat to libraries (Panda and Das 2022, 129).

Throughout history, libraries have played a crucial role in facilitating access to information, fostering literacy and promoting lifelong learning (Imel and Duckett 2009, 183; Saunders 2009, 99). However, in today's context, their mission extends far beyond these traditional functions. Libraries are now at the forefront of initiatives aimed at raising awareness, disseminating knowledge and advocating for sustainable development principles (Townsend 2014, 21). As libraries embark on their journeys, it is essential to acknowledge the interconnectedness of sustainable development and education. Education is not merely a conduit for the transmission of knowledge; it is the cornerstone of societal transformation. SDE represents the integration of sustainability principles into the entire spectrum of learning, from formal education institutions to informal community settings. Libraries, given their unique position as accessible community hubs, are poised to be catalysts for this transformative educational journey (Berryman and Sauvé 2016, 104; Vladimirova and Le Blanc 2016, 254). Education and digital literacy are essential to promoting sustainability. They can trigger changes in society by encouraging behaviours associated with socio-technical transition but in the context of emerging economies this also presents a problem given the widening digital gap (Dovleac et al. 2023).

The 2030 global education development plan, aligned with SDG 4, strives for "inclusive and equitable quality education and lifelong learning opportunities for all" (UNESCO 2016). Vital to the success and relevance of education is the adoption of innovative pedagogies that cultivate inquiry and intellectual stimulation. Opting for an empowering teaching approach is crucial for the meaningful contributions of the next generation to their nation's development (Tahir, Rasool, and Jan 2022). Ensuring education for everyone involves promoting greater flexibility and adaptability to meet the varying needs of students, fostering collaboration in the process. A culture of inclusive education is built on embracing inclusive values and incorporating these principles into both school policies and practical applications. This entails being open to flexible learning arrangements and adjusting the responsibilities of teachers accordingly (Ferguson et al. 2018). Inclusion entails narrowing the

wealth gap between the affluent and the underprivileged, abolishing discriminatory laws, and establishing social safety nets to foster equality.

Narrowing the gap extends beyond basic social protection measures geared solely towards preventing individuals from falling below the absolute poverty threshold (Gupta and Vegelin 2016). Social inclusion refers to the process of providing individuals at risk of poverty and social exclusion with the means and opportunities required to actively participate in economic, social, political and cultural areas of life and attain a standard of living that is deemed typical in their society. The objective of social inclusion is to amplify involvement in decision-making processes that influence lives and to secure access to fundamental rights (Atkinson et al. 2002). In the pursuit of sustainable development education, libraries hold a unique position as inclusive and equitable educational hubs. They are not just repositories of information; they are gateways to knowledge that should be accessible to all, irrespective of socio-economic status, cultural background, age, or physical ability. The inclusivity of libraries is highlighted as they provide the connection of knowledge between individuals at local and international level (Krolak 2006) and achieving inclusivity and equity in library-led educational initiatives is fundamental to the advancement of the SDGs.

This chapter explores the multifaceted ways in which libraries have embraced their pivotal role in advancing sustainable development education, marking a paradigm shift that resonates with the evolving needs of society. First, the concept of sustainable development and the pressing global challenges that make it imperative are elucidated. Next the traditional roles of libraries are examined as is the way in which they have adapted to the changing landscape of information and education. Challenges and barriers that libraries encounter in their quest to lead sustainable development education are also discussed, along with strategies to overcome them. The importance of inclusivity and collaboration in library-led initiatives is also emphasised. In essence, the paradigm shift from libraries as passive repositories to active drivers of sustainable development education marks a pivotal moment in the history of library science and education. Libraries are poised to become the vanguards of change, inspiring and equipping individuals to be stewards of a sustainable future.

The objectives of this chapter include:

- Explaining the concept of sustainable development
- Explaining the role of libraries in sustainable development
- Highlighting the paradigm shift of libraries from repositories of information to dynamic hubs for education and community engagement, emphasising the changing paradigm

- Exploring the role of libraries in promoting information literacy skills that are crucial for understanding and critically evaluating sustainability-related information
- Addressing the challenges libraries face in their efforts to lead sustainable development education and propose strategies to overcome these obstacle, and
- Providing practical recommendations and best practices for librarians, educators, and policymakers interested in harnessing the potential of libraries for sustainable development education.

The authors employed secondary data already published on the subject to construct the chapter.

The Concept of Sustainable Development

Sustainable development is a multifaceted and often-used term that encapsulates a fundamental approach to societal progress. At its core, sustainable development seeks to address the pressing global challenges of our time by integrating economic growth, social equity, and environmental stewardship into a harmonious and balanced framework (United Nations n.d.). Sustainability pertains to upholding a desired condition where the essential environmental functions supporting human life and wellbeing are preserved for the future. Sustainable development involves the process of realising and maintaining this state. These definitions emphasise the requirements for continuity (Maude 2012). One foundational aspect of sustainable development is its emphasis on economic prosperity. It acknowledges that economic growth is essential for improving living standards, reducing poverty, and providing access to necessities (World Commission on Environment and Development 1987). However, sustainable development goes beyond traditional economic metrics and strives for an economy that not only generates wealth but also distributes it equitably among different segments of society (United Nations n.d.).

An inclusive economic approach ensures that no one is left behind in the pursuit of a better quality of life. Sustainable development is a widely-embraced objective endorsed by the international community with the aim of preserving humankind's existence. While there are various interpretations and explanations of sustainability, the overarching goal is consistent: to safeguard the earth's limited resources for the benefit of future generations (Akter, Haq, and Uddin 2024, 133).

Another crucial dimension of sustainable development is social equity. It recognises that development must be socially just, with opportunities and benefits accessible to all, regardless of gender, age, ethnicity, or socio-economic status

(World Commission on Environment and Development 1987). Gardner and Roseland (1989) argued that the worldwide audience has placed its expectations on sustainable development as a remedy for pressing environmental and societal issues, addressing situations where conventional practices have proven to be ineffective. According to Trudeau (2018), incorporating social equity into sustainable development practices requires the involvement of an organisation that promotes social equity, uses tactics that give social equity top priority early in the development process, and provides the necessary material and discursive resources to support this goal.

In this context, sustainable development seeks to eradicate poverty, reduce inequalities and promote social cohesion (Mestrum 2003). In summary, sustainable development represents a holistic approach to societal progress that integrates economic growth, social equity and environmental stewardship. Sustainable development involves a dynamic process characterised by elevating resources, defining investment directions, concentrating on technological advancements, and coordinating the efforts of diverse institutions. This concerted approach aims to enhance the potential for fulfilling human needs and desires (Vare and Scott 2007). While the concept of sustainable development has evolved over time, its core principles and objectives have played a significant role in fostering more mindful behaviours attuned to environmental limitations. This is why the concept has been embraced in various realms of human activities (Tomislav 2018). It envisions a world where prosperity is shared by all, where social justice prevails, and where natural resources are managed responsibly for the benefit of current and future generations. The SDGs reaffirm the support for the continual global endeavour towards sustainable development through education (United Nations 2015). This understanding of sustainable development provides the foundational framework for libraries as they play a pivotal role in educating and empowering individuals to contribute to the achievement of the SDGs.

The Role of Libraries in Sustainable Development

Libraries provide opportunities for self-education, offering access to knowledge and information. They are hubs for intellectual recreation and a source of enlightenment, providing preserved knowledge that enriches mental perspectives and elevates habits, behaviour, character, taste, attitude, conduct and outlook on life (Shukla, Singh, and Mishra 2013, 35). Libraries have historically held a central position in society as repositories of knowledge and information. However, their role has undergone a profound transformation in recent years, driven by the impera-

tive of sustainable development. To understand the contemporary role of libraries in sustainable development, it is crucial to appreciate their multifaceted contributions. The main components of sustainable development are knowledge and information acquisition, dissemination and application (World Bank 1998). Since libraries are not in the business of selling books but rather focus entirely on the lending of books the very idea of libraries is a sign of sustainability (Beutelspacher and Meschede 2020). The widespread accessibility of information, facilitated by the presence of ICT, plays a vital role in promoting sustainable development and enhancing the wellbeing of people worldwide and underscores the key role of libraries in furnishing information for development (Bradley 2012).

Libraries play a crucial role by providing access to information facilitated by ICT tools, promoting utilisation, and visibly contributing to resource conservation, thereby supporting the realisation of SDGs (Dey 2023). Academic libraries are essential for cultivating information literacy skills in students. Effective results stem from moving beyond traditional models, to collaborating extensively with and within educational institutions at various levels. Integration seamlessly embeds information and library services throughout the entire education system, with library staff providing expertise in teaching information literacy. Ongoing improvements in instructional methods cater to diverse student needs. Support for different education levels underscores the academic library's dedication to lifelong learning (Kiviluoto 2015). Librarians play a central role in granting access to information and knowledge, which is a fundamental component for sustainable development. Through the provision of information, libraries have the potential to serve as catalysts in the pursuit of the SDGs (Nworie et al. 2018). Making a library sustainable not only involves the design and renovation of physical buildings but also improvements in daily operations. Sustainable libraries also contribute to community education about responsible environmental practices and they hold a unique position as a community role model through the implementation of sustainable strategies and practices (Binks et al. 2014, 301).

Sustainable development hinges on mitigating information poverty, a task in which all types of libraries play a significant role, but in which community libraries in developing nations should be highlighted. These rural hubs play a vital role in combating global social exclusion, providing essential information and knowledge to empower disadvantaged communities for sustainable development (Mia 2020). Libraries are pivotal in disseminating knowledge related to sustainable development. They provide access to a wide array of resources, including books, academic journals, government reports and multimedia materials, all of which contribute to a comprehensive understanding of sustainability issues (Andrew and Ibraheem 2022; Cholin 2005). Libraries have evolved from passive repositories of information to active agents in the pursuit of sustainable development (Jain and Mutula 2008;

Makotsi 2005). Libraries play a vital role in disseminating knowledge, promoting sustainability literacy, and fostering community engagement (Bennett 2003). To contribute actively to the attainment of SDGs, including SDG 4, Quality education, libraries must receive financial backing from their parent institutions to upgrade facilities, especially digital platforms, and to deliver comprehensive services encouraging individuals to engage critically with sustainability concepts (Nworie et al. 2018).

Libraries also contribute to sustainable development through their physical spaces and operations. Gupta (2020) mentions that libraries achieve sustainability through green designs, practices and technologies. Many libraries have implemented ecofriendly measures, such as energy-efficient lighting and recycling programmes, while also promoting environmentally conscious behaviour among patrons. Many libraries emphasise practices such as efficient printing, recycling, waste reduction, and exploring alternative technologies to prioritise environmental sustainability through green initiatives (Singh and Mishra 2019). As proposed by Jankowska (2010), establishing a framework based on principles, standards and practices is essential to advancing academic libraries' ecofriendly operations. Collections, resources and services ought to take precedence over physical structures in this framework. Developing green library sustainability metrics is key, but should be considered holistically, and extend beyond the mere assessment of vendor policies or recycling initiatives. For example, metrics should consider all the ways in which green library practices and services diminish the carbon footprint, along with the negative environmental impacts of emerging technologies. While libraries can exemplify sustainable practices through green building methods, it is recognised that establishing a new green library or converting an existing one is complex and expensive and may not always be feasible (Afacan 2017; Khalid and Batool 2020).

Library initiatives that contribute to the promotion of environmentally sustainable practices represent a valuable step towards improving the overall lifestyle of society (Singh and Mishra 2019). Using social networking sites and the internet, librarians produce ecofriendly blogs, periodicals, and open access journals focusing on environmental issues. These platforms function as channels for the dissemination of academic environmental research, the sharing of ecofriendly practices, and the exchange of ideas on sustainable solutions. The large numbers of people accessing online resources demonstrate their popularity and serve as encouragement for libraries to embrace sustainable practices and explore novel concepts to make library communities ecologically conscious (Jankowska 2010). Green library initiatives inspire global implementation of ecofriendly ideas, positioning libraries as pivotal agents of environmental stewardship and role models for a sustainable future (Shimmon et al. 2017).

The Paradigm Shift: Libraries as Dynamic Hubs for Education and Community Engagement

Traditionally, libraries were perceived as static repositories of information housing vast collections of books and reference materials. Libraries and information centres engage in diverse activities to conserve traditional knowledge, such as collecting and managing documents, recordings, microfilms, and digital assets. These efforts aim to enhance the accessibility of traditional knowledge for future generations (Dangi and Saraf 2017). Libraries reinforce social norms and ideas by serving as knowledge repositories that preserve and disseminate discoveries from a variety of fields. Digital libraries lack the intellectual atmosphere and tangible appeal of traditional libraries, even though they offer convenient access, efficient search functions, and a wealth of linked materials. The aesthetic experience of holding a book and the intellectual ambiance found in traditional libraries cannot be replicated digitally (Abbas and Faiz 2013).

Amid technological, social and economic shifts, information professionals continue to play a crucial role in meeting evolving user needs. Alongside major technological shifts, traditional roles have evolved, giving way to the emergence of new responsibilities (Vassilakaki and Moniarou-Papaconstantinou 2015). The transformation is particularly evident in libraries' transition from passive repositories to dynamic hubs for education and community engagement. Some contend that a transformative shift is essential within the public library sector. Rather than being limited to acquiring, organising and delivering information materials, public libraries are urged to transcend their traditional role. The conventional function of the library as an intermediary for information and a hub for book transactions is undergoing change. Public libraries are increasingly evolving into dynamic "creative community hubs" fostering social connections, and serving as arenas for active participation, collaborative creation, and learning experiences (Bitter-Rijpkema, Verjans and Bruijnzeels 2011; Johnstone, Choi, and Leong 2016). Libraries, seen as empowering and democratising entities, extend their impact by taking on roles beyond information provision. As influential social institutions, libraries are transforming into global socio-cultural and capacity-building hubs, actively engaging with local communities (Ashraf 2018). Caspe and Lopez (2018) delineate three principal goals in equipping librarians for community and family engagement: disseminating information to families and communities, developing interpersonal skills, and forming a professional mentality that is oriented towards assisting the families to whom they cater. The importance of ensuring young people feel involved in local library and the community is also critical to continued societal engagement, and should be acknowledged by library professionals.

Libraries play an important role in helping young people find free, educational engagement opportunities that meet their interests (Reid and Howard 2016). Given that libraries continue to be crucial for education and intellectual freedom, to remain relevant they must modernise for the 21st century. Digital technologies alter information access and societal interaction. In redesigning library services, prioritising societal needs is essential, especially in enhancing engagement, communication skills and social identity development for the younger generation (Vasileiadou 2018). Libraries in institutions of higher learning have seen a dramatic transformation, going from mechanised or physical to virtual spaces that make use of social networking sites and the internet, with the goal of increasing the academic community's access to library services and resources (Rath 2018). The changing paradigm reflects the adaptability and responsiveness of libraries to the evolving needs of their communities. They have shifted from passive institutions to active contributors to the educational, cultural and social fabric of society, making them indispensable assets in the pursuit of sustainable development.

Promoting Information Literacy: Libraries' Crucial Role in Sustainable Development Education

Emphasising the advancement of education and the eradication of illiteracy stands as a robust approach to fostering development and social empowerment. A central focus of libraries should be the support of universal access to education. Policies concerning ESD should highlight the critical role of digital literacy (Adedokun 2018). Information literacy is an indispensable skill in today's information-rich world, especially when it comes to understanding and critically evaluating sustainability-related information. Information literacy represents individuals' advanced awareness and effective use of information to enhance their lives. Public access to information empowers informed decision-making, fostering improvements in various aspects of life. Communities with greater information access are better positioned to tackle poverty, reduce inequality, enhance agriculture, provide quality education, and support wellbeing in health, culture, research and innovation (Doyle 1994; Wallace, Shorten, and Crookes 2000, 485).

Libraries can and should play a role in the educational process, guiding students to enhance their information literacy skills as an asset for future success (F. Ajegbomogun and V. Ajegbomogun 2015). Samantaray (2017) states that information literacy is the aptitude of citizens to engage meaningfully in society by finding, evaluating, and ethically using supplied information. Information literacy involves effectively identifying information needs, locating, evaluating, proficiently using,

applying and creating information within diverse cultural and socioeconomic contexts.

Information literacy empowers individuals and groups by fostering learning, critical thinking and interpretative abilities. Information institutions constitute knowledge gateways and are crucial for cultivating information-literate communities capable of developing creative, sustainable solutions (Svärd 2022). Libraries have taken on a pivotal role in promoting information literacy, equipping individuals with the skills necessary to navigate the vast landscape of sustainability data, research and resources. Bawden and Robinson (2002) assert that information literacy and related literacies, including digital literacy, mediacy and informacy, involve understanding, skills and attitudes across various levels when dealing with information in different formats and situations. The broad scope of these concepts implies that training needs to be extensive, diverse and tailored to specific contexts.

To help students with both the theoretical and practical components of research, libraries are collaborating to develop an instructional assistance framework. By encouraging dialogue, active participation and feedback to guarantee positive and successful experiences, this model helps students integrate information literacy throughout their learning journeys (King 2016). With an emphasis on providing services, recognising user requirements, and providing solutions, modern libraries have evolved into knowledge centres and continuous educational facilitators. By providing knowledge on topics such as welfare, jobs, ongoing instruction and regional history, they help the community realise its full educational potential (Krolak 2006). In the context of sustainable development, where access to accurate and reliable information is paramount, libraries play a pivotal role in equipping individuals with the information literacy skills necessary to navigate the complexities of sustainability-related data and research.

Challenges and Strategies for Library-led Sustainable Development Education

While libraries have made significant strides in promoting SED, they encounter various challenges in their mission. Recognising and addressing the challenges is essential for ensuring the continued effectiveness of libraries as drivers of sustainability education. Some common challenges are outlined and strategies to overcome them suggested.

Challenges

Inconsistent Services

Limited networking between academic libraries and library professionals together with insufficient and inconsistent staff training are major barriers to academic libraries' ability to provide consistent information services for the accomplishment of the SDGs (Okuonghae and Igbinovia 2019).

Limited Resources

The primary challenges in establishing an environmentally-friendly library revolve around the awareness and comprehension of librarians regarding the fundamental principles of a green and sustainable library. Librarians' awareness of sustainability issues should already be embedded in LIS training. Additionally, the matter of securing financial support from the overseeing authority further compounds these obstacles (Athulya and Thanuskodi 2022). Libraries often face budget constraints, which can impede their ability to acquire relevant resources and implement educational programmes (Krolak 2006).

Digital Divide

Ensuring access to digital resources and technology can be challenging, especially in underserved communities that may lack internet connectivity or devices. Bertot (2003) posited that unequal access to computers and the internet has exacerbated the digital divide; however, while access is important, it might not be the best measure of social or technological equality. It is more appropriate to think of access as a complex idea that encompasses not just computer and technology access but other factors like economic circumstances, literacy in information technologies, and telecommunications networks. Access to information implies having the necessary tools, skills, and opportunities to find, retrieve, and understand information, which is crucial for participating effectively in a digitally connected society.

Changing Information Landscape

Krolak (2006) noted that access to modern information technology was among the most enticing library service in industrialised nations. The continuing rapid evolu-

tion of technology and information sources requires constant adaptation of library services and related training for library staff. Libraries must transform from their conventional function as information repositories and providers to become active participants in the creation and application of knowledge in the local community. New activities include marketing, publishing, research, providing instruction, working together and actively advancing knowledge development, and new knowledge is required as well as an awareness of sustainability issues which have become crucial (Cheng 2001).

Awareness and Engagement

The goal of sustainable development is to address the most important issues facing humanity today and in the future. Realising the promise of sustainable development necessitates a societal transition (Hopwood, Mellor, and O'Brien 2005). While libraries have a clear role to play in supporting the shift, some communities may not be aware of, or fully engaged with, library-led sustainability initiatives, limiting their impact. Librarians must help address environmental challenges without compromising economic development and living standards. Librarians can promote awareness and employ communication strategies to reduce the environmental burden (Dada 2021). To promote understanding, facilitate information exchange, and enable collaborative coordination to accomplish the SDGs, rural libraries and relevant state agencies must strengthen their community connections (Mansour 2020).

Carbon Footprint

Swift digital and technological progress has rendered current library infrastructure obsolete, contributing significantly to the global carbon footprint. Overcoming challenges tied to traditional practices and resistance to change is crucial for effective long-term sustainable development planning. Libraries' carbon footprint is influenced by their digital and physical holdings. Physical collections have a noticeable environmental cost related to the production, storage and distribution of books and printed materials which directly increase carbon emission (Afacan 2017; Fallik, Soper, and Sparks 2012; Wolfe 2012).

Strategies and Recommendations

Strategies to remove or mitigate obstacles are crucial to gaining immediate benefits and ensuring enduring positive change.

Carbon Footprint

Carbon calculation enables the comparison of negative climate impacts, identification of relevant emission sources, and, most importantly, allows the library sector to make evidence-based decisions about how to reduce its climate impact by implementing necessary actions (Sonkkanen 2022). Information can be shared with library communities as a learning opportunity about how others might take similar actions.

Advocacy for Funding

Librarians and library advocates can engage in active efforts to secure funding for sustainability education programmes and resources. Increased funding is necessary to sustain new, sustainability-related education and operational costs.

Digital Inclusion Initiatives

Libraries can collaborate with local government and community organisations to bridge the digital divide by offering public Wi-Fi, lending laptops, and providing digital literacy training.

Ongoing Professional Development

The excellence of a library service is determined by the professional competence of its staff, and proficiency is influenced by the quality and relevance of training received. There is a pressing need is to invest in the professional development of library staff to keep them updated on sustainability, and emerging technologies and information sources.

Community Outreach

Targeted marketing and outreach campaigns must be developed to raise awareness about library sustainability programmes, and to engage community members in sustainability education initiatives. Fostering engagement with individuals willing to contribute support in different capacities is essential. Working in partnership with others, libraries can serve as a platform for sustainable development outreach programmes, and reach interested parties who, while willing, may previously have had limited engagement with library initiatives (Athulya and Thanuskodi 2022). These strategies demonstrate that while libraries may face obstacles in their quest to lead sustainable development education, proactive measures, collaboration and resourcefulness can help them navigate and overcome these challenges effectively.

Libraries play a pivotal role in advancing sustainable development education. To maximise their impact in this area, it is essential for librarians, educators, and policymakers to adopt practical recommendations and best practices. These strategies can help ensure that libraries effectively contribute to the dissemination of knowledge and skills necessary for sustainable development. UNESCO emphasises the importance of participatory teaching and learning methods which empower learners to take action for sustainable development.

> When teaching and learning methods are chosen for a specific setting, they have to match the needs of the learner group (e.g. based on age, prior knowledge, interests, abilities); the context in which the learning takes place (e.g. space in the curriculum, pedagogical climate, cultural traditions); and the resources and support available (e.g. teacher competencies, teaching materials, technology, money (UNESCO 2017, 54).

Libraries must take the first steps in providing exceptional library services, and understand the requirements of the community, positioning services carefully so that users may quickly access them and the information resources they need. Librarians must be prepared to interact with the community on their terms and fill in any service gaps (Stamatoplos 2009). Professionals working in libraries should educate themselves on sustainability, comprehend it, and involve the community in their work (Athulya and Thanuskodi 2022). Libraries should be seen as community hubs that actively contribute to sustainable development within their regions.

Open Educational Resources

Open Educational Resources (OER) are digital research, teaching, and learning resources or materials that are made publicly available or distributed under an open license. Usually without charge, these resources are openly available for use,

modification, and sharing. In the realm of open education (OER), librarians should clearly define a service model specifying the support they can provide. Giving due consideration to staffing and workload, the integration of open pedagogical practices has the capacity to enrich student learning and enhance the visibility, sustainability and appreciation of educators' dedicated work (Carter and Santiago 2023).

Collaboration and Partnership

Libraries can be most effective in supporting ESD by fostering collaborations with educational institutions, non-profit organisations and government agencies. Krolak (2006) also argues that effective information sharing requires cooperation among diverse providers within a country, spanning governmental and non-governmental entities, the media, corporate businesses and the publishing sector. In countries where the publishing industry is not well established, unpublished content holds significant value for the public, particularly when it is in harmony with the objectives of national development. Partnerships can lead to shared resources, joint programming and expanded outreach efforts, enhancing the reach and impact of sustainability education initiatives.

Digital Literacy Training and Workshops

To support sustainable development, libraries must provide digital literacy training programmes to help users navigate online resources effectively. Library workshops and training sessions must focus on information literacy skills, including critical evaluation of sources and engage in seminars, workshops and conferences dedicated to the discussion of SDGs (Gopalakrishnan and Kalpana 2015). Library users must be able to discern credible and reliable sustainability-related information.

Accessibility Initiatives

Library spaces, resources and technologies must be inclusive and accessible to individuals with disabilities (American Library Association 2024) and ensure that everyone can participate in sustainability education.

Tailored Programmes

Libraries must tailor educational programmes to cater to the diverse needs of the local community and match offerings to the age, cultural background and interests of library users when designing sustainability-focused programmes.

Promotion of Sustainability Literacy

Libraries can actively promote sustainability literacy by organising events, book clubs and discussions focused on sustainability topics to encourage community engagement in dialogue and learning around sustainable development.

Advocacy for Sustainable Practices

Libraries can lead by example in sustainability practices, such as energy efficiency and responsible resource management and advocate for sustainable practices in library operations, encouraging others to follow suit.

Evaluation and Assessment

To determine the effectiveness and impact of sustainability education initiatives, libraries must continuously evaluate them and use client feedback and data to refine programmes and ensure they remain relevant and effective.

Policy Support

Policymakers must be encouraged to recognise the pivotal role of libraries in sustainable development education, to support libraries in their sustainability initiatives and to allocate resources accordingly.

Conclusion

Libraries play a crucial role in supporting SDGs by providing access to diverse resources and serving as inclusive educational platforms. Librarians recognised

as essential partners contribute significantly beyond their traditional roles (Panda and Das 2022, 129). Libraries have evolved into versatile spaces offering access to academic knowledge, digital literacy education, and virtual and physical resources. Libraries contribute to promoting inclusivity and equity and to reducing the digital divide. Libraries empower individuals to contribute to sustainability. Libraries and librarians must be resourceful and clear about their motivation, adopting exemplary behaviour themselves, and contributing proactively to the global sustainability agenda (Mathiasson and Jochumsen 2022). Governments at all levels must be involved in guaranteeing the seamless incorporation of libraries and information centres into local and national initiatives. Libraries and information centre require adequate financial backing from both governmental bodies and parent institutions to support activities (Abata-Ebire, Adebowale, and Ojokuku 2018).

The recommendations made in this chapter highlight the need for continued support and improvement of libraries as vital community institutions. By tailoring programmes, providing multilingual and culturally sensitive resources, ensuring physical and digital accessibility, conducting outreach efforts, and offering affordable resources, libraries can actively work to make sustainable development education accessible to all members of their communities. Through implementing the practical suggestions made and adopting best practices, libraries, educators and policymakers can harness the full potential of libraries as catalysts for SDE. Libraries will continue to serve as vital educational and community hubs, promoting a more sustainable and equitable future.

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Rossana Morriello

3 Data Information Literacy for Sustainable Development with a Special Focus on Italy

Abstract: Today's information context has become more complex, with information becoming increasingly disaggregated and granular while at the same time continuing to grow exponentially along with massive expansion of data. Everyone lives in a data society, and citizens are required to be data literate. Whether intended for simple data management activities or for managing data in applications of artificial intelligence (AI), data literacy is crucial for sustainable development from many perspectives. Firstly, data literacy is key for understanding and monitoring the United Nations Sustainable Development Goals (SDGs) and targets by collecting and analysing data. It is essential for any citizen living in today's data society to understand the impact of the complexity and to be aware of the data every person makes available through digital interactions. The results of understanding the implications of releasing and using data are improved well-being and solid social relations. Library education must address the need for librarians to be data- and information-literate which enables them to understand, measure, and contribute to the correct use of data in sustainable development.

Keywords: Data literacy; Information literacy; Climate change; Sustainability; Italy

Introduction

Today, the information context has become more complex. Since the advent of the semantic web, information has become increasingly granular and disaggregated, with data in particular produced and presented for detailed segmentation and analysis. Today's society is data-driven and citizens are required to be data-literate.

The American Library Association (ALA) has emphasised the importance of data literacy basing its approach on a definition of data literacy developed by the Oceans of Data Institute:

> The data-literate individual understands, explains, and documents the utility and limitations of data by becoming a critical consumer of data, controlling [one's] personal data trail, finding meaning, and taking action based on data. [One] can identify, collect, evaluate, analyze, interpret, present, and protect data (ALA 2024).

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https://doi.org/10.1515/978-3-11-133646-6-004

The impact of artificial intelligence (AI) is making its mark and the International Federation of Library Associations and Institutions (IFLA) has addressed various concerns. The *IFLA Statement on Libraries and Artificial Intelligence* declares that libraries need to offer algorithmic literacy to library users to help them understand how artificial intelligence (AI) works, as well as appreciating the ethical, copyright, and diversity and inclusion issues involved with AI (IFLA 2020, 2–3).

Whether intended for comparatively simple data management activities or for managing data for AI applications, data literacy is crucial for sustainable development from many different perspectives. Firstly, data literacy is essential for understanding and monitoring the United Nations Sustainable Development Goals (SDGs) and targets (United Nations n.d.) by collecting and analysing data. As stated by the United Nations (UN), "to fully implement and monitor progress on the SDGs, decision makers need data and statistics that are accurate, timely, sufficiently disaggregated, relevant, accessible, and easy to use" (United Nations 2017).

Citizen science is an instance where data literacy is extremely important as members of the community become more engaged in observing and monitoring the environment. Citizen science is a term commonly used to describe projects in which volunteers collect data intended to be used in organised scientific research. However, the activities that are part of citizen science can become more extensive and complex, going beyond mere data collection, and grouped under an umbrella term (Morriello 2021, 34). The structure of Agenda 2030 is based on the use of data for the purposes of planning, monitoring and evaluating, both at the national and sub-national level, the current state and advancement of the SDGs (Thinyane 2017; United Nations 2024). As established by the UN, data for assessing goal achievement must be the official data supplied by national statistical agencies. However, there are many opportunities for citizens to help fill gaps in the data necessary to establish official indicators, ensure the monitoring of progress on the goals, and raise awareness in communities. Citizen science allows for the rapid collection and processing of large quantities of data across extensive geographic areas where there are not enough official data, and potentially on a global scale (Morriello 2021). For example, citizens can help collect data about rain, heat, and the presence of certain insects that are useful for studying climate change (Morriello 2021, 42). The UN is exploring possible ways to use citizen science in pursuing the SDGs.

In 2017, the UN created the Citizen Science Global Partnership, a network of networks that primarily involves the three major associations dedicated to citizen science, the European Citizen Science Association, the American Association for Advancing Participatory Sciences, and the Australian Citizen Science Association, confirming the significant role of citizen science. Various national policies such as the *Green Paper Citizen Science Strategy 2020 for Germany* (Bonn et al. 2016) identify sustainable development as a privileged domain for citizen science activities.

Numerous projects and studies have examined citizen science and its relationship to the SDGs. One comprehensive study mapped citizen science against the SDGs and determined that citizen science could cover 33% of the 244 indicators of the 2030 Agenda, and was already contributing to SDGs 15 "Life on land", 11 "Sustainable cities and communities", 3 "Good health and well-being", and 6 "Clean water and sanitation" (Fraisl et al. 2020). Another study of citizen projects in relation to the SDGs (Moczek et al. 2021) referred to Schleicher and Schmidt's German study (2020) which confirmed the importance of citizen science to SDG 15, and also included SDG 4 "Quality education" and SDG 13 "Climate action" (Moczek et al. 2021, Paragraph 2). Librarians can help train citizens to collect data for all the SDGs correctly, raise awareness for data collection and use, and thereby increase and enhance participation in citizen science projects (Morriello 2021, 42–43).

Data literacy is a crucial issue for all citizens living in today's data society. Data literacy ensures people understand the implications of the complexities associated with creating and using data and the need for vigilance in ensuring that data made available and released through digital activities is used appropriately. The knowledge required includes appreciating ethical implications, being aware of different applications and uses of data, recognising the importance of data security, privacy and intellectual property, and conforming to laws and regulations. Data literacy in libraries is related to diversity, equity and inclusion (DEI), and social justice, ensuring "no one is left behind", "the central, transformative promise of the 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs)" (United Nations Sustainable Development Group 2024). Libraries can offer data information literacy to any user without barriers.

The first question that the profession of librarianship must answer is whether librarians are data-literate enough to understand, measure, and contribute to the correct use of data in sustainability themselves, and the second question is whether they are able to teach data information literacy for sustainable development to citizens. If not, what kind of education and training must be provided to librarians so that they can assume the important role of imparting data literacy to members of their communities?

This chapter discusses the issues in data information literacy, commencing with a general overview of the concepts of information literacy related to data followed by a framework for organising data literacy for sustainable development in libraries. The chapter focuses on the Italian context based on data collected from a survey of librarians.

Literacy for Sustainable Development

It is not necessary to explain in this chapter what sustainable development and sustainability are and what the two concepts imply for libraries. The website of the IFLA Environment, Sustainability and Libraries Section (ENSULIB) is a valuable reference for this information (IFLA ENSULIB n.d). However, the concept of literacy needs, particularly in relation to sustainability, is explored. Literacy needs are not limited to just knowledge. Knowing about issues central to sustainable development is not enough for people to be considered sustainability-literate. Rather, "Literacy… is a collection of skills that allow for effective participation and influence in diverse areas of social life" and "Sustainability literacy … is the ability to act on that knowledge" (Stibbe and Luna 2009, 11).

For sustainability, there must first be an understanding of the need for systemic thinking, which involves thinking on a large scale not only about the community but also the whole planet. An underlying principle of the United Nations 2030 Agenda for Sustainable Development (United Nations n.d.) is, primarily, a question of intergenerational justice, so that future generations can benefit from resources available and live on the planet. Unfortunately, they will not be able to benefit from the same resources available to previous generations, as many have been extensively consumed and wasted, leading to the current situation of crisis. Nevertheless, actions must be taken now to ensure that future generations can live with sufficient resources.

Any one of the seventeen SDGs in the 2030 Agenda is, therefore, a collective issue, not a single or private one. Achieving the goals is possible only through collective action and cooperation. Understanding sustainability literacy and the crucial aspect of the need for collective action by the community to meet the targets of the SDGs is vital and must be at the very core of information literacy activities in libraries. Each of the SDGs is interwoven with the others. For example, in considering climate change and the environment, Goal 13 "Take urgent action to combat climate change and its impacts", it is crucial to ensure awareness, knowledge and action, because none of the other SDGs can be realised in an unliveable environment.

As emphasised by the UNESCO *Education for Sustainable Development: A Roadmap*, education is a key enabler for the achievement of the SDGs:

> General Assembly Resolution 72/222 (2017) noted ESD as 'an integral element of SDG 4 on Education and a key enabler of all the other SDGs', while Resolution 74/233 (2019) reinforced this by calling upon countries to enhance their ESD implementation (UNESCO 2020, 16).

The ways in which the inclusion of education for sustainable development (ESD) in instruction programmes at any level can enable meeting the Agenda 2030 issue are also outlined in the roadmap:

> ESD raises the awareness of the 17 goals in education settings
> ESD promotes critical and contextualized understanding of the SDGs
> ESD mobilizes action towards the achievement of the SDGs (UNESCO 2020, 16).

The principles underlining UNESCO guidelines refer to the network relations between all goals, and the necessity to respond both at an individual level of knowledge and action and at a structural level with a reorganisation of societal systems. Education means ensuring people are able to think critically and consequently equipped to react appropriately in terms of adaptation and mitigation. The more widespread ESD is, the greater the positive impact particularly through transition from the individual level to the societal level.

Climate change effects are primary disruptive factors and should be at the very centre of education programmes.

> 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).

It is easy to understand how climate change can be a factor of disaggregation of communities for many reasons. Locally, the consequences of extreme events have a major impact on people who are already vulnerable due to socioeconomic status, gender, age, and other factors. Climate change is a cause of migration, with an increasing number of people moving from regions or countries at higher risk to other regions or countries. Migration movements necessitate integrating communities, which is a task where libraries can contribute. However, climate change also has less visible and measurable consequences linked to mental health and well-being, ranging from the impact of socioeconomic threats such as the loss of one's home in a flood, for example, to emotional issues associated with loss of family and friends through migration. Climate change also affects the capacity to adapt and react to climate change effects.

The World Health Organization (WHO) defines mental health as:

> Mental health is a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn well and work well, and contribute to their community. It is an integral component of health and well-being that underpins our individual and collective abilities to make decisions, build relationships and shape the world we live in. Mental health is a basic human right. And it is crucial to personal, community and socio-economic development (WHO 2022).

The United Nations Intergovernmental Panel on Climate Change (IPCC) states that:

> Mental health impacts are expected to arise from exposure to extreme weather events, displacement, migration, famine, malnutrition, degradation or destruction of health and social care systems, and climate-related economic and social losses, as well as anxiety and distress associated with worry about climate change (*very high confidence*) (IPCC 2023, 1).

Information literacy for sustainability entails understanding the whole system, including all direct and indirect implications and consequences, and being aware of how each single action and each person is linked to others and to the whole system by countless relationships. The sum of the relationships is what makes up the system, society, and the planet, and appreciating its complexities has been called "ecological intelligence," which is the ability "to understand the impact of actions on the ecosystems that support life" (Stibbe and Luna 2009, 12), as a counter to "ecological alienation" which is "the feeling that human beings exist independently and separately from an external 'environment'" (Stibbe and Luna 2009, 15).

The Need for Data Information Literacy

Data literacy and data information literacy are often treated in the scientific literature as if they were equivalent. It is necessary and important to distinguish between data information literacy and other forms of literacy, such as data literacy, statistical literacy, and information literacy. Data literacy implies understanding what data means, including how to read graphs and tables appropriately, how to draw correct conclusions from data, and how to recognise when data are used in misleading and inappropriate ways. Statistical literacy is the ability to read and interpret statistics in graphs, reports, tables, studies, statements and analyses (Carlson et al. 2015, drawing on the work of Schield 2010). Another area of necessary skills in modern society is scientific literacy, which is linked to the world of data and to sustainable development. The *UNESCO Science Report*: *The Race Against Time for*

Smarter Development (UNESCO 2021) has addressed various issues. In the report, Schneegans and Nair-Bedouelle pointed out that:

> Scientific literacy is not the same as science literacy. The latter focuses on the acquisition of scientific or technical knowledge for practical application, in order to train the next generation of scientists, engineers and technicians… Scientific literacy, on the other hand, targets the wider population. It seeks to impart the scientific way of thinking, to equip people to approach problems from an analytical perspective (Schneegans and Nair-Bedouelle 2021, 18).

Science literacy pertains to a limited group of people, scholars who deal with science professionally, or those about to embark on a scientific career. Scientific literacy, on the other hand, concerns the entire population, from children to the elderly, and aims to teach a scientific method of reflection and approach to information, based on analysis, observation, experimentation, and the research of primary sources. Teaching scientific literacy involves explaining that there are possible nuances. Nothing is really certain or black or white (Schneegans and Nair-Bedouelle 2021, 18). Knowledge about how science works must be spread and shared; people must understand the scientific method, which is based on doubt and uncertainty rather than certainty.

The scientifically literate can understand the scientific method in all nuances, and the need to use primary sources, original first-hand documents or records, while the scientifically illiterate contemplate only certainties and accept any piece of information or data presented as truth. A lack of appreciation of the scientific method is the basis for the proliferation of fake science, fake information, misinformation and disinformation. The *UNESCO Science Report* was released as a response to the infodemic that overlapped the Covid-19 pandemic, during which much fake information was mixed with scientific and quality information.

One must think critically and seek appropriate primary sources before accepting information or data as valid and understand that data analyses may be distorted due to exploitation or subjectivity, particularly if they are sourced from social networks.

> Whereas definitions of data, statistical, and information literacy focus on the consumption and analysis of information, the production of information is often overlooked in literacy instruction. DIL, then, merges the concepts of researcher-as-producer and researcher-as-consumer of data products. It builds upon and reintegrates statistical, information, and science data literacy into an emerging skill set (Carlson et al. 2015, 15).

Information literacy includes information in any media. Data information literacy refers to a specific format in which information is conveyed. Data information literacy combines the concept of literacy referring both to people as producers of data and to people as users of data. Both are fundamental issues for human-data interac-

tion, which is the overall analysis of people's interactions with the data ecosystem and described by Mortier et al. (2014) in terms of legibility, agency and negotiability:

> *Legibility*, concerned with making data and analytics algorithms both transparent and comprehensible to the people the data and processing concerns …
> *Agency*, concerned with giving people the capacity to act within these data systems, to opt-in or to opt-out, to control, inform and correct data and inferences …
> *Negotiability,* concerned with the many dynamic relationships that arise around data and data processing … (Mortier et al. 2014, 6).

All three competencies are crucial for personal well-being and solid social relations in regard not only to big questions but also to everyday action and participation in society, because to put it very simply, "without data, one is not able to make meaningful informed decisions" (Oyelude 2022, 5). Ensuring that library users gain all three competencies is a central consideration for libraries.

Therefore, data information literacy unites data literacy and information literacy and encompasses a series of competencies, knowledge, and cultural approaches in libraries. Many aspects must be included in data information literacy programmes for libraries:

- Data collection and acquisition: understanding data sources and knowing where and how to collect reliable and relevant data, including scientific research, governmental reports, and open data; being able to distinguish verifiable information from fake news
- Data analysis and interpretation: ability to use statistical tools and methods to analyse data, including tools for data visualisation, ranging from basic ones such as Excel to sophisticated analytical instruments; skills in creating and interpreting graphs, maps, and other visual tools to represent data clearly
- Critical thinking: the ability to evaluate data sources, the quality of data, the usefulness of data for particular needs, methodologies, and the validity of conclusions
- Data organisation: techniques for structuring and storing data effectively
- Data quality assurance: determining and ensuring the accuracy, completeness, and reliability of data
- Data communication: ability to communicate findings through reports, presentations, and dashboards by means of data visualisation tools; storytelling using data to tell compelling stories that highlight sustainability issues and solutions, raise public awareness about sustainability issues and inspire collective action
- Ethical use of data: issues related to privacy and confidentiality, as well as copyright and intellectual property, both in collecting and using data, and
- Transparency and accountability: the use of open data, open-source software, and open platforms.

The last aspect mentioned relating to the openness of data and information is vital and highlights the important connection between freely shared and openly accessible knowledge and sustainable development (Sharma et al. 2016, 629), particularly in relation to data literacy. Opening access to information ensures inclusion and supports achievement of the SDGs. The importance of open access to data is recognised and stated as essential by the European Union (EU), through the implementation of many projects such as "Open Data Day" which promotes open data for advancing the SDGs (EU 2024). Other initiatives include CKAN, an open source tool for housing open data portals, which has been approved by the Digital Public Good Alliance for inclusion in the Digital Public Good Registry as a public good. CKAN is now officially recognised as a data management system that is helping to tackle nine of the seventeen SDGs identified by the United Nations (Open Knowledge Foundation 2023). As already mentioned, sustainable development is a collective issue and requires collective action. Therefore, openly shared information, data, and experience can play a key role in disseminating the ecological intelligence necessary to achieve an effective reversal in behaviour and policies of socio-economic development (Leal Filho et al. 2023; Magro 2015).

Data information literacy for sustainable development empowers communities by equipping them with the knowledge and tools required to participate actively in sustainability efforts, both in terms of adaptation and mitigation. According to the European Environment Agency:

> **Adaptation** means anticipating the adverse effects of climate change and taking appropriate action to prevent or minimise the damage they can cause, or taking advantage of opportunities that may arise. **Mitigation** means making the impacts of climate change less severe by preventing or reducing the emission of greenhouse gases (GHG) into the atmosphere (European Environment Agency 2024).

Both actions require data, which is essential for planning to prevent and minimise damage, and for understanding how each person can contribute to reducing greenhouse gas emissions.

Data information literacy is essential for everyone. Individuals can directly participate in collecting and processing data through citizen science projects as mentioned earlier in this chapter (Morriello 2021, 41–43). Libraries already conduct many citizen science projects and are always well connected to their communities. They function as institutions that operate closely with their communities and are the most widespread institutions across national territories. Additionally, libraries reach people outside formal education paths, such as schools and universities. For this reason, libraries can and must serve as a bridge between the attainment of the SDGs and citizens, and between data information literacy for sustainability and citizens.

To achieve the desired outcomes, data information literacy and sustainability literacy must be integrated into library and information science educational curricula at all levels, including training for librarians. Education in data and software skills for library professionals is well-established, with, for example, Library Carpentry, an evidence-based collection of approaches for teaching computer skills and concepts from The Carpentries community, becoming part of the skill set taught to librarians (Seidlmayer, Müller, and Förstner 2020). Simultaneously, ESD is gaining prominence in school and academic teaching, extending to more idealistic approaches that help people imagine a different world based on alternative economic and social models, as seen in the practice of ecopedagogy (Misiaszek 2020).

Both theoretical and practical approaches are important and must be central to sustainability literacy (Hauke 2018, 2), and to data information literacy. Data information literacy for sustainability pertains to all types of libraries and all people, including teens and youths who are particularly interested in the future of the data society and will experience the increasing role of data in their lives (Bowler, Acker, and Chi 2019). Greening schools is one of the pillars of the UNESCO Education for Sustainable Development programme (UNESCO 2024), which includes not only greening school curricula but also improving teacher competencies for sustainability. It is reported in the UNESCO programme that only 20% of teachers know how to act on climate change issues. Data information literacy supports taking such action.

Consequently, data information literacy must become a fundamental topic in ESD. Librarians must themselves be data information literate in relation to sustainability and the topic should be a basic requirement in their education and training as sustainability becomes an increasingly pressing issue. Only if librarians are aware of, and educated in, these issues can they effectively educate others by organising workshops, seminars, and training sessions for students, professionals, and community members.

Library activities, particularly those focused on information literacy and digital literacy including data, play a crucial role in equipping people with the digital and information skills required to access and use relevant data and information. ALA has defined both data literacy (ALA 2024a) and digital literacy (ALA 2024b). ALA's Digital Literacy Taskforce describes digital literacy as "the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills" (ALA 2024b). Digital literacy seeks to eliminate the digital divide and/or reduce the gap and ensure access to information for everyone, regardless of country or socio-economic status. Data information literacy is crucial in today's data-driven society. Both digital and data information literacy are essential in envisioning a different society, which "leaves no one behind".

Literacy for Sustainable Development in Italy

Italy has experienced recent tragic extreme events. In 2023, the Emilia-Romagna and Tuscany regions were affected by floods which destroyed some libraries and consequently a part of national memory and identity. A particular example is the library of the city of Campi Bisenzio, near Florence, which was responsible for the preservation and national bibliography for children's and youth literature. All collections were destroyed by water. Experts warn that such extreme events will become more frequent.

Few Italian libraries have a risk and disaster management plan, and therefore few can effectively use data to prevent and manage risks and disasters. The Emilia-Romagna regional section of the Associazione Italiana Biblioteche/Italian Library Association (AIB) together with the AIB Osservatorio biblioteche e sviluppo sostenibile (OBISS)/Observatory on Libraries and Sustainable Development organised a course to help libraries prepare risk and disaster management plans (AIB 2024). The course content and details will be made available more widely. There is not currently in Italy a systematic treatment of approaches to managing the risk or recovery in the case of natural disasters and the shared approaches in the plans will be fundamental to the survival of library collections, both print and digital. At the heart of critical planning documents for preserving library collections is the necessity to collect, organise and use data to manage risk, limit damage in the event of a disaster, and implement recovery measures following a disaster.

Members of the community often help during disasters. During the great flood of 1966 volunteers called *angeli del fango* came to Florence to help save the collections of the Biblioteca Nazionale Centrale di Firenze/National Library of Florence which houses the production of the Bibliografia nazionale italiana (BNI)/Italian National Bibliography. Library users and members of the community helped again in 2023. People offering assistance in such circumstances must also be able to understand and use data. Issues in disaster management demonstrate a clear link between data information literacy and sustainable development, especially related to climate change.

Numerous connections between data information literacy and sustainable development have been observed. However, data information literacy for sustainable development is not a prominent issue in Italian libraries, nor in library science studies which presents dual challenges. Data information literacy programmes are not typically offered by libraries, especially public libraries. Data management activities are primarily associated with academic libraries. Many libraries provide courses on research data management, including instruction on preparing data management plans, which are often required for publicly funded projects (Morriello 2020, 9–11; Tammaro 2017). Some public and academic libraries are actively

involved in promoting sustainable development and offer literacy programmes in sustainability and digital literacy. But the competencies remain separate, and data information literacy is not adequately addressed. The literature on librarianship largely overlooks the need to engage with the data ecosystem, not only for students (Beauchamp and Murray 2016, 83) but also for all citizens.

In 2021, OBISS conducted a survey of Italian librarians to collect data about involvement of libraries in activities linked to sustainable development (Morriello, 2024). The results showed that only 30% of respondent libraries had organised activities linked to Agenda 2030. In recent years, however, awareness about the topic has increased at a general level and for libraries. Nevertheless, the libraries responding positively to the survey described the activities they organised within the scope of the UN Agenda and demonstrated a clear emphasis on sustainability literacy activities. The commitment to teaching sustainability included many topics, both theoretical and practical, like ecology and the environment, gender equality, inclusion and intercultural dialogue, human rights, the circular economy, health and medicine, energy saving, diet and nutrition, active citizenship and social participation. Data information literacy did not figure significantly in the topics listed as part of a commitment to teaching sustainability.

A further result of the survey showed many activities relating to digital literacy that libraries were offering to their communities. Digital literacy continues to evolve and must include data and data information literacy, given that the contemporary digital ecosystem is a data environment. However, none of the libraries in the survey mentioned data literacy in response to the question about activities organised for sustainable development which allowed an open answer. The failure to mention data literacy confirmed the lack of awareness about the role of data, particularly in achieving the SDGs. The need for data information literacy is scarcely perceived; there may well be a need to deepen knowledge among librarians about the role of data for sustainable development, and to introduce data information literacy as a basic skill and a specific requirement in a sustainability literacy programme.

The survey also revealed that many libraries collaborate with other institutions to organise activities for sustainable development. A significant 75.4% of respondent libraries reported collaborating with one or more other institutions, with schools being the majority at 42.9%, followed by cultural associations at 39.4%, and other public institutions at 30.8%. Many libraries, 38.1%, focused their activities on children and teens often in collaboration with schools. The findings highlight that the priority audience for data information literacy, as stated by UNESCO, namely young people and students, can be effectively reached by libraries, especially when they cooperate with schools and teachers.

Establishing a common ground between libraries and schools, and librarians and teachers, could address the gap in data information literacy for sustainable development, particularly with young people who constitute the next generation who must grapple with the consequences of climate change and the challenge of achieving the SDGs. The collaborative efforts between libraries and schools can play a crucial role in equipping young people with the necessary data information literacy skills to understand, analyse, and address sustainability challenges effectively.

Conclusion

Information literacy for sustainable development must teach a holistic approach that encourages understanding of the complex interdependencies in natural and human systems. In other words, it must teach global citizenship and promote a sense of responsibility and stewardship towards the planet and humanity. In today's data-driven society, a holistic approach includes the information circulating as data.

Data will increasingly be used by humans and machines, with significant impacts on human lives. Artificial intelligence (AI), particularly generative AI, is the latest advance in technology but will certainly not be the last. While the future of AI cannot be predicted, it can be confidently stated that data will play an essential role. AI has the potential to advance sustainable development significantly by providing innovative solutions to complex problems, optimising resource use, and enhancing decision-making processes. AI can help achieve the SDGs and create a more sustainable future. However, it is crucial to ensure that AI is used ethically and equitably, with careful consideration of potential risks and unintended consequences. An ethical and equitable future data society is possible only if people fully understand the value, implications, risks, and opportunities of data and its use, both for AI and other applications. Young people are the future leaders and managers of society and data information literacy must start with them. Data information literacy is a critical skill for advancing sustainable development. Equipping individuals and communities with the ability to understand and utilise data will enhance decision-making, foster innovation, and drive meaningful action towards achieving the SDGs. Education, access to resources, collaboration, and technology will build a data-literate society capable of addressing complex sustainability challenges.

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Martha Lerski

4 Arts-based Sustainability: From New York to Malawi

Abstract: Recognizing that libraries serve multiple constituencies and subject areas, this chapter documents and advocates for development of transdisciplinary arts-based research (ABR) and culture-related projects linked to environmental challenges. Libraries contribute collections and spaces, as well as the research of library and information scientists. Libraries are currently among invisible contributors to sustainability planning and services. The chapter will link this invisibility to the value of what visual arts refer to as negative space elements in subjects ranging from traditional ecological knowledge to environmental science. Library collections, projects, and research contribute to education for sustainable development (ESD) as required to achieve the United Nations Agenda 2030 Sustainable Development Goals (SDGs). The ABR methodology combines principles of creative arts in the realms of research or interventions which allows for input from multiple methodologies, epistemologies, content areas, and geographies. The ABR methodology is adaptable and can be used with mixed methods, individual or group data gathering or creation, discussion, and/or metaphorical thinking to support investigations of problems, the identification of new patterns, and interpretation. Respectful of stakeholder consent and engagement, libraries can support co-created content knowledge. These endeavors align with UNESCO's roadmap for *Education for Sustainable Development* (2020). Arts methodologies can provide paths for libraries to include marginalized or vulnerable populations in documentation of, and access to, environmental knowledge.

Keywords: Arts – research; Climate change; Cognition; Cultural heritage; Education for sustainable development; Sustainability – research

Introduction

Art and culture are avenues to understanding. Whether in public, elementary school, or academic realms, libraries, through their collections, conservation techniques, or programming, promote documentation, cultural inclusion, conservation, and access to cultural heritage information. Library efforts align with the United Nations Sustainable Development Goals (SDGs) (United Nations n.d.a) in ways

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https://doi.org/10.1515/978-3-11-133646-6-005

which may be ahead of other educational sectors' holistic understandings of environmental sustainability. UNESCO's roadmap for *Education for Sustainable Development* (ESD) notes that "ESD is mostly associated with teaching of scientific knowledge on environment" which "is not enough to bring the transformative power of education to its full force" (UNESCO 2020, 9).

By including a range of topics, languages, and worldviews in their collections, libraries and archives enable cross-disciplinary discovery which may foster improved understandings of environmental challenges documented in vast scientific literature (Hausfather et al. 2022; Miller et al. 2021) and increasingly in the humanities and social sciences. Libraries internally face learning and adjustments to the status quo that individuals and society at large encounter as processes of growth. For instance, multicultural collecting particularly in relation to Indigenous or traditional languages, epistemologies or customs, and inclusive or adaptive metadata have not always been the norm (Alberts, Khalala, and Molefe 2011; Gosart 2021; Littletree, Belarde-Lewis, and Duarte 2020; Mhlongo and Ngulube 2018; Montenegro 2019). As virtual and physical spaces which practice dynamism and learning, libraries model resiliency and ESD pathways.

There is a growing awareness that cultural heritage and the arts are significant in relation to climate change initiatives and the environment (Climate Heritage Network 2023; Convention on Biological Diversity n.d., 2019; Lerski 2022a). Arts-based methods can be employed in research as well as in projects. ABR's creative arts approaches can be used for specific tasks such as data gathering or idea generation, or as a framework for investigating or interpreting gaps in knowledge or understanding. The methodology can be combined with other research practices, and can support inquiry by individuals or groups.

Libraries can support events or projects to facilitate research on SDGs locally and beyond. Among such initiatives is the engagement of local communities in documenting intangible and biocultural knowledge (Lerski and Puluputu Mwale, forthcoming; People's Archive of Rural India (PARI) n.d.); arts-based research (Leavy 2018; Mhlongo and Ngulube 2018); citizen science (CS) (Cigarini et al. 2021; Vohland et al. 2021); metadata creation and evolution (Artese and Gagliardi 2020; Hou and Wang 2019), and proposals for mechanisms to provide library perspectives or open access and reciprocal sharing of diverse knowledge (Fedorowicz-Kruszewska 2023; Hansen et al. 2021; Lerski 2022a, 2022b).

This chapter considers why and how libraries employing arts-based research (ABR), the arts, living heritage (UNESCO n.d.b) and creative processes might involve communities in identifying biocultural knowledge to encourage local agency in conserving and considering worldviews relevant to climate change (Hanspach et al. 2020). As living heritage is a model for fluidity, the chapter investigates how

holistic epistemologies inclusive of arts might contribute to advancements in adaptation understandings, imaginings, planning, and practices.

Beyond their physical and electronic collections, libraries can engage stakeholders via knowledge co-creation; these services and activities take place in varied geographical locations representing rural, urban, and suburban communities. Libraries facilitating ABR can involve stakeholders in investigating or documenting local material, intangible, or biocultural heritage. Investigations of local traditions can contribute relevant knowledge towards climate mitigation or adaptation. Inclusion of communities' full range of outlooks and information involves hearing from those who are vulnerable. ABR methodologies can facilitate work with communities at risk (Coemans and Hannes 2017), and libraries can foster connection for those who are disadvantaged (Summers 2022).

Arts-based Research and Art as a Mode of Seeing

Philosophy of education scholar Elgin (2002) argues that art can act as a conduit to cognition. With ongoing divisions about, or absence of action by global citizens regarding climate change, and attendant challenges (Birchall and Kehler 2023; Bretter and Schulz 2023; Tyson, Funk, and Kennedy 2023), art and culture and libraries' support of avenues of thought and action are important to develop. Through multiple modes of representation "we gain capacities for enriching our understanding of phenomena" (Elgin 2002, 4). Art "challenges complacent assumptions, not just about matters of fact, but also about how problems and proposed solutions should be framed" (Elgin 2002, 12). Educational potential also exists in aesthetic-based research (Bresler 2018).

By more deliberately including arts and culture in sustainability work, libraries might also add to capacity for communication with individuals who do not accept, or who dismiss, scientific arguments. Geoscientist Hegerl argues that the question "do you believe in global warming" has been rendered meaningless, as climate modelling is physics, and therefore "not subject to belief systems" (Hegerl 2022, 1). Copernicus or Galileo may have imagined the same to be true until they, in their respective time periods, discovered that contemporary belief systems did not welcome their scientific discoveries. Today, many are not convinced by scientific arguments as evidenced during the COVID-19 pandemic (Priniski and Holyoak 2022; Rutjens, Van Der Linden, and Van Der Lee 2021; Rutjens et al. 2022). UNESCO's ESD program supports the enlistment of social and emotional learning (UNESCO 2019a, 2019b).

This chapter notes instances of how libraries from Serbia to California include arts in citizen science sustainability programming to meet the need for seeing the world and sustainability through multiple modes. The field of environmental science more broadly can integrate artistic perspectives among approaches envisioning solutions, along the lines of the perspectives presented in the book: *Global Views on Climate Relocation and Social Justice: Navigating Retreat* (Ajibade and Siders 2022).

In Malawi, a community-based organization, KEYS (Knowledge Elders, Youth, Share), (KEYS organization 2023), works to document traditional knowledge and heritage (Figure 4.1). Dance, music, and storytelling are among intangible heritage and arts traditions practiced and promoted to engage a local rural community in, and effectively share information (KEYS organization 2023; Lerski and Puluputu Mwale, forthcoming). Research has found that "appraising sociocultural representations of nature through Indigenous stories allows conservation practitioners to better understand traditional cosmological systems in relation to wildlife and landscapes, including cultural values attached to certain ecosystems" (Fernández-Llamazares and Cabeza 2018, 3).



Figure 4.1: KEYS members planting seeds to support community based organization, 2022. © Frank Puluputu Mwale

In Tanzania, the Makumbusho ya Taifa la Tanzania/National Museum of Tanzania (2024) documents not only the aesthetically-pleasing woven baskets from distinct locations such as the Morogoro, Iringa, and Njombe regions of the Eastern and Southern highlands of Tanzania, but also works to discover the associated artisanal intangible heritage traditions and local ecosystem knowledge. The weaving craft tradition is an example of a connection to the SDGs as it strengthens economic sustainability and the livelihoods of women, who are the main practitioners of the craft, and aligns with SDG aspirations. The librarian author of this chapter based

in New York City, and the Department of Ethnography of the museum memory institution Makumbusho ya Taifa la Tanzania/National Museum of Tanzania (2022) are collaborating to extend digital infrastructures, under GO FAIR (2021) and CARE (GIDA 2023) principles, for greater accessibility to the intangible and biocultural knowledge associated with the making of baskets. GO FAIR principles emphasise making data Findable, Accessible, Interoperable and Reusable. The Global Indigenous Data Alliance (GIDA) has added CARE principles for indigenous data governance which are people and purpose-oriented, and refer to Collective benefit, Authority to control, Responsibility and Ethics.

Art in the advancement of understanding also relates to a proposed database for biocultural knowledge (Lerski 2022a, 2022b). Gathering data is one thing, and may align well with Chat GPT capability, though it is not necessarily useful for synthesis or composing something new (Loh 2023; Newquist 2023). Artificial intelligence (AI) might go around in circles with data which have not all come from vetted sources and which fail to break into the empty spaces or knowledge gaps that have the capacity to provide insight and suggestions for solutions. "Metaphors are ad hoc expedients introduced to fill the gaps that literal language inevitably leaves" argues Elgin (2002, 6). How might library spaces and deliberate information science infrastructure facilitate discovery of relationships and sharing? This chapter presents questions for libraries to consider with regard to sustainability solutions.

A database for documenting and sharing biocultural heritage elements should, in this broadening spirit, be designed for interoperable and open access, with embedded rights protections to enable the linking of data and inferential searching. Such an approach would facilitate the kind of dynamic experiences and interactivity akin to the documentation of living heritage. In addition, an evolving database updated on an ongoing basis by academic and local stakeholders would promote a model of collaboration between the academy and communities and constitute an alternative to dust-gathering collections of isolated and under-optimized information packages, and at the same time support reciprocal sharing of academic ecological knowledge (AEK) and traditional ecological knowledge (TEK) (Lerski 2022a, 2022b).

Transformative Action through Informal and Community Education

Key elements within ESD include "transformative action" which "necessitates a certain level of disruption together with courage and determination" (UNESCO 2019b, Annex I, 2). This interpretation of transformation envisions an extension

beyond formal education to non-formal venues and approaches, social-emotional as well as cognitive learning, and education about community and citizenship. Individual transformation, inclusive of knowledge acquisition, experience, and critical analysis, can support compassion and solidarity (UNESCO 2019b).

Additional attributes frequently associated with the arts are deemed necessary for progress towards achieving SDGs. Inclusion of communities' full range of outlooks and information involves listening to voices which have often been suppressed or ignored, including members of minority or economically disadvantaged populations. Local and Indigenous worldviews are increasingly recognized as important to environmental understandings as well as to inclusiveness and social justice (Aktürk and Lerski 2021; Lerski 2022a; Normyle, Vardon, and Doran 2022; Nursey-Bray et al. 2022; Poole 2018). Libraries can facilitate inclusion of data from, as well as collaborative approaches practiced by, Indigenous peoples including the creation of "long term processes that allow the different implications of approaches to knowledge in relation to stewardship goals" (Whyte 2013, 1).

Are Libraries Equipped to Support Sustainability Goals?

In addition to climate-related institutional initiatives, such as enacting climate action plans to anticipate and prepare for impacts as suggested for New York public libraries (Tansey 2023), libraries participate in a range of sustainability initiatives The report by the International Federation of Library Associations and Institutions (IFLA), *Access and Opportunity for All: How Libraries Contribute to the United Nations 2030 Agenda* (2016), indicates that libraries support all SDGs, inclusive of the following practices:

1. Promoting universal literacy, including digital, media and information literacy and skills, with the support of dedicated staff
2. Closing gaps in access to information and helping government, civil society, and business to understand local information needs better
3. Serving as the heart of the research and academic community, and
4. Preserving and providing access to the world's culture and heritage.

Libraries are dynamic physical and virtual spaces, and evolve as communities needs change, as technologies progress, and as understandings of methodologies and epistemologies advance. TEK as well as local and Indigenous knowledge, often transmitted intergenerationally and orally, are valuable sources of environmental and cultural information. Libraries, along with other cultural institutions, galler-

ies, archives, and museums (GLAM) can work with communities to document and preserve TEK in ways that respect stakeholders' privacy, sharing, and acknowledging preferences and rights (Jacobs and Small 2024; Littletree, Belarde-Lewis, and Duarte 2020; Lerski 2022a, 2022b; Local Contexts 2024; Montenegro 2019). At a 2022 discussion session regarding a proposal for a database for biocultural knowledge, Native American participants shared ideas as well as concerns, and expressed interest in respectful and reciprocal conservation of cultural and ecological information and practices. Nursey-Bray et al. in referring to indigenous peoples caution that a lens of vulnerability and "romanticised ideas of resilience can be used to erase Indigenous agency and capacity to fully participate in decisions made about and for them" (2022, viii). Organizations such as the Institute for Tribal Environmental Professionals (ITEP) at the Northern Arizona University create libraries of conference materials, toolkits, and adaptation documents and videos, with cultural elements intricately embedded (n.d.). Such initiatives highlight libraries which are broad in scope, community driven and promote agency in the realm of sustainability actions.

Arts-based research and projects can facilitate sharing of knowledge and worldviews by engaging communities in sharing intangible and biocultural heritage traditions. At the United Nations Climate Change High Level Ministerial Dialogue for Culture-based Climate Action at the COP 28UAE in Dubai, the section's co-chair noted the "need to define key values and best practices for culture-based climate action [...] and the crucial application of Indigenous Knowledge Systems" (United Nations Climate Change 2023).

Writing in the *IFLA Journal* and noting the context of burgeoning information on the UN 2030 Agenda, Kosciejew (2020) observed that literature was still developing within the library science community and research and noted that the 1987 Brundtland report of the World Commission on Environment and Development identified information as a key element in sustainable development work (World Commission on Environment and Development 1987). "A lack of availability of and access to information results in barriers prohibiting full social and economic participation in society [...] Such a lack consequently inhibits and undermines efforts to sustainably develop the environment, economy and society" (Kosciejew 2020, 330). The resulting gap demands remediation; the recognition of the negative space provides pathways to prevention of slow-onset damages as well as future calamities. Art and culture can support community building and communication of information and ideas.

IFLA took up the call to provide further input into sustainability, including contributions to the post-2015 UN Agenda and the Lyon Declaration of 2014 (Kosciejew 2020). IFLA argued for connecting the various SDGs in line with libraries' diverse collections, professional expertise, and the representation of geographically and

intellectually heterogeneous communities. Pointing to Goal 11b of the SDGs which addresses disaster planning by cities (United Nations Environment Programme 2024), Kosciejew stressed that local libraries are centers of regional information and hold local knowledge (2020, 334). Both are particularly useful in assisting communities following disasters. Community-aware academic and special libraries, along with archives institutions might also have roles to play in supporting dissemination of place-specific information.

An example of action taken at a local level is work by a public library in Užice, Serbia, which actively engaged youth in workshops about sustainability. Librarians used games, visual art, and theater to educate and involve young people in developmentally appropriate ways. The use of recycled materials modeled sustainable approaches (Vučkovič 2018). The organizers stressed that the library's sustainability efforts were economically sustainable and within the capacities of existing personnel and that "such activities are organized with very modest means and do not require engagement of experts in natural science" (Vučkovič 2018, 152).

Looking to digital capabilities needed by individuals seeking high quality information, a 2022 study found that the public use openly shared scientific reports and data (Hicks et al. 2022). The finding supports the role of libraries in facilitating research processes, contributing technologies, emphasizing open access, providing know-how, and sharing open educational resources among local and global patrons. Far from the defeatist dismissals of efforts to provide scholarly or vetted resources to the public at large, the US study determined that "adults [are] motivated to seek out the most credible sources, engage with challenging material, use it to improve the services they provide, and learn more about the world they live in" (Hicks et al. 2022, 1).

With regard to protecting cultural and natural heritage, SDG 11: "Make cities and human settlements inclusive, safe, resilient and sustainable", Target 11.4 promotes the strengthening of efforts "to protect and safeguard the world's cultural and natural heritage" (United Nations n.d.a; United Nations Environment Programme 2024). SDG 4: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" focuses on educational contributions and brings to light opportunities for libraries to provide avenues, through collections, programming, as well as online resources and access, to "ensure inclusive and equitable quality education and promote lifelong opportunities for all" (Kosciejew 2020, 335). Observing gaps, Kosciejew noted an absence of efforts to address natural heritage, even though it, along with cultural heritage, is specified in SDG 11.4. SDG 11.4 includes a specific monitoring goal regarding expenditures towards supporting both cultural and natural heritage, "a new internationally comparable indicator that reflects the total per capita each country spends to protect

their cultural and natural heritage" (UNESCO Institute for Statistics 2023), along with detailed metadata to facilitate documentation of specified categories.

Promoting Inclusion in Conservation of Cultural and Biocultural Heritage

Transformation may involve expanding the definitions of library, or of the kinds of heritage and knowledge that libraries collect, conserve, or share. For instance, the digital People's Archive of Rural India (PARI) project is "a living archive of the world's most complex countryside" (PARI n.d.) documenting fading languages and intangible heritage traditions. Gardens such as the New York Botanical Garden preserve and educate the public about heritage traditions, including the African American Garden (New York Botanical Garden 2024). The previously mentioned community-based organization, KEYS, includes documentation of intangible and biocultural heritage as one of its sustainable development goals and strategies for intergenerational transfer of knowledge (Lerski and Puluputu Mwale, forthcoming) (Figure 4.2). Knowledge about drought-resistant crops, water management, using local flora to protect against flooding, and fire management practices are among biocultural traditions shared by different communities.



Figure 4.2: KEYS planning meeting. © Frank Puluputu Mwale

Libraries can partner with other GLAM institutions as well as with groups such as ENRICH (ENRICH n.d.) and Local Contexts (2024), which engage or represent marginalized populations in documenting and sharing environmental and cultural knowledge. Through digital linking capabilities and metadata systems, modern libraries and repositories can collect documents and artifacts; provide rights-documentation and tiered-access infrastructures; structure granular information about items to facilitate discovery; and make information accessible either physically on site or through digital versions.

Citizen science projects, supported by or co-created with libraries might be facilitated by collaborations between librarians from different sectors, such as public and academic librarians in a region. "Public librarians can provide support to citizens, while academic librarians can help with open science resources" and school libraries could also be involved in partnerships "to provide more learning experiences and relate data to real world examples" suggests Bridgeman (2023, 86) in a review of public library citizen science research. In making recommendations for library support services, Hansen et al. highlight strengths of academic libraries that might equally apply to citizen-driven cultural inputs. "Often CS projects depend strongly on data containing personal or sensitive information. Not all countries have legal, ethical, or insurance policies that encompass citizen scientists in contrast to what is the case for participants in academic research projects" (2021, 24). Along with existing capabilities for research data management facilitation, university and research libraries can educate users about ethical issues as well as advocate for optimal digital infrastructures and metadata to enable interoperability and FAIR practices for citizen science or art projects.

Libraries, as trusted institutions with social capital in communities (Horrigan 2016, 2018; Summers 2022; Wojciechowska 2020), may be able to engage with and represent communities in vital sustainability efforts. Tansey (2023) advocates for library integration into broader institutional, local, and larger governmental region climate action plans. There is also underexplored value in libraries facilitating the gathering of local knowledge to broaden and deepen understandings of ecosystems. Local knowledge may well describe place-specific ecosystem understandings and related cultural traditions as well as disciplinary ontological understandings. Without deliberate interventions to view other information, localized or subject-specific lenses may obstruct seeing or acknowledging differing worldviews (Yeh 2016).

Researchers analyzing perceptions of nature in over 60 languages argued that monolingualism and monoculturalism may deprive us of "rich discourses that encode what their speakers have learned about living sustainably in the local environment" (Coscieme et al. 2020, 38). Libraries should extend place-based community work in local languages as well as support global engagement of communities

in documenting, discussing, and sharing ecosystem knowledge to contribute to vital understandings. As an international library organization, IFLA might facilitate translations for broader sharing of sustainability perspectives and data.

Arts-based Projects to Support and Promote Sustainability

Libraries should consider paths beyond knowledge gathering and data collection, in line with the ESD 2030 recognition of a need to call upon the transformative power of education (UNESCO 2020). They might also develop and sustain programming promoting understanding of the environment and associated philosophical, economic, and social causes and possible solutions. Arts-based research and projects, along with the inclusion of traditional ecological knowledge and its practice of reciprocity, can contribute to increased local and global cognition regarding the drivers of, as well as interdisciplinary responses to, environmental challenges. ABR draws upon creative arts approaches throughout research processes including brainstorming, collection or creation of data or materials, inquiry description, or review (Leavy 2018).

Epistemic access falls within the purview of education. Education scholar Catherine Elgin was elected a Fellow of the American Academy of Arts & Sciences in 2023. The description of her in the Academy's membership directory states: "Recent work considers the question of what makes something cognitively valuable. Elgin has argued that the pursuit of understanding, rather than the pursuit of knowledge, should be the focus of epistemology's concerns" (American Academy of Arts & Sciences 2024). Aesthetics, along with science, is a sphere where "complex symbolization" need not "privilege literal, factual truths" (Elgin 2006, 215). Engaging individuals or communities in discovering, cocreating, documenting, or analyzing knowledge through art contributes to an arsenal of tools and epistemologies relating to sustainability. While art may manifest truths, aesthetic inquiry can, more importantly, facilitate discovery processes (Elgin 1993).

The Los Angeles Public Library has through its Neighborhood Science initiative facilitated urban nature drawing programs to assist the city's researchers with gathering data. Employing visual art, the programs aim to educate the public about recording or creation of research data (IFLA 2022; Los Angeles Public Library 2024). The library sponsors sustainability events which include sewing, zine making, the creation of local biodiversity maps, and photography workshops. The nature drawing program provided participants with tools including instructional context, supervision, colored pencils, sketchbooks, and a magnifying glass to engage them

actively in the citizen science projects to document and map local flora, fauna and fungi (Figure 4.3). The instructions guided participants through a scientific process of discovery first, broadly observing and sketching, and later focusing on observations and drawings through the magnifying lens. As this chapter illustrates throughout, art can be a driver of fresh conceptions or approaches, as well as a facilitator of scientific discovery.



Figure 4.3: Sketching biodiversity at Los Angeles Public Library's Neighborhood Science initiative. © Los Angeles Public Library

The previously mentioned public library in Užice, Serbia, recognized that environmental information, while abundant, was dispersed in that country, and "recorded by different sources and hence not always easily accessible" (Vučkovič 2018, 143) and envisioned its role as supporting the discovery, collection, storage, and accessibility of that information to its library patrons. The process of patrons creating artworks resulted in further activities such as puppet shows and fundraisers benefiting the library, a local children's hospital, and vulnerable members of the local community. In furthering the spirit of the interrelated nature of the SDGs, and to teach values through concrete acts, the library created workshops for young people "to support their creative upbringing, but also direct them to values such as empathy, friendship, love and joy through giving…[inclusive of displaying] understanding and compassion for those left without homes and livelihoods during the spring floods" (Vučkovič 2018, 147).

Rather than viewing arts or arts-based research as extras or less important to understanding than scientific data gathering, libraries should promote arts programming and research methodologies. Culture is gaining recognition among governmental, intergovernmental, and civil society as a critical factor in relation to combatting climate change. At the United Nations COP 28 meeting in Dubai, United Arab Emirates in 2023, representatives gathered "based on a shared conviction that climate change is not just an environmental issue but a cultural one too". The meeting called attention to global communities "at risk of losing their ability to preserve and benefit from their tangible and intangible culture" and the cochair noted the "need to create a path for integrating culture into climate policy for the future, as well as to raise awareness of culture's transformative powers to change behavior and imagination's ability to unlock creative solutions that can engage all members of society across all sectors" (United Nations Climate Change 2023). Building on a series of meetings beginning with the 2019 heritage-focused gathering at the United Nations meeting in New York (United Nations 2019), the COP 28 United Nations meeting's agenda was "to establish political momentum for an effective multilateral response to climate change" spurred by "the knowledge that culture is a unique resource to imagine, to communicate, and to realize a low carbon, climate resilient sustainable future" (United Nations Climate Change 2023).

Along with work by the Convention on Biological Diversity (2019 n.d.) and UNESCO (UNESCO Intangible Cultural Heritage n.d.a), groups such as the Climate Heritage Network (2023) and the Institute of Tribal Climate Professionals (n.d.) have called attention to the links between the environment and the arts, cultural heritage, and biocultural knowledge. The author of this chapter has proposed a database of biocultural knowledge, published on the topic and presented papers at conferences to engage with and seek library and information science and Indigenous stakeholder input respectively.

Epistemological Pluralism and Robust Discussion: Supporting Innovation

Where there is acrimony or division, libraries can facilitate stakeholder discussion about climate mitigation, or the sharing of cultural traditions. Libraries are spaces where digital and analog resources can inform novel ideas and decision making. Resources from broad fields of study, and the dialogue across epistemologies which they enable, can promote critical and contextualized understandings of the SDGs (Nightingale 2016).

Arts-based research is based in creative processes, which welcome questioning of entrenched perspectives. The value of alternate views, or dissent, is explored by Nemeth and Ormiston (2007) and Nemeth (2018). In one visual art, the process of drawing offers a challenge in relation to scientific discovery, a reconfiguring which "through the adoption of a dynamic view [...] deliberately capitalizes on the introduction of alternatives in order to keep the way of inquiry open" (Ambrosio 2023, 69).

Values are among topics explored in social-emotional learning, and robust consideration of perspectives need not close the door on consensus regarding shared standards or mores. In the context of a shared global challenge, the inclusion of a full range of ideas may add to a pool of approaches and contribute tools for addressing a wide range of challenges from drought to displacement. Arguing that "part of the reason dissent opens the mind is that it makes us question our positions". Nemeth has suggested that dissent prompts a pursuit for, and a contemplation of, more options. "Faced with an alternative conception of reality and a different way of thinking, we are brought closer to the kind of thinking we do when we are developing a position rather than defending or changing one" (Nemeth 2018, 133).

Research about the value of alternate perspectives supports the inclusion of nonconforming or divergent inputs in a manner aligning with arts-based discovery approaches. Similarly, ESD research indicates that more input from non-scientific, social, and emotional and behavioral learning fields is needed to reach sustainability goals (UNESCO 2020). Groups tend not to widen their pool of information because they opt for information which is commonly agreed among members, neglecting information that is unique to one or fewer members (Nemeth 2018). How might libraries support discussion and collaboration that lead to a broadening of perspectives?

Gaps and Alternative Approaches as Opportunities

Scheffer, Baas, and Bjordam found that an autonomous disposition can be supported by habits such as planning unscheduled open periods, or "the habit to make empty time as a way to create distraction-free episodes to process the diverse collection of inputs" (2017). Libraries and their spaces are valuable not only in their deliberate structured events and collections, but for the opportunities they foster for unstructured inquiry, serendipitous discoveries, and cross-sector meetings.

Absence of data, or of emphasis, can be significant information as well. For instance, exclusion of Indigenous world views may marginalize stakeholders or deprive global citizens of relevant perspectives or information. The Getty *Art &*

Architecture Thesaurus classifies "negative space" as a form and composition concept, which "describes an enclosed empty space in architecture, sculpture, or painting which makes an essential contribution to the composition (Getty Research 2004). As this chapter argues, an amplification of the visual arts concept of negative space holds potential for cognitive advancements and for solutions surrounding sustainability.

The study by Coscieme et al. referred to earlier sought to understand the broad range of conceptualizations of nature co-existing in the world including valuing local and Indigenous perspectives (2020). It argued that understanding the complex scope of epistemic, ontological, and cultural constructs related to associations between humans and nature can open avenues to accurate and inclusive definitions and descriptions toward discovering solutions to global environmental scenarios.

Callicott sought to understand "very different ways of viewing the world and different values concerning the world [which] can reveal deep assumptions in one's own worldview that might escape critical reflection in the absence of alternative assumptions" (Callicott 2014, 378). Relational concepts of self are considered along with alternative ecological assumptions to ancient and historical traditions of western philosophers: "Most contemporary Westerners think that their atomic or monadic self is simply given … But from the perspective of Asian traditions of thought, the atomic or monadic concept of the self … Rational Individualism – is a socially constructed concept" (Callicott 2014, 381). As with epistemologies of traditional ecological knowledge, elements of the Daoist, Buddhist, Hindu, and Confucian philosophical traditions are presented as perhaps more consistent with environmentalism.

Colonialism has also framed what can be classified, or taken seriously, as knowledge or science. Emeagwali and Shizha opined "Before the advent of Western methods of scientific inquiry, African knowledge and methods had successfully guided people in all spheres of life, including the spiritual, social, educational, agricultural, political and economic" and "its method of acquisition has a practical, collective and social or interpersonal slant" (2016, 7). Indigenous knowledge links environmental knowledge with the arts:

> Indigenous people possess an immense knowledge of their environments, based on centuries of living close to nature. By living in and from complex ecosystems, they have an understanding of the properties of plants and animals, the functioning of ecosystems and the techniques for using and managing them, a system that is particular and often detailed and transmitted to the younger generation through traditional songs, stories, narratives, epics, legends, dreams and practices (Emeagwali and Shizha 2016, 8).

Songs, epics, and legends bring us to the creative realm. Ichumbaki and Lubao (2020) actively call upon a local regional musical tradition, *Bongo Flava*, to engage local communities in recognizing and protecting cultural heritage in Tanzania.

Lenette (2019) argues that ABR-inclusive projects respectful of knowledge holders' priorities allow for collaborative research. The shifting of boundaries often associated with the artistic process can impact how studies are designed or experienced.

Painting workshops in the Kilombero Valley in Tanzania "enabled us to understand and communicate the complexities of socioenvironmental change from a bottom up perspective" observed Johansson and Isgren (2017) in their study using participatory art to understand local perceptions of land use change. Also in Tanzania, as previously mentioned, the Makumbusho ya Taifa la Tanzania/National Museum of Tanzania (Figure 4.4) is documenting the intangible and biocultural heritage traditions of Indigenous basket weavers who carry intergenerational knowledge about their ecosystem (Makumbusho ya Taifa la Tanzania/National Museum of Tanzania Department of Ethnography 2022).



Figure 4.4: Woven basket, Ha Tribe, Kigoma region. © National Museum of Tanzania

There are myriad data and stories from sources other than academic research, or from less-trodden paths within scholarship. Breaking out of the traditional paths for library science documentation, for instance, faculty of the Information School at the University of Illinois Urbana Champaign worked with a university in Beaumont Texas on a project, Ancient to the Future, a day of discussion on extreme weather and inequality. The discussion engaged stakeholders of a flood-prone, petrochemical-reliant, Texas Gulf Coast community in discovery, dialogue, and planning (Ancient to the Future Project n.d.). The 2023 event included a contest for local high school students to contribute creative or nonfiction writing on the topic of inequality and extreme weather. Input from all demographic groups was obtained and contributed to understandings of the local population. The approach taken aligns with the recommendations of a 2023 study arguing that support for climate solutions "may be contingent on people's preference for individual freedom" and suggesting that "future research should examine determinants of worldview development and change in relation to the climate crisis" (Bretter and Schulz 2023).

Grey literature, which is less often included in library collections, but to which libraries can provide access, is another silent space to be supported. Research by Pavlov (2022) specifies a wide range of such resources, often vetted and authoritative, which may contribute to environmental and cultural engagement by individuals around the world. Librarians, if they receive institutional support for time to engage in projects which connect with other departments or groups working on sustainability, can contribute expertise and ideas as well as foster synergetic relationships such as those formed during the planning of events.

At the Leonard Lief Library at Lehman College in New York City, the librarian engaged in research on heritage and climate change joined the campus committee planning the Bronx Environmental Summit (Lehman College 2021). The program invited the chief of the Ramapough-Lunaape Nation Munsee to open the event with a land acknowledgment. The librarian later participated in a campus working group initiated by students to draft and eventually put to a college senate vote a Lehman College Land Acknowledgment, the first such college document at the City University of New York's twenty-five campuses.

Spaces, Collections, and Resources to Support Discovery and Engagement

It is unsurprising that following scientifically documented detrimental changes in climate and the environment (Ghil and Lucarini 2020; Hegerl 2022; National Aeronautics and Space Administration (NASA) Goddard Institute for Space Studies 2023; United States National Weather Service n.d.), initial response approaches prioritized clearly delineated and goal-defined blueprints. However, Scheffer, Baas, and Bjordam (2017) discovered that "successful scientists and artists rarely had a masterplan. Rather, most highly creative careers are driven primarily by serendipity and curiosity... Unbridled curiosity seems the key ingredient". How might libraries support the development and growth of curiosity and inquiry?

A range of spaces which enable individual contemplation or support group inquiry into concepts or data, align with a goal of fostering exploration. Deliberate provision and maintenance of such physical and digital spaces, along with diverse content, could support creative artists and scientists "to escape the attracting force of the established" (Scheffer, Baas, and Bjordam 2017). Public libraries provide spaces as do academic and special libraries, which while targeted at defined curricula of directed course subject disciplines, afford spaces and collections to support cross-disciplinary exploration, discovery, and undirected thoughts.

ABR can be among modes of discovery and co-production of knowledge to understand and address an acknowledged, existing, and growing problem of environmental sustainability. A goal might be to focus on Elgin's suggested move from perceiving a subject's knowledge as "discrete grains, each separately secured" to holistic science, a theory "an integrated, systematically organized account of a domain" (Elgin 2006, 200). The aim is epistemic access. In assessing a theory, the question should not be "does it express knowledge?" but rather "does it convey an understanding of phenomena?" (Elgin 2006, 203).

Creation stories, and storytelling more broadly are art forms linked to traditional or Indigenous knowledge. Through such stories, pathways for understanding reciprocity and the links between humans and other forms of life can be developed (Kimmerer 2018). Gratitude and reciprocity are behaviors and values which are reinforced through storytelling traditions. Noting the presence of cautionary tales regarding the absence of gratitude or related reciprocity, Kimmerer suggests that while the "expression of gratitude may be emotional and spiritual [but] it also engenders very practical outcomes, with adaptive evolved survival values" (Kimmerer 2018, 31). Along with stories, Indigenous traditions include practices, some of "practical reverence" (Kimmerer 2018, 34) such as aerating soil by digging, or weeding to reduce density.

Local studies or interventions engaging communities in discovering, documenting, or sharing intangible or biocultural traditions and knowledge can gather relevant climate-associated data as well as contribute to knowledge co-production and sustained pathways for communities to plan for environmental changes. In the small, climate-vulnerable Caribbean island of Barbuda, residents contributed to understandings of community values inclusive of living heritage practices, ecosystem knowledge about flora and fauna, and local sustainability traditions. Children and adults engaged in visual arts workshops in a mixed methods study (Lerski 2019; 2025). In the second workshop held after category five hurricane Irma had caused vast damage and extended evacuation of all residents from the island, study participants and stakeholders envisioned the creation of a library and community center to support documentation of heritage and ecosystem knowledge. Participants explored local heritage and ecosystems through drawing, painting, and sculpting as well as through engaging with poetry, surveys, questionnaires, and discussions (Figure 4.5). Similar workshops could be created and supported at public and academic libraries.



Figure 4.5: Children's sculpture, Barbuda, August 2017. © Martha Lerski

Engagement of individuals and community building are not dependent on subject focus. Libraries have stepped up citizen science programs and co-creation of knowledge in the science, technology, engineering, and medicine (STEM) realm of sustainability work. Similarly, workshops engaging communities via local culture and arts might spark interest, develop ecological understanding, and build community. What Cigarini et al. discovered about public libraries and citizen science in Spain might apply to ABR: "Library users mainly cited personal motives, social networks, advocacy and socialization as the reasons underlying their participation, as opposed to being interested in CS" (2021, 4). Subjects outside science might fall under the category of citizen social science (Kythreotis et al. 2019).

A global gap, and a potential path for libraries to engage with communities on sustainability, exists in libraries not pulling their weight in engaging in, or evaluating progress towards, environmental sustainability (Fedorowicz-Kruszewska 2023). Examining journal citation reports for library and information science journals between the years of 2008 and 2019, Song et al. do not include mention of climate change, the SDGs, or the environment (2023). There are obvious opportunities for academic and special libraries to develop research protocols, and for a wide range of libraries to co-produce knowledge with local residents

Concrete Ways to Explore and Contribute to Ecosystems

Lund (2019) notes that not only are climate change journals largely subscription-based and behind a paywall rather than openly accessible, but that in developing countries, television, newspapers, and radio may not be available to local stakeholders. How might global libraries facilitate gathering and sharing both basic information and academic studies about climate? There are technical as well as financial barriers to consider. On the technical side of documenting information, Thomer and Wickett explore a "need to support a plurality of data practices and

paradigms" (2020, 1) and recognize that there can be reasons to use spreadsheets rather than databases for some projects. Some institutions, for example, cannot financially support database managers.

Library-hosted town hall discussions with scholars and the public are potentially avenues for investigating adaptation approaches. Presenters should consider particular local or religious beliefs and find respectful ways to contemplate supplemental strategies to existing Indigenous sustainability approaches (Lund 2019).

In addition to providing spaces for arts-based or other discovery, documentation, and discussion regarding ecosystem knowledge, librarians can support efficient structuring, storage and sharing of data through appropriate digital platforms and metadata. Translation of select metadata fields into a widely spoken international language could facilitate discovery as well as reciprocal sharing of relevant information. Lund flags translations of academic publications into local languages as one concrete step that libraries can take. Language considerations also factor into data collection and description. Crowdsourcing from First Nations peoples has been employed to describe elements within the collections of the Library and Archives of Canada (2022, 2024).

Ashie-Nikoi advocates for community archiving to "preserve the histories and traditions inherent in rituals, commemorations, festivals, music, dance naming ceremonies, local stories and sayings, as well as material culture and crafts such as quiltmaking and recipes" (2019, 11). The latter culinary arts tradition would document local ingredients, contributing to ecosystem knowledge linked to culture.

The United Nations 2023 report on SDGs called for innovative ways of scaling up and removing paywalls to share knowledge, including public-private partnerships to support investments in digital infrastructures and stressed that "governments have to ensure that appropriate regulatory frameworks are in place" (United Nations 2023, 56). From local community work to document and share knowledge, to the activities of GLAM institutions and international organizations, sustainability efforts to educate and increase understanding are essential. Libraries should advocate for funding to support low-tech arts workshops for engaging communities for documentation of, and discussion about, local knowledge. Such actions can support creative and cross-disciplinary exploration of sustainability solutions.

While engaging in co-production of local knowledge, libraries serve multiple functions. With institutional support of time and resources, library staff become on-site facilitators. As already mentioned, libraries provide both physical and virtual spaces as well as information skillsets and platforms. Some potential activities for libraries are:

– Workshops/events with funding for materials and staff time dedicated to engagement and planning; arts workshops provide information-gathering ses-

sions for ecosystem and related cultural knowledge; artworks, performative or visual, generate local discussion or formal data collection
- Metadata collection, analysis, structuring, and sharing contributions to local databanks; interoperability features enable sharing of data; partnerships with other libraries support open education
- Discussion sessions generate data and foster community engagement, as well as planning for ongoing community engagement in sustainability efforts
- Dedicated staff time to facilitate community events and to manage inputs of data and preservation strategies
- Use of open source systems and others which allow for interoperability, while ensuring that perfection is not the enemy of the good; use of low cost and low-maintenance functional platforms and tools, such as digital spreadsheets for local input, and
- Co-creation of knowledge with local communities and academic specialists, and the support of publication and academic endeavors through research leave time, mentoring, and critiques.

Conclusion

Just as definitions of what constitutes collections have evolved in response to digital or health changes and challenges, libraries must adapt programming, collections, and services to further vital ESD 2030 goals. Libraries have unique opportunities to contribute. They serve a full range of demographic groups and geographies, collect, and share information from diverse fields of knowledge, and offer expertise, spaces, and infrastructure.

This chapter investigated conceptual arts-based approaches and offered suggestions for concrete local projects and global digital sharing of academic, community, and library-co-created knowledge. By continuing to serve local communities through deliberate sustainability initiatives, libraries can become highly visible vital contributors to international understandings and solutions.

Acknowledgements

The author thanks Philip Maligisu of the Makumbusho ya Taifa la Tanzania/National Museum of Tanzania, and Frank Puluputu Mwale of the KEYS organization in Malawi for their ongoing respective input and collaboration. Some of the chapter's ideas have been presented at conferences, including the 2022 LD4

Conference on Linked Data, “Linking Global Knowledge.” Input from members of Indigenous communities concerning a proposed biocultural database was invaluable at a discussion session: “Envisioning an Open Access, Rights-Based, Reciprocal Biocultural Database towards Sustained Climate Partnerships” at the Institute for Tribal Environmental Professional’s 2022 National Tribal and Indigenous Climate Conference. The author benefited from input at the 2022 Vienna Circle Representation in Art and Science Scientific World Conceptions summer program, and the foundation for this chapter was a paper presented at the ICARUS VI Workshop on Climate Adaptation, at the University of Michigan, Ann Arbor, in 2023.

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Markus Putnings and Michael Zweier

5 Incentives for Open Science and Advancing Sustainability: A German Perspective

Abstract: Open science in ensuring equitable access to information is relevant to the attainment of all United Nations Sustainable Development Goals (SDGs). Badges, prizes and awards evaluate and recognise achievements, encourage involvement in open science and open access practices and provide an opportunity to present related activities to the outside world in a succinct form. The focus, however, is not on mundane self-promotion, but rather on the goal of external and internal reflection and promotion of the work done, as well as an appropriate presentation of the open resources and workflows produced. Prizes and awards constitute a stimulus for best practice, education and exchange both within an institution, with an institution´s users and with the wider community. This chapter provides an overview of the various badges, awards and prizes relevant to Germany as incentive systems for open science and open access activities. The contributions to the SDGs and education for sustainable development (ESD) are contextualised and discussed. It concludes with a selection of recommendations and summarises the most important results.

Keywords: Open access publishing; Open scholarship; Open educational resources; Badges; Awards; Sustainable development goals

Introduction

Reinforcement of the importance of openness to information particularly in relation to the United Nations Sustainable Development Goals (SDGs), along with suggestions for actions and a possible framework are presented in the *UNESCO Science Report: Towards 2030*: "As a specialized agency, UNESCO is, itself, committed to making open access and open data one of the central supporting agendas for achieving the Sustainable Development Goals" (UNESCO 2015, 8). The *Report* suggested a new framework which might be based on assessing science through the lens of a public enterprise working for a sustainable and just world rather than its contribution to a knowledge economy (UNESCO 2015, 13). Further support for

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https://doi.org/10.1515/978-3-11-133646-6-006

the crucial importance of education in, and promotion of, open science is provided in the core tasks and objectives of the *UNESCO Recommendation on Open Science*:

i. promoting a common understanding of open science, associated benefits and challenges, as well as diverse paths to open science
ii. developing an enabling policy environment for open science
iii. investing in open science infrastructures and services
iv. investing in human resources, training, education, digital literacy and capacity building for open science
v. fostering a culture of open science and aligning incentives for open science
vi. promoting innovative approaches for open science at different stages of the scientific process
vii. promoting international and multi-stakeholder cooperation in the context of open science and with view to reducing digital, technological and knowledge gaps (UNESCO 2021b, 6).

The *UNESCO Recommendation* highlights the necessity for creating funding and other incentive mechanisms to publicise, promote and strengthen open science:

> Establishing regional and international funding mechanisms for promoting and strengthening open science and identifying those mechanisms, including partnerships, which can support international, regional and national efforts (UNESCO 2021b, 32).

A variety of motivational techniques can be used to accelerate and reward achievements in relation to open science and to encourage innovation and new initiatives. The most promising are those with positive signals and recognition:

> Politicians and research managers used to speak about carrots and sticks, a combination of reward and punishment to induce the desired open science behaviour. Behavioural psychologists know that generally, reward is more efficient for positive reinforcement than punishment. ...It [meaning the threat of punishment] may work; but it is not helpful to promote ... open science as a positive value and objective (Schöpfel and Azeroual 2021, 449).

Badges, awards and prizes can be a suitable and powerful tool for recognising accomplishments. They are usually based on clear criteria, recognise individual and joint efforts, highlight best practice, create public recognition, and, above all, represent tangible acknowledgement.

This chapter explores open science and the connections between the United Nations SDGs (United Nations n.d.a), the UNESCO education for sustainable development (ESD) *Roadmap* (UNESCO 2020a), the role and contributions of libraries, and potential rewards. The nature of badges and awards is examined and specific

open science badges, awards and prizes which are particularly relevant for, or of interest in, Germany, are identified. The German experience might well serve as an exemplar for others or as inspiration for other countries.

Open Science and the Sustainable Development Goals

Open science (OS) is the concept of making scientific research, research methods, and source code and its dissemination available to all, regardless of educational level or socioeconomic status, with knowledge shared through collaborative networks. Open access (OA) is digitally available scientific information, usually in the form of peer-review publications, which is available freely online without restriction. Open data are data which are freely available and shared. Open educational resources (OERs) are teaching and learning materials available in any format for free use and reuse. Various studies describe how OS or approaches integrated into OS, including OA and OER support, accelerate or enable the achievement of the SDGs:

Mamtora and Pandey (2018, 6–7) describe the contribution of OA to each of the seventeen SDGs. Access to relevant research results, data and information, along with information and communications technology (ICT), facilitates learning, broadens discussion, advances digital inclusion, assists with policy development and project formulation, creates cultural and social awareness, provides access to cultural heritage, encourages collaboration, and informs strategy, all of which contribute to the attainment of each of the SDGs. Open data assists in the reporting of progress towards attainment of individual SDGs and contributes to the promotion of awareness raising. In addition to OA, Mamtora and Pandey consider open data to be essential (2018, 6–8). They state:

> the more freely accessible the information is, without the worry of having to find the funds to acquire the document, the more the likelihood of it being used to solve a problem, and for it to lead towards the successful attainment of a particular goal (Mamtora and Pandey 2018, 3).

Muth and Salvador Lopez (2021) take a more specific look at individual SDGs. For example, OA is primarily of essential importance for SDG 16: "Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels" and in particular for Target 16.10: "Ensure public access to information and the protection of fundamental, in accordance with national legislation and international agreements" (United Nations n.d.e). However, OA is also essential in the context of SDG 9:

"Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation" (United Nations n.d.c) to foster innovation through digitally manipulating open data and to improve knowledge transfer in business and society using freely available information and consequently enhance decision-making by corporations, particularly with regard to sustainable products and services.

In relation to SDG 10: "Reduce inequality within and among countries" (United Nations n.d.d), OA helps to reduce financial inequality, especially the gap between the global north and the global south in access to research information. With regard to SDG 4: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (United Nations n.d.b), OA empowers all interested parties to educate themselves on specific topics. "OA democratises the world of learning in which research information is not only available for the academic elites" (Muth and Salvador Lopez 2021). The benefits are available to political decisionmakers, committed volunteers, corporations and non-governmental organisations engaged in sustainable development.

Camkin et al. (2022) emphasise the current unequal access to reliable information affecting the attainment of the SDGs:

> Achieving the United Nations Sustainable Development Goals is increasingly challenging due to widening inequality in access to scientific and technological knowledge and resources. With science remaining too discipline based, and policymakers too often science averse, there is a need for greater understanding of the opportunities and challenges of open science for science practitioners, policy makers and communities. Acknowledging that open science can be a powerful tool to reduce inequalities, UNESCO has been supporting the shift to open science. Following global multistakeholder consultation, the UNESCO Recommendation on Open Science was adopted in November 2021, establishing a universal definition, common standards and shared set of values and principles (Camkin et al. 2022, 1).

The *UNESCO Recommendation* highlights four aspects of open science, including open scientific knowledge, open science infrastructure, open engagement of societal actors and open knowledge with other knowledge systems (UNESCO 2021b). "In open scientific knowledge, users gain free access to scientific publications, open research data, open education resources, open source, and open hardware" (Camkin et al. 2022, 5).

Open Science and the Education for Sustainable Development Programme

The more information is available and made accessible via OA, open data and OERs, the more important the role of educators becomes. The role of education and the educator is particularly meaningful in the *Roadmap* prepared by UNESCO which is leading and coordinating the Education 2030 Agenda. The *Agenda* focuses on the attainment of the SDGs by 2030:

> Educators remain key actors in facilitating learners' transition to sustainable ways of life, in an age where information is available everywhere and their role is undergoing great change. Educators in all educational settings can help learners understand the complex choices that sustainable development requires and motivate them to transform themselves and society (UNESCO 2020a, 30).

In line with the *Agenda*, the UNESCO Education for Sustainable Development (ESD) programme contributes to the achievement of each of the seventeen SDGs:

> ✓ ESD raises the awareness of the 17 goals in education settings: ESD enhances the understanding of learners and the general public on what the SDGs are and how these goals connect with individual and collective lives.
> ✓ ESD promotes critical and contextualized understanding of the SDGs: Sustainable development often requires a balancing act among diverse views and priorities. ESD raises questions on the inter-linkages and tensions between different SDGs and provides learners with the opportunity to navigate the required balancing acts with its holistic and transformational approaches.
> ✓ ESD mobilizes action towards the achievement of the SDGs: ESD efforts address sustainable development issues, more specifically the SDGs. These efforts continue to mobilize action for sustainable development in education settings in particular in communities, through whole-institution approaches to ESD. (UNESCO 2020a, 16).

The ESD programme is particularly important for SDG 4, "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (United Nations n.d.b).

> While ESD contributes to all 17 SDGs, it continues to have particular relevance for the global education agenda enshrined in SDG 4, in which ESD has a distinct place. ESD is a key element of quality education. Its cross-cutting competencies in cognitive, socio-emotional and behavioural dimensions of learning bear relevance to all areas of education (UNESCO 2020a, 60).

Useful background on the ESD programme, the development of the *Roadmap* and its application in various countries is outlined in a presentation by Won-Jung Byun

(Byun 2020). The UNESCO World Conference on Education for Sustainable Development: *Learn For Our Planet. Act for Sustainability* held online in May 2020 with the support of the German government launched the new decade implementing ESD, ESD 2030 (UNESCO World Conference on Education for Sustainable Development 2020) and resulted also in the *Berlin Declaration* (UNESCO 2022). *Learn for Our Planet* provides an overview of the integration of education into environmental issues globally (UNESCO 2021c).

Open Educational Resources

UNESCO has further highlighted the importance of OERs as part of ensuring access to knowledge to learning for all and adopted a *Recommendation on Open Educational Resources* unanimously at its General Conference in 2019. The role of OERs in building inclusive knowledge societies is noted:

> Open Educational Resources (OER) can support quality education that is equitable, inclusive, open and participatory as well as enhance academic freedom and professional autonomy of teachers by widening the scope of materials available for teaching and learning (UNESCO 2020b, 4).

A survey of OERs in Germany focused on a holistic understanding of OERs, identified various challenges, and indicated more attention to policy-led initiatives was required. The report noted in a state-of-the-art analysis of German OERs, summarizing Ebner et al. (2015):

- Best practice examples exist even without public funding, although a lack of public funding may be holding the developments back
- A commonly shared motive for OER is that the knowledge society requires open access to knowledge and free sharing of this knowledge
- OER are seen as motor for more open learning scenarios
- OER is seen as a solution to licensing problems in the use of learning materials from third parties, and
- There remains a concern of how to assure the quality of OER materials (Orr, Neumann and Muuss-Merholz 2017, 31).

Others have also noted the potential of openness in information and knowledge access towards developing global sustainability and transformation:

> Open education, OER, and parallel movements, such as open science, open innovation, next-generation empowerment, open communication, open partnerships, and open ecosys-

> tems, will be catalysts for systemic change toward a new social contract and knowledge-based action to transform education for global sustainability (Ossiannilsson 2023, 558).

The Role and Contribution of Libraries to Open Science and Sustainability

Libraries play important roles in the field of open science. A systematic review and synthesis of 65 research articles related to library engagement in OS established that library OS practices were primarily focused on OA, research data management, OERs and citizen science. The researchers defined the role of the library from various perspectives. The most important role for academic researchers was that of OS service providers. Libraries and librarians were also regarded as advocates or educators, policy makers, and publishers or knowledge producers (L. Liu and W. Liu 2023, 9). Other roles for libraries and librarians include promoters of research diversity, enablers, evaluators of data and resources, mediators of agreements between research groups and research advisors (Tzanova 2020, 291–295). Education goes hand in hand with promoting the significance of OA to knowledge acquisition and raising awareness of the issues.

> Being strong advocates for Open Access, academic libraries contribute to releasing the research potential of digital technologies and communications by promoting openness and providing easy and universal interfaces to data sets in the institutional repositories, in addition to their primary role (Tzanova 2020, 291).

The roles described for libraries in open science can be largely transferred to commitments, activities and other contributions to achieving the SDGs and, as part of this, target-oriented SDG education within the ESD programme (Figure 5.1). The model presents the library roles in overlapping circles in the centre. The contributions of libraries to both open science and the achievement of the SDG targets are grouped together around the circles. In addition to the provision of ICT, services, and open access to information, libraries offer data and learning materials and support for universal information literacy through institutional curricular support, and also by opening up information access to the general public and citizens, supporting lifelong learning, and emphasising digital inclusion with services to disadvantaged groups and the disabled. Libraries raise awareness and promote OS and the SDGs through community engagement, partnerships with others, and the identification or creation of incentives and rewards for behaviour supporting the achievement of the SDGs. Other contributions include ensuring diversity by offering OERs in multiple languages and from the perspective of different scientific dis-

ciplines, supporting policy developments, participating in projects and providing monitoring measures (Ekpolomo 2023; IFLA 2023 Mamtora and Pandey 2018, 6–7; Mashroofa 2022, 52–54; Muth and Salvador Lopez 2021).

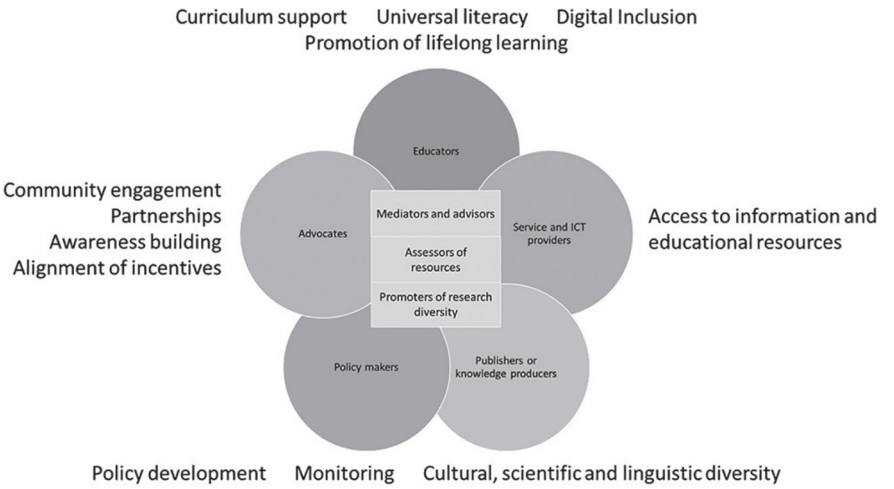


Figure 5.1: Roles and contributions of libraries to open science and SDGs. © The authors

Each role played by libraries overlaps the others. For example, creating open access to information, data and resources in order to achieve the SDGs, is one of the core tasks of libraries in their role as service and ICT providers. It can be achieved through services such as funding for OA publishing or ICT such as repositories. The same goal can be supported by libraries as publishers or knowledge producers in the case of library-operated university presses or as editors or maintainers of online journals or books series via open journal systems (OJS) and open monograph press (OMP). Libraries who are publishers or knowledge producers constitute: "Signatories [to the SDG Publishers Compact who can] aspire to develop sustainable practices and act as champions of the SDGs during the Decade of Action (2020–2030), publishing books and journals that will help inform, develop, and inspire action in that direction" (United Nations n.d.f). In addition, the access possibilities must be communicated, explained and promoted by libraries in their roles of educators, advocates, mediators and advisors. Libraries and librarians as assessors of information resources can point out critical and problematic sources and differentiate quality content from inferior outputs of predatory publishers.

Diverse research materials on SDGs including open data, methodology descriptions for data collection and studies, publications of various kinds, and teaching and educational materials integrating approaches from different disciplines can

be curated, processed and presented by libraries and their subject specialists. The library as promoter of research diversity comes to the fore. Other activities by libraries might involve ensuring that accessible information can contribute to policy development and target monitoring of SDG targets:

> More specifically, libraries can support the implementation of the SDGs by providing access to information, support for literacy and ICT skills, and access to community space…UN Depository Libraries support dissemination of information and research to help decision makers achieve the SDGs (United Nations n.d.g).

Libraries can also function as autonomous policymakers by formulating policies to promote SDG-related and open science practices in their publishing and knowledge-producing activities, distributing the funding required, and allocating funds to publishing through library-managed budgets. When negotiating subscription contracts including publish-and-read agreements, sometimes known as transformative or read-and-publish agreements, libraries can seek to include clauses with terms for wider open access.

Badges, Awards and Prizes

The wide range of activities of OS and OA players, particularly those based in, or supported and influenced by, libraries, and the open resources they have created or enhanced for quality education are not yet perceived or appreciated as they should be, given their societal and global impact over the past decade. Reward systems which seek to recognise achievement and success in OS and OA include badges, prizes and awards which are based on the assessment of a wide range of criteria. They offer the opportunity to promote OS and associated activities in an award-worthy form which can summarise their import and impact.

A European Commission report addressing incentives for OS researchers refers to: “Improved training and support for research dissemination and data curation” as one general measure alongside:

> Visible recognition of Open Science activities (including Citizen Science and Open Education), used widely to enhance reputation and credibility of researchers, establishment of Open Science prizes, and encouraging champions and role models (Miedema et al. 2018, 30).

The report presents a blueprint or roadmap including stages, targets and possible activities to guide European countries in implementing open science activities. To “Incentivise” it is suggested that countries:

- Establish a funding-allocation system that rewards Open Science activities, such as Open Data, Open Education and public engagement
- Establish Open Science prizes and awards, [and]
- Promote transparent assessment criteria and open scientometric databases (Miedema et al. 2018, 112).

The development of OS prizes can be seen in the national action plans of some countries:

> The French National Plan for Open Science requires in a general way that the assessment system for researchers and research institutions must be updated to reflect the principles and practices of open science, giving greater weight to quality rather than quantity; it also announces a "research data award" to showcase and reward teams that have performed outstanding work in this area ... The purpose is clearly stated: the development of open science and more specifically, as for the researchers, the development of good practice regarding RDM, through incentives and rewards (Schöpfel and Azeroual 2021, 447).

In Finland, "Every year, The National Open Science and Research Coordination rewards open science practices" (Open Science 2024). Finland awards several OS and open education prizes which form part of the Finnish support of open science initiatives and the journey toward open scholarship and the promotion of open research practices in the research community.

Awards and education are two valuable pillars of OS (L. Liu and W. Liu 2023, 1) and, as shown in Figure 5.1, also of the SDGs in the context of ESD. Incentives provide in addition to the benefits of clear criteria and targets, assessment, recognition and promotion opportunities. They are genuine substantive real rewards:

> Rewarding and incentivizing require a clearly defined target behavior. However, so far, a comprehensive classification of data-related and contextualized behavior is missing.
> - Most proposals of rewarding and incentivizing put the focus on the researcher. Yet, research data management is team work with essential contributions by data librarians, data engineers, data stewards and so on.
> - Some of the most often suggested incentives (tenure, promotion, funding) are no real rewards – they already exist and the proposal would just add new conditions to get them. More sticks than carrots, in some way (Schöpfel and Azeroual 2021, 449).

In addition to the creation of public interest as a benefit for the society, there are other motivations for visible engagement in OS (Figure 5.2). Reuse, citation advantage, and meaningfulness of the OS results are the most important drivers for open science prize winners and their researcher colleagues (Röwert 2024, 160).

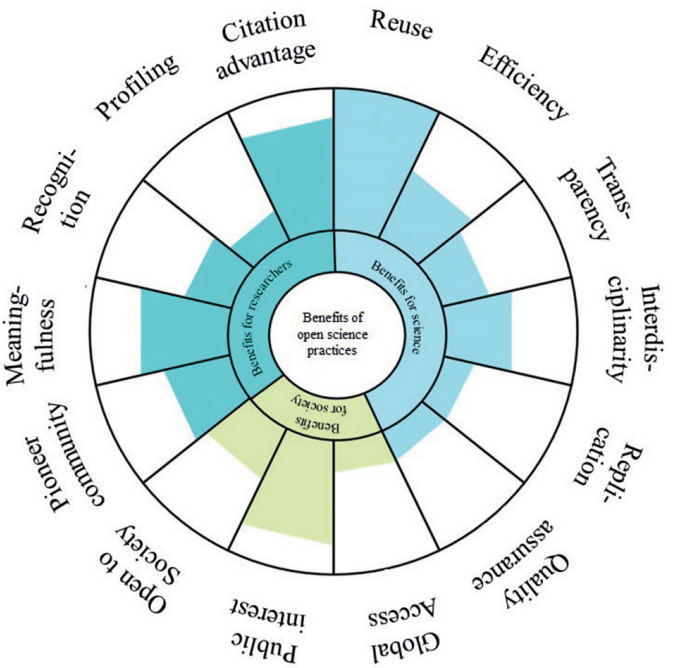


Figure 5.2: Drivers for the engagement of open science prize winners, based on the image by Röwert (2024, 160), translated into English and modified by the authors (Putnings and Zweier 2024)

Defining Badges, Awards and Prizes

Awards honour outstanding achievements in specific fields, perhaps through winning a competition, but in some cases simply through participation and meeting specified criteria. Awards are sometimes differentiated from prizes, as prizes may be part of a competitive effort and associated with monetary or similar rewards (Gallus and Frey 2016, 1701).

A badge presented or displayed, can represent a special achievement and is sometimes used as a motivator of behaviour, a signifier, a credential, or a pedagogical tool. In the digital and educational sectors, badges are used as evidence of completed learning pathways, achievements or special skills (Ahn, Pellicone, and Butler 2014, 3–4). Digital badges are validated indicators of accomplishment and commonly contain details of the assessment, evidence and other metadata required for the badge. Badges are designed to encourage the sharing of knowledge and resources, create evidence-based transparency about assessments, and provide recognition (Petriashvili et al. 2020, 6–8).

Positive Effects of Badges, Awards, and Prizes and their Relationship to Certification

When badges, awards and prizes are granted on the basis of a transparent catalogue of criteria, there is a close connection and overlap with certification. Certification is attestation by a qualified objective third party, that requirements, for example in relation to a product, service, system or infrastructure, have been met. The requirements are defined or set out in the respective certification system, together with the granting rules of the certification body, including the conditions for participation, steps in the certification process and the form of the certificate (Putnings 2018, 255–256).

Badges, awards and prizes are, like certificates, promotional symbols guaranteeing that the defined requirements of the awarding body and its stakeholders have been met; in addition, the award increases awareness of, and trust in, products and services made available, and where applicable, the open nature of information resources. Heightened awareness and confidence in quality can have a positive effect in terms of increased usage. Recipients of badges, awards or prizes raise their profiles within their institutions and with funding bodies, which may prove advantageous when competing for resources. The application for badges, awards or prizes is usually preceded by a self-evaluation, including review, documentation and, if necessary, optimisation of activities undertaken which frequently leads to process-inherent quality improvements prior to submission. Receiving a badge, award or prize boosts staff motivation and can be beneficial for staff promotion and career enhancement, and recruitment particularly if the award and commitment to new library roles, such as OS, are used to promote the library (Putnings 2018, 252–253). Badges, awards and prizes, along with certification, are an essential part of quality communication as part of information marketing (Putnings 2018, 259).

Open Science Badges, Awards, and Prizes Relevant to Germany

This section provides an overview and discussion of selected open science badges, awards and prizes relevant to Germany and its scientific community. A wide range of badges, awards and prizes is available, including OS, OA, open data and OERs, at institutional, regional, national and international levels. Attention is drawn to the most important awards, and, at the same time, their diversity is taken into account. Some badges, awards and prizes included are open only to a specific institution and

its members or restricted to certain networks. Badges, awards and prizes that are largely outside the sphere of influence, responsibility or participation of libraries or librarians, are excluded, along with OS badges used by commercial publishers and journals to label the OS methods of their authors. Certifications, such as the Deutsche Initiative für Netzwerkinformation (DINI) Certificate for Open Access Repositories and Publication Services, are also excluded.

A summary of details about the badges, awards and prizes available in Germany are contained in Table 5.1. The specific details, such as the underlying award criteria, the possible group of applicants, the composition and professional background of the jury or the application procedure, vary considerably. Further information can be found on the referenced websites; in addition, an extended preprint version of this contribution with a more detailed tabular presentation of the badges, awards and prizes is available on Zenodo at https://doi.org/10.5281/zenodo.11617463 (Putnings and Zweier 2024).

Table 5.1: Overview of selected badges, awards and prizes relevant to German libraries

Badge, award or prize	Key information and features
YERUN Open Science Awards, an example from a university research network of universities (Yerun 2021a. https://yerun.eu/).	An award of 2,000€ is made by the Young European Research Universities Network (YERUN). Only researchers, administrative or professional support staff from one of the YERUN universities can apply. Any OS practice or initiative by applicants is potentially eligible.
OEAwards, an example of a global award (OEAwards for Excellence 2024. https://awards.oeglobal.org).	The annual Open Education Awards for Excellence (OEAwards) by Open Education Global (OEG) recognise contributions to the global open education community in a number of categories. There is no cash prize, but all winners are honoured in a virtual hall of fame and in lavish announcement and award ceremonies recorded for YouTube.
Enter, an example of a national award (Enter n.d. https://enter-award.irights-lab.de).	The Enter award is a new German OA award created in 2024 via a third-party-funded project and endowed with prize money of €1,000 in each of five categories: Infrastructure, Transfer of Expertise, Young Talent, Pioneering Achievement and Cooperation. Initiated by the Berlin-based think tank iRights.Lab and supported by the Bundesministerium für Bildung und Forschung. The frequency of the award has not yet been determined.

Badge, award or prize	Key information and features
Humboldt-Universität's Open-Access-Preis/ Open Access Award, an example of an institutional award (Humboldt-Universität zu Berlin. Universitätsbibliothek n.d. https://www.ub.hu-berlin.de/de/forschen-publizieren/open-access/preis?set_language=de)	The Open Access Award of the Humboldt-Universität zu Berlin annually honours outstanding achievements in the field of OA and is awarded to individuals or groups from only the Humboldt-Universität. The total prize money is €5,000 which can be awarded to a single recipient or shared proportionally among several recipients.
Open Library Badge, an example of an award targeted at libraries (Open Library Badge. n.d. https://badge.openbiblio.eu).	The Open Library Badge, which is administered and awarded by a library working group of volunteers, does not follow a specific awarding timetable, but can be applied for throughout the year. There is no competition. Only libraries can apply and at least five out of fifteen defined criteria must be met. Research groups, educators and special initiatives are excluded. There is no cash prize, but badge holders and their best practices are listed and honoured on the project's website.

The OEAwards for Excellence are open to all eligible applicants worldwide "honoring exemplary leaders, distinctive Open Educational Resources, and Open Practices from around the world" (OEAwards for Excellence 2024a). Applications for the YERUN Open Science Awards also have a global focus and visibility because of network memberships but are restricted to researchers and administrative or professional staff from one of the YERUN universities (YERUN 2023, 2). In Germany, the universities included in YERUN are currently the universities of Klagenfurt, Potsdam, Ulm, Konstanz and Bremen (YERUN 2021b).

The Enter award has a national focus on Germany. Individuals or organisations with a place of residence or registered office in Germany are eligible to apply (Open Access Network 2024); the website is available only in German although such services as Google translate make the content more widely available. Humboldt-Universität's Open Access Award is, as the name suggests, not just national but an example of an institutional award which is restricted to members of the university. "Only members of Humboldt-Universität are eligible. In the case of groups, at least half of the group must be members of Humboldt-Universität" (Humboldt-Universität zu Berlin. Universitätsbibliothek 2024). The Open Library Badge has an occupation-specific character and can be applied for by libraries and their librarians only (Open Library Badge 2024).

Relevance of the Badges, Awards and Prizes to the Sustainable Development Goals, Education for Sustainable Development and Libraries

All badges, awards and prizes listed contribute to SDG Target 16.10 "Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements" (United Nations n.d.e). The YERUN Open Science Awards, the OEAwards, the Enter award and Humboldt-Universität's Open-Access-Preis/Open Access Award, focus on recognising activities towards OS and its aspects, such as OA and open education and encourage individual researchers or research groups to make their research and teaching results freely accessible and to be recognised for their achievements. The awards are also aimed at administrative staff and catalysts, such as librarians, and at organisations or infrastructures, such as libraries including their repositories and networks. The Open Library Badge does the same, but is limited to libraries, both public and academic.

SDG Target 17.6 "Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism" (United Nations n.d.h) is also implicitly pursued via accessibility, reuse and collaboration through OS involving knowledge sharing. The OEAwards and the Enter award in particular focus on collaboration and cooperation in specific award categories. A good example is the OEAwards Open Collaboration Award made in 2020. The award winners "developed the international online mentoring programme Open Education for a Better World (OE4BW), which has been designed to unlock the potential of Open Education in achieving the UN Sustainable Development Goals" (OEAwards for Excellence [2020]). The YERUN Open Science Awards consider collaboration as a factor in their award criteria through the proven use of open collaborative methods and tools (YERUN 2023). The Open Library Badge is unique in that it is not aimed at collaborative initiatives from the scholarly community itself, but at the supporting role of libraries through the specified criteria of:

> Support open knowledge communities. Organize community events in collaboration with Wikimedia or other knowledge communities or participate in projects to improve Wikipedia or Wikidata (Open Library Badge 2023).

All badges, prizes and awards implicitly refer to a possible educational contribution of openly accessible research results or the creation of OERs and therefore to the achievement of SDG 4 "Ensure inclusive and equitable quality education

and promote lifelong learning opportunities for all" (United Nations n.d.b) and its various targets. In relation to Target 4.3, for example: "By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university", freely accessible academic teaching materials can reduce inequality in access to higher education. Of the five awards presented in this chapter, the OEAwards in particular have the strongest and most explicit focus on SDG 4 and ESD, which is reflected in the Educator Award, the Open Asset Award for Significant Impact OER and the Open Practices Award for Open Pedagogy (OEAwards for Excellence 2024b). The Enter Award also has a separate category for education and skills transfer (Open Access Network 2024). Within the Open Library Badge, there are several criteria which relate to SDG4 (Open Library Badge 2023). The YERUN Open Science Awards do not explicitly refer to education although open education is inevitably part of open science and nor does Humboldt-Universität's Open Access Award, although OA materials can also include, for example, educational textbooks.

As far as other SDGs are concerned, some badges, prizes and awards aim to eliminate inequality between men and women, and to honour inclusion in their award criteria and categories. For example, the OEAwards include a Diversity, Equity & Inclusion Award (OEAwards for Excellence 2024b) while the Open Library Badge includes the following criteria:

> Usability for all people. Making your own website barrier-free. Libraries should ensure the accessibility of websites, documents, software, and catalogs as well as buildings and workplaces for employees and users.
> Library as an open place. The library offers a course program for integration, inclusion, and/or emancipation to promote equal access for all (Open Library Badge 2023).

Such criteria are relevant to SDG 10 "Reduce inequality within and among countries" and SDG 5 "Achieve gender equality and empower all women and girls".

The OEAwards have more awards that reward not just one but several SDG activities and contributions, for example the Enacting SDG Award which applies to all seventeen SDGs and the Open Resilience Award. The latter identifies exemplary open education practices which address challenges in times of crisis and play a role in SDGs 1, 2, 3, 6, and 13 (OEAwards for Excellence 2024b).

Finally, it may be possible in the Open Library Badge criteria to see a contribution to SDG 8: "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" (UNESCO n.d.i), as well as to SDG 9: "Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation" (UNESCO n.d.c) with the criterion:

> Enable text and data mining. The library allows its users to perform text and data mining on their own and licensed collections. In license agreements, it generally negotiates the right to text and data mining and it informs users accordingly (Open Library Badge 2023).

Text and data mining are important aspects for innovation in areas such as artificial intelligence. Regarding the OEAwards, the Open With Artificial Intelligence Award also fosters innovation (OEAwards for Excellence 2024b). Implicitly, however, in addition to resilient infrastructure providers such as libraries, researchers also contribute to innovation by publishing research in OA and making research data available openly along with open source code and open hardware.

Further Actions

Although librarians are typically permitted to participate in the application process for the various awards as administrative staff, all awards, with the exception of the Open Library Badge, are also open to researchers, research groups, and academic educators. With a few exceptions, such as the Open Library Badge, libraries have mostly not played direct roles in the processes associated with the relevant badges, awards, or prizes in terms of their relationships with awarding organisations. Nevertheless, libraries provide invaluable support for research and OS by making existing knowledge openly accessible and by offering advice and infrastructure for open science in all its manifestations.

The traditional proximity of libraries and librarians to researchers is an advantage in driving cultural change. However, libraries could play a more active role by offering prizes themselves either individually or jointly, or by becoming more actively involved in the organisations bestowing the various awards.

For existing awards, it would be advisable to make a stronger and more explicit reference to the SDGs than has been the case to date. The OEAwards Special Awards such as the Enacting SDG Award, the Diversity, Equity & Inclusion Award and the Open Resilience Award are examples worth emulating.

The processes for awarding badges, prizes and awards are either competitive with multiple applicants applying for assessment and only a few winning the award, or non-competitive, as in the case of the Open Library Badge, where award recipients are required to meet certain criteria. In view of the duality, it is recommended to use the best of both. Non-competitive application procedures with extensive transparent criteria requiring fulfilment ensure that anyone can achieve recognition. The result is similar to a quality certificate awarded for meeting, for example, the standard ISO 9001 for quality management and tantamount to certi-

fication. However, it is only major celebratory ceremonies that create the appropriate publicity and recognition of awards and their support of OS initiatives. Such events are usually associated with competitive procedures where winners who are the best are honoured. Using both a transparent catalogue of criteria for evaluation and assessment and the regular celebration of excellence and winners will produce effective outcomes. Organisations active in open science are likely to have an open access publishing fund; any prize money results from awards must thus not be earmarked for the payment of open access article processing charges.

Finally, making best practice visible is vitally important. The Open Library Badge's approach should be emulated. It lists not only badge holders, but also best practice, and highlights successful projects or activities which have met the criteria. Others can learn from the descriptions of outstanding projects and replicate work, using OA and any open source tools and methods available. Imitation could lead to multiplication of activities.

Conclusion

This chapter has examined open science, the SDGs, the ESD programme, the role of libraries, and badges, awards and prizes as stimulators of progress in achieving the SDGs and ESD. The focus has been on the roles of libraries in transforming the learning environment for sustainable development and promoting open science. At least ten of the seventeen SDGs require ongoing scientific input and to achieve these goals on a global scale, it is essential to make research results and other educational resources openly accessible and disseminate them without restrictions to the intended stakeholders (UNESCO 2021a).

As IFLA states, "Libraries have long been key players in advancing open science and development, and today in particular are playing a key role in ensuring that the two come together for the benefit of all" (IFLA 2023). The activities and potential of libraries are, however, often overlooked, and need to be strengthened (Hauke 2023, 86; IFLA 2023). One marketing activity to enhance the role of libraries is the use of badges, awards and prizes, such as the Open Library Badge in Germany, which is a high-profile honour.

The awards and prizes presented in this chapter reflect from a German perspective a choice of international, national, regional, and institutional awards in terms of coverage and visibility, as well as different aspects of OS, with varying award criteria to be met and with uneven impact on and support of the SDGs. Each badge, award or prize has the potential effect, at its respective level and beyond, to raise awareness for open practices in science, to draw attention to best practice and

to establish open standards, in addition to providing financial support and appreciation where applicable.

Effective marketing methods that can leverage these activities include organising prestigious award ceremonies, highlighting exemplary champions, producing press releases and presenting overviews of previous winners to promote projects that create or foster open access resources, with imitation leading to a multiplier effect.

Among the badges, awards and prizes considered, two stand out in particular. Firstly, the OEAwards, because they not only focus on OS or its components, such as OERs and OA, but explicitly address SDG aspects with award categories such as the Enacting SDG Award and generally place a strong focus on open education in the context of the ESD programme. Secondly, the Open Library Badge, is noteworthy because it is explicitly and exclusively aimed at libraries and considers openness in a broad sense referring to inclusion, the benefits of text and data mining for enhancing innovation to strengthen the economy and society, and the support of open knowledge communities. Libraries have a great role to play in nurturing open science, implementing measures assisting attainment of the SDGs and participating in ESD. Badges, awards and prizes have a part to play in encouraging involvement, recognising achievement and promoting best practice.

Acknowledgements

We acknowledge all badges, awards and prizes that have made information publicly available; special gratitude goes to the iRights.Lab *Enter – Der Open Access Award* team for providing all necessary information even prior to the launch of their award homepage.

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Part II: **Public and School Libraries**

Bridie Schultz, Helen Weston and Jacqueline Lucas

6 Nurturing Young Environmental Stewards: A Citizen Science Corner in an Australian School Library

Abstract: School libraries have great potential to transform learning environments and create real change by empowering young people in their actions for sustainable development. This chapter outlines the innovative, interdisciplinary integration of science, technology, engineering and mathematics (STEM) into school libraries through the concept of the Citizen Science Corner implemented in a school in Brisbane, Australia. It describes how the implementation of a Citizen Science Corner has the potential to revolutionise library spaces and create significant benefits for the science staff within the school, the young citizens that contribute to the project, and the scientists with whom they work. A strong theoretic rationale for the importance of Citizen Science Corners in school library settings is outlined along with practical advice for implementation and reflection.

Keywords: School libraries; Sustainability; Citizen science; STEM

Introduction

The Citizen Science Corner in the school library is a research space which incorporates project-based learning (PBL), a type of active learning or inquiry-based learning. The projects undertaken in the space are based on citizen science, a practice that engages the community in research endeavours. Students can apply knowledge and skills they learn in class to help scientists develop innovative solutions to global research challenges. Students address projects which actively explore real-life problems to identify challenges, pose questions and provide explanations that lead to evidence-based conclusions.

Citizen science is not prevalent in Australian schools (Saunders et al. 2018). There is a lack of understanding of the benefits of integrating citizen science projects into education programmes, and an impression that it is difficult to align citizen science projects with curricula, pedagogy, unit plans and classroom lesson plans. To demonstrate the benefits to education and research, a library team at Loreto College Coorparoo, a girls' school in Brisbane, Australia, collaborated with teaching staff and research professionals to create a dynamic and unique space in the school library through the pilot of a Citizen Science Corner. The Citizen Science

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https://doi.org/10.1515/978-3-11-133646-6-007

Corner has created a means for students to develop critical and transferable information literacy skills as they experience new ways of working with information, including consuming existing knowledge, and generating new knowledge and insights. It has contributed to enhanced science literacy and research skills that engage them beyond the classroom curriculum. Supported by the library staff, the science department and research partners, the space is led and championed by students. The space encourages autonomous learning through citizen science projects and empowers students with the knowledge, skills, values and attitudes to act as agents for sustainable change, allowing students to think scientifically beyond the constructs of classrooms, shelves and traditional library spaces.

This chapter examines the nature of citizen science and ways in which it has been applied in schools against the backdrop of the United Nations Sustainable Development Goals (SDGs) and education for sustainable development (ESD), explores the background and theoretical approach to the development of the Citizen Science Corner, describes the processes and methods by which the Corner was established, provides details of its functioning, identifies the benefits, and outlines the challenges.

Citizen Science, Schools and Sustainable Development

Citizen science or community science is scientific research which involves volunteers, amateurs, non-professionals and members of the general public in collecting and analysing data and making scientific observations in partnership with the professional scientific community.

Citizen science projects involve everyday people who are engaged in the collection and analysis of scientific data to collaborate with, and help, scientists with research focused on understanding the world and creating solutions to real world challenges. Citizen science projects have been created to develop partnerships between local communities and scientific research that benefit both parties involved (Bonney et al. 2016) and most projects are specifically designed to engage with the community, either for the educational benefit of the volunteers, for the benefit of research, or both (Silvertown 2009).

Within schools, citizen science establishes collaborative partnerships between research, science, schools, teachers, and students, increasing community engagement in, and understanding of, local, national and global science challenges (Silvertown 2009). Many curriculum-aligned citizen science projects across the world involve student participants who collect and submit data to a larger, parent research

programme, which is generally aligned to state and/or national science standards (Bonney et al. 2016). Developing partnerships between research industry representatives and schools ensures that teachers and students have an appreciation for, and good knowledge of, how research is performed in the real world.

A notable example of a citizen science project is eBird, a collaborative enterprise managed by the Cornell Lab of Ornithology. It gathers sightings of birds around the world through regional hubs and involves hundreds of partner organisations and thousands of participants and users (Cornell Lab of Ornithology n.d.). It has evolved from a basic citizen science project into a collective social programme that has developed interdisciplinary collaborative partnerships among experts in a wide range of fields: conservation biologists, quantitative ecologists, statisticians, computer scientists, global positioning specialists, app developers and data administrators all working together (Sullivan et al. 2014).

The power of the internet has enhanced the spread and accessibility of citizen science initiatives and international relevance and application and led educators to use citizen science projects to enhance student engagement in school activities. Building on the momentum of internet-based citizen science projects, it is possible to create school-based activities that align citizen science projects with school pedagogy and enhance student engagement in real-world science projects (Trautmann et al. 2013).

Citizen science projects have been integrated into school curricula throughout the world including Europe (Kelemen-Finan, Scheuch, and Winter 2018; Lucky et al. 2014; Zárybnická, Sklenicka, and Tryjanowski 2017), the United Kingdom (Silvertown 2009), and the United States of America (Bonney et al. 2016; Schuttler et al. 2019). Examples of citizen science projects developed specifically for schools include BirdSleuth K-12 (Cornell Lab of Ornithology 2024), a project that inspires young people to connect with local bird habitats to explore biodiversity whilst engaging in citizen science. The Monarch Larva Monitoring Project (2024), is a similar project with monarch butterflies. The Nature's Notebook (USA National Phenology Network n.d.) is used in schools for students to track changes in the timing of plant and animal seasonal activity through an online notebook. Global Learning and Observation to Benefit the Environment (GLOBE) (Hall 2023) is another international citizen science programme set up by the National Aeronautics and Space Administration (NASA) in the US (Bonney et al. 2016).

Participating in citizen science initiatives has created positive attitudes in students toward the natural world and technology and enhanced individual learning outcomes of students. Citizen science has engaged student interest, contributed to self-efficacy, revolutionised motivation, changed behaviour and transformed attitudes (Kelemen-Finan, Scheuch, and Winter 2018). Students also gain skills that are essential to their STEM career development, such as teamwork, scientific com-

munication and developing research plans. The approach has proven effective for integrating science into the classroom as it improves student engagement (Boss and Krauss 2014; Lee, Capraro, and Bicer 2019; Noble et al. 2020) and helps students apply their knowledge and understanding of STEM concepts by working on real-world projects (Capraro and Corlu 2013; Schuttler et al. 2019; Terada 2018).

Citizen science projects inherently embody the principles and objectives outlined by the UNESCO Education for Sustainable Development (ESD) programme (UNESCO 2020). By engaging students in hands-on scientific inquiry within their local communities, citizen science projects cultivate a deeper understanding of scientific concepts and foster a sense of responsibility and stewardship towards the environment and society at a global scale. Because students are exposed to real-world challenges, they are encouraged to critically analyse and contextualise their findings in relation to the Sustainable Development Goals (SDGs) set forth by the United Nations (United Nations 2024).

While the SDGs are typically associated with global policy and development initiatives, they also offer valuable opportunities for integrating real-world issues into STEM education and interdisciplinary learning, exposing students to how scientific principles intersect with social, economic and environmental factors. Knowledge of the SDGs provides students with a framework for understanding and addressing global challenges related to sustainability, including issues such as climate change, poverty, inequality and environmental degradation. For example, projects focusing on biodiversity monitoring or climate change adaptation directly contribute to SDG 13: "Climate action" and SDG 15: "Life on land", while also promoting cross-cutting themes of environmental sustainability, social equity, and global citizenship. By actively involving students in the collection and analysis of scientific data, citizen science projects instil a sense of agency and empowerment towards the achievement of the SDGs and nurture a generation of informed and engaged global citizens, as advocated by the UNESCO ESD programme.

Establishing the Citizen Science Corner

The planning for the Citizen Science Corner at Loreto College Coorparoo, Brisbane, Australia began in 2022 with implementation in 2023 (Figure 6.1) as a pilot programme to address STEM authentically in the school. Science is still an industry where women are establishing their foothold, and Loreto College Coorparoo is dedicated to supporting its 900 female students and encouraging them to consider ways in which they can make an impact in the world. A collaborative team was involved in developing the space and the concept. It included a research partner,

Sativus, a Brisbane-based network of scientists with diverse skills who work across the whole knowledge chain, library staff, the science department, and the students. Engaging wholeheartedly with the space in the library has meant that students and staff could gain genuine experiences in the STEM domain while contributing to global citizenship.

The corner was established as a simple physical space with a bench table and two touch screen computers. It was important that the space was easily adaptable to reflect multiple projects, for example, a pin board map was added to the area for one of the projects. Various projects were chosen for implementation in the space and are described in detail later in this chapter. Students could opt in and out of projects depending on their current interests each school term. All projects had the capacity to involve the whole school, or they could run by themselves with students engaging as they walked by the displays in the library.



Figure 6.1: Grade Seven students using the Citizen Science Corner in the library to enter data into iNaturalist. © iNaturalist project

The Instructional Model

There are many theoretical approaches used in education. The Citizen Science Corner based its approach on the BSCS 5E instructional model. BSCS Science Learning (originally Biological Sciences Curriculum Study) emphasises inquiry learning and research-driven innovation in its approach. The five phases of the model are: Engage, Explore, Explain, Elaborate, Evaluate, with each phase underpinned by actionable steps (Bybee et al. 2006). The approach guided the initial establishment of the Citizen Science Corner.

The first phase, Engage, provided an opportunity to brainstorm the concept or skill being developed and made connections between prior knowledge and new ideas (Skamp and Peers 2012). An initial meeting was held between the research partners, Sativus, Loreto College Coorparoo library staff and the Science Head of Department. The Teacher Librarian and Head of Science spoke with students who had chosen to participate in and lead activities in the Citizen Science Corner and the students collaborated to determine which research projects would be featured in the Corner and discussed how the broader school community including all students, parents and others from the local region might participate. Ongoing communication and workshops between the Loreto College Coorparoo school library team and Sativus ensured engagement which guided the initial establishment of the Corner, along with ongoing maintenance and its evolution. The 5E model enabled not only a continuing relationship between the school and research partners, but also allowed for ownership of individual projects to be led by students within the Citizen Science Corner. The Sativus research partner worked with research organisations to identify existing citizen science projects which would align with the schools' expectations and limitations. Options were presented to student representatives to gain feedback on interest and applicability. The Loreto College Coorparoo library team then designed a fit-for-purpose space within the school library building that included equipment and a display space to facilitate the citizen science projects selected by the students. The space was kept as simple as possible to demonstrate ease of implementation and sustainability.

The second phase of the model, Explore, was characterised by multiple opportunities for students to experience hands-on learning. Phase 2 took two school terms to develop; different citizen science projects were made available for investigation, either concurrently or one per term, depending on school requirements. Students were encouraged to be involved in more than one project to broaden exposure to different types of research projects which might involve, for example, online data collection or outdoor observations collecting data.

The third phase of the 5E model, Explain, was designed to encourage students to develop knowledge of concepts and demonstrate their understanding. Phase 3 was conducted concurrently with phase 2. Students were encouraged to explain

what they had learned through taking part in citizen science projects. Students were also encouraged to explain how the experience added value to what they were learning in the classroom, and how their new knowledge and skills could be applied to real world challenges.

The fourth phase, Elaborate, provided opportunities for students to apply what they had learned to develop a deeper understanding of concepts or greater use of their science inquiry skills. Phase 4 was run concurrently with phases 2 and 3. Students who engaged in the Citizen Science Corner presented their work to the larger school body during school assemblies, podcasts and other community events and elaborated on the projects and what they had learned. Students were encouraged to describe their interests and their understanding of applied science to their families and friends to contribute to a wider community understanding of the exciting opportunities of citizen science.

The final phase of the 5E model, Evaluate, provided an opportunity for students, school members and research industry representatives to review and reflect on their own learnings, new understandings and skills. Phase 5 included the collection of qualitative and quantitative data using surveys, and subsequent analysis of student and industry engagement with the Citizen Science Corner over the course of the year. The outcome of the data collection enabled the library team and research partners to implement improvements into the Citizen Science Corner for the following school year.

The Citizen Science Projects Included in the Programme

The planning for implementation of the Citizen Science Corner involved determining the citizen science projects to be included. Some projects in place in schools throughout the world have been mentioned earlier in this chapter. Selection criteria for projects to be included were devised and refined throughout the programme.

Selection Criteria

To ensure the success and efficacy of the Citizen Science Corner, it was established that the chosen projects must align with schools' pedagogy and resources. Citizen science projects must be:

- Interdisciplinary
- Collaborative

- Accessible to students of all learning abilities
- Digitally interactive and encourage online learning
- Interactive with the outside world
- Ongoing and capable of being run more than once, and
- Aligned with student class learning, but also include unfamiliar elements of science and research.

To enable the best outcomes for the programme, some criteria related to exclusion were identified. Projects to be excluded were those that:

- Involved a significant amount of travel, including travelling interstate
- Involved monetary payments from the school or community to the researchers, and
- Were in stark contrast to what students were learning in class.

It was also important to ensure diversity in the project types, topics and methods used when choosing projects to be included, for example, online data collection, observation and/or environmental sampling. Several international studies examining student engagement with citizen science projects found significant differences in students' interest in different topics and contexts related to STEM activities (Kelemen-Finan, Scheuch, and Winter 2018; Sjøberg and Schreiner 2010).

Three projects were initially chosen for implementation across the four terms of the school year: "Globe at Night", in Term 1, "iNaturalist", in Term 2, and "Soils for Science", in Term 3. Towards the end of the school year, the "Loreto Big Butterfly Hunt" was adapted from the Brisbane's Big Butterfly Count, and added to the school programme in Term 4 as an end of year celebration, acknowledging the success of the other three projects. This fourth project allowed the school library to expand the Citizen Science Corner initiative to bring other curriculum areas into the space. Art and mindfulness activities were developed by Loreto College Coorparoo teachers in relation to the project.

Globe at Night

One of the citizen science projects chosen for inclusion in the Citizen Science Corner was Globe at Night, an international citizen science campaign to raise awareness of light pollution by collecting observations and measurements of stars in the night sky. Globe at Night is a programme of the US National Science Foundation's NOIRLab, the preeminent US national centre for ground-based, night-time optical and infrared astronomy, which is managed by the Association of Universities for Research in Astronomy (AURA) (Globe at Night n.d.). The project runs regularly

throughout the year to raise public awareness of global light pollution. Citizen scientists observe the night sky after dusk and enter observations into an online template. The data generated through participant observations provides a compilation of statistics which can be used by scientists to explore the impact of light pollution in various regions.

iNaturalist

iNaturalist Australia (iNaturalist Australia n.d.) is part of the global iNaturalist network, which is "an online social network of people sharing biodiversity information to help each other learn about nature" (iNaturalist n.d.). It helps users of the network identify plants and animals at the same time generating data for science and conservation. iNaturalist Australia contributes data to the Atlas of Living Australia, which is supported by the National Research Infrastructure for Australia (NCRIS), hosted by the Commonwealth Scientific and Industrial Research Organisation (CSIRO), and the Australian node of the Global Biodiversity Information Facility (GBIF) (Atlas of Living Australia n.d.). Citizen scientists upload observations of nature; experts identify and verify their findings; and scientists use the resulting data to understand environmental biodiversity.

Soils for Science

Soils for Science (University of Queensland n.d.) is organised by the University of Queensland's Institute for Molecular Bioscience. Citizen scientists collect soil samples and send them to the Institute. Participants can track online the development of cultures of microbes from the soil samples. The data are used to develop new antibiotics needed in the fight against drug-resistant infections.

The Loreto Big Butterfly Hunt

The final and fourth project undertaken in 2023, the Loreto Big Butterfly Hunt, involved observing butterflies eclosing from chrysalises and attending an immersive educational activity with Bugs Ed. It was undertaken as part of Brisbane's Big Butterfly Count which began with the butterfly season 2020/2021. An initiative of Brisbane Catchments Network (BCN) and all its member groups, the project is a direct result of BCN's Biodiversity Strategy and aims to engage Brisbane residents

of all ages and knowledge levels, provide learning opportunities and the gathering of local butterfly data (Brisbane's Big Butterfly Hunt n.d.).

The Big Butterfly Hunt at Loreto did not involve collecting or uploading data. Students and staff immersed themselves in the butterfly lifecycle, learning about the native flora which attracts butterflies and how to make feeders. The library purchased four chrysalises which were positioned on the front circulation desk. Students and staff guessed when the butterflies would eclose. The eclosing was captured on time lapse camera.

Evaluating the Citizen Science Corner Pilot Programme

The Citizen Science Corner was a pilot programme and determining its success through collecting quantitative and qualitative data was important. The numbers of students engaging in the programme and their personal responses to the citizen science activities were captured to determine for future consideration what projects worked well in the space. Evaluation was undertaken at each phase of the programme to facilitate responses to feedback during the development and to evaluate the overall impact of the activity (Figure 6.2).

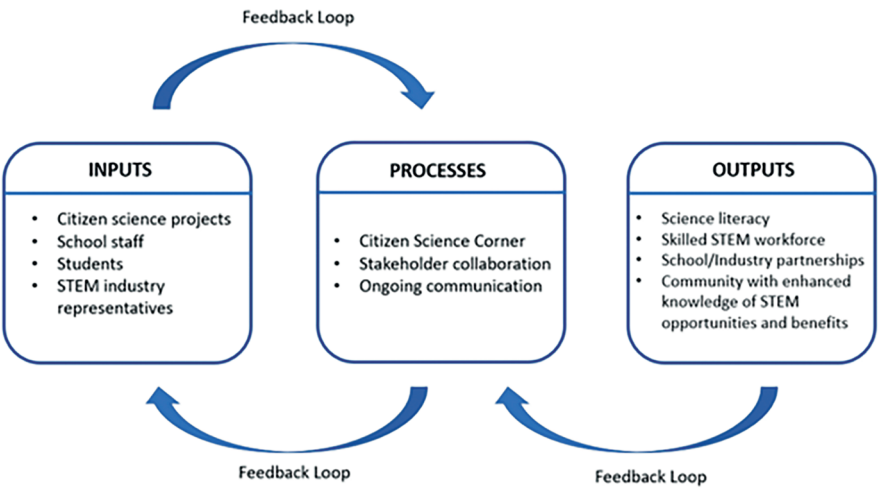


Figure 6.2: Programme evaluation framework for the Citizen Science Corner. © By the authors

Student Feedback

Data was gathered to inform the BSCS 5E phases. A feedback form was used with participants after each project. Participants were asked two questions:

1. Have you participated in a citizen science project before?
2. What brought you here (to the corner) today?

The number of students participating and their motivations for participating informed future projects were recorded. Based on previous experiences, curiosity and self-identified gaps in their own knowledge, students also identified projects and topics they would be interested in undertaking in the future.

Students participating in the projects were surveyed throughout the year and of the 84 responses received to the two questions asked, 76% indicated no previous involvement in citizen science projects. When asked "what brought you here today?" many responses reflected favourably on the value of the hands-on learning experiences and demonstrated the significance of the second phase of the 5E model, Explore. For many, being involved in real-life research was the special attraction. One student reported that "being able to participate in this was cool because I get to help researchers to keep the sky clean and healthy"; another student was excited that she was "contributing to research"; and others commented that it was "cool" or "interesting" to help scientists who would benefit from their research contributions.

Student comments supported the third phase of the 5E model, Explain. Students demonstrated the applications of their new knowledge and skills to real-world challenges which motivated and reinforced their learning. One student stated that she engaged in the Soils for Science project because her "aunt reacts to a lot of medication and antibiotics. So we want to help find medication for her." Another student stated that she participated in the iNaturalist project because "there is a termite nest at my house and I was curious and wanted to do more research". Participating in locating and identifying species provided answers to her questions.

The fourth phase, Elaborate, denotes a deeper understanding of science concepts which allows students to expand on science inquiry skills. The comments "I like science" and "my science teacher got me involved" seem to indicate that involvement in the citizen science corner strengthened existing knowledge and skills. Student science results could be cross-checked against citizen science participation to explore any relationship between participation and skills and knowledge growth.

Evaluate is the fifth phase of the 5E model and two additional clarifying questions were asked during the survey following up on the Soils for Science project. The first extra question focused on the reasons for previous non-participation in

the citizen science programme and the second sought information about topics in which the students would be interested for future projects. Soils for Science was the third project for the year and the responses to the additional questions were helpful in shaping and improving the delivery of the Citizen Science Corner initiative. Some students surveyed would have participated in earlier projects held during the year. Of the 42 students who responded to the Soils for Science survey, 76% indicated they had not previously participated in a citizen science project. Some said that they had been too busy or lacked the time. One response was encouraging: "Have been busy – but like this project and the idea it is really helping". Insufficient details about the programme and lack of knowledge were cited as the reason for non-involvement by about one third of the students. Another student wrote, "I rarely ever visited the library so I could not know or see what projects or "activities" were being held. But now that I'm trying to take time out of my day and coming and visit the library, I have become more interested in the projects that were being held".

Useful responses were received to the question regarding future citizen science projects. "If you could choose a citizen science project, what would you like to do, or what theme would you like it to be?" 16.6% of students wanted to extend their understanding in a soils project and 38.18% wanted to engage in a project related to the discovery of vaccines and medications, which was closely linked to soils; 9.52% wanted to revisit the Globe at Night project; 7.14% suggested water quality; 9.52 % were interested in global warming; 9.52 % in sustainability and a further 9.52 % were interested in knowing more about plants and the environment. The library staff and science programme leaders reviewed the suggestions to inform future projects.

The library and science departments monitored the projects on an ongoing basis, noting any issues and taking actions to strengthen project outcomes. For example, in response to students' inability to photograph observations of natural phenomena due to busy weekend schedules, library staff took extra photos and included these in a communal folder for students to upload into iNaturalist.

Student Participation

The numbers of participants in the Citizen Science Corner demonstrated a steady increase in interaction with citizen science projects. In Term One, 2%, 18, of the 900 students in the school engaged with the Globe at Night project. Term Two saw an increase with 5%, 45 students, interacting with the Citizen Science Corner. In Term Three, the participation increased again with 11%, 99, of the students participating in the Soils for Science project. The participation rate in the final Butterfly Hunt project was 20%, 180, of the school population, a substantial increase from 18

to 180 students over the life of the programme, demonstrating considerable interest engaging with citizen science projects and also indicating that momentum and popularity grow over time (Table 6.1). It is a slow burn; nothing succeeds like success; students have complex lives; and participant interests vary.

Table 6.1: Student participation in the first twelve months of the Citizen Science Corner

Project	Participation	% Total School Population
Globe at Night	18	2
iNaturalist	45	5
Soils for Science	99	11
Loreto Big Butterfly Hunt (Brisbane's Big Butterfly Count n.d.)	180	20

Student Comments and Remarkable Moments

There were several noteworthy moments and student reactions that were pleasing surprises for the school library and science departments. Any school comprises students of different abilities and interests, and it was noted that several neurodivergent learners participated enthusiastically, often leading the way, in projects that required classification work, in particular the iNaturalist and the Big Butterfly Hunt, and assisted with the classification of the butterfly display without needing to refer to support sources. One student interacted directly with a scientist who was researching the species of grass she had identified in the background of a bird photo. The same student was a very enthusiastic uploader of photos into the iNaturalist database. School library staff noted that the Citizen Science Corner was "a great equaliser", welcoming students across the full range of abilities to play an active role based on their personal strengths and interests.

The butterfly hunt project roused considerable interest. When the butterflies began to emerge from the chrysalises, word spread, and students and teachers ran from the playground and their desks to watch the butterflies emerge. It proved to be an exciting event and a learning moment that will be long remembered.

When students returned to school after the summer break, a new student in Year 7 visited the library for the first time and discovered the Citizen Science Corner. She approached the library staff and asked: "How do I get involved with ACSA?" ACSA is the Australian Citizen Science Association (n.d.) and the exchange was pivotal, demonstrating the value of the Citizen Science Corner as a recognis-

able space worthy of student engagement and interaction. Students indicated in discussion how much they enjoyed sharing their citizen science ideas and information. The opportunities for social connection and their value for improved social and emotional well-being cannot be underestimated.

Challenges with the Citizen Science Corner

When first establishing the Citizen Science Corner at the school, it was discovered that smaller project activities should initially be put in place to get the concept up and running. Over time, the projects could become more complex and diverse as student engagement and industry involvement increased. It was also found during the programme that the resources required to establish, maintain and extend the Citizen Science Corner differed, depending on the type of project in which the students wanted to be involved. At a minimum, a Citizen Science Corner in any school library must include sufficient computers for both data collection and data entry, and a collaborative space for students to meet. Depending on the type of projects selected, other equipment such as microscopes might be required.

Two main challenges to the establishment, maintenance and evolution of a Citizen Science Corner in schools emerged: engagement from teachers and students, and effective communication from researchers and industry. Although the 5E instructional model used for the Citizen Science Corner explicitly states that involvement from students and teachers is key, there is a risk that the initial engagement and enthusiasm might decrease over time. The citizen science projects selected by students must ensure applicability and appropriateness to a specific cohort. For example, an emerging new technology may be popular with students who become reluctant to engage with projects that do not feature the desired technology. The Citizen Science Corner is designed to add value to what students learn in class; if teachers no longer see alignment to their lesson plans, there may be a perception that the Citizen Science Corner detracts from students' learning, rather than adds to it (Bonney et al. 2016). The feedback loops outlined in the programme evaluation framework (Figure 6.2) have been implemented in the Citizen Science Corner programme to ensure that any lack, or complete loss, of engagement with students or teachers is identified and rectified as soon as possible.

Ensuring effective communication between researchers and their organisations and the schools participating in their citizen science projects is also a challenge to the success of the Citizen Science Corner. ACSA has many citizen science projects that include resources for schools; unfortunately, some resources were created by scientists in isolation and do not align with school curricula or inte-

grate easily into lesson plans. Schools are therefore less likely to select such projects for inclusion in citizen science projects as it would require extra work from staff to develop resources that will help communicate the project requirements to students. For example, if a citizen science project involves identification of water bugs in samples that students collect from their local waterways, it is essential that the students receive information on how to identify and categorise the water bugs to ensure proper understanding, learning and data collection. If the industry partners do not supply accurate, easy-to-understand project communication resources to schools and students, there is a risk that the students will collect inappropriate data and become uninterested in the concept of citizen science. There is also the risk that if background resources are unavailable, teachers or librarians seeking to develop them will not have the time to do so, which may result in the elimination of interesting or engaging projects for the students.

Challenges emerging with the pilot programme were dealt with, particularly through the methodology adopted, and the resulting benefits overwhelmed any issues or concerns.

Benefits of the Citizen Science Corner

Locating and creating a Citizen Science Corner as a specialised area of the school library ensured that the corner was visible to the wider school community and served as an enhancement to library promotional activity. By partnering with the science teaching teams to engage students in research projects contributing to real life global solutions, library staff were able to provide a supportive environment to add value to student learning, particularly in the areas of information and science literacy.

By consuming and producing information as part of citizen science projects, students engaged with, and developed, critical information, media and science literacies. These literacies share many of the same indicators and outcomes of school curricula and while standards and content used in schools vary across the world, those used in Australia and developed by the Australian Curriculum Assessment and Reporting Authority (ACARA) are typical of others and include critical analysis, understanding bias, selecting precise information, or identifying inconsistencies and contradictions (ACARA [2024c]). Students who wished to dig more deeply into project topics requested more information. Library staff curated information and presented print sources on the shelves in the area and recommended websites for further exploration. Students who were comfortable with independent research found online information using the computers located in the space. Literacy capa-

bilities were developed and enriched through science as students investigated the natural world and engaged with scientific vocabulary. Students tested, used and enhanced their skills in accessing and producing scientific documentation through presenting data in written, verbal or visual form. Ultimately, the Citizen Science Corner in the library was a space where all students had the opportunity to locate and use information to learn.

The seven general capabilities of the Australian National Curriculum are designed to "equip young Australians with the knowledge, skills, behaviours and dispositions to live and work successfully" and were all able to be aligned with the citizen science projects. The capabilities are critical and creative thinking, digital literacy, ethical understanding, intercultural understanding, literacy, numeracy, and personal and social capability (Australian Curriculum and Reporting Authority 2024a). The projects also supported the cross-curriculum priority of sustainability applying in Australia (Australian Curriculum and Reporting Authority 2024b) and deepened student engagement with learning area content in meaningful and memorable ways.

Students used systems thinking to engage with complex systems holistically and began to understand the interconnecting relationships and cyclical nature of projects, particularly in the Soils for Science project where students extended their knowledge by examining the soil profile and determining how outputs from the ecosystem can contribute important antibacterial microbes to sustain the global population from the consequences of viral super bugs. Critical thinking was addressed through student engagement in robust and real-world discussions with research professionals such as the Office of the Queensland Chief Scientist and citizen science project creators, to consider the impacts on sustainability when the status quo is not challenged. In doing so, students considered cultural and global perspectives, accessing information beyond the project's parameters. Importantly, students were made aware of politics, power, control and influence in seeking changes in relation to sustainable development.

The projects were conducted from the library because the innovative space created allowed students to work autonomously with science and information. The library works across curriculum areas in the school and independently of linear school timetables and was able to reinforce systems thinking through the projects. The projects gained a whole-of-school focus and a greater overall impact because the work was not compartmentalised and limited solely to the science department.

Earlier discussion in this chapter referred to benefits for students involved in citizen science. Taking part in projects enables students to gain insight into real research, enhances scientific literacy and develops informed attitudes toward science (Bonney et al. 2016; Bybee and McCrae 2011; European Commission 2015; Kelemen-Finan, Scheuch, and Winter 2018; Saunders et al. 2018). The Cornell Lab

of Ornithology has been part of citizen science projects since its inception, and has identified six categories of individual learning outcomes for students who contribute to citizen science projects:

- Interest in science and the environment
- Self-efficacy
- Motivation
- Knowledge of the nature of science
- Skills of science inquiry, and
- Behaviour and stewardship (Phillips et al. 2014).

The relevance of the first, interest in science and the environment, has also been acknowledged by the European Union which has implemented actions to enhance the relationship between citizen science and student education (European Commission 2015).

Governments, employers, and the workforce at large have recognised that formal education must support skills essential to careers in the 21st century, including critical and creative thinking, problem solving and use of digital technologies. A strong foundation of skills in science is integral to the success and global competitiveness of all countries. Schools must have access to relevant, up-to-date information from researchers to ensure curricula and lesson plans reflect current skills and knowledge expectations and that students acquire them. The Citizen Science Corner in the school library addresses the needs by providing opportunities for real-world application of science skills through authentic learning.

Citizen Science Corner's Contributions to the Sustainable Development Goals

The alignment of the outcomes of the Citizen Science Corner with curricula related to sustainability in the Australian context has already been noted. The implementation of the Citizen Science Corner also exemplifies a robust alignment with the objectives of the UNESCO ESD programme, particularly in raising awareness of the seventeen SDGs within educational settings. The programme built the capacities of the teaching staff at the school, drew their attention to the SDGs and developed skills to create high learning engagement for students. The staff involved became change agents throughout the school by exerting leadership, taking action, and demonstrating accountability. Through the Citizen Science Corner, the school library has come to serve as an effective resource for pursuing the SDGs. Students have become competent in, and contribute towards, the valuable goals identified in sustainable development.

Through the integration of citizen science projects into school activities, students have been provided with opportunities to engage critically with real-world challenges, promote a contextualised understanding of the SDGs, and mobilise ESD in the form of actionable tasks that contribute to research projects pursuing the achievement of the SDGs. The projects within the Citizen Science Corner initiative directly addressed SDG 3: "Good health and well-being", SDG 13: "Climate action" and SDG 15: "Life on land". Students gained insights into the importance of soil health for biodiversity, local biodiversity and the role of local ecosystems in climate resilience. Hands-on activities help students appreciate the practical applications of science in addressing global challenges. SDG 4: "Quality education" was also addressed along with technology, the subject of UNESCO's 2023 Global Education Monitoring Report (UNESCO 2023, [2024]).

In terms of resourcing, the Citizen Science Corner began with two recycled laptops which were used during the engagement process in all the projects to enter data collected by the students and demonstrated the ease and low cost with which innovative programmes can be achieved, at the same time addressing inequities as championed in SDG 10: "Reduced inequalities". The Citizen Science Corner did not need to be an expensive activity to allow students to engage in citizen science, experience a novel approach to scientific learning, grow and develop data and digital literacy skills, and gain an awareness of the SDGs. Through their involvement in the Citizen Science Corner, students developed a deeper understanding of the interconnectedness between scientific research and global sustainability challenges and actively contributed to addressing the challenges by collaborating with real-world scientists and helping them work toward the SDGs.

Conclusion

School libraries and citizen science projects are a dynamic match for bringing ESD to life. They transform learning environments, bring meaningful and important projects into libraries, and most importantly, raise awareness about the environment and improve the lives and well-being of young people. Over time, the implementation of citizen science projects creates a change of practice in the school and local community. Young people actively engage in research activities both within, and outside of, the classroom and even identify new opportunities to engage with industry or contribute to research. The school library provides the perfect environment to facilitate and showcase the work undertaken for school communities.

One challenge affecting the future of research is the lack of student engagement through isolation or failure to appreciate its impact. Integrating a sense of

shared purpose to learning and research along with bringing a sense of wonder back into schools through citizen science will again highlight the importance and benefit of community involvement in the future of the globe.

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7 Creating Green Libraries in Colombia through Education for Sustainable Development

Abstract: In the context of escalating environmental, social and economic concern, UNESCO's Education for Sustainable Development (ESD) programme has emerged as a vital tool for promoting sustainability across various sectors. Libraries, traditionally seen as gatekeepers of knowledge, have increasingly embraced green initiatives, aligning their operations with sustainability principles. The shift has positioned libraries not just as repositories of books but as active players in the global sustainability agenda, aiding in the achievement of the United Nations Sustainable Development Goals (SDGs). This chapter explores ESD as a driver enabling libraries to implement green practices and enhance sustainability. The integration of ESD into the services of the Biblioteca Empresas Públicas de Medellín (EPM)/EPM Library in Medellín, Colombia, is examined as a case study to identify best practice approaches and to gain insights into the library's sustainability initiatives and their impact. The experience of the EPM Library exemplifies the transformation occurring in libraries when they actively integrate ESD into services and initiatives and promote environmental awareness and actions among users.

Keywords: Education for Sustainable Development; Sustainable Development Goals; Green libraries; Libraries – Colombia

Introduction

In the face of pressing global environmental challenges, the imperative for sustainable practices across all sectors has become vitally important. The introduction of the United Nations 2030 Agenda and its Sustainable Development Goals (SDGs) (United Nations n.d.a; United Nations [2015]) has catalysed efforts to address the challenges through integrated and holistic approaches. Libraries have emerged as platforms to foster sustainability. The UNESCO Education for Sustainable Development (ESD) programme has become a key mechanism for achieving the SDGs and outlined the principles of the transformation required (UNESCO 2020). Libraries have responded by seeking to embed green practices into their services and operations. The role of ESD in libraries is multifaceted, targeting the enhancement of

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https://doi.org/10.1515/978-3-11-133646-6-008

community awareness about environmental issues and promoting sustainable behaviours in library users.

In the evolving landscape, the concept of a sustainable library, a green library, extends beyond the conservation of resources to include a commitment to society. Green libraries are not limited to environmental friendliness but embrace a broad approach to sustainability through innovative services and programmes. The International Federation of Library Associations and Institutions (IFLA) Environment, Sustainability and Libraries Section (ENSULIB) has defined green libraries as: "A *green and sustainable library* is a library which takes into account *environmental, economic* and *social sustainability*. Green and sustainable libraries may be of any size, but they should have a clear sustainability agenda" (IFLA ENSULIB 2022). ENSULIB has identified the following components of libraries' sustainability agenda:

- Green buildings and equipment: The emissions, or carbon footprint, of the building and equipment are actively decreased
- Green office principles: Operational routines and processes are environmentally sustainable
- Sustainable economy: Consumption is restrained, circular and sharing economy practices are advanced and are made accessible to the community
- Sustainable library services: Relevant and up-to-date information is easy to access for users, shared spaces, devices, and environmental education are offered, and operations are efficient. The library has a positive carbon handprint
- Social sustainability: good education, literacy, community engagement, cross cultural diversity, social inclusion, and overall participation are considered. The library works actively to reduce inequality
- Environmental management: Environmental goals are SMART (Specific, Measurable, Achievable, Realistic and Timebound), and the library works to decrease its own negative impact on the environment. The library's environmental policy, its implementation and the results of environmental work are communicated to a broader audience, [and]
- Commitment to general environmental goals and programmes: Commitment is guided by the UN Sustainable Development Goals, the Paris Climate Agreement and related environmental certificates and programmes (IFLA ENSULIB 2022).

This chapter explores the integration of ESD within library services which has not only repositioned libraries as crucial agents in promoting sustainability but also showcased their potential to significantly influence local and global environmental outcomes and examines the issues through the lens of experiences at the Biblioteca Empresas Públicas de Medellín (EPM)/EPM Library in Medellín, Colombia, to assess

how ESD acts as a driver for libraries to embrace and exemplify green practices and contribute actively to attainment of the SDGs.

UNESCO's Education for Sustainable Development Directions

UNESCO at its 40th General Conference in 2019 endorsed a *Framework for the Implementation of Education for Sustainable Development (ESD) Beyond 2019* (UNESCO 2019). In 2020, UNESCO produced its *Education for Sustainable Development: A Roadmap* to provide guidelines for implementation of the framework featuring ESD for 2030 (UNESCO 2020). The *Roadmap* is an urgent call for action, outlining a strategic plan to advance education by empowering learners to contribute to sustainable development. It emphasises the need for educational systems to foster the knowledge, skills, attitudes, and values that enable individuals to contribute to a sustainable future.

> ESD for 2030 builds on the Global Action Programme (the GAP) that aimed to reorient and strengthen education and learning to contribute to all activities that promote sustainable development. It places a stronger focus on education's central contribution to the achievement of the Sustainable Development Goals (SDGs). ESD for 2030 directly contributes to SDG 4 on quality and inclusive education, in particular Target 4.7, as well as all other SDGs, to provide relevant education that puts responsibility for the future at the centre (UNESCO 2020, iii).

Various documents have influenced the directions taken by recommendations for ESD implementation. The *Berlin Declaration on Education for Sustainable Development* advocated for a broad integration of ESD through formal, non-formal, and informal education pathways and emphasised the importance of commitment by all to the principles espoused.

> Integrate ESD into all levels of education and training from early childhood to tertiary and adult education, including technical and vocational education and training (TVET), and into non-formal education and informal learning, so that all individuals are provided with lifelong and life-wide learning opportunities for sustainable development (UNESCO 2022, 3).

The inclusion of non-formal and informal education methods is crucial as they often reach a wider audience and adapt more flexibly to local contexts and cultures, and enhance the overall effectiveness and inclusivity of sustainability education. Libraries have a key role to play in this regard and in ensuring that ESD is accessible to everyone, promoting lifelong learning and empowering communities

to act towards sustainable development. The *UNESCO World Conference on Education for Sustainable Development (ESD)*, held online in May 2021 in Berlin endorsed the *Berlin Declaration* and emphasised the urgent need for action and commitment to ESD (UNESCO World Conference on Education for Sustainable Development (ESD) 2021).

The UNESCO ESD *Roadmap* calls on Member States of the United Nations, along with regional and global stakeholders to involve themselves in five priority action areas to achieve the seventeen SDGs. Actors and actions are identified for each area. Libraries are well positioned to contribute to each of the five priorities:

- "Advancing policy": Integrate ESD into both education and sustainable development policies at all levels to create enabling environments that support ESD through policies aligned with sustainable development goals (UNESCO 2020, 26)
- "Transforming learning environments": Adopt whole-of-institution approaches that embed sustainability into all aspects of educational settings, from curriculum to campus operations, ensuring that educational institutions practise what they preach in terms of sustainability (UNESCO 2020, 28)
- "Building capacities of educators": Emphasises the importance of equipping educators with the necessary skills and knowledge to deliver quality ESD using transformative pedagogical approaches, and professional development to enhance ability to integrate sustainability concepts into teaching (UNESCO 2020, 30)
- "Empowering and mobilizing youth": Engage and empower young people as critical agents of change who can envision creative and ingenious solutions to sustainability issues; provide them with opportunities to contribute to sustainability, acknowledging their potential to lead innovative sustainability efforts (UNESCO 2020, 32), and
- "Accelerating local level actions": Encourage sustainable development actions at the local level, where change is most tangible and directly impactful, engage local communities, utilise local resources, and address local sustainability challenges through education (UNESCO 2020, 34).

Libraries serve as key platforms for disseminating information on environmentally friendly practices through initiatives like urban gardening, food sharing, and makerspaces. Libraries deliver programmes on information literacy.

> Information Literacy empowers people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goal.

> Information literacy and lifelong learning have been described as the beacons of the information society, illuminating the courses to development, prosperity and freedom (UNESCO n.d).

Information literacy enables users to acquire habits aligned with sustainable practices and to learn about and understand the priority actions of the Roadmap: policy support, transformative learning environments, capacity building, empowerment and partnerships in promoting ESD.

Empresas Públicas de Medellín (EPM)

Empresas Públicas de Medellín (EPM) is a public utility owned by the municipality of Medellín in Colombia. Founded in 1955, EPM is one of the largest and most important companies in Colombia, providing a wide range of public services. The services include electricity generation and distribution, natural gas distribution, water supply and sanitation, wastewater treatment, and telecommunications. EPM operates primarily in Colombia but has expanded its operations to other countries in Latin America, including Mexico, Guatemala, El Salvador, Panama, and Chile. It invests in renewable energy projects, such as hydroelectric power plants, and implements initiatives to improve water management and reduce greenhouse gas emissions, among other significant endeavours (EPM 2024).

On August 10, 2000, EPM established the Fundación EPM/EPM Foundation (Fundación EPM 2023) to address various social needs essential for community development. The Foundation focuses on strategies that empower communities to take charge of their own development (Fundación EPM 2023, 2024). In 2021, the Foundation participated in the UNESCO World Conference on Education for Sustainable Development in Berlin, affirming the importance of strong actions and commitment towards ESD as part of the work of the Foundation. The Foundation has developed an ESD strategy that includes an Escuela de Educación para el Desarrolla Sostenible/ESD school for employees, Ecosistema de Experiencias Sostenibles/Sustainable Experiences Ecosystem, a specialised educational agenda, and the creation of educational resources for schools and informal education settings (Fundación EPM 2022, 5). Recognising the need to educate people of all ages about the SDGs, the Foundation launched the ESD school to empower employees who interact with over two million people annually. The initiative bolstered the foundation's capacity to promote ESD through its services and to its stakeholders.

Ecosystem of Sustainable Experiences

The Fundación EPM/EPM Foundation has created the Ecosistema de Experiencias Sostenibles/Sustainable Experiences Ecosystem across its seventeen city spaces (Figure 7.1). The ecosystem includes the Biblioteca Empresas Públicas de Medellín (EPM)/EPM Library, the Museu del Agua/Water Museum, the Parque de los Deseosy y Casa de la Música/Park of Desires and House of Music, and fourteen Unidades de Vida Articuladas/Articulated Life Units (UVAs). The various spaces host educational programmes focused on the prioritised SDGs and function as a circular model where good practices from one space are replicated in others, incorporating lessons learned (Fundación EPM 2022, 19).



Figure 7.1: An ecosystem of sustainable development experiences. © Fundación EPM

While the EPM spaces other than the Library are not the focus of this chapter, it should be acknowledged that they contribute to ESD. For example, the Museo del Agua/Water Museum promotes awareness and understanding of water as a vital resource for life and sustainable development, and the impact of climate change on water. A significant part of the museum's mission is to educate the public about sustainable water use and environmental conservation. Similarly, the Parque de los Deseos y Casa de la Música/Park of Desires and the House of Music is an interactive and educational environment which hosts cultural and educational events, including workshops, lectures, and public gatherings, and features a large terrace with an urban farm, used for promoting education about urban agriculture. It has brought together a network of 58,000 urban gardeners, and has distributed 2,000

clean seeds, contributing to food sovereignty and planetary health by promoting the creation of pollinator gardens and home-grown food.

Unidades de Vida Articuladas/Articulated Life Units (UVAs) are innovative community spaces built around the EPM water tanks. The multipurpose facilities are designed to transform public areas into community hubs, providing a variety of social, educational, cultural, and recreational activities. Significant progress has been achieved in the community's adoption of sustainability knowledge through the 5,023 educational activities conducted across the 14 UVAs. Notable initiatives include the development of circular economy fairs and the first second-hand clothing bazaars in two of Medellín's communes, Manrique and Villa Hermosa, which saw the participation of 4,580 people and the delivery of educational activities focused on sustainable social entrepreneurship that have been attended by 3,919 young people and adults.

Biblioteca Empresas Públicas de Medellín (EPM)/EPM Library

The Biblioteca Empresas Públicas de Medellín(EPM)/EPM Library is managed by the Fundación EPM/EPM Foundation and provides both public and specialised library services to EPM employees and the general community (Biblioteca EPM 2023). The library plays a role in fostering sustainable and competitive communities within the metropolitan area of Medellín. The creation of a specialised, business-oriented public library has significantly contributed to the social appropriation of knowledge, promoting several SDGs, including SDG4, Quality education: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (UNESCO 2024a).

What is now the EPM Library was established in 1967 as a business consultation centre to provide employees with access to information resources that would strengthen their professional development and knowledge. Technical standards were among the most consulted materials, and due to the specificity of the resources offered, students in related fields also frequented the centre, despite the limited access granted to the external public at the time (Grupo editorial Revista EPM 2020, 112).

The library spans approximately 10,000 m^2 and was designed as a "pyramid of knowledge". General information is available on the lower floors of the pyramid and progresses to increasingly specialised knowledge on the upper levels, with books integrated into the columns of the structure, symbolising knowledge as the central feature. The library accommodates reading areas, book storage, internet

and audiovisual rooms, exhibition spaces, children's areas, technical zones, training areas, a cinema, auditoriums, study cubicles, a cafeteria, and commercial spaces. The facilities provide a wide range of services, making it a modern, innovative, and accessible place for all (Figure 7.2) (Wikipedia 2024).



Figure 7:2: EPM Library, aerial view. © Fundación EPM

In 2010 the EPM Foundation took over the management of the space. The library has enhanced its visibility through the EPM Foundation's programmes and projects. Collaborative work has strengthened support for different regions and communities across Medellín, enabling many people to access and benefit from the educational offerings provided by the library.

Since 2021, the EPM Library has served a diverse audience, with a particular emphasis on promoting ESD. Through its various programmes and initiatives, the EPM Library aims to raise awareness, foster critical thinking, and provide tools for individuals to make informed decisions that contribute to a more sustainable future. The library organises workshops, seminars, talks, and exhibitions on eco-friendly practices such as energy conservation, waste reduction, and recycling, encouraging the community to adopt sustainable behaviours.

Examining the Operation of the Biblioteca EPM/EPM Library

This chapter reports on a case study examining the operation of the Biblioteca EPM to analyse ESD as a driver that enables libraries to implement green practices and enhance their sustainability.

The Case Study

The case study approach provides a real-world context to investigation which adheres to a framework of qualitative, exploratory, and descriptive research. The method was chosen for several reasons. Case studies are valuable in addressing questions related to how and why a particular phenomenon occurs, particularly in contexts where knowledge is limited. A single case study enables researchers to delve thoroughly into the context and theory of a particular instance and establish connections with the distinctiveness and revelatory aspects of the chosen case (Yin 2014, 3–16). Qualitative case studies prove helpful when the observed phenomenon is ongoing, allowing for in-depth contextualised explanations which not only serve to identify cause-effect mechanisms but also contribute to the challenging and refinement of existing theoretical frameworks (Welch et al. 2011, 755–757). The case study at Biblioteca EPM is intended to uncover valuable insights and best practices that can be applied universally in library contexts.

Primary data was collected through two main channels. Firstly, an extensive document analysis was conducted, involving a meticulous examination of Fundación EPM/EPM Foundation reports and internal documents. The intention was to extract detailed information regarding the library's sustainability policies, initiatives, and the resultant impact. Secondly, a series of semi-structured interviews was undertaken to explore deep, contextual, and complex elements that defined the interactions between the library and its users, employees, and external allies and to probe various aspects of the library's operations and its influence on community engagement, resource accessibility, and educational support. The interviews were designed to allow respondents the flexibility to express their views in an open-ended manner while adhering to a structured guide that ensured consistency across all interviews.

Participants were selected using a purposive sampling technique to cover a broad spectrum of perspectives and included:

- Library users who regularly used the library's resources to understand how the library supported their educational and informational needs
- Library staff from various departments within the library to gain their insights into the library's internal operations and strategic objectives, and

– Representatives from organisations that collaborated with the library to examine the library's external relationships and the library's role within the wider community network.

The total number of interviews was not predetermined but guided by the principle of data saturation. The interviews were conducted until no new information was observed emerging from the data. There was a total of sixteen interviews which were transcribed verbatim. The subsequent data analysis focused on thematic analysis to identify, analyse, and report themes within the data that were correlated against the main topics of UNESCO´s *Roadmap*. The approach provided a rich, detailed, and complex account of the data, aligning with the overall objective of the research to explore the multifaceted role of Biblioteca EPM within its community.

The Results

In 2023, the EPM Library engaged more than 21,000 participants in 1,048 educational activities and contributed significantly to the SDGs through robust education initiatives, workshops and training sessions on sustainability and the SDGs, reading clubs on global matters, exhibitions and displays, robotics, and technological courses provided on digital learning platforms.

Respondents highlighted the library's role in environmental education, science, robotics, the circular economy and technology. The library emerged as a remarkable institution promoting ecological development by offering diverse environmental courses, such as Terrarium Creation, Water Footprint, Entrepreneurship and Circular Economy and Home Gardening. The interviewees emphasised the library's distinctive contribution to sustainable development and in particular its role in bridging the gap between awareness and actionable knowledge.

Actions Undertaken by Biblioteca EPM in Support of Education for Sustainable Development

The following is an overview of the initiatives and actions undertaken by the EPM Library in alignment with UNESCO's ESD programme. They are structured around the five priority action areas described earlier in this chapter: "Advancing policy", "Transforming learning environments", "Building capacities of educators", "Empowering and mobilizing youth", and "Accelerating local level actions" (UNESCO 2020, 25–34). Through these comprehensive strategies, the Library has

made significant strides towards achieving the SDGs, demonstrating its strong commitment to sustainability and community development.

Advancing Policy

The EPM Foundation and Library actively promote and finance the integration of sustainable development principles into educational policies including the educational strategy *My Name is Earth* in collaboration with the Ministerio de Educación Nacional/Ministry of Education and the Ministerio de Ambiente y Desarrollo Sostenible/Ministry of Environment and Sustainable Development of Colombia (Figure 7.3). The pedagogical approach has become national public educational policy. The initiative focuses on teaching children aged three to twelve about climate change, water care, and strategic management of ecosystems and constitutes the first pedagogical content in the country for climate change education for early childhood and primary students that are aligned with the curriculum standards of the national authority and available for everyone online.

The strategy aims to democratise education for sustainable development and raise awareness among students from an early age and primary school about the importance of adopting sustainable behaviours and habits to mitigate the triple planetary crisis of climate change, pollution and biodiversity loss, being experienced (Fundación EPM 2022, 37). The strategy uses storytelling to create physical and digital educational resources on topics such as climate change, water conservation, and strategic ecosystems for children aged three to twelve. The resources include books for children, teachers, and caregivers, a puppet show, and travelling suitcases containing materials to teach environmental sustainability. There are also virtual resources such as songs, games, books, and videos, accompanied by pedagogical guides to support the appropriate implementation of content in the classroom.

The impact of the *My Name is Earth* strategy has been significant. Since its implementation, over 1,681 educational activities have been carried out, involving approximately 20,835 children, educational agents, and families. The puppet show has been well-received by the educational community, with requests for participation in school activities and presentations at various events and festivals. The strategy has garnered national attention, with the participation of 50 education secretaries from across the country during its launch.

The strategy has created awareness about the SDGs, the 2030 Agenda, and the environmental challenges facing the community. It has successfully engaged 250 educators as replicators of the strategy in early childhood education centres and schools in the region, reaching an even wider audience.



Figure 7.3: My Name is Earth strategy. © Fundación EPM

Partnerships are crucial to the EPM Foundation's and the EPM Library's approach to ESD. They have formed alliances with the relevant Colombian government ministries, UNESCO, Colombian universities, and other local entities, demonstrating a strong commitment to collaboration and cooperation. Additionally, the Foundation has participated in various local and international events and festivals, such as the Feria Internacional del Libro de Bogotá (FILBO/Bogota International Book Fair, the 2nd Office for Climate Education (OCE) International Seminar on Climate Change Education (Office for Client Education 2024) and UNESCO's ESD-NET Global and Regional Meeting Transforming Education Together (UNESCO 2024b).

Transforming Learning Environments

The EPM Library has significantly transformed its learning environment to reflect and promote sustainable practices. The library's infrastructure features large windows for natural light, and solar panels, and greatly reduces energy consumption and carbon footprint. Notably, the installation of 450 monocrystalline Passivated Emitter and Rear Contact (PERC) solar panels generates approximately 281.2

MWh of energy annually, covering about 38.98% of the library's energy needs and reducing CO_2 emissions by 81 tons, equivalent to planting 289 trees.

Interviewees highlighted several aspects of the library's infrastructure that contribute to sustainable development. The large windows allow natural light to enter, reducing the need for artificial lighting and saving energy. Additionally, the design of the library, incorporating both natural light and an urban garden, creates a refreshing and tranquil atmosphere. Water fountains at the entrance enhance the overall ambiance and promote environmental awareness.

The EPM Library prioritises social inclusion by ensuring its resources and services are accessible to all community members. Through various outreach programmes, it engages marginalised groups. For example, the Library provides educational resources and creates a welcoming and inclusive space for children from low-income backgrounds, promoting social equity and empowering individuals to participate in sustainable development activities. The EPM Library collaborates with the Escuela de Ciegos y Sordos, Francisco Luis Hernández Ciesor/Educational Institution and School for the Blind and Deaf (Programas Telemedellín 2020) to offer adapted courses, such as a piano course for a deaf audience and a basic electronics course for deaf children. These initiatives have positively impacted 109 individuals with diverse abilities, showcasing the library's inclusive approach.

The library has a specially equipped room and a dedicated team for a Robotics Club (Figure 7.4), providing all the necessary materials to conduct workshops and various activities. This innovative, entirely free programme targets young people from vulnerable communities, including indigenous populations who traditionally lack access to technological education. The initiative reaches beyond the urban landscape of Medellín, extending its transformative impact to rural areas where such educational opportunities are even more scarce.

Serving a total of 1,770 children and young people, the Robotics Club partners with eleven educational centres to deliver high-quality, hands-on learning experiences. These partnerships are crucial, as they enable the programme to provide robust educational support and foster a deep interest in technology among participants. By bridging the gap in access to technological education, the Robotics Club not only equips young minds with critical skills for the future but also promotes inclusion and equal opportunity.



Figure 7.4: Robotics club, a free educational space for children. © Fundación EPM. Private record

The Library has a special area dedicated to the *My Name is Earth* strategy. It promotes educational content and readings, conducts workshops with students, trains educators, and organises various activities to encourage environmental concern among children, their families, and educators. Finally, by offering internet access, the Library enables users to explore online educational and entertainment content, enhancing learning experiences. The significant volume of access to online resources reflects the library's efforts to cater to the diverse interests and needs of its patrons. Additionally, the library's guided visits have attracted large numbers from both the local community and beyond, indicating its success in creating engaging and informative experiences for visitors.

Building Capacities of Educators

The EPM Library places a strong emphasis on building educator capacity to deliver high-quality education for sustainable development. Through the ESD school, the

foundation has proactively conducted continuous training sessions for employees over the past two-and-a-half years. Topics covered include the 2030 Agenda, sustainable development, climate change, the circular economy, and sustainable cities. Ongoing education emphasising lifelong and lifewide learning ensures that the workforce is well-equipped with the knowledge and skills necessary to foster a culture of sustainability.

The EPM Library prioritises capacity building by providing training and support to educators and caregivers and ensures that educators are well-prepared to implement strategies effectively and deliver high-quality education for sustainable development. As already mentioned, the EPM Library has a specially equipped room to develop the *My Name is Earth* educational strategy. Ongoing training activities are conducted in the space for primary school teachers and educators from kindergartens in the city, teaching best practices for implementing the strategy in classrooms. The workshops involve active participation from students, using experiential pedagogical methodologies.

Additionally, there is a special section of the library called the SDGs Reading Club, featuring a curated selection of titles that enables teachers to promote knowledge of the SDGs among their learners. The initiative has attracted 943 participants and includes a practical component where students and their families learn experientially about the SDGs. For example, after completing the readings related to SDG 1: "End poverty in all its forms everywhere" (United Nations n.d.b), a bazaar was held inviting students, their families, and the community to participate. Funds raised were donated to foundations serving vulnerable communities and directed to benefit children. The Library's SDGs Reading Club is based on an initiative led by UNESCO (United Nations n.d.c).

Empowering and Mobilising Youth

The EPM Library recognises the power of youth to lead and promote sustainable development and understands the importance of involving young people in practical activities such as events, workshops, and exhibitions related to sustainability. These activities provide young people with hands-on experience along with critical perspectives about what is happening to the planet, empowering young people to become proactive agents of change. In 2023, the library hosted two major events: BiblioTech and the National Story and Illustration Contest. The BiblioTech event hosted 37 activities and engaged 3,828 participants, promoting dialogue, learning, and interaction on sustainability and cultural topics, including entrepreneurship and literature for young people. The event is designed to inspire and equip young

individuals with the knowledge and skills necessary to contribute to sustainable development.

The XI Concurso Nacional de Cuento e Ilustración Biblioteca EPM/National Story and Illustration Contest involved over 300 participants (Flórez 2023). It nurtures creative thinking towards building a sustainable future and is crucial for promoting sustainability among young people, as it encourages them to express their ideas and solutions through storytelling and art. By contributing to the SDGs, the contest plays an integral role in empowering and mobilising young people to become advocates for a better world. Figure 7.5 presents a promotional image from the contest.



Figure 7.5: Communication piece of the XI National Story and Illustration Contest. © Fundación EPM

Accelerating Local Level Actions

The EPM Library accelerates local action by serving as a dynamic community hub that facilitates access to educational resources and promotes active participation in societal issues. Highlights include:

- Language Week, attracting 529 people and offering language learning opportunities

- Children's Day celebrations in April and October, with 454 participants, and
- Robot Sumo Tournament within the Robotics Club's seedbed program held in five public schools, engaging over 80 students.

The EPM Library strengthened its reading promotion and library services by implementing the lending of a collection of over 40,000 titles to the entire community, whether they were registered users or not, and facilitated 19,810 loans to 6,774 people. The library participates throughout the year in numerous book events, including a book and culture festival, special book days, and a youth reading parade with attendance at over 76 activities by 4,748 participants. The library's four exhibition spaces also attracted 27,141 visitors.

The library and the fourteen UVAs focus on SDG 8: "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" (United Nations n.d.d) and SDG 10: "Reduce inequality within and among countries" (United Nations n.d.e). The Parque de los Deseos y Casa de la Música/Park of Desires and the House of Music addresses SDG 2: "End hunger, achieve food security and improved nutrition and promote sustainable agriculture" (United Nations n.d.f) and SDG 12: "Ensure sustainable consumption and production patterns" (United Nations n.d.g). The Museu del Agua/Water Museum targets SDG 6: "Ensure availability and sustainable management of water and sanitation for all" (United Nations n.d.h) and SDG 13: Take urgent action to combat climate change and its impacts" (United Nations n.d.i).

All activities of the Fundación EPM's ecosystem contribute to SDG 4: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (United Nations n.d.d) and promote SDG 17: "Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development" (United Nations n.d.k) through more than 500 partnerships with various community actors, including schools, kindergartens, public entities, companies, corporations, and community action boards, among others.

The extensive infrastructure of the Fundación EPM, including the EPM Library, along with its activities focused on ESD, serves over 2,500,000 people in Medellín and the metropolitan area. EPM's comprehensive approach to accelerating local action leverages knowledge, behaviours, habits, and sustainable practices among people of all ages, fostering a culture of sustainability within the community. By engaging with a wide range of stakeholders, the Fundación EPM not only educates but also empowers citizens to take active roles in creating a sustainable future, demonstrating the powerful impact of community-driven initiatives on achieving the SDGs.

The library's strategic location and inclusive outreach efforts ensure that educational opportunities and resources are accessible to all community members,

including those from disadvantaged backgrounds. One stakeholder highlighted that the library's services are invaluable, especially for those who may not otherwise have access to such resources. The library's offerings, both physical and virtual, provide opportunities for learning, access to new technologies, and the chance to explore different opportunities, for individuals, particularly children, who may not have the economic means.

Conclusion

The commitment to implement ESD for 2030 presents a significant opportunity for libraries not only to fulfil their traditional roles but also to become agents of sustainable development. Libraries like the EPM Library play a crucial role in promoting sustainable development and environmental awareness within their communities. By aligning with the UNESCO *Roadmap*, libraries can become agents of change and contribute to a greener future. One-way libraries can contribute is by implementing sustainable practices within their own operations. By adopting environmentally friendly initiatives, such as reducing energy consumption, incorporating urban gardens, and promoting digital resources, libraries can set an example for their communities.

Additionally, libraries can serve as knowledge hubs for sustainability-related information. They can curate collections of books, articles, and other resources that educate and raise awareness about environmental issues, climate change, and sustainable practices. By providing access to reliable information, libraries empower individuals to make informed decisions and act towards a more sustainable future. Partnerships and collaborations are also key in advancing sustainability efforts. Libraries can forge alliances with governmental bodies, educational institutions, and community organisations to amplify their impact on formal, non-formal, and informal learning sectors. By working together, libraries can develop educational programmes, workshops, and events that promote environmental awareness and sustainable practices.

Effective communication is paramount in mobilising action towards sustainability. Libraries can engage their communities through targeted outreach efforts, such as organising seminars, lectures, and awareness campaigns. By leveraging media channels and engaging education stakeholders, libraries can promote their message, inspire collective action towards sustainability and play a vital role in mobilising resources for sustainable initiatives. Libraries can encourage voluntary contributions, advocate for sustainable practices, and seek funding opportunities to support environmentally friendly projects. Initiatives like *My Name is Earth*

implemented by the EPM Library demonstrate how libraries can engage communities and leverage resources effectively to promote sustainability and environmental awareness.

In conclusion, libraries, like the EPM Library, have a unique opportunity to contribute to sustainable development and promote ESD. By aligning with the UNESCO *Roadmap* for ESD, implementing sustainable practices, fostering partnerships, communicating effectively, and mobilising resources, libraries can become powerful agents of change in promoting a greener future.

Acknowledgements

We would like to acknowledge the employees of the EPM Foundation, especially the EPM Library´s team, which has worked to build a more harmonious world through sustainable development and ESD.

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8 Cultivating Sustainability: Education and Action in Hungarian Public Libraries

Abstract: In 2020, the United Nations Educational, Scientific and Cultural Organization (UNESCO) launched the Education for Sustainable Development (ESD) Global Agenda for Action to support the achievement of the United Nations Sustainable Development Goals (SDGs) by 2030. The Agenda seeks to strengthen education and learning for goal achievement in both formal and informal settings, including the out-of-school environment, where libraries play a key role in transferring sustainable development, environmental protection and related knowledge to society. The aim of this chapter is to present sustainable development education and environmental literacy in the context of Hungarian public and county libraries. In Hungary, a national library development strategy ensures all citizens have access to information through a collaborative network of county and city libraries that play a central role in providing services and facilitating electronic access to information resources to smaller villages and settlements. The chapter provides an outline of the public library system in Hungary and presents examples of the contributions made by Hungarian libraries to the UNESCO ESD programme to inspire others elsewhere in the world to ensure that sustainable development becomes a reality rather than a dream.

Keywords: Sustainable Development Goals; Public libraries – Hungary

Introduction

In 2020, UNESCO launched its Education for Sustainable Development (ESD) programme (UNESCO 2020), which promotes awareness of the United Nations Sustainable Development Goals (SDGs) (United Nations n.d.a) in the educational environment. The various documents promote a critical and contextual understanding of the SDGs and focus on mobilising personal and societal transformation to achieve them. Education for environmental awareness, a sustainable development mindset and worldview, and the general dissemination of green literacy information, focusing on reading and writing in and about the environment, need to start at an early age. What is green literacy?

> Green literacy represents the ability to understand the impact of human decisions and actions on the environment by raising awareness of sustainable development and encouraging crit-

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https://doi.org/10.1515/978-3-11-133646-6-009

> ical thinking. Its task is to change the behavior of an individual or the entire institution (Čadovska and Tkalčič 2017, English summary).

However, lifelong learning can help people to develop their knowledge and competences into old age and contribute to changing behaviour. The work of libraries is of particular importance in this respect, as libraries reach all sections of society through informal and non-formal education which are key to the UNESCO ESD framework (UNESCO 2019). Libraries also play a bridging role between school-based education and non-formal education, as many schools organise visits to local libraries as part of their curriculum and many public libraries support student activities at schools. The knowledge of students and their teachers about the SDGs is increased by participation in local library activities. Public and school libraries can help to communicate the UNESCO ESD programme to integrate the role and importance of the seventeen SDGs in education. Of all types of libraries, public libraries are used by the widest demographic group including people of all generations, ranging from toddlers through young people to older generations. Public libraries are able to develop a sense of environmental awareness in all their users.

The Public Library System in Hungary

In Hungary, the government has created a public library system in which the role of the county-level and municipal libraries includes coordinating and supporting local smaller village or settlement public libraries in the county, collecting and providing information resources and making them available electronically. The system includes the Könyvtárellátási Szolgáltató Rendszer (KSZR)/Service System for Rural Areas/Library Supply Service System (Hungary. Könyvtári Intézet/Library Institute 2024), which was established following the abolition of a former administrative system for libraries in Hungary. The current operation of the KSZR is governed by a decree of the Ministry of Human Resources. Hungary is divided into nineteen counties and the KSZR is operated by the municipal libraries in each county, contracting with local government authorities to provide local library services in the respective regions.

In 2022, there were 3088 public libraries in Hungary with 1.5 million registered users (Public Libraries 2030 n.d.). Local governments provide library services to their citizens. County and municipal authorities operate public libraries with smaller communities. There are twenty county libraries, nearly three hundred municipal libraries and over 2,500 village libraries (Magyar Könyvtárosok Egyesülete (MKE)/Association of Hungarian Librarians n.d.). The larger libraries work collaboratively with the smaller libraries in the county through the Könyvtárellátási Szolgáltató

Rendszer (KSZR)/Service System for Rural Areas/Library Supply Service System, which provides a wide range of library services to the residents of villages and small towns. Public libraries have special roles, like the collection of local documents and information, assisting users in finding relevant information sources for everyday life issues, and supporting lifelong learning.

The approach ensures that the availability of information resources and participation in events and training are as accessible to people living in small towns, villages and rural areas they are to those living in large cities. In places where there is no library facility, mobile library facilities using library buses ensure service delivery (Figure 8.1).



Figure 8.1: The library bus of Bródy Sándor Könyvtár/Bródy Sándor County and City Library. © Bródy Sándor Könyvtár

The UNESCO ESD programme places a strong emphasis on the changing learning environment and sees families, local communities and non-governmental workers as important participants. They are key library stakeholders in small communities and constitute the group that the programme highlights: "it is the community that is the locus of action for sustainable development" (UNESCO 2019, Annex 1, 3). In Hungary, the public library system enables libraries to pass on environmental awareness and green literacy to their users, thereby contributing to UNESCO's ESD programme.

How do Hungarian Libraries Support the Sustainability Development Goals?

Based on the advocacy work of the International Federation of Library Associations and Institutions (IFLA) and its Environment, Sustainability and Libraries Section (ENSULIB), Hungarian libraries like others throughout the world have taken great care to promote the SDGs to the widest possible audience beginning with activities almost immediately after the publication of the SDGs (IFLA 2018; IFLA ENSULIB n.d.)

The Magyar Könyvtárosok Egyesülete/Hungarian Association of Librarians (MKE) played a major role in developing the IFLA response to the emergence of the SDGs and in determining actions to be taken. The Association organised several events for library professionals on the topic, including in November 2017, a seminar entitled *Könyvtárosok az ENSZ 2030 Agenda és a fenntartható fejlődés megvalósításáért/Librarians for the UN 2030 Agenda and sustainable development*, on the opportunities for librarianship and advocacy in relation to achieving the SDG targets in the UN 2030 Agenda and focusing attention on sustainable development (Magyar Könyvtárosok Egyesülete/Association of Hungarian Librarians 2017). The outcome of the workshop was the document Librarians for Implementing the UN 2030 Agenda and Sustainable Development Goals, which also collected good practices related to the goals from different locations in the country (Hajdu Barát 2018a).

In April 2018, MKE held an international IFLA seminar "Let's Work Together!" a regional workshop for librarians from the Czech Republic, Poland, Romania, Slovakia, Ukraine and Hungary, with two librarians attending from each country. The aim of the event was to raise awareness of the SDGs and to provide support and contributions to the IFLA strategy (Hajdu Barát 2018b; IFLA 2019). The support has been achieved mainly through various events and programmes to raise awareness of particular SDGs. Each event provides participants with the opportunity to learn from presentations and to work through practical examples that will help develop a critical and contextual understanding of each goal. The SDG objectives should be seen in a holistic way, not individually, because they are interlinked and impact on each other.

Following what has been learned, a further series of events and activities relating to the goals of the UN SDGs is being organised by county and municipal libraries which will demonstrate how Hungarian public libraries can raise awareness of the importance of sustainable development among library users of all generations.

Hungarian Public Libraries Inspire Their Communities

Hungarian public libraries have organised many events to communicate the SDGs to their communities and implement the recommendations and proposed actions outlined in the UNESCO ESD programme. For each of the seventeen goals, libraries of all sizes have reached out to their local users demonstrating that not only libraries in big cities, but also libraries in small towns and villages, can made a difference. Both small and large communities can make the journey towards sustainable development for a more liveable future.

Goal 1: End Poverty

Goal 1: "End poverty in all its forms everywhere" (United Nations n.d.b) speaks to the fact that for a better quality of life and sustainable development, poverty eradication is a fundamental challenge that must be tackled in every country. The extent of poverty varies across the world and the number of people who are deprived and therefore disadvantaged varies widely. The causes of poverty vary from one nation to another and are complex. However, it is clear that countries where learning and access to knowledge are neglected have higher rates of poverty. One of the fundamental ways to eradicate poverty is to ensure access to learning and information, which is linked to Goal 4: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (United Nations n.d.e).

The role of libraries in collecting and providing curated and reliable information is indispensable for people of all ages. Children need to be educated at an age-appropriate level, starting as early as possible, so that they have access to the right information and knowledge. Adult and older generations must not be forgotten; the development of digital literacy will become even more important for them as the world becomes increasingly electronic.

> UNESCO defines digital literacy as the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for employment, decent jobs and entrepreneurship. It includes skills such as computer literacy, ICT literacy, information literacy and media literacy which aim to empower people, and in particular youth, to adopt a critical mindset when engaging with information and digital technologies, and to build their resilience in the face of disinformation, hate speech and violent extremism (UNESCO 2024).

In Hungary, in addition to digital literacy, foreign language skills are a key factor. Although most schools teach foreign languages to their pupils, many people need to improve their language skills by taking extra lessons. It is a great help for adults if language courses are available at the local library. A good example is the Kossuth Lajos Közösségi Ház és Könyvtár/Kossuth Lajos Community Centre and Library in the village of Üröm, where English classes are organised three times a week, especially for senior students.

Hungary has held an annual Internet Fiesta since 2000. Each year, programmes organised under the event are linked to a specific theme and libraries across the country participate and showcase services through scheduled activities (Internet Fiesta 2024). As part of Internet Fiesta 2023, a language learning programme for people over 55 years old was held in the Ady Endre Városi Könyvtár/Ady Endre City Library in Baja, the second largest town in Bács-Kiskun County, entitled *Rendhagyó angol/Unconventional English*, which showed participants how the internet can help them learn languages (Internet Fiesta 2023c). Language courses are being offered to a wide range of people, with the library providing a venue. Courses which support lifelong learning and train people in a wide variety of areas can be a great help to citizens in everyday life and in finding employment.

Public libraries in Hungary provide many other information resources and services including reading camps to combat poverty in times of need, ranging from natural and other disasters involving floods or mud slides, through provision of assistance to the community in less developed rural areas, to support of regions affected by the Russian-Ukrainian war. The coordinated services provided by the Könyvtárellátási Szolgáltató Rendszer (KSZR)/Service System for Rural Areas/Library Supply Service System and the mobile library services have provided considerable assistance to people living in small towns and villages in accessing information. Library buses in the counties have played a significant role in eradicating poverty in the domestic context.

Goals 2 and 12: End Hunger and Sustainable Consumption and Production

Goal 2: “End hunger, achieve food security and improved nutrition and promote sustainable agriculture” (United Nations n.d.c), is linked to consumption and production, which are included in Goal 12: “Ensure sustainable consumption and production patterns” (United Nations n.d.m). In developed countries, hunger is not as common as in developing countries. However, it can also be a problem in developed countries if there are fewer harvests in a given year because of climate issues and a greater need for food to be imported. Factors affecting yields include drought

and flooding, which are becoming more prevalent in countries including Hungary due to extreme weather conditions. According to the Központi Statisztikai Hivatal/Hungarian Central Statistical Office, the area affected by drought in Hungary exceeded 50% between 2000 and 2021, which significantly aggravated the problem of adequate food supply (Hungarian Central Statistical Office 2022a). Food wastage has emerged as a significant issue along with food security ensuring that food is safe and nutritious, particularly in relation to salvaged food which might include dented cans, or food close to its use-by date, and which, according to statistical data, has been steadily increasing since 2015, with surplus food from commercial activities being distributed by the appropriate organisations to those in need (Hungarian Central Statistical Office 2022c). Adequate food supply in the 21st century is a topic of growing concern.

A good example of how libraries can contribute to Goals 2 and 12 is through seed libraries, which have become more commonly established since the 2000s. In Hungary, for the first time in autumn 2019, the Óbudai Platán Könyvtár Ezüsthegyi Könyvtára/Ezüsthegy Library Branch Library of Óbuda Platán Library included a seed library among its services (Szépvölgyi 2020a). The Library was a runner-up in the fifth IFLA Green Library Award in 2020 (Szépvölgyi 2020b). The example set was followed by the Illyés Gyula Könyvtár Tolna Megyei/Illyés Gyula Library of Tolna County in Szekszárd, which added seed lending to its services in 2022 (Illyés Gyula Könyvtár Tolna Megyei 2022a, 2022b) and also won an IFLA Green Library Award in 2023 with second place. Users borrow seeds of plants that grow well in the local environment. They sow the seeds in their gardens or window boxes at home, collect them at the end of the growing season, and return part of the harvest to the library. In 2023, the Deák Ferenc Megyei és Városi Könyvtár/Deák Ferenc County and Municipal Library in Zalaegerszeg also launched its seed library service.

Libraries through making seeds available are making a major contribution to enabling members of society to grow useful crops including vegetables and fruit at home, thus helping to improve nutrition. In addition, the seed libraries play a role in educating the public about horticulture and nutrition. This type of library is new to Hungary; several school groups have visited the Óbudai Platán Könyvtár Ezüsthegyi Könyvtára/Ezüsthegy Library Branch Library of Óbuda Platán Library to learn more. The librarians offer visitors a series of interlinked programmes, imparting knowledge about plants to students in a deeper way. Seed lending services in libraries allow both young people and adults to grow a variety of medicinal and useful plants like tomatoes, peppers and cucumbers on balconies, enabling them to create gardens for themselves (Figure 8.2). Residents learn how to grow sustainably on the balcony of a home and library users become aware of the importance of sustainable consumption, through which they can contribute to the UN SDGs.



Figure 8.2: Seed packets for loan in Óbudai Platán Könyvtár Ezüsthegyi Könyvtára/Ezüsthegy Library Branch Library of Óbuda Platán Library. © Szépvölgyi Katalin

Goal 3: Health and Well-being

Goal 3: "Ensure healthy lives and promote well-being for all at all ages" is essential for sustainable development (United Nations n.d.d). This goal has changed dramatically since the global COVID-19 pandemic which has made a major impact on society and essential health services, with increased rates of depression and anxiety among members of society. Healthy living involves, among other things, reducing addiction to substances like alcohol or tobacco. It is important for municipalities to ensure proper wastewater treatment, reduce air pollution and increase the extent and availability of parks and green spaces. According to data provided by the Központi Statisztikai Hivatal/Hungarian Central Statistical Office (2022b), the amount of green space per capita owned by municipalities increased from 2016, but since 2018 has stagnated or slightly decreased. While libraries cannot directly contribute to greening, they can raise awareness of the importance of nature and the environment through various programmes.

The Csorba Győző Könyvtár/Csorba Győző Library in Pécs is raising awareness of the importance of sustainable development and nature awareness through a series of Könyvtári KisÖKOs/Library Small ECO Lectures with the involvement of

experts. Film screenings and lectures are held to promote ecological thinking, and excursions are organised with the participation of users. Figure 8.3 shows the programmes that took place in the first semester of the small ECO programme series. They included the *Vadon-vasárnap/Wild Sunday Discovery Trip* to discover edible wild plants and the *Méhek – mézről mindenkinek/Bees – Honey for Everyone* session for children, where they were given a presentation on the importance and benefits of honey.

In addition to organising lecture series on healthy lifestyles, libraries can also organise trips to the countryside to bring lectures to life. At the Illyés Gyula Könyvtár Tolna Megyei/Illyés Gyula Library of Tolna County, nature walks have been a tradition in the lives of librarians for decades (Kovács et al. 2023). The library has developed a nature walk community in which users are actively involved. In many cases, the tours are led by expert guides, who also lead botanical tours around town. In addition to learning about the plants, the walks organised for the members of the youth club provide them with local history.

There are also city libraries that have been awarded the title of *Bird-friendly Library*. One such library is the Petőfi Sándor Városi Könyvtár Kiskunfélegyháza/Petőfi Sándor Municipal Library in Kiskunfélegyháza, where they make boxes, shelters and watering places for birds, helping them to nest near the library. A *Madárbarát Klub/Bird Lovers Club* was founded, where participants could get even closer to the habits of birds through bird watching (Vajda 2016). The Hamvas Béla Pest Megyei Könyvtár/Hamvas Béla Pest County Library, the Lőrinci Városi Könyvtár és Művelődési Ház/Lőrinci Municipal Library and Cultural Centre and the Algyői Könyvtár/Algyő Library have also been awarded the title of *Madárbarát Munkahely/Bird Friendly Workplace* (Bicskos 2022; Regéci 2011).

These examples all show that libraries are already running popular health and well-being programmes for users, to encourage them to learn about natural heritage and lead healthy lifestyles. Participants learn about inter-relationships and connections that are part of everyday life in the natural environment and acquire a holistic vision of the world and society from an early age.



Figure 8.3: Poster of Könyvtári KisÖKOs/Library Small ECO Lectures at the Csorba Győző Könyvtár/ Csorba Győző Library. © Csorba Győző Könyvtár

Goal 4: Quality Education

Libraries have a key role to play in providing access to information for educational outcomes. Public libraries have long been a link between information, people, education, and knowledge. The IFLA Strategy 2019–2024 emphasises the role that libraries play in society. A key initiative is: "1.1 Show the power of libraries in achieving the Sustainable Development Goals" and Strategic Direction 3 includes: "… empower the library field to deliver high quality services that meet community needs and foster literacy, innovation, heritage preservation and access to information for all users" (IFLA 2019). Libraries seek to provide all sectors of society, from the youngest to the elderly, with the right information, at the right time and in the right place, keeping abreast of changes in the digital world.

The ESD programme places a strong emphasis on Goal 4: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (United Nations n.d.e), in which libraries have become key players, although not mentioned explicitly. The rapid changes associated with digitisation are forcing society to keep pace with the transformation occurring. The older generation must catch up with the use of computers and doing business online, while all face challenges with artificial intelligence (AI), chatbots and misinformation. The young are challenged by appropriate uses of social media. The ESD programme sees skills development as one of its primary goals in the light of the changes occurring, and a cornerstone of "lifelong learning in cities and communities, with the understanding that ESD is not a topic but a holistic approach to reshaping education to address sustainability challenges" (UNESCO 2020, 47).

Libraries in Hungary have recognised the importance of their educational role and are organising programmes for all levels of users to gain new skills, acquire fresh knowledge and master new techniques. Since 2023, the József Attila Megyei és Városi Könyvtár Tatabánya/Tatabánya József Attila County and City Library has hosted the NetNagyi Klub/Net Granny's Club, which provides an opportunity for older people to learn about changes in the digital world. The sessions include ebooks, online shopping, editing photographs on a computer or smartphone and various apps (Szilassi 2024).

A major topic in the digital world today is the emergence of AI and platforms like ChatGPT. Libraries have responded swiftly, and as part of the 2023 and 2024 Internet Fiesta event series (Internet Fiesta 2024), visitors to the Békés Megyei Könyvtár/Békés County Library were able to try out ChatGPT, learn about AI, and appreciate its advantages and shortcomings in activities provided (Békés Megyei Könyvtár 2023).

Robotics is another area that has a major impact on the technological solutions of the 21st century. In Hungary, robotics is mainly taught in extra-curricular

lessons in secondary schools. In Kecskemét, the Katona József Könyvtár Bács-Kiskun Megyei/Katona József Library of Bács-Kiskun County offers various activities related to robotics and Somogyi Károly Városi és Megyei Könyvtár/Somogyi Károly City and County Library in Szeged provides weekly robotics classes (Katona József Library n.d.). Young children can learn about robotics, robot programming and experiment with Lego Ev3 robots, either independently or with help.

These examples demonstrate that libraries are keeping pace with changes in the digital world and striving to provide users with the knowledge and skills essential for lifelong learning, and that libraries in Hungary are contributing to the ESD objectives.

Goal 5: Gender Equality

Goal 5: "Achieve gender equality and empower all women and girls" (United Nations n.d.f) highlights in particular the importance of ending discrimination and violence against women and girls and emphasises the importance of women's rights to education, their effective use of information and communication technologies and the empowerment of women and girls at all levels. Gender equality has become a key issue today, challenging both developed and developing countries, but from different angles. In developed countries, the main challenges are unequal pay and discrimination in the workplace, while in developing countries the chief concerns are the prevention of forced marriages for underage girls and increased participation in education. Students hear about gender equality at school, but libraries can do a great deal to provide relevant information to encourage girls and women. It is vitally important to provide students from an early age with information that broadens their vision, knowledge and perspectives.

Libraries provide access to literature on women's rights and services to help girls and women acquire the skills they need. The Bródy Sándor Könyvtár/Bródy Sándor County and City Library has set up *Tinizug*/*World of Teens* to provide access to literature and fiction books, especially for teenagers (Eger a te Történeted 2019). The Bródy Sándor library has also set up a sewing corner for registered users and offers courses for those interested. Several libraries, including Katona József Könyvtár/Katona József Library in Kecskemét and Eötvös Károly Megyei Könyvtár/Eötvös Károly County Library in Veszprém have parents' rooms or corners where parents, particularly mothers, can take care of their children and babies without disturbance (Őrsi 2021). Libraries contribute to gender equality in the community.

Goals 6 and 14: Water Management, Sanitation, and Oceans

Goals 6 and 14 are about sustainable water management. Goal 6: "Ensure availability and sustainable management of water and sanitation for all" (United Nations n.d.g.) and Goal 14: "Conserve and sustainably use the oceans, seas and marine resources for sustainable development" (United Nations n.d.o) are linked. Improving water quality is a priority, so that safe drinking water is available to all, and eradicating pollution of the sea and maintaining the oceans' ecosystem are vitally important. In developed countries the population usually has access to clean water and effective sanitation to maintain public hygiene. However, in many developing countries, access to water is a privilege, many people invest considerable time and energy in collecting water, and there are often serious problems with water purity. The COVID-19 pandemic highlighted the vital importance of sanitation, hygiene and water purification for human health. As a result of climate change, water levels are dropping and, in severe cases in many lakes and rivers, drying up completely, further reducing access to water.

Libraries can support information resource discovery and provide access to information and information resources on water supplies and systems, sanitation, and energy production, conservation and use for professionals, policy makers, researchers and planners in government and non-governmental organisations (NGOs) as well as citizens. Libraries can contribute to the efficient allocation of resources to sustainable water infrastructure projects. Libraries organise programmes to disseminate water-related information to users. On World Water Day the Martonosi Pál Városi Könyvtár/Martonosi Pál City Library in Kiskunhalas focused on children. Library staff made fun paper fish and provided younger children with colouring books about aquatic animals (Füstös-Kis 2023). In 2023, the Sárszentmihály Könyvtári, Információs és Közösségi Hely/Library, Information and Community Centre in Sárszentmihály focused on the pre-school age group and used a well-known Hungarian cartoon feature film, *Vizipók-Csodapók/Water spider wonder spider* to involve discussion about water along with a series of games in the library, also on World Water Day (Internet Fiesta 2023e).

In addition to young children, it is important to reach teenagers when discussing the future of the planet and sustainability, particularly in relation to water supply. The Városi Könyvtár Tab/Tab Village Library delivered a programme *VÍZ kVÍZ – felsős iskolásoknak/Water for Water – for secondary school children* as well as one for children generally (Internet Fiesta 2023b; Városi Könyvtár Tab/Tab Village Library 2023). In some cases, the programmes can be combined with other activities in the library. A good example is the Huszár Gál Városi Könyvtár/Huszár Gál City Library in Mosonmagyaróvár where an interactive library lesson was held: *Mese a Visztuláról/A Tale of Vistula*, focusing on the importance of environmental

protection in line with the World Water Day on May 22 (Internet Fiesta 2023a). In the Kossuth Lajos Művelődési Ház és Könyvtár/Kossuth Lajos Culture House and Library in Előszállás, library visitors could listen to a story on the occasion of World Water Day in a space created and decorated within the library as a small lakeside (Figure 8.4) to match the theme of the day (Kecskés 2023). Many libraries in Hungary have taken the opportunity of events like World Water Day to raise awareness of the importance of water sustainability concerns. Primary schools celebrate World Water Day annually, and often connect their events to the services provided by public libraries.



Figure 8.4: Decoration of the Kossuth Lajos Művelődési Ház és Könyvtár/Kossuth Lajos House of Culture on World Water Day 2023. © Nyúl Gabriella

Goal 7: Affordable and Clean Energy

Goal 7: "Ensure access to affordable, reliable, sustainable and modern energy for all" emphasises the use of renewable energies (United Nations n.d.h). The world's energy production and use have increased significantly in recent decades, with a major impact on global warming. Renewable energy technologies are increasingly becoming one of the more environmentally friendly approaches. Solar panels are often installed on the roofs of buildings to generate electricity to provide heating

and cooling and the use of natural light to illuminate interiors is also gaining ground.

The use of affordable, sustainable energy has become an important objective for libraries. Even where solar panels cannot be used, energy-saving light bulbs are now commonplace. Libraries also strive to educate their users on low carbon consumption energy sources in addition to using energy-efficient sources in buildings. Many libraries organise programmes on energy use, such as the programme *Fenntartható és megújuló energiatermelés – környezetbarát és olcsóbb energia!/Sustainable and Renewable Energy Production – Environmentally Friendly and Cheaper Energy!* at the Somogyi Károly Városi és Megyei Könyvtár/Somogyi Károly County and City Library in Szeged, where presentations on renewable energy sources were given (Somogyi Károly Városi és Megyei Könyvtár 2022). It is important that libraries continue to make users aware of the relevance of traditional sustainability values, because as the ESD *Roadmap* states: "Ironically, the task of teaching sustainability principles may become more challenging, as technologies give the illusion that they have resolved or can resolve the majority of sustainability problems" (UNESCO 2020, 59). Libraries will continue to play an important role in helping users increase their knowledge of renewable energy sources, and to supporting the SDGs in educational offerings.

Goal 8: Economic Growth and Productive Employment

Goal 8: "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" is a cornerstone of economic success (United Nations n.d.i). The COVID-19 pandemic triggered one of the worst economic crises in decades and halted progress for all. Many people lost their jobs due to forced job closures or were required to retrain. In addition, recent graduates often find it difficult to secure work in their chosen fields. The advisory liaison role within public libraries is invaluable; library staff often help the unemployed to locate employment opportunities and prepare and submit job applications. By providing free internet access for registered users, libraries give jobseekers the opportunity to find new employment as quickly as possible. Several libraries in Hungary have so-called eMagyarország/eHungary points, which include a range of internet and econsultancy services with ecounselling where librarians can help people learn the practicalities of egovernment and eservices. One such service is at Városi Könyvtár, Mezőkövesd/Városi Public Library in Mezőkövesd.

Since 2006, National Library Days in October have been organised throughout Hungary on the basis of a coordinated, unified concept. The annually changing but interrelated themes, the varying needs and interests of different age groups, and

the rapid changes occurring have made these days the most important and most attended in the profession. Together with the Internet Fiesta, they have included programmes on using customer portals and instructing users on information technologies including apps (Félegyházi Közlöny 2022; Internet Fiesta 2023d). Providing skills and advice about digital services to library users is of significant value to library users, particularly those who do not have internet access at home or who are not familiar with egovernment processes. The provision of non-formal education by libraries improves the chances of the less privileged in gaining employment and taking advantage of the right to work. The establishment of eHungary points has resulted in cooperation between governmental and non-profit institutions in providing project-based learning and action for sustainability.

Goal 9: Industry, Innovation and Infrastructure

Goal 9: "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation" notes that reliable and affordable infrastructure is crucial for all and particularly important for helping underdeveloped regions catch up (United Nations n.d.j). The pace of development is growing rapidly thanks to the emergence of technical innovations. Research and development in different fields are developing at a high speed, which requires the establishment of a reliable, sustainable infrastructure. Arguably, libraries are at the heart of science and innovation, and provide access to research infrastructure, data, and quality information which foster innovation and competitiveness. In addition to providing users with access to information, municipal and city libraries can organise events to provide citizens with information about recent innovations and new systems. Within the framework of the National Library Days in 2022, the Dankó Pista Művelődési Ház és Könyvtár/Dankó Pista Cultural Centre and Library in Satymaz organised a robotics session for junior school children (Országos Könyvtári Napok 2022a), while the Katona József Könyvtár/Katona József Library in Kecskemét introduced the public to the world of virtual reality in a session entitled *VRoom - Vár a VR/Vroom/Wait the VR* (Katona József Könyvtár/Katona József Library 2022) and provides robotics classes (Katona József Könyvtár/Katona József Library n.d.). The Besnyő Könyvtári, Információs és Közösségi Hely/Besnyő Library, Information and Community Space showed teenagers how smart devices can help them gather information (Országos Könyvtári Napok 2022b). Virtual reality (VR), like robotics, is a topic of particular interest to young people, and libraries can target them specifically. An opportunity exists to use VR to find creative and imaginative solutions to sustainability challenges. By providing a venue for programmes on innovation techniques, librar-

ies can help to achieve one of the objectives of ESD, namely, to reach out to, and increase the knowledge of, the younger generation.

Goal 10: Reduced Inequalities

The elimination of social, economic and political inequalities, equal access to information, freedom of expression and the protection of personal data are essential for the independence of the individual, which is addressed in Goal 10: "Reduce inequality within and among countries" (United Nations n.d.k). Social inequalities are present in all countries, and the pandemic has exacerbated them. Libraries, through their role in society have a key role to play in promoting how social inequalities can be addressed through equal access to lifelong learning, digital literacy and information for users of all ages. In Hungary, libraries launched a unique series of programmes to tackle social inequality in the mid-2010s. In 2015, the *KönyvtárMozi/LibraryMovie* programme was launched in cooperation with professional organisations to provide cinema for people living in small settlements and villages with fewer than 5,000 inhabitants.

> The aim of the LibraryMovie is: to present the outstanding values of Hungarian film culture to people living in small villages as part of the basic cultural services, and to support the cultural community organisation, the collective experience of which is provided by films (Ramháb 2018, 54).

The film screenings are accompanied by talks and lectures, allowing users to reflect on and discuss the film together. In 2016, KönyvtárMozi/LibraryMovie launched a series of gypsy tales s part of the series, several short, animated films were produced, which present Roma traditions and culture, familiarising young users with the customs of this ethnic group and breaking down barriers of cultural differences. The series is accompanied by a workbook, which includes exercises to help to learn more about Roma culture, thereby developing emotional intelligence and social skills including tolerance, and acceptance of identity. Libraries are assisting young people to contribute to the ESD priority area of eradicating poverty and inequality and promoting a culture of peace in the years to come. The programme makes children sensitive to, and accepting of, different identities and ethnic groups.

Goal 11: Sustainable Cities and Communities

Goal 11: "Make cities and human settlements inclusive, safe, resilient and sustainable" is key (United Nations n.d.l). Waste recycling, reuse of materials, water conservation and energy efficiency are all contributing factors. Ensuring the safety of the population and maintaining physical and mental well-being are essential for sustainable social coexistence. In 21st century urban development, the Smart City concept has emerged with a focus on developing the natural and built environments and the digital infrastructure of municipalities in ways that improve the service quality and efficiency and use innovative information technologies sustainably with increased community involvement. In addition to social and environmental sustainability, economic sustainability is a key priority in the development of smart city strategies (European Commission n.d.) Information and communication technology (ICT) will help cities to become smarter and more efficient in their use of resources, saving costs and energy, improving services and quality of life and reducing the ecological footprint of the city and its inhabitants.

The Smart City programme commenced in Hungary in the 2010s and a growing number of municipalities is getting involved. A major contribution to the development of the smart city model is made by the Modern Cities Programme and the Digital Success Programme 2.0 which seeks to create a digital economy, an effective digital infrastructure, digital competences and a digital state and public administration. Smart city developments have commenced in the cities of Szeged, Debrecen and Miskolc (Szalai 2019). The developments have mainly related to public transport, renewable energy use in buildings, and large-scale selective waste collection. In addition, two Hungarian cities, Budapest and Debrecen, are part of the EuroCities programme which coordinates programmes in areas such as the liveable environment, social inclusion and digital innovation.

Libraries provide information related to smart cities to their users. They are also involved in smart city development projects themselves in areas such as energy use, digital literacy and digitisation of collections. Libraries promote social cohesion in towns and cities and help integrate national minorities in local communities. The war in Ukraine has caused large numbers of people to flee to neighbouring countries, including Hungary, and cannot be ignored. It is important that the people who settle in Hungary are able to integrate into their new environment, and it is important that the local community welcomes them.

Libraries play a significant role in protecting and preserving cultural heritage for future generations. The Lajosmizse Város Művelődési Háza és Könyvtár/Lajosmizse City House of Culture and Library, for example, hosts events such as the Tűzzománc tabor/Fire Dance Camp, the *Jász hímzőkör/Jász Embroidery Circle* and the

Ecsetfilces kalligráfia workshop/Brush Calligraphy Workshop to familiarise users with traditional crafts.

Goals 13 and 15: Climate Action and Life on Land

Goal 13: "Take urgent action to combat climate change and its impacts" (United Nations n.d.n) and Goal 15: "Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss" (United Nations n.d.p) are interlinked and related to other SDGs. Increasingly, heat waves, droughts and floods are having a major impact on the functioning of ecosystems and the world at large. The NGO was founded by Hungarian companies to assist corporations and institutions on their journeys towards environmental management, sustainability and social responsibility. One project is the *Passzold vissza Tesó!/Pass Back Your Brother!* campaign involving KÖVET, the Jane Goodall Institute and the Foundation for Africa. Used mobile phones are collected by libraries and other participating institutions for recycling through professional treatment to remove hazardous waste. Funds generated support local communities in the African region, afforestation and habitat renewal. The II. Rákóczi Ferenc Könyvtár/II. Rákóczi Ferenc Library in Miskolc, the Illyés Gyula Könyvtár/Illyés Gyula Library of Tolna County and the Békés Megyei Könyvtár/ Békés County Library in Békéscsaba have joined the campaign.

Libraries participate in the Earth Day garbage collection campaign *TeSzedd! Önkéntesen a tiszta Magyarországért/Take it! Voluntarily for a Clean Hungary* and organise activities for the younger generation on the occasion of the Madarak és Fák Napját/Birds and Trees Day, which has been celebrated for decades.

Goal 16: Peace, Justice and Strong Institutions

Goal 16: "Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels" (United Nations n.d.q). Libraries promote effective access to up-to-date information supporting justice and inclusion. In a digital world, public institutions increasingly communicate electronically and make their services available digitally. Citizens must make online appointments, file tax declarations digitally, request official documents or certificates through computer communication and undertake a myriad of activities in their daily lives online. Libraries have the modern infrastructure to provide users with access to public services along with

training in their use. Libraries contribute to peaceful and inclusive societies by providing safe, inclusive and open spaces, and in doing so, they not only provide information, but also promote social justice and foster a sense of belonging for everyone.

Goal 17: Global Partnership

Goal 17: "Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development" (United Nations n.d.r). The SDGs can be achieved through a commitment to global partnership and inter-institutional cooperation. For libraries, partnership has many components. Municipal libraries in the county cooperate with each other, as well as with libraries in the cities, villages and settlements in their regions. In addition, partnerships with local schools, nursery schools and, where appropriate, aged care facilities are essential to reach out to different sections of society. Foundations, associations, public agencies, government agencies, cultural institutions, economic and industrial enterprises and corporations all play a key role in promoting sustainable development, and libraries can collaborate with them to bring the importance of environmental awareness and sustainability in everyday life closer to everyone.

Conclusion

There are many examples of Hungarian public libraries' efforts to raise awareness of the SDGs among their users, regardless of age, gender or age group. This chapter has shown that it is not just the larger city and county libraries in Hungary that are working hard to increase users' awareness of environmental protection and green literacy through informal learning, but also smaller village and settlement libraries. The Könyvtárellátási Szolgáltató Rendszer (KSZR)/Service System for Rural Areas/Library Supply Service System operating in Hungary helps to ensure that people living in small villages have the same opportunities to access information and to improve their skills as people living in larger towns.

UNESCO's ESD programme sees the education of young people as an opportunity for changing attitudes and actions to sustainability, and libraries have an increasingly important role to play. A child may first hear about selective waste collection or energy saving in the library and then go home and discuss the issues with family members, spreading the word on environmental responsibility. Library professionals are on the right track in addressing the young on issues of sustainable development. It is today's young people and the next generation who will face the

consequences of unsustainable development and it is therefore all the more important to ensure they have awareness and knowledge and to involve them in decision making and planning: "ESD for the future should prepare the next generations to stay vigilant for 'new' problems" (UNESCO 2020, 59). Today, the younger generation is becoming more vocal about environmental damage, but it is important that more people speak out and take action.

The examples provided in this chapter additionally show that the partnership and cooperation of society's leaders, government elected representatives and employees, and local community members are essential components in achieving the goals. Libraries have already shown that they can work closely with different organisations; partnerships must continue to be prioritised into the future to accelerate action at local level. The examples presented in this chapter demonstrate successful activities and inspire others to make people more aware of their environment and to ensure that future generations can enjoy the world.

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Mariam Bhanu and V.K. Dhanyasree

9 Libraries Striding Towards a Sustainable Society in India

Abstract: This chapter describes work undertaken at the Valapattanam Grama Panchayat Library in Kerala, India as it pursues activities in connection with the United Nations Sustainable Development Goals (SDGs). It is written as a case study based on an interview with the head librarian and on documents written about the activities undertaken in the library. The exemplary initiatives implemented by the Library have been included in the SDG Stories of the International Federation of Library Associations and Institutions (IFLA) *Library Map of the World.* The Library is the only public library in Kerala, a state of India, which focuses on educating the community on the SDGs and it sets an example for other libraries both in India and elsewhere to adopt similar practices to promote sustainable development.

Keywords: Public libraries – India; Sustainability – India

Introduction

Kerala is one of twenty-eight states in India. It is known for its exceptional performances in the educational and health sectors compared to the rest of the Indian states. Kerala has consecutively retained the first rank in the United Nations Sustainable Development Goals (SDGs) indicators released by the National Institution for Transforming India (NITI) Aayog, a public policy think tank focusing on India's economic development. NITI Aayog compiles an SDG index (NITI Aayog 2020) which measures performance of the seventeen SDGs and their 169 targets (United Nations n.d.a). Kerala has scored 80 points in SDG 4, Quality education. However, the state did not become educationally prosperous overnight. Instead, there is a long history tracing how the people of Kerala fought centuries old battles for the right to education. There was a visible dearth on the educational front in the princely states of Malabar, Travancore and Cochin due to the illicit methods practised in previous times such as slavery and the caste system, which hindered oppressed communities from achieving even primary school education. Underprivileged classes were stripped of all basic human rights including education.

The trajectory of educational growth in Kerala can be traced to the erstwhile British imperial rule, when educational policies were introduced in Travancore and Cochin during the later half of the 19th century. The new education policies introduced under British rule were focused on promoting western science and

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https://doi.org/10.1515/978-3-11-133646-6-010

literature through the medium of English as propounded by Thomas Babington Macaulay in 1835 in his document *Minute on Indian Education* (Nair 1976, 32–36). Since the provision of learning English was available only to the elite members of society, the imposition of using a foreign language posed a threat to the many indigenous and vernacular school systems that existed in the region causing a divide within the society. Over the years, Kerala witnessed relentless resistance against monarchical rule and the rise of social reform leaders. Demand for better educational and employment opportunities, the establishment of educational institutions by various religious organisations, and the growth in the number of village libraries and reading rooms were significant factors in the advancement of education in Kerala (Nair 1976, 37–40).

Despite imperial rule, Kerala had a strong inclination towards the idea of libraries and literacy, although they were intended for use by only a select community. The intensity of interest is clearly reflected in the establishment of the Trivandrum Public Library, the state's first public library in 1829, making it one of the oldest public libraries in India. However, the library was available for the elite members of society only, particularly the British and royal classes (Bavakutty 1982, 251–252). In later years, the decision was made to open the library to the public and it was handed over to the government by the then ruler of Travancore, Sir Sri Moolam Thirunal Rama Varma VI in 1898. The decision was monumental and the library was the first library declared open to the public prior to India's independence in 1947. The latter half of the 19th century witnessed the establishment of several public libraries during the erstwhile British rule, namely Ernakulam Public Library in 1870, Trichur Public Library in 1873 and Kottayam Public Library in 1882. An increase in the number of public libraries in various parts of the state paved the way for a historic public library movement in Kerala (Devarajan 1990).

Public Library Movement in Kerala

It was around the time that India secured independence from colonial rule in 1947 that the library movement gained momentum in Kerala. The establishment of reading groups had a pivotal role to play in Kerala's library history. The Malabar Vayanasala Sangham/Malabar Vayanasala Community, a library association formed in 1937, was the first of its kind to be established in Kerala prior to independence; however, due to unprecedented events, the organisation collapsed. Another body was subsequently established under the name Travancore Grandhasala Sangham/Travancore Grandhasala Community that later came to be known as the Kerala Grandhasala Sangham/Kerala Grandhasala Community. This body was

formed through the initiative of Puthuvayil Narayana Panicker who is considered the father of the public library movement in Kerala (Cyriac 2023), and included representation from 47 libraries in Travancore, a kingdom in the southern part of modern Kirala which lasted from about 1729 until 1949.

Under the stewardship of Panicker, a library culture evolved in the state as a place where local people would meet for informal gatherings and engage in meaningful discussions. Public libraries had a huge influence in educating the common person in an informal system, which later helped instil a civic responsibility among the people of Kerala. The public libraries were not simply spaces for reading books but also places to exchange ideas on the existing political and economic system in the state, particularly when the state was going through difficulties after independence. The Kerala Grandhasala Sangham/Kerala Grandhasala Community, later known as the Kerala State Library Council, implemented phenomenal initiatives to cultivate a reading culture across the state by establishing rural libraries in the villages of Kerala, with the intention of elevating the underprivileged and underdeveloped classes within the community (Devarajan 1990).

Developing an educational system in Kerala has not been an easy task. After independence in 1947, the Communist Party of India won the general assembly elections and formed the governing cabinet under the leadership of E.M.S. Namboothiripad (Bavakutty 1982, 255). With the intention of democratizing the existing private schools, the government introduced an Education Bill only for it to be rejected. It created an outcry among religious groups, since most of the private schools in Kerala at the time were run by Christian or Nair, a group of Hindu castes. Many feared that the Bill introduced by the atheist communist party would compromise religious integrity and take autonomy away from the schools. The government faced harsh criticism from religious organisations as well as opposition political parties, which resulted in the toppling of the government, and the establishment of presidential rule in the state (Lieten 1977, 3–9). However, the cabinet was somewhat successful in helping to draft a Library Bill for the state in 1959 with the help of the renowned S. R. Ranganathan (Bavakutty 1982, 251–252). Ranganathan helped formulate a library development plan by consulting with the Kerala Grandhasala Sangham/Kerala Grandhasala Community and visiting some of the libraries in Kerala. In 1989, after a decades-long battle, the Bill was finally approved by the Kerala Legislative Assembly, making Kerala the seventh state in the country to pass a library act, the Kerala Public Libraries Act, 1989 (Devarajan 1990).

Despite the economic and political instability in the state, the library movement garnered favourable feedback from citizens as public libraries offered a platform for lifelong learning irrespective of caste, creed or gender. The Kerala Grandhasala Sangham/Kerala Grandhasala Community pioneered the battle against illiteracy in the state by providing evening schools in the libraries and nurturing reading

habits. In later years, the Sangham came under the control of the state government and was renamed the Kerala State Library Council, a body which continues today and enables public libraries to receive grants and funding for acquiring resources and which organises myriad programmes for the delivery and revival of library services.

In this chapter, the authors have selected the Valapattanam Grama Panchayat Library as a case study since it is the only public library in Kerala that organises activities based on the SDGs. The library has created many forums for different age groups such as a children's forum, a women's forum, a youth forum and an elderly forum as directed by the State Library Council. Each forum offers a wide range of programmes which are both entertaining and educational. The library aims to create a sustainable and resilient society by ensuring the participation of the local community and engaging them in activities to improve their skills for learning, education and employment. An in-depth examination of the Valapattanam Grama Panchayat Library provides insights for others to emulate.

Promoting the UNESCO Education for Sustainable Development Programme through Public Libraries

The UNESCO Education for Sustainable Development (ESD) programme (UNESCO n.d.) emphasises the role of education and its contribution towards the actualisation of the United Nations seventeen SDGs. It is only through education that the public become aware of the SDGs and their relevance in the present day. For this reason, SDG 4, Quality education: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" is one of the key goals among the seventeen SDGs (United Nations n.d.b). The role of public libraries is particularly relevant because their fundamental purpose is to provide equal access to information for everyone everywhere. Historically, the existence of public libraries has always been defined by its core objective of promoting education within the community as demonstrated in the IFLA-UNESCO Public Library Manifesto which "proclaims UNESCO's belief in the public library as a living force for education, culture and information, and as an essential agent for the fostering of peace and welfare through the minds of all people" (IFLA 2022). The UNESCO ESD programme focuses on spreading awareness of the SDGs to the public and mobilising efforts for the actualisation of the SDGs. Public libraries are best suited for this role as they are closely associated with the members of the community and can address the issues at a grassroots level. Numerous studies have been conducted to substantiate how public libraries play an integral role in educating the community.

Mansour (2020) explains how rural libraries in Egypt are working towards the attainment of the SDGs by analysing the activities of 34 rural public libraries in the four main administrative divisions of Egypt. The results of the study show positive steps being taken regarding education with more than two-thirds of the library staff, 69.4%, making long term plans for educating illiterate individuals of both genders, as well as the elderly. The role of public libraries in achieving the SDGs is praised and welcomed by international organisations since they have the potential to reach and influence all segments of population within society. Koscie-jew (2020) emphasises the central role of public libraries in contributing towards each SDG and notes how public libraries promote lifelong learning including the development of technical skills that help to secure decent jobs, employment and entrepreneurial opportunities.

By presenting the world-renowned Bibliotheca Alexandrina as a case study, Abumandour (2020) emphasises that public libraries are the best suited platform for elearning and lifelong education for science, technology, engineering and mathematics (STEM) subjects. The author examines the number of elearning courses offered by educational institutions and public libraries worldwide. By comparing different types of libraries, elearning resources were found to be offered more frequently by educational institutions than public libraries. The author suggests that although the Bibliotheca Alexandrina public library has the potential to address the demands and needs of users in searching STEM-related subjects, a team of experts in STEM and information technology support could enhance opportunities for elearning in STEM subjects through public libraries.

Sustainable Development Initiatives at the Valapattanam Grama Panchayat Library

What is the true purpose of a library? Is it simply to store books or does it enlighten readers to go beyond passive reading, encourage curiosity and lead to self-discovery? While some libraries are curated for readers to indulge them in stories, novels and self-learning, there are others that stand firm to instil civic values for future generations. One of the priority services of a library is to build a strong foundation for younger generations on how to be responsible citizens. The librarian takes on a behemoth role in ensuring that the public understands a library is not just for lending books, but that it is a community hub for exchanging ideas, engaging in thoughtful conversations and instilling good values.

The public libraries in Kerala are affiliated with the previously mentioned state higher authority, the Kerala State Library Council. The Council audits its

public libraries every year and grades are allotted from A+ to F according to the activities organised by the library. Future funding depends on the grade secured by the libraries. For example, a library with an A+ grade would receive 50,000 Indian Rupees/US$596.55 as an annual grant to purchase books whereas a library with an F grade would receive 12,000 Indian Rupees/US$143.16 as the annual grant. The State Library Council has observed a steady decline in the number of library patrons during the past few years particularly after the COVID-19 pandemic and the proliferation of social media that rose concurrently with it. The pandemic had a negative impact on all spheres of life in Kerala just as it did everywhere else in the world. One of the major negative impacts was the accelerated use of smart phones among the younger generation, especially school students. Children had to use smartphones and laptops to attend online classes, which increased their screen time more than ever before. Strict restrictions on travel made children's lives miserable and they resorted to smartphones for endless streaming of *YouTube* and other social media platforms to provide relief from boredom.

> Kerala has always taken pride in its robust public library network. The state has 9,207 public libraries, and 6,811 of them are affiliated to the Kerala State Library Council (KSLC). However, Kerala continues to limp in its effort to equip them with better technology and infrastructure, and transform them into vibrant information hubs (Mohan 2022).

Various initiatives are being undertaken to deal with the issues. Programmes offered by the Valapattanam Grama Panchayat Library have made headlines in newspapers and garnered international recognition among library professional associations including IFLA. The Valapattanam Grama Panchayat Library is a one-person library describing itself as a Rural Community Knowledge Centre with an active team of volunteers in a village with a population of 7955 in Kerala (Mathew [2021]). As previously mentioned, the Kerala State Library Council's guidelines indicate that every library should implement forums for different age groups to ensure equal participation of community members. The librarian of Valapattanam Grama Panchayat Library, Binoy Mathew, has done a remarkable job in this regard (Mathew [2021]).

One successful programme "The Creative Home – Defeat COVID-19" was an online learning session organised for children by the librarian through *WhatsApp*. It was a huge success and enabled children to interact with each other by engaging in different activities such as origami, poster making, fancy dress competitions and sessions with personalities from different professions such as novelists, doctors, actors, artists and others.

The library focuses on educating children about the relevance of the SDGs and engaging them in various SDG-related activities. Binoy Mathew stated in a personal

interview that today's children are tomorrow's promise. The library has created new opportunities for children by organising a range of events to encourage them to become responsible citizens (Valapattanam Gramapanchayat Library n.d.). The activities of the library during the pandemic are included in IFLA's Library Map of the World (IFLA 2021).The library's successful initiatives to educate the community of Valapattanam village about the SDGs are outlined in the following.

SDG 4: Quality Education

One of the imperative roles of public libraries relates to SDG 4: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" and includes the invigoration of critical thinking by providing learning resources (United Nations n.d.b). A sustainable learning platform for lifelong learning irrespective of age and gender is paramount and public libraries are perfectly positioned to function as active members in society to help achieve this target. The Valapattanam Grama Panchayat Library is focused on empowering children and many initiatives are being organised to help foster quality education for the student community which are featured on the library's blog (Valapattanam Gramapanchayat Library n.d.).

Promoting Reading Habits

In connection with promoting reading habits among children, the General Education Department in Kerala has begun a campaign to make the community aware of the relevance of reading skills in a technologically advanced society. The library held the inaugural function of the campaign by collaborating with the local Block Resource Centre in Kannur district. Block Resource Centres (BRCs) in Kerala conduct in-service teacher training and provide academic support to teachers and schools on a regular basis as well as helping in community activities. BRC personnel and students attended the programme, and other well-known personalities in the community were present for the occasion.

Qitab/Book 2023 – Reading Festival

The library in partnership with Kudumbashree, a local self-governing authority, decided to conduct an extensive reading festival. It commenced on June 19 to celebrate National Reading Day in India, which was inaugurated in 1996 in remem-

brance of Puthuvayil Narayana Panicker's contributions as the father of the library movement in Kerala.

Library Diary

A notable initiative of the library is the distribution of diaries to the children's forum members so that they can consider their ideas and report their views on recent books they have read. The diary is entitled *Ente Pusthaka Kurippukal Ente Nireekshana Kurippukal*/*My novel and observation notes*. Every month the diaries are analysed and the best diary notes receive an award from the library (Figure 9.1). Such practices not only promote reading habits among children but also develop critical analysis of novels or journal articles. Language and handwriting skills are simultaneously developed.



Figure 9.1: Diaries "My novel and observation notes". © VPGP Library Facebook

YouTube Channel News @ Kutty Views

In the era of fast-moving developments in information and communications technology (ICT) including artificial intelligence, it is necessary to remain informed of emerging changes. To familiarise children with new ICT applications, the library has launched a *YouTube* channel where members of the children's forum present events hosted at the library in a news reporting format. For this purpose, the

librarian organised a *Media workshop* webinar where the online editor of Asianet News, a mainstream news channel in Malayalam, the local language, was invited to conduct sessions on media literacy. As of August 2024, there are 33 videos posted on the Valapattanam Grama Panchayat Library *YouTube* channel "Kutti Views" with most presented by the Friends of Children's forum (Kutti Views n.d.).

Mayflower 2023

It is vital to keep children engaged in different activities separate from school. Outdoor activities help to develop motor skills as well as life skills. In the era of smartphones and the internet, it is easy for children to become trapped and lost in an online world. The library constantly advocates for educating children as the promising future generation and organised a sequence of activities under the name *Mayflower 2023*. The activities were targeted at school students during the summer vacation as a fun learning experience. A ceramic artist was invited to conduct a workshop for the children to learn new skills and develop creative ideas on an open platform. On the second day, the members of the children's forum were introduced to the world of science with the help of a subject expert who conducted experiments with batteries, magnets, coins, water and matchsticks. As part of the summer camp, the children were provided with the opportunity to visit the book festival hosted at Kannur to interact with book publishers for the first time and understand how book acquisition in the library works. The children suggested books to be purchased by the library. A workshop on folklore songs was also organised as part of the summer vacation camp.

Overseas Education Webinars

The library provides a unique opportunity for youngsters to seek information on overseas education by hosting webinars with students in foreign universities. A physics research scholar from North Carolina University in the US, and a student from Valapattanam village pursuing a PhD in Vienna, were invited to a webinar to interact with the students on the possibilities of higher education in foreign universities.

SDG 5: Gender Equality

Public libraries are well-positioned to educate and empower women by introducing them to the world of knowledge. For many developing and transitioning economies, public libraries have played a key role in creating awareness on various issues related to women in society such as equal rights to education, domestic violence and harassment against women, sexual and reproductive health, self-employment, digital literacy and other topics (Izah 2021). The women's forum of Valapattanam Grama Panchayat Library is actively involved in empowering women by ensuring their participation in various community engagement activities. The following initiatives of the Valapattanam Grama Panchayat Library contribute towards SDG 5: "Achieve gender equality and empower all women and girls" (United Nations n.d.c).

Women's Cycle Club

The initiative of the cycling club, formed by the library in connection with International Women's Day celebrations, was a transformational experience for the members of the women's forum. The cycling club is a programme of the women's forum where they meet regularly in an open playground and immerse themselves in stress relieving activities such as physical exercise and games and make themselves comfortable in women's community activity (Figure 9.2).



Figure 9.2: Women's cycle club. © VPGP Library Facebook

Film Club

The women's forum in collaboration with "Kudumbashree" a women's empowerment programme implemented by the government of Kerala, in 1997, organised the screening of the Malayalam movie *Jaya Jaya Jaya Jaya Hey* (Wikipedia 2024a) and the *Great Indian Kitchen* (Wikipedia 2024b) that address the issues of women in today's society. The movies address the core issues and challenges of Indian women who are supposed to live by the norms set by society from the moment of birth to the day they are married.

Book Discussion

The library has implemented many programmes for improving literacy among community members. Occasionally the members of the women's forum meet for a book discussion on a selected book to share their views, feelings and opinions in a healthy, open debate. Such events are helpful to remain current with literature in the digital age where reading a book can be considered a miraculous task.

SDG 8: Decent Work and Economic Growth

The eighth Goal of the UN SDGs is: "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" (United Nations n.d.d). Job candidates require digital skills to succeed in today's world since every job sector demands technologically-skilled personnel. Free internet connectivity and exposure to ICT facilities in the community develop people's computer skills. Public library spaces can be upgraded and used to educate the community through the use of ICT facilities and to create awareness of the latest developments in the fields of communication and technology.

One of the major factors that contribute towards the growth of public libraries is the volunteering activities for young people. The youth forum of Valapattanam Grama Panchayat Library is involved in career guidance events and coaching classes for competitive examinations.

Coaching Programmes for Competitive Exams

In India, young candidates seek government sector jobs through state level Public Service Commission (PSC) exams or central level UPSC (Union Public Service Com-

mission) exams. Jobs in the government sector have added benefits such as pension and health insurance but can be secured only by qualifying through the highly competitive entrance examinations. Usually candidates choose to undertake paid entrance coaching classes because they are believed to provide better study materials and learning sessions. However, students often forget about, or are unaware of, the public library platforms where they can prepare for the examinations free of charge with supporting study materials available in the library. The Valapattanam Grama Panchayat Library has a strong focus on the area and organises competitive exam training classes every year. There is a staggering response for this programme since it has helped many candidates pass their PSC examinations. The library has implemented the initiative with a view to fulfilling SDG 8.

SDG 9: Industry, Innovation and Infrastructure

The ninth Goal of the SDGs: "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation" (United Nations n.d.e) supports micro-small-medium sized enterprises (MSMEs), the backbone of countries throughout the world, and youth entrepreneurship. The goal also emphasises igniting the thought processes and creative abilities of human beings, and focuses on research, technology and innovation.

Space Science

A public library is not only a place for reading books. The Valapattanam Grama Panchayat Library provides an open platform for children to awaken their scientific curiosity by organising science clubs where children are able to interact with scientists. India has recently made groundbreaking achievements in its outer space programme, including the successful deployment of Chandrayaan-3, a lunar exploration mission. The librarian invited the former chief scientist of the Indian Space Research Organisation (ISRO) to interact with students and organised classes on various opportunities in the outer space programme (Figure 9.3).



Figure 9.3: Space Science Programme. © VPGP Library

SDG 11: Sustainable Cities and Communities

SDG 11: "Make cities and human settlements inclusive, safe, resilient and sustainable" (United Nations n.d.f) focuses on making cities and communities sustainable and ensuring that marginalised segments such as elderly people, refugees, and migrants find a safe place for shelter and livelihood (United Nations n.d.f). Libraries play a leading role in accommodating people from different social strata because they provide safe, neutral civic spaces for everyone.

Valapattanam Grama Panchayat Library organised a half day trip for elderly members of the community to a local pet station and a beach in Kannur with the help of Panchayat authorities and staff of the tourism department. According to participants, the trip was most memorable as they had indulged in fun-filled activities like singing.

SDG 12: Responsible Consumption and Production

SDG 12: "Ensure sustainable consumption and production patterns" (United Nations n.d.g) emphasises mindfulness in relation to energy use and environmental impact. One of the benefits of the Valapattanam Grama Panchayat Library is the enormous community support it receives from the village which helps to solicit donations and sponsorships for improving the library's infrastructure. The library was refurbished using funds donated by the Member of Legislative Assembly (MLA) Foundation of the Kerala State Legislative Assembly with all necessary amenities including solar panels. Equipped with air conditioners, computers, sound systems and other electronic equipment the library sets an example for the community to follow through its own adaptation of sustainable methods to conserve energy and reduce its carbon footprint on the environment.

SDG 13: Climate Action

The 21st century has seen some of the worst climate disasters in history. An initiative to create a sustainable environment for future generations, a legally binding climate agreement, was signed in Paris in 2015 and is referred to as *The Paris Agreement* (United Nations n.d.k). The SDGs have also attached considerable importance to climate change in the thirteenth Goal: "Take urgent action to combat climate change and its impacts" (United Nations n.d.h).

Observing World Meteorological Day and World Water Day

The librarian of the Valapattanam Grama Panchayat Library never misses an opportunity to educate children on SDGs through observing days of international relevance such as the World Meteorological Day and World Water Day. Climate change and conserving water resources are among the SDGs addressed on these occasions.

Knowledge on Wheels

The library organised a cycle training session for members of the children's forum in recognition of World Bicycle Day observed on June 3. As part of educating the children on the SDGs, the librarian came up with the interesting notion of familiarising children with how to ride bicycles on the streets of Valapattanam which helped them understand simple, sustainable, and clean modes of transport, and strategies for mitigating the negative impacts of climate change.

SDG 15: Life on Land

The fifteenth Goal of the SDGs is focused on the conservation and restoration of natural ecosystems of land and water: "Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss" (United Nations n.d.i).

Learning about the Environment through the Library

To educate and create awareness among children about the diversity of creatures living around us, the Valapattanam Grama Panchayat Library invites a nature observer to interact with the students to discuss the specialised adaptations of living beings including the elephant, tiger, praying mantis, bacteria and viruses. Children have a unique opportunity to learn about the characteristics of living creatures and how they help to maintain a balanced ecosystem.

Biodiversity Garden

Library members collaborated with the head of the Botany Department of Payyanur College, local representatives of the various community groups in Kerala including the Grama Panchayat village council, the Kudumbashree an initiative launched in 1998 to uplift the women community belonging to Kerala's predominantly working class (Williams et al. 2011), and the National Service Scheme (NSS) volunteers, and students of Valapattanam Higher Secondary School to open a biological garden (Figure 9.4) within the premises of Krishi Bhavan, a state government authority in India developing agricultural practices.



Figure 9.4: Biodiversity Garden. © VPGP Library Facebook

SDG 17: Partnership for the Goals

The SDGs are achieved through effective partnerships and several have been highlighted in the work undertaken by the Valapattanam Grama Panchayat Library in the projects already outlined. Goal 17 states: "Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development" (United Nations n.d.j). Multi-stakeholder partnerships between countries and regions on key areas such as finance, trade and technology are essential to achieving all the SDGs.

One Day Library Visit

The Valapattanam Grama Panchayat Library is located in a rural area far from the hustle and bustle of the Kannur township. Its unique style of library operations has brought national and international recognition and college and school students along with library professionals from different parts of the country have made the effort to visit the library. Following a visit to the library, the Master of Business Administration (MBA) students from Chinmaya Institute of Technology, along with their professors, made a promise to take part in the library's voluntary activities. This declaration will assist in future collaboration between a public library and academia. The library promotes visits from local schools and colleges to make the community aware of the laudable practices it has adopted. The library continually sets an example for public libraries within the state and across the country, and indeed across the world, to adopt innovative practices that will contribute to the SDGs. Collaboration between institutions contributes to global partnerships for sustainable development.

Conclusion

Public libraries and reading rooms have been key drivers in the transformation of the education sector in Kerala. There is a popular saying "It takes a village to raise a child". Successful outcomes require team efforts. Change begins with an individual. Gradual adoption of new ideas by others leads to successful ventures. The same applies when it comes to the actualisation of the SDGs. Collaborative effort from NGOs, governmental organisations, educational institutions, public institutions and community organisations is required for implementation of the SDGs. Public libraries are neutral civic spaces; they make praiseworthy efforts to educate the

community; and they engage users in activities related to SDGs. The case study of Valapattanam Grama Panchayat Library provides insights into how a library in a rural village is breaking barriers in building a sustainable community. Under the stewardship of the librarian who has been there for the past sixteen years, the library has done a remarkable job in its transformation from a dusty old structure waiting for library users to an operational powerhouse equipped with solar panels, air conditioners, quality furniture and a splendid collection of books spearheading innovative services, knowledge programmes and outgoing information delivery collaboratively with the community.

Public libraries are uniquely positioned to address the core issues of a community. They are not just providers of information and facilitators for reading books, but platforms that engage the community in targeted discussions. A key factor enabling the development of a broader, educational mindset for the people of Kerala has been the unbiased platform public libraries provide for the common people. Kerala is known as the state with the highest literacy rate in India, particularly in the district of Kottayam where every person is literate, partly because of the strong literacy campaign driven by public libraries which has proved to be popular and successful in India's post-independence period. There is a significant and valuable resource of 6,696 public libraries across the state through which practices similar to those implemented in Valapattanam Grama Panchayat Library can be implemented (Mohan 2022).

In spite of the funding received from the State Library Council, many public libraries in Kerala are unfortunately not able to maintain sufficient quality in the library services they provide to the community due in part to low community participation and a general lack of qualified library professionals. During extensive visits to libraries across the state it has become apparent to the authors of this chapter that librarians employed in public libraries are often inexperienced and do not have a sound knowledge of library professional practices. Many public libraries in Kerala still follow archaic library processes limited to the lending and borrowing of resources. The employment of qualified library staff with well-developed knowledge and skills in ICT and library professional practices, imagination, and a vision of what is possible would improve the operations and services of the state's public libraries.

Acknowledgement

The authors wish to thank Mr. Binoy Mathew, librarian of Valapattanam Grama Panchayat Library, who graciously shared information with the authors about the

library's activities and provided us with the supporting data required to write this chapter.

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Ana Zdravje

10 Beyond the Bookshelf: Green Libraries as Catalysts for Sustainability in Slovenia

Abstract: Green libraries from all over the world educate local communities on the subject of sustainable development. Programmes provided by libraries must be carefully planned in accordance with the Sustainable Development Goals (SDGs) of the UN Agenda 2030 and UNESCO's Education for Sustainable Development (ESD) directions. The consequences of reckless human intervention in the environment and contributions to global warming are drastic and irreparable. Saving the planet for future generations requires positive action. This chapter describes the development of green libraries, the origin and emergence of the green library concept in Slovenia, and the influence of green literacy programmes on the local environment in Slovenia.

Keywords: Sustainable development; Green literacy; Green libraries; Public libraries –Slovenia; Environmental protection – Slovenia

Introduction

As a consequence of the current prominence of green trends and sustainable environmental policies, green libraries are growing in importance and increasing in number globally. This chapter presents the concept of green libraries and the ways in which they raise awareness and educate local communities on sustainable development with particular reference to Slovenia. The programme of each green library must be carefully planned in accordance with the United Nations 2030 Agenda for Sustainable Development *Transforming our World* and its Sustainable Development Goals (SDGs) (United Nations n.d.a; United Nations n.d.s, Clause 18) the *UNESCO Global Action Programme on Education for Sustainable Development* (ESD) (UNESCO 2018) and subsequent UNESCO documents which explore ways of attaining the SDGs.

This chapter presents an overview on the concept and development of green libraries to the present day based on the available literature. It describes the Slovenian public library context and focuses on one of the first green libraries in Slovenia, with a discussion about the introduction of a green library model into the local Slovenian context, the response of the local community to the new library activities, and the development of the programme in accordance with the SDGs and the UNESCO ESD programme. The chapter concludes with a summary of the

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https://doi.org/10.1515/978-3-11-133646-6-011

benefits brought by the introduction of the green library model and an analysis of the opportunities for further development of libraries in Slovenia and elsewhere.

Green Libraries and Green Literacy

Green Libraries

A literature review consulted sources available in English to find the most relevant definition of the term green library. The concept itself was originally developed in the English-speaking United States of America and referred to two primary aspects:

- The first and most common use relates to the library building as planned, built, or renovated in such a way as to diminish its environmental impact, and
- The second focuses on the library as a social and information centre whose activities, operation and mission are concentrated on the significance of environmental questions and directed towards a sustainable environmental policy and the development of green literacy (Antonelli 2008; Aulisio 2013; Hauke 2015).

The definition provided by the Environment, Sustainability and Libraries Section (ENSULIB) of the International Federation of Library Associations and Institutions (IFLA) combines the various elements:

> *A green and sustainable library must take into account environmental, economic and social sustainability.* Green and sustainable libraries may be of any size, but they should have a clear sustainability agenda which includes … Commitment to general environmental goals and programmes: Commitment is guided by the UN Sustainable Development Goals, the Paris Climate Agreement and related environmental certificates and programmes (IFLA ENSULIB 2022).

Although not mentioned directly, the commitment includes the UNESCO ESD programme.

As a worldwide umbrella organisation for libraries, IFLA supports and promotes green libraries with its own activities, and, since 2016, its international ENSULIB Section has made the annual IFLA Green Library Award to libraries that "best communicate their commitment to sustainability" (IFLA ENSULIB [2024]). IFLA encourages and promotes libraries, including green libraries, in the context of the UN 2030 Agenda for Sustainable Development, which is reflected in the key initiatives of the IFLA Strategy 2019–2024 and its Strategic Direction 1: Strengthen The Global Voice Of Libraries with "1.1 Show the power of libraries in achieving

the Sustainable Development Goals" (IFLA [2019]). The initiative demonstrates the importance of the role played by libraries in achieving the SDGs.

IFLA (n.d.a) regards libraries as key institutions participating in achieving the SDGs as exemplars, educators and enablers. In many communities, libraries are the only locations that allow for access to important information including environmental topics. As local, well-known and trusted institutions, libraries are uniquely positioned to lend their resources, provide their infrastructure and optimise their locally integrated situations to pursuing certain goals of sustainable development, for example, promoting the importance of a clean and healthy environment and its protection (IFLA n.d.b).

Different types or parts of libraries may be designated as green libraries, such as the library of the United States International University Africa in Kenya (Ogola 2018), a component of the National Library Board of Singapore (Lin and Wan 2013), the Seattle Central Library in the United States (Athens 2007), the Cockburn Health and Community Centre Library in Australia (Cockburn Libraries 2016) and the Chinese University of Hong Kong Library (Jones 2017).

Green Literacy

The ENSULIB definition indicates that a green and sustainable library must focus on environmental, economic and social sustainability and have a clear sustainability agenda. Green literacy is a key part of the educational process aimed at directing users towards sustainable development and has been defined as:

> Green literacy represents the ability to understand the impact of human decisions and actions on the environment by raising awareness of sustainable development and encouraging critical thinking. Its task is to change the behavior of an individual or the entire institution (Čadovska and Tkalčič 2017, English summary).

Both green literacy and sustainable development seek the same goals: to change the behaviour and actions of individuals and institutions, to reverse negative trends, and to correct damage already inflicted. Kurbanoglu and Boustany describe green information literacy in the following way:

- A set of conventional skills expanded to include sustainable thinking
- Sustainable thinking – considering how our information behavior, choices and actions affect environment – is indispensable and additional component of green information literacy (Kurbanoglu and Boustany 2014).

Green literacy is part of information literacy and imparting skills and knowledge concerning green literacy is tailor-made for libraries, which have always responded to societal trends with new initiatives. The core function of libraries is the provision of convenient and easy access to the most recent information. Improved performance and enhanced quality of services require use of the latest technology (Čadovska and Tkalčič 2017).

Library Activities Supporting Sustainability

Libraries are places of formal and informal learning; libraries provide information and promote new trends. Libraries are socially responsible institutions integrated into their local communities; they embody an ideal platform for the dissemination of green ideas and the encouragement of sustainable development. Libraries as public spaces have enormous potential to partner with a wide spectrum of individuals and organisations in delivering their programmes and activities, ranging from local experts and non-government organisations (NGOs) to regional economic and political government entities.

UNESCO's ESD *Roadmap* setting the directions for achieving the SDGs by the year 2030 (UNESCO 2020) seeks to strengthen the abilities of countries and governments to provide quality education on climate change. The *Roadmap* emphasises the creation and exchange of knowledge; it provides policy guidelines and technical support to member states of UNESCO; and it carries out projects on the ground. UNESCO encourages innovative approaches and informal learning and stresses the importance of assistance from the media, networking and partnerships. ESD is a lifelong learning process and a key component of quality education at all levels. The *Roadmap* promotes the seventeen SDGs in all educational environments and reinforces that students in all environments along with the wider public must strengthen their understanding of the SDGs and their connection with individual and collective life:

> ESD empowers learners with knowledge, skills, values and attitudes to take informed decisions and make responsible actions for environmental integrity, economic viability and a just society empowering people of all genders, for present and future generations, while respecting cultural diversity. ESD is a lifelong learning process and an integral part of quality education that enhances cognitive, social and emotional and behavioural dimensions of learning. It is holistic and transformational and encompasses learning content and outcomes, pedagogy and the learning environment itself. ESD is recognized as a key enabler of all SDGs and achieves its purpose by transforming society (UNESCO 2020, 8).

Green Libraries in Slovenia

Global trends influence libraries in Slovenia, which are no longer solely places to borrow books and other materials or to socialise at literary events but spaces for education, enlightenment, inspiration and transformation. Slovenia has committed itself to the implementation of Agenda 2030 and its goals (Slovenia 2017). In Slovenia, green libraries tend to be public libraries. Public libraries operate within the legislative framework of the Slovenian library system. The Nacionalni Svet za Knjižnično Dejavnost/National Council for Library Activity is a professional advisory body within the Ministry of Culture which focuses on the operation and development of libraries and provides expert advice. The Council recommends that Slovenian libraries help fulfil the following societal needs:

> The public library as a programme provider of public services with the help of library materials and facilities impacts the quality of life of individuals and local communities. The library contributes to the development of knowledge and culture, the proliferation of democratic decision-making, the promotion of library use, the understanding of diverse forms of literacy, and social tolerance. The library participates in achieving social goals both on the local and national level, prompted by the needs and challenges of the local community (Slovenia. Nacionalni Svet za Knjižnično Dejavnost 2018, 3. Translated from Slovenian by the author).

In short, public libraries in Slovenia cooperate and collaborate. They jointly develop, and deliver responses to, at a local and national level, the same social development goals covered by Agenda 2030. Public libraries are rooted in the local community and in a position to understand and react to local issues. Libraries in Slovenia are actively adapting to social needs and becoming increasingly visible as social hubs that inform, educate and raise awareness amongst their users on various subjects, including healthy lifestyles, environmental care and management, and sustainable development. Green libraries were virtually unknown in Slovenia until recently and significant change has occurred in the last decade.

Implementation of Green Library Principles in the Šentvid Library

The Šentvid Library, a larger community branch of the Mestna knjižnica Ljubljana/Ljubljana City Library, serves as a good example of the adoption of green library principles. In October 2013, the Mestna knjižnica Ljubljana/Ljubljana City Library (MKL)) commenced a six-month renovation of its community branch library in Šentvid, located on the green outskirts of the city. Since nearly half of the area of the Četrtna skupnost Šentvid/Šentvid District is covered by forests, MKL took

the opportunity presented by this remarkable environmental setting to develop a green library concept that would combine and connect different organisations, groups, and individuals in the locality. MKL seized the prospect of the renovation of the existing building to capitalise on the environment, to assemble an appropriate library collection for the setting, and to develop a suitable programme of events which would harmonise with the location. The Šentvid Library's mission is "Living in Harmony with Nature" (Zdravje 2019). The library plays a significant role in educating, informing and raising awareness among the local population about the importance of protection and conservation of natural resources, and of a healthy lifestyle. Due to the nearby location of two kindergartens, three primary schools, two high schools, a music school, and a health centre, the library has accordingly planned its activities with their interests and needs in mind.

Since 2015, the Šentvid Library has incorporated and implemented the ESD programme as outlined in the *Roadmap*:

- ESD raises the awareness of the 17 goals in education settings
- ESD promotes critical and contextualized understanding of the SDGs, and
- ESD mobilizes action towards the achievement of the SDGs (UNESCO 2020, 16).

Library activities related to coexistence with, and protection of, nature include a thematically appropriate book collection in an ecological corner (Figure 10.1), and events for both adults and children such as exhibitions, scientific lectures, workshops, lists of recommended books, fairy tales, an ecological reading badge and a literary quiz.



Figure 10.1: Ecological corner Šentvid Library. © Ana Zdravje

Šentvid Library-Green Library: Eco-Week Third Week of the Month, first conceived as a pilot project for families in 2015, became a regular part of the library's programme in 2017 with the aim of making nature and its protection a living part of the green library (Table 10.1). The library has become a green teacher imparting green literacy to its users (Zdravje 2019).

Table 10.1: Šentvid Library-Green Library: Eco-Week Third Week of the Month

Project Elements	**Components**
Participants	Šentvid Library and outside personnel, guest speakers and performers, organisations, associations, schools and kindergartens
Duration	Tuesday to Friday, third week of February, March, April, October, and November
Goals	Promotion of the library and introduction of its activities to a wide range of potential users in the Šentvid District, the City of Ljubljana, Slovenia, and internationally in Austria and Croatia; enrolment of new members; establishment of contacts with the Šentvid District, schools and kindergartens for potential future cooperation and integration into the local community; establishment of contacts with organisations and associations in the district and its surroundings; cooperation with non-governmental organisations, the Municipality of Ljubljana, economists and businesspeople; exemplar for other libraries
Target groups	Families, inhabitants of Šentvid, Ljubljana and its surroundings
Partners	Šentvid District, primary schools, the two Šentvid high schools, nearby kindergarten units

The Eco-Week programme continues and runs from Tuesday to Friday in the third week of the months of February, March, April, October, and November, and includes two separate eco-workshops for adults, children and young people, a fairy tale hour focused on the environment, and an eco-event with a scientific lecture, workshop, or round table, organised and delivered alternately by colleagues, students and external facilitators. Preparation for the Eco-Week included a financial plan and an integrated promotional image campaign featuring a poster and a leaflet bearing a tree symbol. In Eco-Week the Šentvid Library demonstrates environmentally friendly practices as recommended by the UNESCO ESD programme and has gained recognition as an important provider of environmental awareness and education in the local community.

The library's regular partner is the Šentvid District, which promotes the activities of the library on its website and lists all events in its newsletter, while local primary schools act as occasional partners. The Franc Rozman Stane Primary School and the Šentvid Library, for example, have successfully collected food and other material for an abandoned animal shelter called *Gmajnice*, both in the school

and the library. Children and their teachers were able to donate several boxes of animal food to the shelter.

Eco-Week has been an all-round success: from 1 January 2015 to 30 April 2019, there were thirty-five scientific lectures and workshops for adults, twenty-seven fairy tale hours for children which were attended by parents who took the opportunity to participate and learn, and twenty-seven eco-workshops for children and teenagers. Visitors were satisfied with the events and were very complimentary about lecturers such as Viki Grošelj, a well-known mountaineer, teacher, writer, photographer, mountain rescuer, mountain guide and the Slovene who climbed the most 8000-metre peaks and was the first Slovene to climb all the highest peaks of the continents (Grošelj 2023).

Events have been well attended, especially the fairy tale sessions which were skilfully organised and led by the librarian of the City Library of Ljubljana (Figure 10.2). The participants in eco-workshops for adults, organised in cooperation with various institutions and partners, and in eco-workshops for children, organised by the Creation Corner (Figure 10.3), demonstrated their creativity, crafting fine artefacts made of natural and waste materials. While the participants' satisfaction and progress have been noted through observation, the library plans to measure the value and impact for participants through quantitative performance indicators. Eco-Weeks could be arranged in other libraries and coordinated into a national project, especially in libraries already offering similar activities.



Figure 10.2: Fairy tale session Šentvid Library. © Ana Zdravje



Figure 10.3: Fairy tale children's art work, led by the Creation Corner Šentvid Library. © Ana Zdravje

In 2018, the Šentvid Library successfully participated in the 1st International Conference on Green Libraries, *Let's Go Green!*, in Zagreb and the Brioni Islands with a contribution entitled "Šentvid Library-Green Library". Two green libraries from Slovenia, MKL Šentvid Library and the Franc Ksaver Meško Library Ormož, presented their programmes to participants from over twenty countries. The response was very positive, which encouraged further development of the green library concept. Following the conference presentation, the libraries were invited to participate in other related international projects and activities. In 2019 the Šentvid Library was announced as one of the five runners-up among thirty-four worldwide participants in the 2019 IFLA Green Library Award competition (IFLA ENSULIB 2019; Zdravje 2019).

Addressing the Sustainable Development Goals and Education for Sustainable Development in the Šentvid Library

The SDGs (Figure 10.4; United Nations n.d.a) have been integrated into the sustainability programmes being offered by the Šentvid Library. The following outlines each goal and the activities undertaken by the library in relation to the goal in the hope that they might serve as inspiration for library services in other settings.



Figure 10.4: Sustainable Development Goals. Source: https://www.un.org/sustainabledevelopment/news/communications-material/

Goal 1: No Poverty

Goal 1: "End poverty in all its forms everywhere" (United Nations n.d.b). The library offers free entry to all activities, including events and educational programmes, to children, adolescents and adults, including the marginalised and the poor. Library members pay an annual membership fee which is €18 for adults and €11 for students. Children and unemployed people do not pay a membership fee.

Goal 2: Zero Hunger

Goal 2: "End hunger, achieve food security and improved nutrition and promote sustainable agriculture" (United Nations n.d.c). The library has hosted lectures and workshops by experts on edible wild plants and their use in cooking. The library has promoted the Šentvid District market and its locally grown foods, using promotional material and leaflets, and articles in the library's newsletter.

Goal 3: Good Health and Well-being

Goal 3: "Ensure healthy lives and promote well-being for all at all ages" (United Nations n.d.d). Violeta Irgl, founder and director of the Institute for Trauma Recovery, Psychotherapy and Counseling, Rahločutnost, and specialist in marriage and family therapy has delivered lectures at the library in the context of University of the Third Age (U3A) focusing on intergenerational relations, adolescence, alcoholism, suicide and self-care, and contributing to attainment of Goal 3.

Goal 4: Quality Education

Goal 4: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (United Nations n.d.e). The library strives for equal access to all levels of education, training and activities for children, adolescents, adults, marginalised groups, and children living in difficult circumstances. The entrance to the library was reconstructed in 2014 and equipped with a ramp to allow access for parents with prams, and to children and people with disability. In order to enable a safe, non-violent, accepting and encouraging learning environment, the library is a UNICEF Safe Spot (Slovenia Times 2013). The library promotes education on sustainable development and living, human rights, gender equality, a culture of peace and non-violence, respect for cultural diversity, and the contributions of culture to sustainable development, through fairy tale sessions, eco-workshops, exhibitions and events.

Goal 5: Gender Equality

Goal 5: "Achieve gender equality and empower all women and girls" (United Nations n.d.f). In lending library material, the library gives priority to mothers with children, raises awareness of gender equality through the fairy tale sessions, lectures, discussions about books for children and adults, and the reading club, and promotes respect. The library has put up posters drawing attention to violence against women and children.

Goal 6: Clean Water and Sanitation

Goal 6: "Ensure availability and sustainable management of water and sanitation for all" (United Nations n.d.g). The drinking water dispenser in the library is con-

nected to the water mains, removing the need for bottled water and promoting the importance of fluid intake for human health. Users are encouraged to bring their own drinking cups.

Goal 7: Affordable and Clean Energy

Goal 7: "Ensure access to affordable, reliable, sustainable and modern energy for all" emphasises the use of renewable energies (United Nations n.d.h). The library uses gas heating and LED lighting. Energy-efficient windows were installed during the renovation.

Goal 8: Decent Work and Economic Growth

Goal 8: "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" is a cornerstone of economic success (United Nations n.d.i). The library promotes sustainable tourism that creates jobs and encourages local culture and creative production. The library provides exhibitions featuring local artists including a permanent exhibition about Janez Bitenc, a Slovenian composer, pedagogue, publicist and music editor who is one of the most important Slovenian music creators for children and who once lived in the building housing the Šentvid Library. The library also features displays of local handicrafts, produces promotional material for workshops, and holds joint events with the Šentvid District, schools and kindergartens supporting economic growth and development. The library holds books and other material about work, employment, and education and training for employment. MKL holds workshops on resumé writing and preparing for job applications and interviews.

Goal 9: Industry, Innovation, and Infrastructure

Goal 9: "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation" (United Nations n.d.j). The library enables accessibility of information and communication technology through the provision of copying, printing and scanning equipment. It also assists citizens to master the use of the internet and social media in order to increase personal potential, growth and creativity. The library daily connects inhabitants, individuals, and profit and nonprofit organisations in the local environment with the aim of increasing opportunities in everyday and professional life and business activity.

Goal 10: Reduced Inequalities

Goal 10: "Reduce inequality within and among countries" (United Nations n.d.k). The library promotes the integration of all individual users and members, as well as groups of users, including those who might have special needs, into social, economic and political life. The library provides equal opportunities for its users with library policies that ensure equitable and effective relationships with its members and other users. The library collects, processes, stores, maintains, organises, presents, and communicates library materials and information, and facilitates the discovery and use of library material, and ensures all local citizens have access to knowledge, information and services, regardless of age, gender, disability, race, language, nationality, origin, religious affiliation, social and economic status, employment, education level, and political conviction (Slovenia. Nacionalni svet za knjižnično dejavnost 2018).

Goal 11: Sustainable Cities and Communities

Goal 11: "Make cities and human settlements inclusive, safe, resilient and sustainable" (United Nations n.d.l). The library has underpinned efforts to protect and conserve world cultural and natural heritage in its local environment. It has done so through events and initiatives such as the 150th anniversary of primary schools and reading associations, the 150th anniversary of the Vižmarje Tabor/Vižmar camp political meeting focused on nationalism (Društvo Blaž Potočnikova čitalnica/Blaž Potočnik Reading Association 2019) the archival collection of Janez Bitenc, the eminent composer previously mentioned, along with exhibitions and posts on the Kamra website recording past historical and cultural events within the community and remembering significant people (Kamra 2016a, 2016b, 2016c), all of which contribute to the life of the city. The library organised an open-air event *Šentvid Library Reads beneath the Treetops* and plans to set up library activities on the green area in front of its building. In its day-to-day operations, the library practises appropriate waste management and waste separation and participates in the spring clean-up exercise in cooperation with the Šentvid District. The library also holds collections on the subject of the proper construction of buildings from locally sourced materials.

Goal 12: Responsible Consumption and Production

Goal 12: "Ensure sustainable consumption and production patterns" (United Nations n.d.m). The library attempts to lower its waste through preventive measures. It seeks to reduce consumption, and recycle or reuse materials such as paper. It informs local inhabitants and users about sustainable development and environmentally-friendly lifestyles and promotes sustainable tourism and local culture and artefacts through the local Wednesday market, and through posters and promotions in the library. De-accessioned books and other materials are given to interested visitors free of charge.

Goal 13: Climate Action

Goal 13: "Take urgent action to combat climate change and its impacts" (United Nations n.d.n). While the most important actors on the global level are national and international institutions and conventions, there is much to be done at the grassroots level. The library does its part in educating and informing all users and visitors on climate change, its causes and consequences, and its impact on food production, through exhibitions, lectures and workshops for children and adults. The library's collections on ecological subjects can be usefully integrated into organised events such as the fairy tale sessions for children and lectures for adults.

Goal 14: Life Below Water

Goal 14: "Conserve and sustainably use the oceans, seas and marine resources for sustainable development" (United Nations n.d.o). The library holds books and other material on the subject and organises scientific lectures on food sustainability and appropriate eco-fairy-tales for children, raising awareness of nature degradation and the need to preserve global and local water sources.

Goal 15: Life on Land

Goal 15: "Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss" (United Nations n.d.p). Given that half of the Šentvid District is covered by forests, there is plenty of opportunity for both theoretical and practical awareness-raising regarding deforestation, problems of

hunting and poaching, and loss of biodiversity. Sustainable use of terrestrial ecosystems has been further promoted by scientific lectures on wild food and food sustainability, the fairy tale sessions, the library collections, talks, workshops, and the endorsement of sustainable handmade artefacts. In cooperation with one of the local schools, the library collected food and other materials for the local shelter for abandoned animals.

Goal 16: Peace, Justice, and Strong Institutions

Goal 16: "Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels" (United Nations n.d.q). As a UNICEF Safe Spot, the library promotes the struggle against all kinds of violence. It ensures public access to information on basic rights and freedoms in accordance with domestic legislation and international agreements; endorses trust and transparency through efficient and responsible management; promotes respect for the rule of law on a national and international level, especially regarding immigrants and their integration; and offers its services to everyone, regardless of personal circumstances.

Goal 17: Partnerships for the Goals

Goal 17: "Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development" (United Nations n.d.r). As already noted, the Šentvid District is a regular partner of the library and a consistent promoter of the library's activities. The library occasionally partners with the local schools on projects including the previously mentioned successful collection of food for the local shelter for abandoned animals. Productive cooperation at the Eco-Week has led to further development of projects and partnerships with other cultural and literary organisations, such as the Društvo Blaž Potočnikova čitalnica/Blaž Potočnik Reading Association and other community groups like the local fire-fighting association. In turn, the new partners have provided broadened support and promotion of the library and its projects, including Eco-Week. As already mentioned, in 2016, the library participated in the programme which secured for Ljubljana the European Green Capital Award, promoting responsible use of water and wood.

Conclusion

Protection of the environment and sustainable development are topics that will influence life now and in the future and are of concern to everyone. It is important that libraries set a positive example of social responsibility through developing their own activities and programmes. In Llubjana, the Šentvid Library activities continue to make their mark within the community with Eco Week in March 2024 and include sessions on gardening, plant exchanges, and food preparation from plants (Mestna knjižnici Ljubljana/Ljubljana City Library 2024). New initiatives are being trialled with a reading green campaign. The Šentvid Library programme is an exemplar and similar activities could be incorporated into any type of library including school, college, special, public, national and university libraries, depending on the target groups, the opportunities and the available resources, such as space, human resources, and financial frameworks, among others. For example, primary school libraries could offer a lecture for parents and teachers on one day during a designated Eco-Week; or if more resources and staff were available, separate workshops could be offered for parents, teachers, and children. For planning and preparation purposes, between three to five Eco-Weeks a year could be achievable for smaller institutions, with more on offer at larger, better-resourced institutions. Potential participants need to be given sufficient lead time, and activities provided must be engaging. Successful activities can be repeated.

Paying attention to green ideas and green policies is not a passing fad of the 21st century. Apart from ensuring reduced impacts on the environment in which library users live, the construction of modern, ecologically-minded, energy-efficient buildings can substantially lower the consumption of resources and operational expenses, allowing financial savings to be channelled into other priorities, such as purchase of library material, the provision of sufficient and high quality personnel, environmental education initiatives, renewal of infrastructure, innovative information systems, and the full implementation of green libraries.

Public libraries cooperate in the planning and realisation of the goals of social development at the local and national level, based on the needs and challenges of local communities. Slovenia has adopted the United Nations 2030 Agenda for Sustainable Development (United Nations n.d.s) through the activities of various Ministries and SLOGA, a Slovenian global action organisation representing NGOs, and has its own Agenda for 2030 (SLOGA 2016; Slovenia 2017). The *IFLA Strategy 2019–2024* (IFLA [2019]) has also adopted the realisation of the SDGs as a priority. The strategic plans of Slovenian libraries must incorporate the SDGS into their operations and organise their services and actions accordingly. Green libraries have a significant role to play in raising awareness, and guiding and educating the population. While there are currently only two green public libraries in Slo-

venia, it is to be expected that, given public interest, current scientific evidence, compelling rapid social change, and the *IFLA Strategy 2019–2024* the number of green libraries will grow and strengthen, not only in Slovenia, but throughout the world.

Librarians must be educated in sustainability and how to communicate its aims. Knowledge and skills will enable libraries to develop activities and programmes in keeping with local environments and to set priorities and objectives according to the opportunities and resources available. Small beginnings with quality offerings can be upgraded to match the desires, demands and needs of the community, and the available opportunities and resources, both financial and human. Perseverance will prevail. Libraries have a powerful opportunity to educate and inform their users about local and global environments and the opportunities for making the world in which they live a better place. Libraries can implement the UNESCO ESD programme, pursue the SDGs, and develop green literacy for sustainable development in every environment. The model has been proven in the Slovenian library context; it is neither difficult nor expensive; it can be extended and implemented elsewhere.

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11 Green Libraries Meet the Arts in Spain: Alliances Shift Feelings, Consciousness and Actions

Abstract: This chapter presents literary and arts-related activities carried out by the green libraries of the Red de Centros de Información y Documentación Ambiental del Estado español (RECIDA)/Spanish Network of Environmental Information and Documentation Centres as well as other similar libraries in Spain. The activities undertaken are framed within the UNESCO Education for Sustainable Development (ESD) programme, and are intended to respond to the United Nations Sustainable Development Goals (SDGs), climate change concerns and environmental issues. Services and programmes appealing to feelings and emotions have been provided by the Centres in a different and effective way to raise community environmental awareness, awaken consciousness and encourage actions improving sustainability. Examples of activities are outlined to explain their application and to inspire others.

Keywords: Sustainability – Literary collections; Arts and literature; Green libraries; Nature writing; Education for sustainable development; Public libraries – Spain

Introduction

Current environmental issues including climate change, disruption in ecosystems, the loss of biodiversity, deforestation, and urban development pose significant challenges to the planet leading to new narratives and fresh coping mechanisms. Literature and the arts, in all their diverse expressions, can serve as powerful tools to assist people in dealing with new ways of thinking and acting and in themselves be used for environmental education and awareness. A wide range of people can be reached and their awareness of environmental issues raised by appealing to feelings and emotions through art and literature. In an increasingly urbanised world disconnected from nature and the environment, it is crucially important to provide and promote connections to natural surroundings. Artistic expression assists people to reflect on current environmental issues.

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https://doi.org/10.1515/978-3-11-133646-6-012

Green libraries participate in initiatives to deal with new issues and conduct and promote artistic initiatives as a catalyst for public environmental action. Activities undertaken align with many of the Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (United Nations 2015; United Nations n.d.a). Objective 4, Quality education (United Nations n.d.c) is the most significant of the SDGs discussed in this chapter. Education is related to all of the SDGs and in particular to the creative and artistic actions and experiences outlined. Several other SDGs are relevant including SDG 3, Good health and well-being (United Nations n.d.b), including mental health; SDG 5, Gender equality (United Nations n.d.d), promoting the presence of women and their active participation; SDG 13, Climate action (United Nations n.d.e) involving care for the planet; SDG 16, Peace, justice and strong institutions (United Nations n.d.f), providing access to environmental information and documentation, protecting fundamental freedoms and complying with legislation and agreements; and SDG 17, Partnerships for the goals (United Nations n.d.g), networking libraries with each other and with educational, and professional communities and any others that enrich and increase the influence of libraries and the dissemination of actions regarding the SDGs.

UNESCO has developed: *Education for Sustainable Development: A Roadmap* (2020) to guide implementation of the SDGs. Education for sustainability (ESD) employs innovative and action-oriented pedagogy. Priority action area five of the *Roadmap* emphasises "Acceleration of actions at the local level" (UNESCO 2020, 34). The use of literature and art can develop the knowledge and awareness needed to take the transformative actions which will help to make society more sustainable.

This chapter explores noteworthy projects and experiences in the areas of the arts and literature which have been undertaken or primarily supported by the Red de Centros de Información y Documentación Ambiental del Estado español (RECIDA) /Spanish Network of Environmental Information and Documentation Centres, the green library network of Spain. The projects outlined are initiatives that have a community focus and drive meaningful transformation and actions for sustainable development (RECIDA 2018). Libraries and library networks are an ideal bridge to incorporate ESD, taking advantage of their alliances and links with associations, institutions and community groups, and supporting sustainability communication through reading, literary production and artistic expression. It is hoped that the initiatives outlined will serve as an inspiration for others.

RECIDA – the Spanish Green Library Network

The Red de Centros de Información y Documentación Ambiental del Estado Español/Spanish Network of Environmental Information and Documentation Centres (RECIDA) was established in 2004 within the framework of the Permanent Seminars of the Ministerio para la Transición Ecológica y el Reto Demográfico/Ministry for the Ecological Transition and the Demographic Challenge in Spain (Toril Moreno 2021). The network is coordinated by the Centro Nacional de Educación Ambiental (CENEAM)/National Centre for Environmental Education (Spain CENEAM n.d.) and managed through the Organismo Autónomo Parques Nacionales/National Parks Agency. RECIDA works in collaboration with other centres in organising annual seminars (Spain CENEAM n.d.; Toril Moreno 2021).

RECIDA comprises 165 centres distributed across the seventeen autonomous regions of Spain and the autonomous city of Ceuta. Twenty-two years of annual meetings have provided training, exchange of experiences, professional contacts, networking, and the implementation of joint projects that have led to the implementation of innovative ideas. The network's strategic plan aligns with the SDGs, and with the International Federation of Library Associations and Institutions (IFLA) *10 Reasons for Environmental Sustainability in (Public) Libraries* (Sahavirta 2020).

Various seminars have showcased library initiatives in line with the concept of sustainability. RECIDA has participated in many events, such as the Congress on Sustainable Development Goals organised by the UN Base (Quart de Poblet de Valencia), and Puentes Digitales in Valencia 2019 (RECIDA 2019), and the United Nations Climate Change Conference also known as COP25 held in Madrid 2019. The participation of RECIDA green libraries in the global climate summit COP25 deserves special mention (Toril Moreno 2019). Selected from 1,500 proposals, RECIDA secured a space in the Civil Society Green Zone, a special space where collective action can transform climate policy into concrete outcomes. RECIDA took the opportunity under the title *Green Libraries for the Climate (RECIDA), Treasures to Change the World*, to showcase its network, promote high-quality environmental information, encourage green reading, and strengthen collaboration with publishing houses.

In 2021, the Consejo de Cooperación Bibliotecaria/Library Cooperation Council of the Ministerio de Cultura y Deporte/Ministry of Culture and Sports highlighted RECIDA's work as an inspirational example for the world in the publication *La Implicación de las Bibliotecas Españolas en la Agenda 2030/The Involvement of Spanish Libraries in the 2030 Agenda* (Sellés Carot and Martínez González 2021) and it was a finalist for the Ministry's award in 2018. In 2021, RECIDA was a finalist in

the project category of the IFLA Environment, Sustainability and Libraries Section (ENSULIB) Green Library Award (IFLA ENSULIB 2021).

Literature and the Natural Environment

The environmental and social crisis facing the planet has compelled all to find new ways of understanding nature, the environment and the relationships the community maintains with the world. Natural ecosystems not only provide resources for consumption and use but also hold cultural value related to the community's very existence and emotional and spiritual well-being. The degradation of ecosystems causes distress. Concern for the destruction of the natural environment has been expressed in literature since ancient times, but the publication of *Walden* by Henry David Thoreau, an American naturalist and philosopher (1854) laid the foundation of cultural ecological thinking (Buell 1995).

Thoreau's work marked the beginnings of nature writing, a genre that encompasses literary texts containing scientific information and descriptions of the natural world, accompanied by philosophical reflections and opinions that go beyond a simple naturalistic essay. Nature writing seeks to connect the reader emotionally with the environment. While Thoreau might be considered the father of nature writing, it is essential to mention two earlier essays that influenced subsequent nature literature, *Nature* by Ralph Waldo Emerson (1836), and *Rural Hours* by Susan Fenimore Cooper (1850, and are pioneering works on rural environments that include contemporary concepts such as conservation and environmental awareness. However, if there is a book that is a landmark in the commencement of contemporary environmental thinking, it is *Silent Spring* by biologist Rachel Carson (1962).

In Spain, nature writing as a genre has been widely available only in the last decade. The emergence of nature writing in Spain has been thanks to independent publishers who decided to invest in the genre in the context of the global environmental crisis. Whether due to the need to reconnect with green environments or an increased environmental sensitivity, the works of classics such as those mentioned earlier, along with other authors including John Burroughs, John Muir, Aldo Leopold and Annie Dillard (Romero 2023), have resonated with the public and found an important place in the publishing industry.

Promotion of Green Reading

IFLA ENSULIB has defined a green library as "a library which takes into account environmental, economic and social sustainability" and indicated that the agenda for a green library should include, among other activities, sustainable library services, social sustainability, environmental management, and a commitment to general environmental goals and programmes (IFLA ENSULIB 2022a). Green libraries in Spain undertake many activities in fulfilling their mission. Environmental libraries in Spain not only make their collections available to the public but also seek alliances with the publishing industry. They develop innovative projects to promote green reading, support literary creation through educational and informative activities, and disseminate natural science information through the humanities. There is a wide range of possibilities with reading as the engine of change and action. RECIDA's green libraries have developed approaches to shared collections on sustainability including group loans of materials on particular topics to schools; they have sponsored literary festivals, reading events, storytelling sessions, writing classes, interactive workshops and public lectures by well-known authors; they have prepared guides and listings of books and other materials for all ages; and they have emphasised the development of book clubs and similar initiatives.

Book Clubs Address Environmental Challenges

Building on the emotional appeals of environmental literature and the insights offered by the narrative of fiction focusing on climate change and sustainability issues to imagine future scenarios, RECIDA's green libraries have repurposed the classic model of book clubs. The clubs are an effective tool that fits well with social and environmental challenges. The library context additionally offers the benefit of being a cultural leisure option with one of the lowest carbon footprints.

Sometimes scientific literature about climate change is not enough to resonate with the public. An environmental narrative can be much more powerful and foster perspective changes through art and fiction more successfully than other approaches which might provide facts and figures. When emotions are stirred by reading essays, novels, or poetry, and combined with socialisation through participating in discussing prior reading, the outcome is the motivation to change beliefs and behaviour in the face of challenges like the climate crisis. Environmental analysts and communicators agree that while individual efforts towards climate action matter, true transformation occurs through community and collective action. Libraries can make a significant contribution. Socialising the environmen-

tal reading experience contributes to promoting change on a wider scale, while also making libraries authentic agents of change.

Organising a reading group may seem daunting. Library professionals must communicate technical and scientific information as well as other literary content and may sometimes feel unprepared to engage in conversations with their users, including researchers or specialists in the field. They may also lack sufficient materials to use or human resources. RECIDA is committed to creating reading communities where centres are open to all audiences through narrative. A working group has been established with representatives across the various Centres constituting RECIDA and it is charged with sharing experiences and challenges, promoting the creation of combined collections for exchange, empowering library professionals to lead clubs, and finally, mapping parallel experiences and initiatives across cultural and arts sector organisations with which interaction is possible including public libraries, cultural centres and bookstores. The initiatives developed have been successful and provided encouragement and support that have seen the book clubs flourish.

Reading Clubs Initiatives

CENEAM has mapped out the availability of reading clubs across Spain (Spain CENEAM 2024a). Pioneering nature reading clubs have emerged from private initiatives, such as the Ecoclub de lectura, Grupos Ciclo, La Casa Encendida/Reading Eco Club, Groups Cycle, Incendida House, a cultural centre in Madrid. This initiative introduced by environmental consultant Ignacio Santos has focused on environmental novels since 2015 (Santos 2020). Since 2019, the Naomi Klein Reading Club selects essays and political ecology works for its meetings. It convenes at the Biblioteca Pública Municipal "Iván de Vargas"/Iván de Vargas Public Library in Madrid. Another inspiring example dating to 2016 is the Letras Salvaxes Reading Club led by nature writer Antonio Sandoval Rey at Moito Conto bookstore in A Coruña, Galicia.

The Mediateca del Museo de Ciencias Naturales de Barcelona/Media Library and Documentation Centre of the Museum of Natural Sciences of Barcelona was the first RECIDA centre to propose environmental book club meetings in 2019, linked to the programming of its exhibitions. It links its book club to the Biblioteca Ramon d'Alòs – Moner. In 2020, RECIDA invited the coordinator of the Eco-Reading club of La Casa Encendida to its annual seminar to encourage RECIDA's libraries to set up reading groups. Drawing inspiration from this experience, in 2021, the Centro del Agua y el Medio Ambiente de Zaragoza/Centre for Water and Environment of Zaragoza (CDAMAZ) created the Green Reading Club in its library (Figure 11.1).



Figure 11.1: Sessions of the Green Readings Club at the CDAMAZ library. © Marga Muñoz

Encouraged by the RECIDA working group, other centres have established clubs and linked together, including the Clube de lectura Clorofila, Centro de Documentación, Centro de Extensión Universitaria e Divulgación Ambiental de Galicia (CEIDA)/Clorofila Club, Documentation Centre, University Extension and Environmental Dissemination Centre of Galicia (CEIDA) in Oleiros A Coruña which commenced its initiative in 2023 (CEIDA 2024). Other more recent examples include the Biblioteca de Parcs i Jardins/Parks and Gardens Library of Barcelona, the Biblioteca Pública Municipal/Municipal Public Library Francisco Gómez-Porro in Villarrubia de los Ojos, Ciudad Real and the Museo Nacional de Ciencias Naturales/National Museum of Natural Sciences, managed by the Spanish National Research Council (CSIC) of Madrid, which has a green book club.

In April 2022, RECIDA became part of the scientific committee of the annual conferences held by the leading Spanish association for professionals in the areas of libraries, information management and archives, the Sociedad Española de Documentación e Información Científica/Spanish Society for Information and Scientific Documentation (SEDIC) which is dedicated to sustainability. An example of activi-

ties operating through this forum is a workshop promoting green reading clubs at the Real Jardín Botánico de Madrid/Royal Botanic Garden of Madrid, which enabled an interesting and productive encounter among professionals (Pardo Cereijo 2022).

In recent years, a wave of reading clubs has emerged across Spain, with clubs taking inspiration from each other, often without knowing each other and sometimes spontaneously. The following are some of the clubs that are active in different parts of Spain. All are driven by the same goal: raising awareness and promoting nature through reading.

- The Eco-club de lectura BERTA Caceres/Berta Cáceres Club at the Biblioteca Pública Provincial de Almería Francisco Villaespesa/Villaespesa Public Library
- The Ecoclub de lectura gaia/Ecoclub Gaia at the Biblioteca Depósito del Sol/Library Deposition of the Sun in Albacete
- El Bosque de Letras Club/The Forest of Letters Club, which initially met in a bookstore and now, at the suggestion of the Biblioteca Pública María Moliner/María Moliner Public Library, meets in Villaverde, Madrid. It is a roving eco-club involving various public libraries
- Club de lectura "Literatura de natura" meeting at the Library Collserola- Josep Miracle in Vallvidrera, part of the network of municipal public libraries of Barcelona
- Naturae club at Biblioteca Pública de Segovia/Public Library of Segovia
- Clubs de lectura UCJC at the Biblioteca/Library, Universidad Camilo José Cela/University Camilo José Cela
- Club de lectura, Carro de Combate Boicot al Plástico/Plastic Boycott Battle Tank, by a group of journalists and artists, with a focus on responsible consumption
- Clubes de lectura at the Biblioteca Pública Juan Compañiel/Juan Compañel Public Library of Vigo
- NaturaLlibres, a bookstore in the Pyrenees specialising in nature and mountains has been sponsoring book reading groups in events in rural areas
- The Centro de educación ambiental Valle del Lozoya/Environmental Education Centre Valle del Lozoya (El Cuadrón) in Sierra de Madrid has sponsored a Literatierra: grupo de lectura rural y de naturaleza
- A reading group has been created in the Sierra de Guadarrama, in the bookstore La Guarida in Cercedilla, Madrid, and
- The Club de lectura rural/Rural Reading Club provided online by Mallata, an initiative directed towards projects on sustainability.

A more playful and emotionally engaging format is provided by a Literary Eco Menu: reading aloud to taste nature, developed in 2021 by the Centro de Documentación Ambiental Domingo Quiroga/Domingo Quiroga Environmental Documentation Centre of CEIDA (Oleiros, A Coruña). It involves a menu of literary

dishes, each corresponding to an extract from a book, through which a surprise menu is designed and prepared by the library. The reading takes place outdoors, accompanied by conversation and collective reflection, allowing a diverse range of environmental topics to be covered and experiences, memories and feelings to be discussed around the table. This original idea from CEIDA has been prototyped and adapted for students by the CENEAM Centro de Documentación/Documentation Centre in Valsaín, Segovia and by CDAMAZ in Zaragoza, where readers bring their own excerpts from novels, essays, stories, or poetry (Spain. CENEAM 2024).

The warm reception of RECIDA Book Clubs in different locations is encouraging and the concept is catching on. Book clubs in public libraries and bookstores have achieved similar success, with most having an average of six years of continuous activity. Through book clubs and group reading, individuals engage critical thinking, deepen understanding through conversation, and broaden a multifaceted view of social and environmental reality. Clubs serve as an entry point for sensitising and rallying individuals who may not be initiated, convinced of, or active in environmental causes. Participation in book clubs often leads to involvement in other environmental workshops and activities.

RECIDA's shared collections travel across Spain to other public libraries and educational institutions. The online or in-person attendance of authors at sessions is becoming more frequent, and collaboration with publishers is being sought to contribute to the creation of book series. The opportunity also exists to collaborate with digital lending platforms such as eBiblio to generate collections and multiple licences for environmental novels and essays. An ongoing goal for RECIDA is to create an ecosystem of green readings and to nurture and lead the cross-pollination of ideas, connecting experiences and establishing a national network of green reading clubs. The network aims to connect with other international examples, fostering genuine connections among environmental libraries.

Promotion of Children's and Youth Literature

If there is a thriving sector in Spanish publishing, it is that of children's and youth literature. It is in this field that works related to biodiversity and caring for the planet have continuously grown. The growth in the area is attributed to the fact that illustrated works or literary stories make it easier to understand the world.

A significant number of RECIDA libraries have a wide selection of children's and youth literature in their collections, catering to both families and education professionals who are seeking resources to address current environmental themes. Among the activities related to promoting green literature intended for children, is the lending of green collections including stories, novels, and comics to school com-

munities and it is one of the traditional services with high demand in all libraries across the network. Materials are placed in a suitcase for easy distribution. Some of the libraries offering this service include:

- Centro de Documentación del Parque Natural de la Zona Volcánica de la Garrotxa (Olot, Girona)
- Los centros de documentación, Xarxa de Parcs Naturals, Diputació de Barcelona
- Servicio de Documentación y Educación Ambiental del Ayuntamiento de Barcelona
- Centro de Documentación y Recursos para la Educación Ambiental de Cantabria (CEDREAC)
- Centro de Extensión Universitaria e Divulgación Ambiental de Galicia (CEIDA)
- Centro de Documentación del Agua y el Medio Ambiente de Zaragoza (CDAMAZ), and
- Centro de Documentación (CENEAM) (Segovia)

School communities and families are the primary audience for the resource guide *Verde que te leo verde* (Toril Moreno and Amaya 2024), an original idea from CDAMAZ and currently coordinated by the CENEAM Documentation Centre. Various libraries in the network, together with other public libraries, have collaborated on the project. The guide includes a selection of children's literature on the environment for readers aged up to twelve years in the various languages spoken in Spain. It also features an index by age group and another associated with the SDGs.

Another way to connect with younger audiences and families is through environmental storytelling which is a magical way to engage people through the power of stories. The participatory experiences encourage imagination, creativity and a sense of community. In RECIDA, several centres organise storytelling sessions, where inclusivity, the promotion of local authors and attention to diversity are taken into account. Sometimes the sessions are accompanied by interactive workshops relating to specific themes. This approach has been taken by CENEAM and some libraries in the Centres de documentació DocAmbCat/Network of Environmental Documentation Centres in Catalonia. Libraries take advantage of environmental events for special activities or include them as an integral part of regular programming by offering targeted reading laboratories or workshop sessions.

Connecting People with the Environment through Culture

A primary focus of green libraries is to promote cultural activities that connect the public with environmental concepts both through literature and spoken languages.

Literature and Nature Festivals

Literary festivals centred on the relationship between literature and nature play a crucial role in focusing on sustainability issues. The festivals provide ideal opportunities for bringing readers and writers together through book presentations, talks, exhibitions and workshops. They create a relaxed atmosphere that encourages community participation and are excellent occasions for learning and leisure. Several such festivals take place in different regions of Spain.

In Catalonia, the Saó Festival d'Art Natura I Pensament al'Alt Pireneu has been held at the Centre d'Art i Natura Farrera/Farrera Art and Nature Centre in Lleida since 2013. Participants create artistic works and readings about nature. Another festival in Catalonia is Arts i Natura, organised by Lo Pati Centre d'Art-Terres de l'Ebre/Lo Pati Art Centre-Terres de l'Ebre since 2015 in the Natural Park of Els Ports, Tarragona. It engages various libraries from neighbouring regions.

Literanatura is a festival that is particularly notable in Catalonia and is directly promoted by the public libraries of Barcelona. It has delivered three events and is currently curated by Gabi Martínez, a writer, screenwriter and journalist. Literanatura provides a genuine encounter with local and international authors writing on nature. It encourages rethinking the relationship between people, artistic creation and the natural environment. RECIDA actively participated at the first of the events held in 2018. The Literanatura model is spreading to Latin America. It combines book presentations, concerts, round table discussions, guided tours, conversations between authors, exhibitions and artistic activities related to nature. It takes place at the Collserola Library – Josep Miracle located in Vallvidrera within the Collserola Natural Park. The library specialises in nature writing and sustainability and was recognised in 2022 by IFLA as one of the top five green libraries globally (IFLA ENSULIB 2022b).

Literanatura has travelled to other regions of Spain, such as Extremadura, where, under the name Siberiana it took place in the La Siberia Biosphere Reserve. Coordinated by Gabi Martínez since 2020, the festival takes place in the rural village of Tamurejo (Badajoz), a sparsely populated rural area. It has the privilege of hosting renowned nature writers who captivate the audience. RECIDA actively participated in the 2021 festival by giving a presentation and facilitating a discussion.

In central Spain, there is Festival LINA which focuses on children's books and nature and originated in Valladolid in 2019 thanks to the Junta de Castilla y León. LINA collaborates with library staff from the Red de Bibliotecas Públicas de Castilla y León/Public Libraries Network of Castilla y León who recommend reading guides for each event in the series. RECIDA participated in the 2019 event by presenting its publication *Verde que te leo verde,* which has subsequently been updated in 2024 (Toril Moreno and Amaya 2024).

Letras Verdes/Green Letters, a national meeting on nature and rural literature, has been held in the Canary Islands annually since 2021, and it brings high-quality culture to rural areas such as Buenavista del Norte and Los Silos. The festival is set against the backdrop of the Teno Rural Park. At the 2023 event, RECIDA had the opportunity to present the network and its activities promoting nature and environmental reading. The 2024 event will include art.

There are several other notable Spanish literary festivals in which RECIDA's green libraries plan to participate. They include:

- Alto Palancia Lit Fest
- Bosquegrafies
- Voces del Extremo/Voices from the Extreme
- Festa Amergin de Poesía Atlántica/Amergin Atlantic Poetry Festival, and
- La Biblioteca del Bosque/The Forest Library, at the Biblioteca Torrente Ballester/Torrente Ballester Municipal Library in Salamanca.

The festivals offer a unique opportunity for direct connection with nature, writing and active exchange between authors and attendees. Participating in such events allows for a rich and healthy engagement with the world, countering what might seem to be the digital, cold and distant aspects of contemporary life. The commitment to culture and sustainability remains a primary goal, fostering a sense of community and shared appreciation for literature that explores the relationship between humanity and the natural world.

Supporting Literary Creation

As part of educational and outreach activities, RECIDA's green libraries have initiated programmes that equip public centres with the essential tools for a literary and creative exploration of nature, for example, providing batches of books to discuss in reading clubs, providing advice on topics, titles, or contacts with writers, and guidelines on how to prepare activities.

A significant initiative has been the literary workshops launched by Centro de Documentación Ambiental Domingo Quiroga/Environmental Documentation

Centre of CEIDA in 2017. Led by writer Antonio Sandoval Rey, the workshops aim to provide participants with insights into writing environmental essays and to guide them in taking initial steps in composing naturalistic works. Over two days, attendees engage in theoretical and practical sessions, exploring the historical evolution of nature writing and gaining knowledge about the techniques essential to the writing process. The programme culminates in an inspiring nature walk, allowing participants to compose and share their written pieces. Nature serves as the most energetic source of inspiration during the workshops.

Since 2023, the CEIDA Centre has incorporated a literary creation programme for both adults and children that focuses on haiku. Haiku, a magical Japanese poetic form, serves as a means of observing nature and perceiving changes in the landscape. The creative programme introduces participants to the art of crafting haiku, inviting them to explore and reflect on the natural world through the captivating lens of this concise and evocative poetic style (Figure 11.2).



Figure 11.2: Literary Creation Workshop and Children's Workshop: Introduction to haiku at CEIDA Library. © Ana Pardo Cereijo

In 2023, the CENEAM initiated its first Literature and Environment Residency, a project (Sandoval Rey and Toril Moreno 2023) under the Spanish government's Plan de Acción de Educación Ambiental para la Sostenibilidad/Environmental Education for Sustainability Action Plan (PAEAS) (Spain. Ministerio para la Transición Ecológica y el Reto Demográfico 2024). The CENEAM's green library served as a resource hub and inspiration for the ten participating writers, who spent nine days using its facilities and extensive collection. Located in the vicinity of the Sierra de Guadarrama National Park, the centre's surroundings provided an ideal setting for the creation of environmental literary texts.

Alliances with Publishing

Libraries, particularly green libraries, play a crucial role as cultural hubs and promoters of environmental awareness. Many green libraries have created alliances with the publishing sector by organising book presentations, providing spaces for authors writing on nature, and showcasing latest releases. The COVID-19 pandemic has prompted a transformation in work across all sectors, and the cultural domain is no exception. New challenges have emerged, necessitating the reimagining of activities that were traditionally conducted in person. Book presentations and meetings with authors are prime examples, with several RECIDA libraries adapting events for virtual presentation.

One notable example is the *Ratones de Bibliotecas Verdes/Green Library Mice* video collection from the green library of CENEAM (Spain CENEAM 2023). This initiative introduces books that contribute to environmental conservation and climate change mitigation, and promotes the Centre's library collections. The Centro de Documentación y Recursos para la Educación Ambiental en Cantabria (CEDREAC) has its own YouTube channel, *Sinapsis Ambiental el canal de recursos para la educacion ambiental/Environmental Synapse* as a primary platform for environmental education. The channel has been used to share recordings of virtual author meetings and book presentations, contributing to the dissemination of environmental knowledge.

Additionally, the collaboration agreement between RECIDA and the Asociación de Periodistas de Información Ambiental/Environmental Information Journalists Association (APIA) has allowed professionals from green libraries to present literary works authored by experts in environmental communication. The Centro de Documentación del Agua y el Medio Ambiente de Zaragoz (CDAMAZ)/Documentation Center for Water and the Environment in Zaragoza began the collaboration with the presentation of a book in which an APIA journalist participated, which marked the start of future collaborations.

Art and Environment in the Library

The RECIDA green libraries leverage art as a strategy for environmental awareness and as a means to enhance scientific knowledge. The incorporation of art into the library benefits society by reaching diverse audiences, including those within the spheres of art and science (Ravenstahl 2022). Synergy is achieved by pairing the artistic sector, its works, its creative capacity, and its ability to convey messages, with libraries, their collections and their capacity to generate dynamic communications and visibility. Art serves to evoke emotions and stimulate reflection on important themes such as the environment. The following are experiences from some RECIDA centres that use artistic expression to generate environmental awareness.

Special Projects

The Biblioteca/Library of the Centre d'Educació Ambiental de la Comunitat Valenciana/Centre for Environmental Education of the Valencian Region (CEACV) undertook two projects in 2022: a book on art and the environment, and collaboration with a significant contemporary art centre. The goal of the book project MAiMA: Monográfico Arte y Medio Ambiente (Benlloch Tamborero 2022) was to showcase how artistic activity can disseminate and convey messages about the importance of the environment and the issues affecting it. Experiences, practical cases, reflections and interviews were compiled about painting and street art artistic projects that frame their work within an environmental context. It was presented at the Institut Valencià d'Art Modern (IVAM), a leading centre in current artistic trends in Spain.

The exhibition *Emergency on Planet Earth* at the Centre del Carme Cultura Contemporània (CCCC)/Carmen Center Contemporary Culture was one of its main events during 2022. A dozen urban artists expressed through their works views on topics such as climate change, loss of biodiversity, water issues, consumerism, waste, and the use of chemicals in agriculture. The participation of CEACV in the project involved providing educational content to enliven the exhibition and programming educational workshops. A series of talks and round table discussions was organised for public participation. The library held workshops where more than 400 people participated. The collaborative project linked education, training and environmental awareness, and highlighted the advantages of combining efforts in reinforcing messages and conveying them to society in a strong, direct and efficient manner leading to changed perceptions and behaviour.

RECIDA has libraries in art centres, for example in the Centro de Investigación, Documentación y Cooperación/Research, Documentation, and Cooperation Centre (INDOC), a service provided within the Centro de Arte y Naturaleza (CDAN)/Centre

for Art and Nature of the Beulas Foundation, located in Huesca, near the Pyrenees. INDOC has an international collection on the relationships between art, nature, land art and landscape. Art is the main focus of its environmental awareness actions. Over the years, INDOC has sought to achieve quality connections between the research materials of the art centre and the landscapes surrounding CDAN through three levels of intervention: the art centre's own garden; the Beulas estate, an adjacent landscaped space where the painter José Beulas (1921–2017) lived; and the art and nature collection that unfolds throughout the province of Huesca, where top international artists have intervened.

Collaborative Activity

Activities are carried out through collaboration with a university or a landscape interest group, and INDOC serves as a scientific resource for students while providing sessions on art and nature. Gardens are used as spaces for artistic intervention and reading; group tours are conducted around the artworks and are accompanied by the promotion of related books and literature. An example activity is *Conversations with the Landscape*, developed by a fine arts research group from the Rey Juan Carlos University in Madrid (Domínguez del Triunfo 2023). In March 2023, a research stay was conducted at INDOC with a subsequent visit to the gardens of CDAN.

An example of a documented walk took place in October 2021 when INDOC hosted the Encuentro Matrix Cultura 2050: Resonancias y transmisión de entornos (8 y 9 de octubre)/Matrix Cultura 2050 project: resonances and transmission of environments. Promoted by the Livemedia association, the project investigated over three days how technological tools can communicate and make landscapes feel in real-time. The aim was to reflect on linking contemporary art to walking as an aesthetic practice. Another project involved the use of books from INDOC as part of a performance work *Trees as Archaeology* by the artist Fernando Casás. On other occasions, the library's action is limited to selecting books and, together with the Didactics Department, to accompany research groups to artistic expeditions in the landscape they wish to visit (Figure 11.3).



Figure 11.3: Accompanying visit to the artwork *Three Sun Vessels for Huesca* by the artist David Nash. © CDAN

During the 2021–2023 triennium, two European cooperation projects were promoted by the library. One was the CDAN *NATURALIZAR, Encuentro europeo de iniciativas de Arte y Naturaleza en el contexto de la Nueva Bauhaus Europea/NATURALIZAR, European Meeting of Art and Nature Initiatives in the Context of the New European Bauhaus* which involved the European Commission making CDAN a partner in the New European Bauhaus (NEB) initiative focused on combining sustainable spaces with delving into aesthetics. The INDOC library participated in the events and has organised specialised courses. In 2022 the INDOC library participated in the NEB festival by creating a book exchange for researchers. The second project involved two institutes, Lycée Adriana, Tarbes, France, and Centro Público Integrado de Formación Profesional Montearagón (CPIFP), Montearagón, Huesca, Spain, in a trans-border initiative *Microproyecto Paisajes-Pyrénées: training in landscape art*. A team of vocational training students and teachers in landscaping, environmental artists in residence and cultural managers was created, and library actions and materials facilitated community reflection on the relationships between climate change and landscape on both sides of the Pyrenees and the varying perspectives on landscape and heritage (Ramos de León 2023b).

Another initiative has been work by CDAN with the Colegio Oficial de Arquitectos de Aragón on La transformación contemporánea del territorio/The Contemporary Transformation of the Territory, a vision of the landscape in a context of accelerated change. A project undertaken together with the Menéndez Pelayo

International University focused on thirty years of art and nature: 30 años de arte y naturaleza: Las Maladetas, antes y después de Richard Long/Las Maladetas, 30 years of art and nature before and after Richard Long.

Integration of Art and Reading

The Centro de Documentación y Recursos para la Educación Ambiental en Cantabria (CEDREAC)/Centre for Documentation and Resources for Environmental Education of Cantabria participates in a programme that combines environmental art exhibitions and the promotion of reading. Since 2022, the Centro Botín/Botín Centre has invited CEDREAC and other public libraries in Cantabria to conduct a stimulating guided tour of the exhibitions it hosts. Each library selects books from its collections inspired by the environmental art exhibition. The lists are published by the Botín Centre on its website and some materials are acquired by the Centre and made available to visitors who can browse them on-site or borrow them.

Parks and Libraries, Naturally

Managers of protected areas and environmental libraries have always understood that integrating their work in spirit of collaboration will reach a larger portion of the population than operating separately. An example is the programme *Parcs i biblioteques ...naturalment!/Parks and Libraries...Naturally!* which was initiated in 2017 and is still expanding in Catalonia. It currently includes 45 libraries and seven research centres from seven protected areas or land reserves in public ownership. Over one hundred workshops and activities of an artistic or cultural nature are organised annually with around 3,000 people participating.

Libraries offer art workshops on painting the natural environment seeking inspiration from their natural surroundings. The Biblioteca Elisenda de Montcada/Elisenda de Montcada Library in Montcada i Reixac in Barcelona conducts workshops on art and botany which focus on transmitting the values of the neighbouring park, Parc de la Serralada de Marina. Other libraries operating in an urban environment organise sketching meetups which provide drawing or painting as expressive practice using nature as a backdrop. A travelling exhibition can be created from the resulting work, and the messaging about the importance of nature conservation shared. Such an approach is demonstrated by the programme *Viu el parc/Live the Park!* managed by the Diputació de Barcelona/Provincial Council with the collaboration of libraries and municipal culture departments in the province. The

programme aims to bring diverse cultural expressions involving theatre, music, poetry, opera, photography, dance, and land art to the rural environment of villages in protected natural areas. Land art is art made using natural materials such as vegetation, water, stones, and soil, especially in their natural environment.

Similar programmes are offered by the Biblioteca Ferrer i Guàrdia/Ferrer i Guardia Library, the Biblioteca Jaume Perich/Jaume Perich Library, and the Biblioteca De Martorelles/Martorelles Library. In all three, workshops combining art and nature are organised to promote land art creations in the surrounding forests with the participation of local artists. The same visual artists lead the activity, starting with a guided tour through the forest, explaining how nature is their source of inspiration and knowledge. Using elements collected from nature, including rocks, branches, leaves and feathers, participants create an artistic work in the forest or in the library, and discuss the works created with the invited artist. Libraries adopting the initiative include the ones already mentioned along with the Biblioteca de Mira-sol/Mira-sol Library in Sant Cugat del Vallès, and the Biblioteca Tirant lo Blanc/Tirant lo Blanc Library. The project mOts/Words which commenced in 2024 is bridging historical memory and art, bringing together a dozen libraries and research centres in the province of Barcelona. Based on the recovery of words and phrases from the rural environment that have fallen into disuse, and with a fully participatory approach aimed at the local population, users of the participating libraries will create various artistic works together, guided by a collective of local artists and with the natural environment as their inspiration.

Green Libraries as Exhibition Spaces

Conceived as open spaces for the entire community, some green libraries from RECIDA have experimented with new services, providing users with venues to host temporary exhibitions including photographs, paintings, sculpture or other artistic works. The themes of the exhibitions have been wide-ranging including forests, biodiversity, endangered animals, marine pollution, water, geology, mountains, waste, botany, birds, trees, energy, and the climate crisis; books on the chosen topic always accompany the exhibition. The library becomes a welcoming place for amateur artists who, in most cases, do not have the opportunity to exhibit their works in museums or art galleries. Reading rooms are transformed into hybrid spaces where books and various artistic expressions come together with a common goal: to appeal to emotions through art and awaken the critical spirit of visitors.

The CDAMAZ reading room in Zaragoza is in the former convent of Santo Domingo in Zaragoza and has a ten-year history as an exhibition space and a connection with environmental artists (Figure 11.4).



Figure 11.4: Exhibitions at CDAMAZ Library. © Marga Muñoz

A more recent example is the Centro de Documentación Ambiental Domingo Quiroga/Domingo Quiroga Environmental Documentation Centre – CEIDA, which relocated in 2022 to a new venue, the former stables of Pazo de Lóngora in Oleiros, A Coruña. Today, as a result of user demand, it opens its reading rooms to host exhibitions and enthusiasts seek the opportunity to showcase their artistic works. All the activities described serve as perfect opportunities to combine art and the environment through complementary exhibitions, combining books, lectures, workshops, or other activities related to the theme of the artworks. Minds and hearts are engaged; messages are conveyed and reinforced; and attitudes and actions towards sustainable endeavours are changed.

Conclusion

The role of libraries and documentation centres has evolved in parallel with the new services demanded by society. Libraries are no longer merely places for the storage of books and documents; they constitute cultural hubs with widely rec-

ognised social functions. Libraries serve as allies wherever and whenever the community demands action. Green libraries and environmental documentation centres, through their activities and steadfast support for the SDGs and Agenda 2030, and a recognition of the value of ESD, contribute to a more just and compassionate society. Substantial changes have taken place in RECIDA green libraries which have opened their doors and services to all types of audiences while maintaining an active role in the communities they serve.

Green libraries have harnessed the power of the arts and literature, two essential tools to appeal to emotions and have created new narratives to awaken public interest in the environment. The extensive uptake of the activities described in this chapter reflect the enthusiastic reception of the provision of literary and artistic perspectives on sustainable outcomes. It is no less than was expected. As stated in the UNESCO ESD programme, the result of offering opportunities for the community to engage actively with sustainability serves to "empower people to take responsibility for present and future generations and actively contribute to societal transformation" (UNESCO 2020, 149). The theoretical and practical knowledge required to realise and advance a more sustainable way of life, human rights, gender equality, peace, global citizenship and cultural diversity, is gained through symbiotic understandings of nature, literature and the arts. Libraries collaborating with other cultural and environmentally related organisations and their communities have the capacity to promote reflection and environmental awareness in a society eager to connect with its natural surroundings. Artistic endeavours and nature are two sides of the same coin and offer numerous paths to explore and many actions to undertake.

Acknowledgements

A big thank you to all the staff of RECIDA's green libraries who make it possible for nature-inspired art and literature to be accessible to the public.

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Part III: **Academic Libraries and LIS Education**

Roxanne Missingham

12 Empowering Students for a Sustainable Future: Information Literacy in Academic Libraries

Abstract: The United Nations Sustainable Development Goals (SDGs) provide a global aspiration for change to ensure a more equitable approach to meet the challenges faced by all nations. Academic libraries have taken a key role in delivering against Goal 4, Quality education, and Goal 9, Industry, innovation and infrastructure. Information literacy activities have a major impact on education, providing capabilities for students to deal with the complex information environment for their study and future contribution to society. Library theory over the past one hundred years reflects a philosophy that aligns strongly with the SDGs. Information literacy activities delivered by academic libraries have evolved to strongly support the SDGs. Open access programmes led by academic libraries have transformed access to knowledge underpinning the success of several SDGs, primarily SDG 10, Industry, innovation and infrastructure. Indicators developed by national library associations reflect the significance of the work of academic libraries through these initiatives.

Keywords: Academic libraries; Sustainable development; Information literacy; Open access; Library assessment

Introduction

> Libraries bring unique strengths and collective strength to global sustainability challenges (OCLC 2024).

In the decade since the adoption of the United Nations Sustainable Development Goals (SDGs), the recognition of the role of libraries has undergone a quiet revolution (United Nations 2015). The momentous agreement to goals that would tackle the urgent environmental, political and economic challenges facing the world provided a context to rethink the contribution that libraries might make. The International Federation of Library Associations and Institutions (IFLA), together with national library associations, had advocated for many decades for the importance of including information and libraries within this grand vision (Byrne 2004, 2018).

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https://doi.org/10.1515/978-3-11-133646-6-013

Reviewing the contribution of academic libraries to the significant work of aligning activities with the SDGs is timely.

The potential of libraries to be a transformative agent for the SDGs is encapsulated in the statement of former IFLA President, Donna Scheeder: "There is no sustainable development without access to information. And there is no meaningful, inclusive access to information without libraries" (IFLA 2017). The importance of establishing a role for libraries in their contribution to sustainable development in education has a strong history of focusing on university library activities in education and training (G.E. Gorman 2003, 5–6).

Libraries are an essential element of the modern nation. At their heart they provide services that enable communities to understand their history and to become informed citizens through access to collections and support capabilities for the achievement of information literacy. Libraries come in a range of shapes and institutional relationships to engage with their users. Public, state and national libraries service their communities within government structures. Libraries within educational institutions such as universities contribute to the knowledge that students gain and researchers share with the world. Specialist libraries such as law and medical libraries contribute to specific knowledge for the work of their institutions. Scheeder's words reflect the significant role of national and international developments (IFLA 2017).

The SDGs express actions to which libraries could contribute in different ways. For academic libraries, the focus has been services delivered directly to library users (Bangani 2023; CAUL 2019; Garcia-Febo et al. 2017; Thorpe and Gunton 2022). Students and academics in universities supported by libraries have been the major focus of activities developed under Goal 4: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all", particularly through its targets and indicators (United Nations n.d.a). The activities have contained elements designed to create greater equity through programmes such as information literacy training. In addition, the role of universities in providing the community with access to knowledge has been embraced as work supporting Goal 9: "Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation" (United Nations n.d.b). The transfer of knowledge through providing access to research outputs from universities has been a primary manifestation of work in this area.

The SDGs have enabled academic libraries to reframe and enhance programmes that have been reflected in national reports and the targets of national library associations (ALA 2022; Australia. Department of Foreign Affairs and Trade 2018; ALIA 2021; United Nations 2017a). These developments provide the opportunity for the work of academic libraries to be recognised and valued in new ways.

A vital element of the drive to reframe academic libraries to address sustainable development is the UNESCO *Roadmap* (UNESCO 2020). The document calls for actions to ensure that Education for Sustainable Development (ESD) is within global, regional, national, and local education policies to support a holistic approach with a focus on increasing capabilities of educators and acting locally. Interpreting ESD in the academic library context has focused on information literacy (Abubaker 2022) and access to information digitally (Dey 2023).

This chapter reviews the theory of library and information science as it relates to the development of activities to support the SDGs. It assesses the contribution of academic libraries to Goals 4 and 9 through programmes delivered by academic libraries on information literacy and open access publishing. The most relevant targets relating to Goal 4, Quality education are "Education for sustainable development and global citizenship" and "Eliminating all discrimination in education", with a focus on collections. The most relevant targets relating to Goal 9 are "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation" with a focus on enabling access to research outputs, and "Develop sustainable, resilient and inclusive information infrastructures" with a focus on research information infrastructure provided by academic libraries, particularly in ensuring collections are openly accessible.

Library Science Theory: Setting the Scene for the Sustainable Development Goals

To understand how libraries have adapted to fulfil the intent of the SDGs, library theory provides insights into the adoption of philosophies that align with the principles behind the goals. For Goals 4 and 9, library services directly relevant are programmes to disseminate knowledge and ensure individuals have the capacity to engage with information to achieve participation effectively within their society. The crucial role of libraries in promoting social and economic reform to support national development has been recognised by library theory steadily over the years. Information literacy provides a case study of the emergence of theory. Information literacy theory has emerged as an area of deep study only in the last twenty years, paralleling the evolution of the SDGs. Information literacy refers to equipping individuals with the skills to participate actively in society and its underlying principles echo values which have emerged in library theory over the past hundred years.

The origins of information literacy can be traced to the concept of educating library users to find the information resources they require. The theoretical base

for many library services is contained in the five principles of the father of modern library science, S.R. Ranganathan. Ranganathan's influence continues to this day. "It is safe to say that no single individual has made quite such a wide-ranging contribution to the development of library and information services in his own country as S. R. Ranganathan. Internationally, he is probably best known for his revolutionary theories on bibliographical classification" (Foskett 1991, 1).

Ranganathan's fourth principle "Save the time of the reader" is the basic premise to most library services which focus on the user (Ranganathan 1931, xxviii). The proposition is based on a fundamental conception of libraries as serving all people and positions library science within a vision of democratising access to knowledge for the whole community consistent with the philosophy of the SDGs. Given the restrictions on access to many libraries in the past with requirements of citizenry or membership of institutions such as universities, religious orders or societies, democratising access represents a major step forward to establish libraries as elements in a rights-based approach that underpins the SDGs.

In describing the nature of the fourth law, Ranganathan calls out a problem for all library readers (1931, 361-III). He describes the situation where access to library collections can be a limitation because of the volume of materials and the technical issues of collection description and arrangement. Articulating the concept as a principle that focuses on assisting the reader, Ranganathan emphasises the value of reference staff in assisting readers to access knowledge within the collection, passing on their skills to readers, leading to greater access to knowledge. Over the years the principles have been reassessed, in particular in the light of new technology. New insights have been gained from applying the principles to establish a framework for library education and practice that takes the digital ecosystem into account.

Many have reinterpreted Ranganathan's laws, but the first to do so significantly in the digital age focused on explaining the concepts of serving all people and contributing to rights in a reworded set of principles:

1. Libraries serve humanity.
2. Respect all forms by which knowledge is communicated.
3. Use technology intelligently to enhance service.
4. Protect free access to knowledge.
5. Honor the past and create the future (M. Gorman 1995; M. Gorman and Crawford 1995, 8).

Reconstructing the new values and changing approaches to library theory and education placed information literacy at the heart of a powerful movement for harnessing libraries to support equality, inform citizenry, and empower communities. The new approach brought to the fore the principle of adapting technologies and

services to enhance society by aligning them with social and economic needs and concluded:

> Librarians... should never be ashamed to defend and to show by example the core values – community, literacy, learning, service, reason, democracy, and intellectual freedom – upon which the culture of libraries is built (M. Gorman and Crawford 1995, 183).

A 2014 reinterpretation of Ranganathan proposed that the principles be reclaimed under the heading "know your community and its needs" (Connaway and Faniel 2014) and commented:

> At its heart, "every person" exudes a strong sense of public purpose, the fervent belief in access to information for all people, which remains a central tenet of librarianship. In fact, the desire by librarians to serve all people has increased in importance in today's digital world, as evidenced by efforts to bring workstations, licensed resources, web content, information literacy and Internet connections to all segments of the population in all parts of the world, even the most remote (Connaway and Faniel 2014, 27).

Delivering skills that support access to knowledge held in libraries is a theme that continues, embodied in information literacy theory and practice. The theories set the scene for the research and practice that builds on the social responsibilities of libraries and takes on the challenge of digital inclusion and equity to incorporate services to enhance community knowledge and support sustainable development. Significantly, key aspects are providing services and support to all, be they citizens, refugees, marginalised populations or those who have experienced historic discrimination. The rights of access and support to users are thus seen as essential to ensure access to knowledge through collections and the information skills that are essential to navigate through the knowledge contained within library collections and the broader digital world. Recognising rights for sustainable development within library and information science establishes the base from which information literacy programmes and theory can be developed.

The development of information literacy as a stream in library and information science is built on the twin elements of seeking to create informed users and responding to the changing information environment. Its early formation was through analysis of information problems in the United States. The term "information literacy" was documented in a 1974 US report for the National Commission on Libraries and Information Science which argued that the mass of information available required a literate citizenry: "In our age of information overabundance, being information literate means being able to find what is known or knowable on any subject" (Zurkowski 1974, 21). Over the following decade it was sporadically referenced in library symposia and journal articles focusing on skills required to

locate and assess information through published materials. Conferences on knowledge had the occasional paper providing early conceptual analysis (for example Burchinal 1976) and the 1970s saw the emergence of a first industry definition in 1979 with wider debate and scholarly consideration in the 1980s (Behrens 1994, 310–311).

The explosion of the digital environment from the 1980s on saw new interest in the topic. Library and information science scholars began to discuss the theoretical questions fundamental to understanding information literacy within the concept of an information society (Kuhlthau 1987; Olsen and Coons 2009). It was in this environment that higher education institutions became the scene for developments in information literacy theory that resulted in a wide range of training and support programmes which were designed to increase the ability of students accessing education support provided by university libraries through developing capabilities to fully participate in education and the new information society.

Theory and practice in library and information science supporting rights and the knowledge-based activities have come from a history that has been contested with a focus on local communities rather than national sustainable development. Libraries have often been the agents of the state in restricting access to information through banned books and controls on access offered to the privileged few. Works in collections, including published and unpublished works, reflect the bias of the record keepers, record makers and publishing practices. Recognition of bias in the narratives within libraries is being explored with new programmes to decolonise or rectify limitations contained within collections (Crilly and Everitt 2022; Hurley, Kostelecky, and Aguilar 2017; Kleiber et al. 2018; Wilson 2022). Emerging themes of services focused on refugees (Serra and Revez 2023; Stoner et al. 2022) have highlighted that the complexities of social inclusion and rights of information access have yet to be fully realised both in practice and through library and information science theory, suggesting there is much to be achieved for equity of access and citizenship through a sustainable development approach.

Libraries supporting higher education institutions have a special place in this environment as holders of globally significant collections of human history and contemporary research, and for fulfilling the role of facilitating the development of competencies for the emerging generation of leaders. The dual roles provide the opportunity to assess and implement theories that lead to evolving practices for delivering programmes designed to underpin capabilities required to harness library collections for equitable and informed access to knowledge. Information literacy theory has developed as the overarching concept to understand the meta-literacy of students and academics, with theory based on sociocultural, cognitive and behavioural science. Hicks, Lloyd, and Pilerot (2023) summarise theoretical developments; Bruce's work in 1997 exemplifies the approach. The evolution of informa-

tion literacy based on knowledge and capability in a diverse set of literacies around text, data, equity and primary materials has led to the development of programmes and theory that reflect the need to equip the community for a complex and contested information ecosystem.

It is more important than ever to understand the theory and work of libraries to contribute to the SDGs. The world is "plagued by a duo of dangerous crises: climate and conflict" (World Economic Forum 2024, 4). Within this precarious environment the most severe risk identified by the Forum is that "over the next two years, foreign and domestic actors alike will leverage misinformation and disinformation to further widen societal and political divides" (World Economic Forum 2024, 8 and chapter 1.3). The rising tide of misinformation is the new frontline for human conflict, such as in Russia's war against Ukraine (OECD 2022) and elections (for example, Brennan Center for Justice 2024). In Australia, the government body that manages elections has gone as far as to publish a disinformation register (Australian Electoral Commission 2024).

In the current climate of increased interest in equity and greater threats in the environment through disinformation, the importance of theory and practice in library and information science is evident. Developing information literacy programmes to increase the capacity of students and the broader community to access and effectively use information is timely. The nature of the contribution of academic libraries for informed democratic processes and knowledge for individuals to exercise their rights is a cornerstone for modern nations.

Information literacy is thus a key element in providing services to support the SDGs. Literacy programmes offered by higher education libraries, and the adoption of a vision of professional practice based on principles embodied in international work to address inequities in information in developing countries, are fundamental to this change. The advocacy and programmes of IFLA underpin many of the worldwide developments. Libraries are leading change in knowledge services that actively support Goal 4, Quality education.

Information Literacy: Application and Theory in Higher Education

Through the late 1980s and 1990s information literacy was a major topic in higher education libraries and associations. Theory in the sector focused on the achievement of an "information literate individual" (for example, Bruce 1997). During this period, the major library associations analysed the emerging theories to establish frameworks for the implementation of actions defined in standards and

guidelines for libraries to produce information literate individuals. Higher education libraries formed a central plank in the work undertaken, consistent with the philosophy of producing graduates who require complex information skills to navigate their careers be they in research, industry, government or community organisations.

In the US, the American Library Association (ALA) established a Presidential Committee on Information Literacy which issued a Final Report in 1989 (ALA 1989). The recommendations included building programmes to provide individuals with the ability to recognise when information was needed, and to locate, evaluate and use the needed information effectively. The Association of College and Research Libraries (ACRL) Board established a Task Force on Information Literacy Competency Standards in 1998 to develop standards to guide higher education institutions. The standards were approved in January 2000 (ACRL 2000) and were rapidly adopted across all states in the US, evolving through new pedagogies and frameworks. In October 2009, President Barack Obama proclaimed National Information Literacy Awareness Month demonstrating a national commitment to information literacy (The White House President Barack Obama 2009).

In the UK, the Standing Committee of College, National and University Libraries (SCONUL) in 1999 appointed an Advisory Committee on Information Literacy who issued a briefing paper on seven sets of information skills in higher education to lead implementation of information literacy programmes in research libraries including higher education. The briefing paper was based on the "twin dimensions of the 'competent' student and the 'information literate' person (SCONUL 1999). The approach has morphed into "Seven Pillars of Information Literacy", "a model defining core abilities and understandings of information literacy in higher education" (SCONUL 2024). Significant developments in the UK in relation to information literacy have taken place through Jisc, a not-for-profit organisation providing digital, data and technological support for universities. It has produced information literacy models with associated guidelines and training materials beginning with 2015 and six elements focusing on digital capabilities including information literacy (Jisc 2015a, 2015b). The model has been refined into a digital capabilities framework (Jisc n.d.a, Jisc CEAL n.d.b, 2024).

In Australia, the Federal Government's National Board of Employment, Education and Training (NBEET) undertook a report into higher education libraries in 1990 (Henderson and Austen 1991) which raised the importance of higher education libraries as agents for a successful education system. The report "brought university libraries out of that tunnel and squarely into the light" (Radford 1993, 251). It proposed that libraries teach information literacy skills within a developed context in programmes for current students and lifelong learners. A further report funded by NBEET *Developing Lifelong Learners through Undergraduate Educa-*

tion (Candy, Crebert, and O'Leary 1994) emphasised the importance of training to produce information literate graduates. Information literacy standards were published by the Council of Australian University Libraries (CAUL 2001). A more extensive second edition contained detailed guidance endorsed by several library associations (Bundy 2004). The Australian material drew from international research emphasising the importance of the literate individual and the contribution of higher education to creating a sociocultural environment that integrates information learning into education programmes (Bruce 1996, 1997, 2011). The national discussion and development of guidelines and standards led to programmes in all libraries within higher education institutions to create a new generation of graduates who could navigate the sea of digital information to be able to leverage their rights as informed individuals.

As research into information literacy evolved, the breadth of theoretical foundations expanded beyond concepts of lifelong learning and providing agency to individuals. Sociocultural theories based on human cognition were adopted to establish learning paradigms and approaches to understand the interactions within the higher education system required to achieve information literacy. Vygotsky has influenced the conceptual basis of information literacy profoundly:

> From this (Vygotsky's) perspective, learning and development occur on two planes: first on the social plane (interactions with others) and then on the psychological plane (within the learner or researcher). This describes a process of human cognitive development which is situated in, but not limited to, social interaction (Wang, Bruce, and Hughes 2011, 298).

The shift led to a move from a focus on training and skills to an embrace of the library context within higher education, and an approach that incorporated awareness and cognitive impact reflecting "the idea that IL is more than just a text-based literacy, it is also a social and physical experience with information" (Lloyd and Williamson 2008, 9). Kuhlthau echoes this finding in her summary of more than twenty years of research finding that:

> in the holistic experience in the process of information seeking, incorporating the physical, cognitive and affective dimensions from the perspective of the user...(her model) challenged the traditional source approach to librarianship that attempted to solve users' information need solely by location of sources while ignoring the more confounding interpretation tasks that confront users in the process of using information for learning and where users are seeking meaning rather than merely seeking information (Kuhlthau 2024).

Developing systematic programmes in higher education to put information literacy into practice through libraries has been facilitated by stakeholders such as government bodies and professional associations in conducting research and deter-

mining best practice. Within the university library sector, practitioners have led content development and applied theoretical foundations through iterative processes. Over the last decade the original concept of a single set of information literacy skills and knowledge has expanded as specialised literacies relating to complex research capabilities and other information aspects emerged (for example, Cope and Kalantzis 2009, and New London Group 1996). The diverse literacies relate to the various principles of the SDGs, marshalling library and information science knowledge for students and broader communities.

The development of the SDGs and their predecessors, the Millennium Development Goals (MDGs) (United Nations 2017b), paralleled the development of information literacy theory and practice. National reporting on the SDGs has incorporated information literacy as a key element. The stretch targets for Australian libraries feature literacy as their first target including information literacy (ALIA 2021). The baseline report (ALIA 2022) also features information literacy and reports on progress. The SDG framework has provided an opportunity to give information literacy high visibility on international and national agendas.

Higher Education Library Literacies

A diversity of literacies has emerged within libraries and other cultural areas within universities and more broadly. In terms of their alignment to SDG 4 all are built on concepts of facilitating access to, and use of, information through providing training and access to materials to support the individual capabilities of the community in an information-dense environment.

In 2024, the literacies for which higher education libraries provide support are listed below (Table 12.1).

Table 12.1: Contemporary information literacy activities in higher education

Type of literacy	Elements	Key Theorists/ Researchers	Key human rights issues
Information literacy	Using information technology for awareness and communication; finding information from appropriate sources; executing a process; controlling information; building a personal knowledge base in a new area of interest; working with knowledge and personal perspectives to gain novel insight; and using information wisely for the benefit of others	Bruce 1997 Lloyd 2021 Lloyd and Talja 2010 Kuhlthau 1987 Kuhlthau 2015	Express goals in programmes to ensure equity in access to information and the ability to use information for equity in education Lifelong critical analysis skills Overcoming historical and sociocultural inequality
Archival literacy	Application of information literacy with special attention to archival descriptions and understanding the nature of archives collections	Yakel and Torres 2003 Robyns 2001 Carini 2016 Hankins 2019 Huang, Sun, and Zhou 2023 Andersen 2006	In addition to building individual capabilities there is a focus on creating accessible archives to unlock the historic data for all from records that have "hidden" histories Expands privacy rights as an essential theme
Data literacy	Research data management and governance including sensitive data and research ethics	Mandinach and Gummer 2013a Mandinach and Gummer 2013b Guler 2019 Jisc 2024	Rights of researchers as well as ethics codes for those whose data has been collected
Academic writing literacy	Focused on developing academic skills for success in study.	From educational theory Wingate 2012 Scholtz 2016	Rights focus is on enabling equal participation in education
Academic integrity literacy	Focused on ethical behaviour in the educational context	From academic integrity research Eaton 2021 Powell and Singh 2016	Rights include respect for copyright, ethics and recognition of the work of others

Type of literacy	Elements	Key Theorists/ Researchers	Key human rights issues
Artificial intelligence literacy	Elements include building technical understanding, copyright and ethics	Builds on academic integrity and data literacy Ng et al. 2021 Cormack 2021 Jisc 2023	Understanding rights from a cybernetic perspective rather than legal
Media and information literacy	Creation of knowledge to deal with misinformation and media bias	Whitworth 2012 Hobbs 2010	

The new literacies address challenges due both to the nature of the digital environment and to information skill equity. However, challenges remain in terms of the content that is accessed. For example, resources may record colonial and historical inequity which are sometimes referred to as uncomfortable truths, while also creating knowledge that can be used to provide a basis for rectification of inequities. The emergence of interest in Indigenous cultural and intellectual property (Kearney and Janke 2018) which has yet to be settled in legislation and guidelines (Australia. Department of Infrastructure, Transport, Regional Development Communications, and the Arts [2024]) is an example of the complexity of this area. An Australian example of the power of archival literacy is how records of pastoral stations reveal data that can be used for wage redress cases for Aboriginal and Torres Strait Islander people (Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS 2024). The development of archival literacy not only equips individuals to access and use resources; it also enables information to be harnessed to address contemporary human rights matters.

Connecting the higher education community to literacies delivered through training and support services builds on existing library strengths. The knowledge of library staff and their interaction with students expand information to create an environment that explicitly addresses issues of those who lack equity and knowledge. The creation of new literacies brings a set of actions that enhance the fundamental skills and resources that align with the nature of the SDGs. These developments address the needs of individuals through contextualised knowledge (Jaeger, Taylor, and Gorham 2015; McCook and Phenix 2006) aiming to overcome inequities of access to the collections and the Internet, and through the provision of safe spaces for access to information.

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

capabilities, and educational practices. By providing services for information literacy, education becomes a goal that is delivered not just while students are studying but through a set of capabilities developed throughout the rest of their lives, thereby implementing the targets associated with SDG 4 (United Nations n.d.a).

Setting the Scene for Sustainable Development Goals through Open Access

The open access (OA) movement began through advocacy by scholars and librarians. Its progress as theory and practice paralleled the development of the MDGs and the SDGs. Early advocates proposed a change to the scholarly information ecosystem:

> OA benefits literally everyone, for the same reasons that research itself benefits literally everyone. OA performs this service by facilitating research and making the results more widely available and useful. It benefits researchers as readers by helping them find and retrieve the information they need, and it benefits researchers as authors by helping them reach readers who can apply, cite, and build on their work. OA benefits nonresearchers by accelerating research and all the goods that depend on research, such as new medicines, useful technologies, solved problems, informed decisions, improved policies, and beautiful understanding (Suber 2012, ix).

A series of community statements emerged from meetings of scholars, librarians and ultimately funders and publishers to articulate the vision:

- Budapest Open Access Initiative, declared on February 14, 2002 (BOAI 2024)
- Bethesda Statement on Open Access Publishing (Brown et al. 2003)
- Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, published in English on October 22, 2003 (2024)

Open access is seen as a positive social good removing barriers to works that have in the past traditionally, when in digital form, been locked behind paywalls. Paywall mechanisms ensure that only those with a subscription can access the material, preventing a public good or public benefit from access to what is often publicly funded research. The theoretical discussions about OA focus on practice and theory drawing from knowledge production, actor/network, social and business change theory (Pinfield et al. 2020). Breaking down the barriers to access to research that is of public benefit resonates with many. There are debates about the best means and unintended consequences of some actions, such as a rise in predatory publishers, as the models that underpin the change to open access evolve. As much scholarly

research is undertaken in universities, it is inevitable that the changes in practice are in a large part being implemented by academic libraries.

Open Access and the SDGs

In terms of the SDGs there are three major goals that relate to the work of academic libraries on OA. The first is Goal 4, Quality education. The production of open educational resources (OERs) has had a transformative impact on education. Many OERs are produced by libraries through university presses that sit within libraries, such as White Rose University Press (2024), the Australian National University Press (2024) and University College London Press (2024). They are also produced by consortia of libraries such as the Council of Australian University Libraries (CAUL 2023a) who fund common infrastructure to deliver access to OERs.

The prohibitive price of textbooks is a significant disincentive to participation in education (Missingham 2016). Open access resources, particularly textbooks, overcome this barrier to education in developed and developing countries. Importantly, there are educational benefits in relation to equity through enhanced access to textbooks. Most OA textbooks are available in accessible formats and are compliant with the obligations under the Marrakesh Treaty (World Intellectual Property Organization [2024]). The treaty was adopted on June 27, 2013, in Marrakesh, was support for enforcement on June 30, 2016, came into force on September 30, 2016, and has since been signed by 93 countries. It ensures the production and international transfer of specially adapted books for people with visual impairments through establishing a set of limitations and exceptions for copyright legislation.

Academics in discussions with academic librarians have reported favourably on the transformation in pedagogy as a result of unlimited free access for students to OERs, and the enhanced quality of the student experience. Open access textbooks integrate new technologies such as virtual models that facilitate digital equity in access to knowledge. A recent systematic review has found that “open education has prompted a movement to empower students in manners that are not possible with traditional copyrighted materials” (Clinton-Lisell 2021, 263).

Goal 9, Industry, innovation and infrastructure, benefits from the work of libraries in making research openly accessible to promote business activities. The extent to which university research is made available through repositories managed by university libraries and the amount of use it receives indicates its impact on industry and the community. In Australia in 2022 there were more than 2.6 million research outputs in repositories which generated over 46 million downloads (CAUL 2023b) (Figures 12.1 and 12.2).

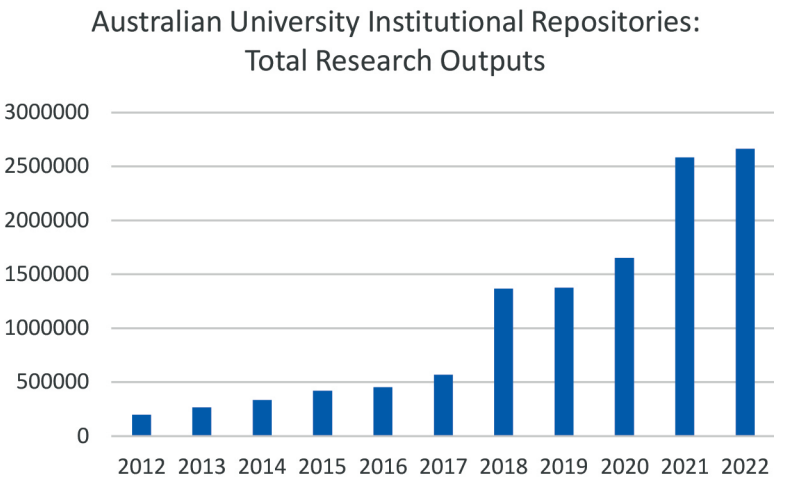


Figure 12.1: Australian university institutional repositories: research outputs 2012–2022. © CAUL statistics (CAUL 2023b)

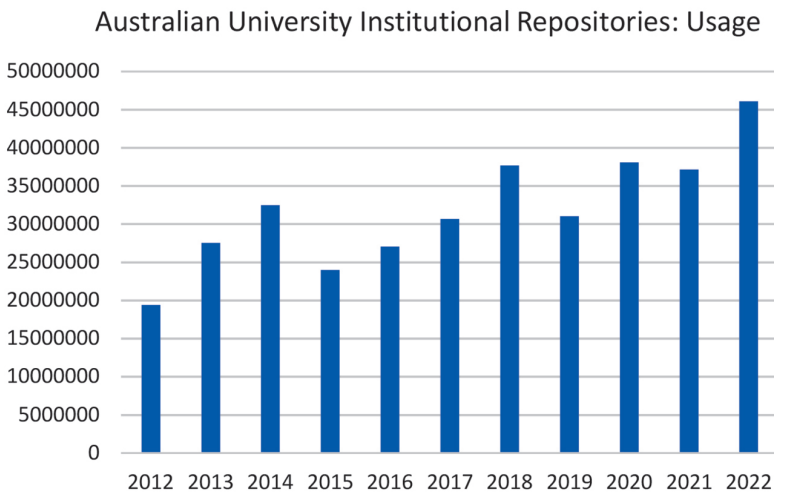


Figure 12.2: Australian university institutional repositories: usage 2012–2022. © CAUL statistics (CAUL 2023b)

Goal 10: "Reduce inequality within and among countries" (United Nations n.d.c), is impacted by the activities of libraries. University libraries make information available to individuals who are not students or staff and who have in the past not been able to access research. The removal of barriers to access adds an information right

that benefits both people in developing countries where access has been limited because of lack of financial resources andglobal people not directly associated with universities who benefit from additional access to research outputs. Digital university institutional repositories and web services enable individuals who are geographically isolated to have easy access to knowledge.

University leaders have recognised the important contribution that making research available more broadly can achieve:

> The fundamental contribution to society by universities lies in creating and passing on knowledge for its own sake and engaging with society in its application.
> Universities today are an integral part of society, actively participating in fulfilling "a third mission" for universities, namely involvement in socio-economic development (International Alliance of Research Universities 2021).

Academic libraries play a major role in delivering the outputs of research to many, fulfilling the missions of their universities. The contribution to the SDGs through this work is measurable and impactful. The broad programme of activity includes institutional repositories, open access publishing, collection acquisition through Read and Publish Agreements (Hinchliffe 2019), open data and open science initiatives, global digital collection initiatives such as Hathi Trust Digital Library (2024) and CLOCKSS (2024). Advocacy supporting open access is making a major contribution to equity, social inclusion and economic development. Many initiatives are in play and demonstrate that libraries are taking action locally and globally through international consortia and collaborative organisations to strengthen services to users, enhance information literacy, and deliver on the SDGs.

Conclusion

Academic libraries have strengthened existing services and developed new ones in the past decade, most notably in information literacy and open access, and programmes provided are making a significant contribution to the SDGs. The actions are significantly improving equity of access and addressing the complexities of information creation, discovery, organisation, access and use. Academic libraries are responding as leaders to changes in the digital environment and delivering successful outcomes and benefits to their users, arming people with the knowledge and skills required to deal with the spread of disinformation and misinformation.

A vision of equitable access to knowledge for students delivered by library programmes has been based on an evolution in library science theory which can be traced back to the 1930s. Enhancing this vision in the digital age has created an

environment that recognises new forms of inequity, such as that experienced by refugees and marginalised populations and those with limited digital access.

The initiatives of academic libraries have had a major impact on education. They have provided services that have improved student capabilities to navigate the complex information environment they encounter in their learning experiences. And importantly, capabilities are built to underpin students' future contribution to society. Libraries have demonstrated a great diversity of initiatives in addressing the SDGs in an education context (Hauke 2020).

Activities to implement open access for the research outputs of universities have also seen a dramatic increase in the last decade. The public mission of universities is fulfilled through services delivered by libraries to make research outputs available to all. Repositories and innovative agreements with publishers, such as Read and Publish agreements to transform the scholarly communication ecosystem and overcome paywalls have been major tools to activate this goal.

National indicators for the SDGs reflect the significant contribution of academic libraries (ALIA 2021). In Australia, the first two targets for 2020–2023 are literacy and access to knowledge (ALIA 2022). These are the cornerstones for impact in the academic library sector activities relating to Goals 4 and 9. Releasing the data on the activities of libraries through national reporting by library associations places the achievements within a framework of national significance. It also contributes to reporting by government, making the role of libraries visible within national policy.

A diversity of funding and policy approaches has supported the initiatives of academic libraries. The creation of repositories in universities in Australia was funded by the Australian Federal Government recognising that national initiatives are required to fund the sector. Open access publishing has been largely funded and led by individual universities with the larger open access presses sitting within academic libraries. Acquisition initiatives to ensure OA have been led largely by CAUL, with libraries and publishers working together cooperatively. Preservation of digital content for long term access has seen libraries participate through international ventures such as the HathiTrust (2024) and CLOCKSS (2024). Researchers have themselves led other initiatives and discipline-based preprint services like arXiv (2024) have provided international infrastructure for OA.

Implementing activities that have delivered achievements against the SDGs has thus been supported by partnerships between libraries, library associations, universities, policy makers and researchers. The vision has been significantly shaped and led by academic librarians. Currently the major question for academic libraries is predicting the next steps. Alternative initiatives have been led by partnerships outside of academic libraries. Programmes such as Plan S and the national German consortium DEAL have emerged as cooperative activities of funders and

publishers aiming to make the next change to the scholarly publishing ecosystem (Deal Konsortium [2024]). Will academic libraries continue to take the lead or will market forces lead to different solutions for knowledge equity and improvements in quality education?

In the US, the memorandum for *Ensuring Free, Immediate, and Equitable Access to Federally Funded Research* requires federally funded research to be made open access "without an embargo on their free and public release" (White House Office of Science and Technology Policy 2022, 1). Academic libraries have provided an infrastructure for the safe management of research outputs. Development of knowledge and infrastructure to support this commitment may result in different roles for libraries and for funding bodies.

A new set of activities and roles for academic libraries is likely to evolve to address the opportunities in the coming years. These will expand the impact of academic libraries as agents contributing to the SDGs in new ways. The theory and practice that have led libraries to this point provide a sound footing for future developments.

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Arnold Mwanzu and Joseph Mwangi

13 Championing Sustainable Development in Academic Libraries: Insights from East Africa

Abstract: Sustainable development has become a global priority. The United Nations (UN) member states have endorsed the Sustainable Development Goals (SDGs) to transform the world by 2030 into a sustainable society. This chapter reports on academic libraries' initiatives in East Africa, including Kenya, Uganda, Tanzania and Rwanda, which were explored through interviews and focus groups with librarians from East African university libraries. Library efforts can be assigned to the five priority action areas: advancing policy, transforming learning environments, building the capacity of educators, empowering and mobilising youth, and accelerating local-level action, as envisioned under UNESCO's Education for Sustainable Development (ESD) framework (UNESCO 2020, 25). The chapter reports on the perspectives provided by the librarians interviewed and describes the contributions academic libraries are making to realise some of the SDGs. Through the provision of access to information and resources, academic libraries provide access to knowledge to foster innovation, promote inclusivity, and support the overall development of individuals and communities. The role of academic libraries as information hubs and collaborative spaces makes them valuable contributors to the UN's efforts towards sustainable development. The pillars of the SDGs, including an educated and skilled workforce and innovative and efficient system-building information infrastructure, are founded in library services. Academic libraries contribute to a knowledge society which empowers individuals to seek, evaluate and use information to achieve the SDGs.

Keywords: Academic libraries – Africa; Sustainable Development Goals; Education for Sustainable Development; East Africa

Introduction

Sustainable development has become a global priority as societies recognise the need to address environmental degradation, social inequality, and economic challenges. The United Nations member states endorsed the Sustainable Development Goals (SDGs) in 2015 with some amendments since to transform the world by 2030 into a sustainable society (United Nations 2015). Bangani and Dube examined com-

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https://doi.org/10.1515/978-3-11-133646-6-014

munity engagements of academic libraries in South Africa and found they were contributing to the attainment of SDGs 2, Zero hunger; 3, Good health and well-being; and 13, Climate action (2024). Mashroofa reported that academic libraries in Sri Lanka were contributing to nine SDGs with no clear targeting in their planning (2022). Libraries support interconnectedness, reduce the digital divide, and promote the knowledge society and technological innovation. By providing access to information and resources, libraries promote education and literacy and contribute to sustainable development.

This chapter reports on initiatives being undertaken in academic libraries in East Africa as observed in practice, described in the literature, and explored through interviews and focus groups with librarians. In particular, the chapter outlines the potential of academic libraries to contribute to realising six of the SDGs: 2, Zero hunger; 4, Quality education; 5, Gender equality; 10, Reduced inequalities; and 13, Climate action (Table 13.1; United Nations n.d.a). Libraries have taken responsibility to contribute to the attainment of the SDGs, with the support of researchers and technical teams, by making information and communications technology (ICT), information resources, and education available.

Table 13. 1: Sustainable Development Goals discussed in this chapter (United Nations n.d.a)

Goal	Description
SDG 2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture (United Nations n.d.b)
SDG 4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (United Nations n.d.c)
SDG 5	Achieve gender equality and empower all women and girls (United Nations n.d.d)
SDG 10	Reduce inequality within and among countries (United Nations n.d.e)
SDG 13	Take urgent action to combat climate change and its impacts (United Nations n.d.f)

Academic libraries play a role in attaining the SDGs by leveraging their resources, expertise, and influence within the academic community. The United Nations SDGs address various global challenges, including poverty, inequality, climate change, environmental degradation, peace, and justice. In East Africa, academic libraries, as part of their core functions, provide information access, undertake research, teach literacy skills, and provide information on sustainable development issues.

Academic Libraries in East Africa

According to the World Population Review, the population of Africa exceeds 1.5 billion. East Africa is the region on the eastern side of the African continent and comprises eighteen sovereign states and four territories and with a population of almost 490 million, in its narrowest sense, includes Kenya, Tanzania and Uganda largely due to their shared history, and Rwanda, which is in Central-Eastern Africa. Academic libraries in East Africa are vitally important in supporting governmental and non-governmental organisations to deliver on the SDGs. The East African region boasts slightly over 200 Universities, most of which have functional academic libraries that support the teaching, learning and research mandates of their universities. Universities through their libraries are increasingly seen as drivers of innovation, catalysts of social and economic transformation as well as knowledge creation centres. The libraries provide information resources in a wide range of formats for students, researchers, faculty, and members of the community. Library facilities encompass ICT, including hardware and software, and space for knowledge access, creation and use. Library staff provide expertise in information discovery and use and pass on skills and knowledge to library users through information literacy programmes and interactive digital activities. The knowledge economy has made information a critical tool for development. Libraries foster community development, build capacity through literacy skills, and enable the community to address emerging challenges (Atuase 2018).

Libraries in Africa have a long history with the ancient library of Alexandria as a significant example. While oral traditions were strong, codification and script development led to more permanent records and the emergence of libraries. Academic libraries were a later development and have always stood out as an integral university service (Lubanga and Mumba 2021; Tella 2020). The establishment of academic libraries in Kenya dates back to 1951 in the Royal Technical College, currently known as the University of Nairobi (Otike and Barát 2021). In Kenya, as in most countries, academic libraries are established simultaneously with their parent organisations and serve the teaching, learning, and research needs of their institutions. Most academic libraries rely on parent organisations for funding and support which enables them to offer service delivery to their users effectively. The institutions provide funds for the purchase of information resources, subscriptions to databases and journals, staff salaries, and the delivery and expansion of library services. Kenya has over 70 academic libraries from the same number of universities. The number of students served is over half a million. The large number of academic libraries necessitates competition for resources and staff and has accelerated the introduction of library and information science programmes in universities to cater for increased demand for a qualified workforce (Otike and Barát 2021).

In Tanzania, academic libraries support research, data collection, information management and dissemination for researchers and the academic community, as well as teaching and learning support. In 2010, Tanzania developed research data transfer procedures to enhance research output sharing with foreign institutions and stakeholders (Mwilongo and Kotoroi 2021). Academic libraries in Tanzania collaborate with research and development agencies such as Tanzania Commission for Science and Technology (COSTECH), Economic and Social Research Foundation (ESRF), and Research on Poverty Alleviation (REPOA) to help meet community and stakeholder needs in research and development (Mwilongo 2021; Mwilongo and Kotoroi 2021).

Academic libraries provide academic communities with information resources to support teaching, learning and research. However, academic libraries today serve wider audiences than the staff and students of their own institutions. Academic libraries have evolved to support many differing community development agendas. They are assuming new roles to accommodate societal needs as evidenced by the introduction of strategic plans that point the library towards community development through new services (Okuonghae and Igbinovia 2019). Modern academic libraries collaborate across sectors. Academic libraries must critically review their policies and services to ensure they remain relevant to research and development programmes being undertaken in the communities they serve.

Some community agendas that academic libraries have recently embraced are reflected in the UN 2030 Agenda which offers a common blueprint for peace and prosperity for the community and the planet. In particular, academic libraries are well aligned to SDG 2, Zero hunger (Bangani and Dube 2024; United Nations n.d.b), SDG 4, Quality education (Mashroofa 2022; United Nations n.d.c), SDG 5, Gender equality (Yap and Kamilova 2020; United Nations n.d.d), SDG 10, Reduced inequalities (Mashroofa 2022; United Nations n.d.e), and SDG 13, Climate action (Bangani and Dube 2024; United Nations n.d.f).

Education for Sustainable Development

In 2022, five years after the United Nations Agenda 2030 was adopted, it was clear that new tools were needed to achieve sustainable development. Education for sustainable development (ESD) is one tool developed by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) to clarify and define the role of education in the attainment of the seventeen SDGs particularly through the developments of a *Roadmap* (UNESCO 2020):

✔ **ESD raises the awareness of the 17 goals in education settings:** ESD enhances the understanding of learners and the general public on what the SDGs are and how these goals connect with individual and collective lives.

✔ **ESD promotes critical and contextualized understanding of the SDGs:** Sustainable development often requires a balancing act among diverse views and priorities. ESD raises questions on the inter-linkages and tensions between different SDGs and provides learners with the opportunity to navigate the required balancing acts with its holistic and transformational approaches.

✔ **ESD mobilizes action towards the achievement of the SDGs:** ESD efforts address sustainable development issues, more specifically the SDGs. These efforts continue to mobilize action for sustainable development in education settings, in particular in communities, through whole-institution approaches to ESD (UNESCO 2020, 16).

The *Roadmap* identifies five priority action areas that provide a way of attaining all seventeen SDGs through sustainable education:

- Advancing policy
- Transforming learning environments
- Building capacities of educators
- Empowering and mobilising youth
- Accelerating local level action (UNESCO 2020, 25–36).

Advancing policy is a primary mechanism that ensures uptake and inclusion of the SDGs in education systems (Didham and Ofei-Manu 2018). Policymakers are responsible for calling out the global transformation required for sustainable development. They are also instrumental in creating environments that enable the scaling up of successful ESD initiatives in educational institutions, communities, and settings where learning occurs (UNESCO 2020, 26). The five priority action areas were examined in a study which explored the extent of their impact in East African university libraries through interviews, observations, and focus groups with librarians working in the libraries. The results are outlined later in this chapter.

Some people attribute the world's current unsustainable lifestyles and practices to deficiencies in the global education system which have resulted in a lack of focus on helping learners to think critically about their lifestyles. To address this situation, the *UNESCO Global Action Programme on ESD* (UNESCO 2016) called for a reorientation of education to provide learners with the skills, knowledge, attitudes, and values required to contribute to sustainable development (Qablan 2018). To attain this objective and transform the education system, it is important to build the capacity of trainers. Along with new attitudes and clear understandings of the importance of long-term goals, educators must constantly upgrade their capabilities to align them with the emergence of technology-driven teaching methods and interdisciplinary courses (Adu, Appiah, and Yamson 2016). New knowledge and

skills will enable educators to transform their roles to deliver educational programmes effectively.

The availability and use of library resources will help educators attain their goals and professional satisfaction and in turn help students. Capacity building is vital in academic libraries both for library staff and for library users to ensure the mission of providing the information resources students require to support teaching, learning and research is realised. Academic libraries organise various capacity-building programmes including workshops, conferences, seminars, user orientation and training programmes to provide educators with insights into contemporary pedagogical approaches to facilitate knowledge transfer to learners (Debnath and Sinha 2019).

Young people and future generations will face the consequences of unsustainable development. It is young people, therefore, who must become vocal and active in envisioning creative and ingenious solutions to sustainability challenges. Additionally, young people are seen as important consumers, and their consumption patterns evolve with the macro-level trajectories of their countries. It is important to empower and mobilise young people through an understanding of the impact of their actions and consequently ensure they actively work towards a sustainable future. "Young people across the world are creative and active social innovators and entrepreneurs that can lead the change for a sustainable future" (UNESCO 2020, 32).

Academic libraries play an important role in supporting the information needs of young people who require libraries and librarians to help them navigate the information age, and produce, manage, and consume knowledge and information important to societal development and economic productivity (Kalugho 2018). Public libraries promote knowledge acquisition by offering culture and knowledge access that elevates both institutions and people. Academic libraries work to fill skills and literacy gaps, offer learning opportunities, support career and educational development, and encourage self-improvement (Kalugho 2018). Libraries are gathering places for young people outside of school hours; they provide information resources to meet research needs, access to training and career opportunities; and they facilitate self-directed lifelong learning.

Learning environments must be transformed to encourage learners to be change agents with the knowledge, means, willingness, and courage to take transformative sustainable development actions. Learning institutions must be aligned with sustainable development principles to reinforce learning content and pedagogies through the way in which institutions manage and make decisions (UNESCO 2020, 28). The transformation of higher education has prompted an examination of librarians' roles in university libraries. Identifying and predicting new and future

skills requirements for library staff in an ever-changing environment are difficult tasks.

During the COVID-19 pandemic, librarians were challenged to rethink their roles and responsibilities. Understanding student learning needs and processes and adapting to online teaching have contributed to a shift both in how users conduct research and learn, and in how librarians assist users. According to Decker (2017), creating a learning culture in an academic library encourages library and information professionals to continue learning and to gain new skills. By becoming learning organisations with competent and well-trained workforces, libraries are better equipped to survive and thrive in the continuously changing information environment. Academic library staff must be encouraged to improve their skills and feel supported to learn and develop as individuals (Thorpe 2021).

Supporting Sustainable Development

Academic libraries play a multifaceted role in advancing the SDGs by supporting education, research, innovation, knowledge sharing, community engagement, and environmental sustainability. Their contributions are essential for building a more sustainable and equitable world. This section examines the contribution of academic libraries to five SDGs: SDG 2, Zero hunger; SDG 4, Quality education; SDG 5, Gender equality; SDG 10, Reduced inequalities; and SDG 13, Climate action (United Nations n.d.a).

Zero Hunger

Libraries play a crucial role in contributing to SDG 2: "End hunger, achieve food security and improved nutrition and promote sustainable agriculture" (United Nations n.d.b) by providing access to information on food production, safety, handling, and preservation (Mbagwu et al. 2020). Library clients use information on food and health to make informed nutrition decisions. Equipping people with the right information empowers them to pursue a development agenda, including ending hunger by promoting sustainable agriculture involving food security and resulting in improved nutrition. Academic libraries enable and promote public access to quality information and communication (Mbagwu et al. 2020). Academic libraries make information about hunger eradication available. Academic libraries support research into sustainable agriculture by providing access to information. Academic libraries provide a broad range of research services and products to schol-

ars researching sustainable agriculture (Rhoe, Oboh, and Shelton 2010). Libraries connect research and agricultural extension services through the provision of access to practical knowledge and supporting material. Libraries support agricultural extension workers in delivering evidence-based information to farmers and disseminating sustainable agricultural practices (Panda, P. Kaur, and N. Kaur 2023).

Quality Education

Academic libraries can be aligned with SDG 4: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (United Nations n.d.c). Academic libraries provide access to relevant information, information literacy training for students, faculty, researchers and students visiting from schools, and promotion of reading and writing. They facilitate library visits from young students as well as the community, supply learning materials such as textbooks and computers, and training programmes for researchers (Atta-Obeng and Dadzie 2020; Bangani 2023). Academic libraries' resources and services are central to education systems; they provide sound and adequate support for the core goals of learning institutions, including teaching, learning, and research (Eze and Uzoigwe 2013).

Gender Equality

SDG 5: "Achieve gender equality and empower all women and girls" (United Nations n.d.d) has various targets, including improving the use of enabling technology, specifically ICT, to promote women's empowerment (Mashroofa 2022). Academic libraries contribute to the attainment of SDG 5, as they extend women's access to ICT. Support provided by academic libraries in teaching, learning, research, policy-making, formulation and adoption of regulations which ensure equity, and undertaking programmes for the empowerment of women help attain gender equality as envisioned in SDG 5 (Mashroofa 2022). Academic libraries provide women with equitable access to knowledge that builds capacity, contributes to empowerment and enhances confidence to overcome barriers (Atuase 2018).

Reduced Inequalities

Academic libraries play an important role in attaining SDG 10: "Reduce inequality within and among countries" (United Nations n.d.e) by providing access to information and knowledge, building community cohesion, and exposing people to various

cultures and ideas (Woodson, Telendii, and Tolliver 2020). Academic libraries support economic well-being by enabling people to acquire job skills, find jobs and establish businesses. Libraries help improve the community's quality of life, support the success of researchers, homeschoolers and business professionals, create social capital in the community, and create links between individuals which improve social trust (Woodson, Telendii, and Tolliver 2020). Academic libraries provide hardware, software, and internet connectivity which increase digital literacy of the community and empower people to enhance their living standards. Academic libraries play a role in bridging the digital divide and help attain the goal of reducing inequalities within and among countries (Leguina, Mihelj, and Downey 2021).

Climate Action

Among the seventeen SDGs is Goal 13: "Take urgent action to combat climate change and its impacts" (United Nations n.d.f). One of the ways libraries push for climate action is by promoting sustainable lifestyles which reduce climate impact. Most people do not understand climate change; libraries can take responsibility for promoting awareness of the human practices that result in a negative climate impact, and ways to combat climate change. Critical information includes understanding how individual actions like shopping and diet contribute to climate change along with the use of green energy and products (Aytac 2022). Academic libraries can contribute to SDG 13 by embedding sustainable thinking in information literacy, embracing green practices in information literacy training by encouraging use of electronic resources, minimising the distribution of print on paper training materials, recycling all materials used and adopting the use of sustainable materials.

Academic libraries promote environmental literacy and educate their communities through various channels such as films, exhibitions, lectures, poetry readings and targeted websites. Libraries organise climate awareness seminars to promote environmental literacy (Bangani and Dube 2024). The International Federation of Library Associations and Institutions (IFLA) Environment, Sustainability and Libraries Section (ENSULIB) has emphasised the importance of green libraries: "A *green and sustainable library* is a library which takes into account *environmental, economic* and *social sustainability*" (IFLA ENSULIB 2022). Mwanzu, Bosire-Ogechi, and Odero (2023a), in their study on the emergence of green libraries, highlight that libraries in Kenya have adopted and implemented green practices and developed strategies to enhance green libraries and promote environmental sustainability. The libraries have emphasised redesign and renovation in line with green library standards to meet ever-changing user demands.

Championing Education for Sustainable Development

It is evident that academic libraries are integral to achieving the SDGs by providing access to knowledge, fostering innovation, promoting inclusivity, and supporting the overall development of individuals and communities. The role of academic libraries as information hubs and collaborative spaces makes them valuable contributors to the UN's efforts towards sustainable development.

Academic libraries' efforts contribute to the realisation of SDGs 2, Zero hunger; 4, Quality education; 5, Gender equality: 10, Reduced inequalities, and 13, Climate change, and to ESD initiatives spearheaded by UNESCO (2020). The ESD framework sets the objectives of enabling society through education to develop people's attitudes, skills, and knowledge so that they can make informed decisions for their own good and the good of others in the present and future, and follow through with implementation. ESD presents a vision for development which addresses social concerns such as the fight against poverty and gender inequality, and the protection of human and animal rights (Kanga 2016).

As reported earlier in this chapter, the ESD *Roadmap* highlights five priority areas to be pursued to ensure sustainable development: advancing policy, transforming learning environments, building the capacity of educators, empowering and mobilising youth, and accelerating local-level action. This chapter reports on a study which examined how libraries in East Africa are addressing the ESD priorities areas; provides insights from librarians; presents best practice from a local perspective; and highlights gaps in practices contributing to the realisation of sustainable development.

How are Libraries in East Africa Dealing with Education for Sustainable Development?

An investigation was undertaken of how academic libraries in East Africa are approaching the priority areas in ESD which have been identified by UNESCO.

The Objectives and Methods Chosen

The study adopted a mixed-method approach and conducted focus group discussions with librarians and online interviews with library managers to collect data

on how academic libraries approach the priority areas in ESD. The sustainable practices adopted for use within the libraries were observed and images of the library building, reading spaces, and events coverage were captured and explored. This chapter reflects the literature reviewed and drawn on for the study, and some aspects examined are further illustrated in this section from other sources.

The target population was academic university libraries in Kenya, Uganda, Tanzania, and Rwanda. The study included a total of 177 libraries. Purposive sampling was used to select library managers who were considered to have appropriate knowledge and experience on library practices on ESD. The library managers provide leadership and make key decisions in the libraries and directly impact ESD practices. The library staff are involved in the implementation of the decisions reached by library managers. The library staff were recruited to the study through snowball sampling, that is, some librarians were initially chosen and others contacted through them.

Thirty library managers were interviewed, complemented by ten focus group discussions with library staff. Each focus group discussion involved six members of library staff. The focus group discussion guide included five broad questions touching on ESD priority areas. The researchers were responsible for conducting the focus group discussions. The findings are presented in a narrative as they relate to each of the five areas targeted within the ESD *Roadmap*.

Advancing Policy

Libraries contribute to advancing policy around each of the five SDGs examined in this chapter: zero hunger, quality education, gender equality, reduced inequalities and climate action, primarily, according to the librarians in the focus groups, through dissemination of information pertaining to the SDGs policy implementation. The librarians from the focus groups pointed out that academic libraries in East Africa typically provide access to a wide range of information resources that advocate for policy, including policy briefs, books, journal articles, research reports, and knowledge repositories and databases. Government, non-governmental organisations, and lobbyists donate policy advocacy materials to academic libraries. Sobalaje and Ogunmodede (2015) noted that the capacity of the state to establish effective policies relies on its ability to understand information pertinent to the state's economic, social, cultural, and financial conditions and a country's information centres, including academic libraries, facilitate access to information that enables appropriate decision-making and planning.

Academic libraries in East Africa distribute policy documents to their users and the community creating awareness around policies that are being developed and

assisting in developing, adopting and implementing new policies. According to the librarians interviewed, academic libraries have been instrumental in championing climate action through inclusion of climate action material into library collections and the distribution of policy briefs and documents on climate action. Academic libraries in East Africa have established dedicated sections for displaying leaflets on climate action, gender equality, and campaigns against hunger and inequalities. According to Aghoghovwia (2014), most East African citizens who are subject to policies implemented by the government cannot afford newspapers or magazines containing policy information. Libraries provide free copies of newspapers, magazines, and other relevant documents with new policy information to ensure people can become aware of new policies and their impact.

Academic libraries' roles in supporting research in East Africa help to advance policy around ending hunger, improving quality education, promoting gender equality, reducing inequalities and contributing to climate action. One of the university librarians interviewed stated that academic libraries in Kenya supported policy research by offering access to scholarly literature, institutional knowledge repositories, reference software and data analysis programmes. Academic libraries also assist with literature reviews, and other aspects of the research process, helping policymakers and advocates to make evidence-based decisions. According to Padhan and Naidu (2022), quality research ensures appropriate policy creation and adoption by state and private organisations. Academic libraries are at the centre of research institutions, and support the production of high-quality research that informs good policy.

Some libraries engage with partners to promote environmental sustainability. The majority of head librarians noted in the in-depth interviews that academic libraries formed partnerships within their institutions or with government organisations, and frequently with non-government organisations (NGOs). Two effective partners mentioned in Kenya were the National Environment Management Authority (NEMA) and the Kenya Forests Organisation Service, especially when the libraries have events such as tree planting.

The interviewed librarians also reported that as part of advancing policy on climate action, libraries are adopting green initiatives concerned with environmental sustainability. The green library movement in the local libraries is still developing. IFLA ENSULIB has identified the characteristics of a green library:

- Green buildings and equipment: The emissions, or carbon footprint, of the building and equipment are actively decreased.
- Green office principles: Operational routines and processes are environmentally sustainable.
- Sustainable economy: Consumption is restrained, circular and sharing economy practices are advanced and are made accessible to the community.

- Sustainable library services: Relevant and up-to-date information is easy to access for users, shared spaces, devices, and environmental education is offered, and operations are efficient. The library has a positive carbon handprint.
- Social sustainability: Good education, literacy, community engagement, cross cultural diversity, social inclusion, and overall participation are considered. The library works actively to reduce inequality.
- Environmental management: Environmental goals are SMART (Specific, Measurable, Achievable, Realistic and Timebound), and the library works to decrease its own negative impact on environment. The library's environmental policy, its implementation and the results of environmental work are communicated to a broader audience.
- Commitment to general environmental goals and programmes: Commitment is guided by the UN Sustainable Development Goals, the Paris Climate Agreement and related environmental certificates and programmes (IFLA ENSULIB 2022).

Most librarians in the study considered their library green to some extent and were able to point to some green library practices in their libraries.

According to Chowdhury (2012), libraries should serve as an example of environmental sustainability and be first in line in incorporating values of sustainable construction. The notable green libraries in East Africa include Makerere University Library in Uganda, the Catholic University of Eastern Africa Library and United States International University-Africa (USIU-A) Library and Information Center in Kenya (Ogola 2018), University of Global Health Equity Library in Rwanda and Muhimbili University of Health and Allied Sciences Directorate of Library Services in Tanzania. Figure 13.1 shows images of some of the library buildings demonstrating the use of sustainable features and natural light. The first two images show library buildings with adequate windows to let in natural light at the Catholic University Library and USIU-A Library. The third and fourth images show reading areas under natural light coming through the windows and translucent roof sheets.



Figure 13.1: Use of natural lighting at Catholic University of Eastern Africa and USIU-A libraries. © Catholic University and USIU-A Libraries

The USIU-A green library has created a garden inside the library as a demonstration to users of green buildings (Figure 13.2).



Figure 13.2: Tree planting inside the Library. © USIU-A Library

Several libraries reported using various methods to remind people about energy conservation. Examples include messages displayed in all areas to remind users and staff to switch off the lights when leaving the premises. There is tangible evidence to show that libraries are deeply involved in creating awareness of greening initiatives toward a sustainable environment. Institutions that host academic libraries often appoint environment ambassadors to help promote environmental sustainability. Many of the librarians interviewed in East Africa reported conducting educational programmes in sustainability as a way of raising awareness.

Transforming Learning Environments

Academic libraries in East Africa are helping transform the learning environment to realign it to sustainable development as envisioned in the ESD framework. One way is by integrating digital resources and technology into learning spaces and collections, including ebooks, online journals, multimedia materials, and collaborative tools. The adoption of these strategies enhances learning experiences and accessibility, provides access to global knowledge and promotes sustainability by reducing use of paper and storage space. The librarians interviewed indicated that academic libraries in East Africa are embracing digital transformation to provide enhanced services and access to information.

Key components are library consortia including the Kenya Library and Information Services Consortium (KLISC), the Consortium of Uganda University Libraries (CUUL), and the Consortium of Tanzania University and Research Libraries (COTUL), which offer jointly purchased ebooks and online databases for libraries to access information remotely. One of the university librarians from Uganda interviewed pointed out that the National Library of Uganda has digitised historical archives, making them accessible to a wider audience while also preserving the materials for the long-term. Kato, Kisangiri, and Kaijage (2021) indicated that academic libraries are investing significantly in digital resources, including monographs, educational event promotional posters, online images, workshops, symposia or colloquia, and visiting interviews.

Librarians in the focus groups observed that academic libraries in East Africa are adopting sustainable collection development practices, focusing on digital resources and environmentally-friendly materials. A notable example of a university library that promotes open access is the main Library of Makerere University in Uganda, which promotes open educational resources (OER), reducing the need for expensive physical copies and extending accessibility. The Institut Français du Rwanda's Library favours ebooks and digital subscriptions to reduce paper usage and improve access. According to Adedokun (2018), allowing people to access

appropriate information freely gives them equal rights to resources, access to basic services and enables them to improve their nutrition, gain quality education, attain gender equality, reduce inequalities globally and combat climate change.

The open access initiative is another way in which academic libraries can transform the learning environment. All the academic libraries in East Africa advocate for open access, making research output freely available to the public. The university librarians interviewed acknowledged that they supported the open access initiative through their libraries' management of institutional digital repositories, which collect, preserve, and disseminate research output from their institutions. Open access initiatives support the SDGs by promoting information access, fostering collaboration, and accelerating the dissemination of knowledge. Open access initiatives also align with SDG 10, which seeks to reduce inequalities within and among countries (Jain 2021). Open access helps make quality information available to a wider audience, which is critical for sustainable development. Providing open access resources helps create equal opportunities for everyone to obtain the information they need.

Academic libraries conduct information literacy training among students and other library users. According to the librarians involved in the focus groups, information literacy training is delivered through workshops, tutorials, and structured subject guides. The training provided empowers library users to think and evaluate information critically, contribute to informed decision-making, and engage with SDG-related issues. According to Adedokun (2018), enlightened people are more likely to comprehend, support, and develop solutions that take sustainability into account. Information literacy is an inclusive approach to, and essential component of, ESD.

Libraries are reimagining their spaces to create inclusive experiences, and to accommodate diverse learning styles and preferences. The librarians interviewed illustrated how their academic libraries have transformed their traditional spaces to meet emerging user needs and accommodate green library concepts. Modern library spaces prioritise the user experience with increased seating space, comfortable seats and improved lighting. One of the librarians from Uganda referred to the inclusion of indoor/outdoor areas filled with natural light, and providing both relaxation and study spaces.

Academic libraries feature curated collections that reflect diverse perspectives and provide an environment where users can explore and appreciate different cultural, social, and global viewpoints related to the SDGs. Lehmann (2023) reported that in the next decade, libraries will continue to change and expand their roles as key community services.

> The public and academic library remains an uplifting and important feature in the community and on campus. Libraries are not dying, but evolving. Libraries are important cornerstones of any healthy community; they give people the opportunity to find jobs, explore scientific research, experience new ideas, and learn about wonderful stories, while at the same time providing a sense of place for gathering … the library of the future will be an indoor extension of public space or green space … driven by sustainable design principles and based on a strong focus on user engagement (Lehmann 2023, 253–255).

Building Capacities of Educators

Academic libraries play a significant role in building the capacities of educators to teach and support their students effectively by providing resources, training opportunities, and a supportive environment, which helps advance the global commitment to sustainable development and education. According to Klain Gabbay and Shoham (2019), faculty members acknowledge that libraries help them with their teaching needs, but that more is required in research support.

Academic libraries provide educators with research skills training, including literature searching, data collection, data analysis, manuscript preparation, guidance on publishing research findings in relevant academic journals, and grant proposal writing. One of the librarians interviewed explained that his library has set specific days of the week for lecturers to book training sessions with the library. Another librarian reported on collaborative research with faculty to provide practical experience in the process. Kennan, Corrall, and Afzal (2014) propose that educators' training concentrates on bibliometrics and research support services; however, there is a call for a more comprehensive, specialised library information science education to prepare librarians for providing wider research support to the communities they serve.

Academic libraries maintain collections for professional development, which educators can use to advance their knowledge and skills. According to one of the librarians from Tanzania, academic libraries acquire collections specifically designed for professional development, including books and resources on pedagogy, curriculum development, and innovative teaching methods.

Empowering and Mobilising Young People

Libraries are vital in empowering and mobilising young people by providing them with resources, opportunities, and supportive environments. Arranging for primary and high school learners to visit the library was identified by the librarians

interviewed as one of the leading practices that the library undertakes to empower and inspire the younger people in their pursuit of education and career paths.

The librarians in East Africa noted that their libraries offer many educational resources, including books, journals, online databases, and multimedia materials. Providing access to information helps empower the young by nurturing a passion for learning, critical thinking skills, and knowledge about various topics, including social issues and sustainable development. Dang (2016) observed that libraries can provide volunteer opportunities for young people, enabling them to learn new skills, gain confidence and improve self-esteem. Academic libraries can provide literacy support and train young people in skills that are in high demand in the community. They can also help minimise youth unemployment by creating awareness of entrepreneurship opportunities.

Academic libraries bridge the digital divide by providing access to computers, internet connectivity, and digital tools which helps young people develop digital literacy skills, stay informed about current events, and engage in online platforms for social and civic mobilisation. Academic libraries serve as spaces for civic engagement, encouraging the young to become informed and active citizens. They host forums, discussions, and events focused on social and political issues, providing a platform for young people to express opinions and advocate for change. Kranich, Reid, and Willingham (2004) and Kranich (2012) noted that academic libraries present an appropriate platform to rekindle the civic spirit, connect users with their communities, support public participation and inspire community actions toward problem-solving and decision making. Academic libraries use many techniques to engage communities and help students understand citizenship and community participation in a democratic society by providing information and extending opportunities for civic dialogue and deliberation, which are important in decision-making.

Accelerating Local Level Action

Academic libraries are critically important in accelerating local-level action by serving as community hubs, information centres, and catalysts for positive change. Libraries often house collections documenting local history, culture, and traditions. By preserving and showcasing these aspects of the community, libraries contribute to a sense of identity and pride and provide a foundation for local action and involvement. The librarians interviewed in East Africa noted that many upgrades have been made in their libraries to ensure they did not fall behind current world standards. Most libraries have embraced green concepts, which align with Goal 13,

which encourages urgent action to combat climate change and its impacts (United Nations n.d.f).

Academic libraries provide access to information about local government services, community organisations, and local initiatives and empower residents to participate in local decision-making processes and become informed advocates for change. According to Zurinski et al. (2013), libraries, through public engagement, help strengthen democracy, establish strong communities, and empower individuals to participate in the activities of their communities in a meaningful, innovative and sustainable way.

Academic libraries serve as dynamic community spaces that empower individuals, foster collaboration, and provide the necessary resources for local-level action. By facilitating access to information, promoting civic engagement, and supporting community initiatives, libraries contribute significantly to accelerating positive change at the local level. Mehra and Srinivasan (2007) espouse the role of academic libraries in accelerating local-level action through a framework that extends the library's function to engage in community action and act as active catalysts of social change.

According to Mwanzu, Bosire-Ogechi, and Odero (2023b) there has been an increase in the adoption of green library initiatives among academic libraries globally. However, there has been a gap in terms of implementation in some countries in Africa. In the interviews, librarians in the focus groups reported that they had participated in green initiatives in the community and become involved in governmental, organisational, and community initiatives. Governments have targets or milestones they want to reach regarding forest cover and sustainable endeavours along with hygienic community spaces including marketplaces, and incorporate institutions such as academic libraries to help. Accordingly, academic libraries observe essential days such as World Environment Day and work with organisations such as National Environment Management Authority (NEMA) in Uganda by participating in greening initiatives. Librarians in Kenya noted in the interviews that library staff organise annual greening events such as tree planting and cleanup days in nearby towns and marketplaces aimed at environmental sustainability, contributing to ongoing green initiatives. Figures 13.3a and 3b show librarians in Kenya participating in tree planting in an annual greening event.




Figures 13.3a and 3b: Librarians in Kenya participating in tree planting in an annual greening event. © Arnold Mwanzu

The librarians interviewed in the focus groups observed that libraries in East Africa support SDG 13, Climate action, by positioning themselves as catalysts for positive change in sustainable infrastructure. Several libraries in East Africa have adopted sustainable infrastructure practices to minimise their energy consumption and carbon footprint. For example, the Aga Khan University Library in Nairobi, Kenya uses solar panels to generate renewable energy. The Kenya National Library Service (KNLS) and the Catholic University of Eastern Africa Library in Nairobi have implemented rainwater harvesting systems to conserve water resources.

The librarians interviewed reported on green library services being provided to promote environmental sustainability. Services linked to greening require validation to ensure that appropriate action occurs. One of the librarians referred to the existence of an energy management committee which offered advice on environmental sustainability and environmental literacy services. Occasionally, some librarians are called upon to participate in workshops related to environmental literacy. The energy management committee takes care of events in the library and ensures that best practice is implemented.

Another element of green library service is to have designated library staff who train users on best practices in environmental sustainability. One university librarian interviewed noted the appointment of a librarian who prepared programmes for users on how to access and use library services sustainably. Some libraries conduct targeted training, identifying demographic groups with which to share information about greening initiatives and environmental sustainability. Librarians interviewed noted that academic libraries have outreach programmes that engage the wider community and involve topics like reading habits and tree planting.

Conclusion

The prime purpose of academic libraries in East Africa is the support of learners in their studies, faculty in their teaching, and researchers in producing high-impact research. All activities undertaken are critical in supporting community goals, particularly the attainment of sustainable development goals. Effective sustainable development relies on an educated and informed society. The pillars of the SDGs include an educated and skilled workforce, innovative and efficient systems, and up-to-date facilities and infrastructure; all can and must be found in library services. The contribution of academic libraries in East Africa to establishing a sustainable world helps empower society to seek, evaluate and use information effectively to achieve the sustainable development goals outlined by the United Nations.

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14 Implementing a Sustainability Agenda at Göttingen University Library

Abstract: In 2020, UNESCO launched its programme, Education for Sustainable Development: A Roadmap (2020), and emphasised the pivotal role of education as a key enabler for the successful attainment of all of the United Nations Sustainable Development Goals (SDGs) (United Nations n.d.a). Germany has a national plan for implementation of ESD through UNESCO's Deutsche UNESCO-Kommission/German Commission for UNESCO. Libraries are crucial to the realisation of the SDGs because they provide public access to information, preserve information to ensure ongoing and sustainable access, and help people to develop the capacity to use information effectively. However, libraries can also inspire sustainable awareness and individual responsibility in the community through practical examples of their own. The Niedersächsische Staats- und Universitätsbibliothek Göttingen (SUB Göttingen)/Göttingen State and University Library plays a part in implementing Germany's ESD national plan and strives to improve its environmental performance by engaging in its own projects to diminish its environmental footprint and create awareness about the importance of the SDGs amongst library users and employees. Library-led initiatives lend credibility to the University's and the region's commitment to ESD and communicate values, goals and ongoing efforts towards sustainability. This chapter provides insights into the initiatives undertaken, outlines the related processes and challenges faced, and presents the lessons learned. The learnings have been an important part of the process and illustrate the necessary adaptation to internal structural developments and the positive impact of sustainability activities. ESD extends beyond theoretical knowledge and encourages the incorporation of hands-on experiences that illustrate sustainable practices and the relationship to community learning.

Keywords: Academic libraries – Germany; Education for Sustainable Development; Sustainable Development Goals; Seeds; Sustainability – Political aspects; Community engagement in higher education

Introduction

In 2020, UNESCO launched its Education for Sustainable Development (ESD) programme with a *Roadmap* to support the attainment of the United Nations SDGs

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https://doi.org/10.1515/978-3-11-133646-6-015

(United Nations n.d.a) by the year 2030 (UNESCO 2020; UNESCO. Deutsche UNESCO-Kommission/German Commission for UNESCO n.d.a). It highlights the role of ESD as a key enabler for the successful achievement of all Sustainable Development Goals (SDGs). People with a good education are better equipped to tackle the issues of concern. ESD plays a vital role in the 2030 Agenda for Sustainable Development (United Nations [2015]) by helping individuals make informed decisions (UNESCO 2020, 16). The responsibility for executing UNESCO programmes on ESD on behalf of the German Federal Government lies with the Bundesministerium für Bildung und Forschung/Federal Ministry of Education and Research (UNESCO. Deutsche UNESCO-Kommission/German Commission for UNESCO n.d.a). The underlying concept is that only with a joint commitment to ESD will it be possible to anchor sustainability in education discourses and vice versa. The National Action Plan specifically addresses education plans, curricula and teaching, with an emphasis on enhancing ESD networks, promoting good practices and adopting comprehensive institution-wide approaches to ESD (Germany. Bundesministerium für Bildung und Forschung/Federal Ministry of Education and Research n.d.).

Academic and research libraries have a responsibility to drive the process of ESD forward. They have the opportunity to address sustainability themes in various ways. Every day, academic libraries are engaged in the stewardship and curation of knowledge, information and data. They are responsible for providing, improving, or even developing related information infrastructure. As key players in achieving the SDGs, they facilitate access to educational print and online materials, databases, software and general services, and enable users to acquire the knowledge needed to address pressing sustainability challenges. The presence of sustainability initiatives serves as a foundation for transparent communication regarding the library's values and ongoing efforts. Clear communication must ensure community members fully understand the library's intentions and actions and is essential for promoting meaningful engagement and facilitating learning.

The Niedersächsische Staats- und Universitätsbibliothek Göttingen/ Göttingen State and University Library

Libraries play a pivotal role in supporting education, research and interdisciplinary collaboration and actively foster a collective effort toward attaining SDGs. In this context, the role of the Niedersächsische Staats- und Universitätsbibliothek Göttingen/Göttingen State and University Library, hereafter referred to as SUB Göttin-

gen, in consolidating, organising and disseminating knowledge is essential for the pursuit of sustainable development. As a central facility of the Georg-August-Universität Göttingen/Göttingen University and of the German state of Lower Saxony, the SUB Göttingen is one of the largest academic libraries in Germany and holds a position of high importance for the areas of study, teaching and research. Göttingen University and the library are closely intertwined with the city of Göttingen's community and infrastructure. Out of 120,000 residents, 31,000 are students, constituting a significant portion of the population. There is a Zentralbibliothek/Central Library which receives approximately 5500 visitors per day, an historic downtown building, and six divisional libraries located in different areas of the city.

Employees of the institution are deeply rooted in the City. The University is a central player that shapes the city of Göttingen and the surrounding communities. The library is used by students, professors, scientists from all over the world, schoolchildren, citizens, teachers, and tourists, and its high visitation rates establish a tangible link to the community, emphasising that what is learned and seen in the library plays a pivotal role in influencing and contributing to the broader development of the city and nearby areas. The SUB Göttingen's sustainability agenda influences community learning by acting as a catalyst for ideas and fostering awareness. It plays a key role in promoting sustainable practices and shaping learning experiences for both users and the broader community. The sustainability activities described in this chapter aim to raise awareness in the community in different ways and encourage people to act responsibly. Ideas and concepts that may work in theory but do not actually play out as desired are reviewed, discussed and optimised.

Sustainable Initiatives

The SUB Göttingen's library has established a Sustainability Working Group that has developed a sustainability policy and implements sustainability projects such as waste separation systems, care for bees, reuse of technical devices, and the support of private provision of a seed library. Creating and implementing sustainability activities within the library demonstrate a commitment to addressing environmental challenges and establish a foundation for engagement with the community and community learning. It is important for librarians to be innovative in developing new practices focused on sustainability in all areas of library operations, not only the environment (Henk 2014).

Much like any other academic library, the SUB Göttingen significantly contributes to several of the United Nations seventeen SDGs (United Nations n.d.a) through its daily operations. Some notable contributions include:

SDG 3, Good Health and Well-being

SDG 3: "Ensure healthy lives and promote well-being for all at all ages" (United Nations n.d.c). Through access to health-related literature and resources, the SUB Göttingen indirectly promotes good health and wellbeing by supporting research and enabling access to medical literature.

SDG 4, Quality Education and SDG 10, Reduced Inequalities

SDG 4: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (United Nations n.d.d). Academic libraries support quality education by providing access to a diverse range of educational resources; the SUB Göttingen provides open access resources, textbooks and educational materials. The Universitätsverlag Göttingen/Göttingen University Press, part of the SUB Göttingen, publishes its books in open access with the printed versions of publications provided as an additional service (Universitätsverlag Göttingen/Göttingen University Press 2022). By providing open access to information, the SUB Göttingen also contributes to SDG 10: "Reduce inequality within and among countries" (United Nations n.d.f) by ensuring that knowledge is accessible to a diverse audience, regardless of socio-economic background.

SDG 9, Industry, Innovation and Infrastructure

The SUB Göttingen runs one of the largest research and development departments among Germany's libraries with its services supporting SDG 9: "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation" (United Nations n.d.e). The department's focus includes developing and establishing digital research infrastructure for data and services, as well as researching different aspects of research data management. The activities incorporate managing digital repositories, databases and other technological systems that support storing and retrieving scholarly information. The SUB Göttingen offers regular training programmes that enhance digital literacy and support research and development activities by providing resources, services and expertise.

SDG 17, Partnership for the Goals

The SUB Göttingen plays a collaborative role by fostering partnerships amongst academics and various stakeholders and promoting knowledge exchange and collective efforts toward sustainable development. SUB Göttingen supports SDG 17: "Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development" (United Nations n.d.i) through various activities. The Zentrale Kustodie/Centre for Collection Development is an organisational group of the SUB. It manages the operation of Forum Wissen, which is the Museum des Wissens/Museum of Knowledge (Forum Wissen n.d.), an interdisciplinary museum of the university focused on the creation and communication of knowledge through twelve uniquely designed spaces with changing exhibitions containing diverse objects from the university's collections. Forum Wissen invites the public to access the intellectual and material assets of the University and allows people who previously had relatively little contact with the academic world to engage with it. At the same time, Forum Wissen impacts the world of science and humanities by creating space for interdisciplinary work with objects in the collection, encouraging researchers to extend their horizons. It also incentivises people to form their own perspectives and become involved in the multifaceted process of knowledge in the making.

Beyond the provision of educational resources, the response of academic libraries to the SDGs increasingly involves measures to ensure sustainable building management, the exploration of sustainability opportunities in daily library workflows, advocacy of sustainable approaches and processes on committees, and serving as a role model for visitors through various sustainable measures. Additional opportunities exist to contribute to library networks that actively implement the SDGs.

The Work of the Sustainability Working Group

Addressing the SDGs within the capacity of a library is not only growing in urgency but is becoming more achievable. To address the opportunities, as already mentioned, SUB Göttingen developed a sustainability policy and established the SUB AG Nachhaltigkeit/Sustainability Working Group, hereafter referred to as SUB SWG. The SUB SWG cooperates with the Green Office of Georg-August-Universität Göttingen (n.d.a) and participates in the meetings within the University of the Senatskommission für Klimaschutz und Nachhaltigkeit/Senate Commission for Climate Protection and Sustainability (KfKN) (Georg-August-Universität Göttingen n.d.b). The members of the SUB SWG are library staff who, out of personal interest, engage

in library sustainability work alongside their primary responsibilities, without holding specific positions dedicated to sustainability. The activities, working methods and challenges encountered by the SUB SWG are explored in this chapter using selected examples of projects undertaken.

In 2022, all SUB employees were encouraged to share their suggestions for improvements in sustainability and ideas for a more sustainable library on a shared platform. Over 80 proposals were submitted, demonstrating that library staff were strongly interested in sustainability. While some ideas faced implementation challenges due to limited capacity and funding, others were deemed feasible but had not been implemented previously simply because no one had actively pursued them.

Beyond the measurable outcomes, it has become increasingly evident that institutional interdependencies between SUB Göttingen and the University play a crucial role in implementing planned sustainability measures. Various areas of responsibility, including architectural considerations, copyright issues, or fixed practical regulations, have needed to be considered. In all large institutions, complex organisational structures and paths of communication exist. While size can be beneficial in contributing a richness of knowledge to projects, it can also prolong straightforward processes. While the implementation of the SDGs seems urgent, the delays and time taken can be demotivating. Equally significant in facilitating the realisation of necessary ideas are limited time and budget along with staff capacity. The SUB SWG members must accommodate their work on sustainability within their other professional responsibilities and money must be raised for all resulting costs, as the SWG has no allocated budget.

While achieving the SDGs is one of the library's tasks, it is important that the structures, personnel and financial resources are available and committed to support the efforts required. As Tribelhorn emphasises, "tremendous effort from leadership is needed to ensure that the correct steps are taken to reach some of the sustainability goals" (Tribelhorn 2023, 2). Library leaders must address the fundamental questions of why, what, who, when, and how, and understand change management and the diverse ways in which change is implemented. Library leaders are encouraged to establish an organisational culture of sustainability which is essential to successful change and expertly manage any resistance. A well-defined sustainability policy offers guidance. As already noted, the SUB Göttingen has a sustainability policy in place (Niedersächsische Staats- und Universitätsbibliothek Göttingen/Göttingen State and University Library n.d.a) to guide its activities.

The SUB Göttingen Sustainability Policy

The SUB Göttingen is committed to ESD and must critically examine both the provision of sustainability educational resources and its own structures, processes and opportunities for improvement. A sustainability policy is key in this context; it acts as a roadmap. The policy showcases the SUB's dedication to environmental responsibility: when well-implemented, it provides a framework guiding community members toward sustainable practices, raising their awareness and encouraging behavioural changes. Community education is challenging without a meaningful guideline, as action might otherwise be arbitrary.

The SUB SWG developed its sustainability policy (Niedersächsische Staats- und Universitätsbibliothek Göttingen/Göttingen State and University Library n.d.a) through consultation with various departments including directors, facility management and logistics, user services and information technology, to assess topics for the library's sustainability journey, learn about the existing rules and regulations, and to anticipate potential obstacles and limits. The policy provides an outline of thematic priorities which paves the way for more specific details in a related catalogue of activities appended to the general guidelines. Special attention has been given to considering any existing university agreements and to highlighting the library's commitment to monitoring relevant developments. In addressing topics such as data management, data traffic and potential negative energy balances, it became evident that there was relatively limited knowledge, necessitating further research for appropriate concrete measures.

A key topic identified when compiling the policy was waste management and an examination revealed that the library, with its numerous branches and visitors, needed to improve waste separation and reduction in both internal and public areas, as well as to communicate recurring reminders of waste-reducing behaviour along with regular monitoring of performance. The assessment of waste management underscored the close collaboration needed between various components of the processes involved including cleaning services, facility management, logistics and user services who manage the daily interaction with library visitors. The SUB SWG provides facilitation and support, initiates discussions and emphasises the sustainability policy during decision-making processes to ensure its effective implementation. The following topics are addressed in the Sustainability Policy:

> Energy Management
> ...The most energy-efficient practices and all available options will be considered carefully when selecting lighting, heating and cooling systems and equipment...
> Materials Management
> The Library will integrate the principles of 'reduce, reuse and recycle' into every aspect of its operations, including purchasing decisions. When purchasing items, the Library will strive

> to ensure that the environmentally friendly alternative is given precedence; this includes repairability Emails, Data Traffic and Electronic Devices.
> Reducing the CO_2 footprint and CO_2 equivalents is an essential part of the Library's sustainability goals..., the best way to reduce the overall C02 footprint ... is to buy fewer electronic products, keep these devices for as long as possible, and use products that consume less electricity... The reduction of the CO_2 footprint should also be integrated into documentation, information, and subsequent storage obligations.
> Transport
> The library will invest in and use videoconferencing and other technological solutions to reduce employee travel, especially air travel... Employees will receive information about car sharing and other sustainable transport options. Preferential use and provision of cargo bikes and e-bikes for the campus will be an aspiration.
> Water Reduction/Saving
> Water-saving devices are being introduced and staff members are being trained to use water more consciously (Niedersächsische Staats- und Universitätsbibliothek Göttingen/Göttingen State and University Library n.d.a).

The sustainability policy draft was circulated among the directors and their feedback discussed and incorporated. A subsequent presentation and discussion involved both the directors and department heads. Following approval from this group, the policy was made available to the staff in both German and English and added digitally to the new staff welcome pack. The SUB SWG collaborated with the SUB Göttingen Abteilung Öffentlichkeitsarbeit/Public Relations Department to create a dedicated *Sustainability* web page, where the policy was published and is accessible to everyone (Niedersächsische Staats- und Universitätsbibliothek Göttingen/Göttingen State and University Library n.d.a). It is planned to review the policy annually. In addition, the SUB SWG has designed its own logo in collaboration with the Public Relations Department.

The next section of this chapter explores the various initiatives undertaken in implementing the Sustainability Policy and includes the promotion of green mobility, potential use of photovoltaics on the roof of the library, the Göttingen Saatgut-Bibliothek/Göttingen Seed Library, encouraging wild bees, and waste separation.

Green Mobility

The SUB SWG identified transport and mobility as one of the areas where excessive CO_2 emissions were being produced by staff, be it on business trips or daily commutes to the workplace. While business trips are addressed by a new univer-

sity policy that restricts future air travel, the SUB SWG addressed daily commuting through several planned activities.

The first involved promoting existing public transport offerings as an alternative to private commuting by car. While the University offers a discounted subscription to the local public transport service provider, it was discovered that its availability and benefit to staff were not widely known. To raise awareness, the SUB SWG designed and displayed information posters in several well-frequented locations within the library. New staff have been made aware of the public transport opportunities in the internal welcome file for new colleagues, along with information about parking spaces for cars and bicycles. Communication is a key component of ESD, involving the sharing of information, raising awareness and educating individuals about possible green mobility practices for sustainability.

The second action evolved around the idea of making commuting by bicycle, using either pedal power or e-bikes, more attractive to those who commute by car. A staff survey will be conducted by the group to obtain a better picture of colleagues' use of various means of transport and to explore the reasons behind the choices made. The information collected will help identify needs and wishes and be used to prompt actions to help staff opt for more environmentally friendly commuting options, including the installation of charging stations for e-bikes or building secure parking spaces since motorised bicycles are a common target for thieves.

Photovoltaics on the Library Roof

One initiative investigated was the installation of solar panels using photovoltaics on the roof of the library. The project was directed towards one of the seventeen United Nations SDGs, 7, Affordable and clean energy (United Nations n.d.a) through producing clean, solar-powered energy on the Zentralbibliothek/Central Library's roof (Niedersächsische Staats- und Universitätsbibliothek Göttingen/Göttingen State and University Library 2024). Incorporating sustainable practices in the construction of academic buildings aligns with ESD principles by providing an opportunity to impart knowledge about minimising environmental impact within the educational environment. The SUB SWG collaborated closely with the Library's and the University's facility management and logistics teams to investigate achieving the desired outcomes. Many parties were involved because of shared responsibilities. The library's facility management is responsible for the library buildings in general and has a deep insight into the specifics of the build-

ings and the university's facility management hosts a separate Energy Controller department (Georg-August-Universität Göttingen/Göttingen University n.d.c) that includes assessing areas for on-site photovoltaics. Many sustainability initiatives involve numerous departments and multiple areas of responsibility must be considered which leads to increased communication efforts and a greater likelihood of encountering objections.

Following an inspection of the library's roof by members of both facilities teams, the idea of installing photovoltaics was discarded. Unfortunately, the roof construction would be suitable for generating only about 60kWp whereas the roof areas of other buildings on campus could yield considerably more. Additionally, installing photovoltaics would require the addition of railings to secure workers during the installation and maintenance of the equipment. The architectural design of the library building is copyrighted which means that any design modifications including those related to sustainability would require permission from the copyright holder. While legal protection ensures that the original creative expression and arrangement of elements cannot be replicated or implemented without authorisation, situations can arise where antiquated rights, possibly held by copyright holders who may have already passed away, no longer align with new developments. Nevertheless, adhering to the legal requirements is necessary. While the desired outcome was not achieved in this instance, valuable information and contacts were gained through the exploratory process. Göttingen University is active in installing on-site photovoltaics and although the library does not have clean energy directly from its roof, the issue is being addressed elsewhere in the University with considerable progress on campus.

Göttinger Saatgut-Bibliothek/Göttingen Seed Library



Figure 14.1: The Göttingen Seed Library. © Claudia Hake

The SUB Göttingen supports the Göttinger Saatgut-Bibliothek/Göttingen Seed Library (2024), which was privately initiated by two SUB employees in February 2023 (Figure 14.1) and is listed as an ESD player within Germany (UNESCO. Deutsche UNESCO-Komission/German Commission for UNESCO n.d.b). It was installed on the first floor of the SUB's Zentralbibliothek/Central Library and is clearly visible to all users. The work associated with the seed library generates costs that are paid privately. Many potential sponsors require proof of organisational not-for-profit status s and it became necessary to ensure the seed library's status and future through affiliation with JugendAktion Natur- und Umweltschutz Niedersachsen e. V. (JANUN), a youth environmental network in Lower Saxony. The seed library joined JANUN Göttingen in November 2023 (JANUN Göttingen n.d.) and is part of its Gartengruppe/Garden Group Göttingen and is therefore deemed a not-for-profit organisation and able to apply for sponsorship funding. Relevant targets in the SDGs for the seed library are:

- SDG 2, End hunger, Target 2.5 … maintain the genetic diversity of seeds … (United Nations n.d.b)
- SDG 12, Responsible consumption and production, Target 12.8 … ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature (United Nations n.d.g)
- SDG 15, Life on land, Target 15.5, Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity … (United Nations n.d.h)

– SDG 17, Partnerships for the goals, Target 17.17, Encourage and promote effective public, public-private and civil society partnerships … (United Nations n.d.j)

The Göttingen Seed Library is committed to propagating open-pollinated crop varieties and imparting the necessary knowledge to do so, focusing on the cultivation of seeds and their significance for both humans and the environment. The main aim is to secure and propagate regional varieties, promote biodiversity, enable access to open-pollinated seeds and encourage the community to take responsibility for seed propagation and variety conservation. The seed library's motto is "Leihen – Säen – Ernten – Weitergeben/Borrow – Sow – Harvest – Pass on" (Göttinger Saatgut-Bibliothek/Göttingen Seed Library 2024). Anyone with a balcony or garden can participate and borrow open-pollinated seeds from the Göttingen Seed Library free of charge and without registration. After successful cultivation, the harvested seeds are returned. There is a seed-adoption program for historical or particularly rare varieties. Participants are accompanied through the seed and cultivation season with newsletters and knowledge events.

The Göttingen Seed Library is part of a larger network of hobby gardeners, community gardens, horticultural educators and producers of organic, open-pollinated seeds in and around Göttingen, and collaborates with so-called eco-schools who cultivate seeds they borrow at the seed library. Students have produced images of seeds and agricultural plants, which were exhibited in collaboration with the Biodiversitätsmuseum/Biodiversity Museum Göttingen (Figure 14.2), part of the Georg-August-University Göttingen. The aim was to engage in discussions on topics such as seeds, humans and the environment, and agricultural plants both within schools and during the exhibition (Biodiversitätsmuseum/Biodiversity Museum Göttingen 2021).

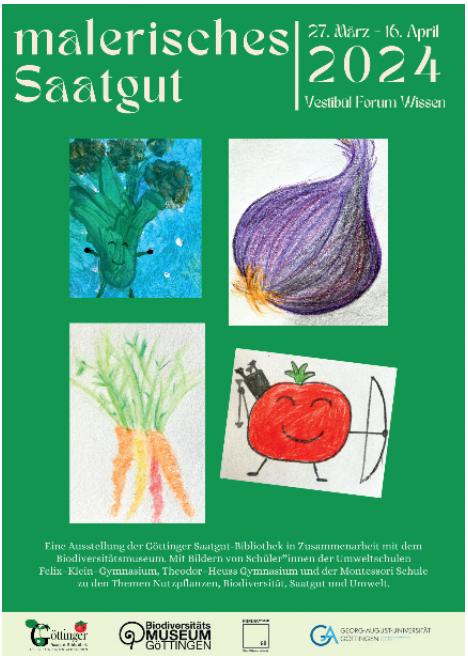


Figure 14.2: Exhibition poster. © Göttinger Saatgut-Bibliothek

Sharing seeds, knowledge and experiences promotes networking and supports joint efforts to preserve the diversity of varieties. Private commitment to sustainability projects is greatly strengthened by the fact that many people in the immediate vicinity have seeds, gardens, ethical convictions and a basic desire to participate actively in biodiversity development. The example of the seed library shows that many people are open to sustainable ideas and willing to take on responsibility for taking action. Some citizens visited the SUB Göttingen for the first time when they came to the seed library. Citizen-oriented projects in an academic library are opportunities to build bridges. The high visibility of the seed library in the SUB, close to the main entrance, serves as a recurring reminder for the many people passing by every day and draws attention to sustainability as a priority for the library.

Encouraging Wild Bees and Pollinators

The following example shows how individual sustainability ideas connect different players, specific knowledge and pragmatic solutions. The original idea of placing

honeybees on the roof of the SUB Göttingen was replaced with the idea of creating a perennial meadow adjacent to the SUB Göttingen to encourage wild bees, insects and other pollinators.

People typically think of honeybees when they hear the term bee. Honeybees rely on pollen and nectar as their food source, and they produce honey. More importantly, they contribute to plant pollination and, consequently, plant reproduction. The SUB SWG initially wanted to support pollination by housing honeybees on the roof of the Zentralbibliothek/Central Library. The trees on campus and the Alter Botanischer Garten/Old Botanical Garden located across the street from the library would serve as ideal food sources (Georg-August-Universität Göttingen/Göttingen University n.d.d).

Originally, the concept envisioned that the bees on the roof would be observable by library users while ensuring that unauthorised entry onto the roof was prevented. However, discussions with an experienced beekeeper revealed that it would be more practical to grow colonies, instead of installing honeybee hives, since carrying heavy honey through the building and potentially dripping wax would pose challenges. Growing colonies supports bee reproduction but does not lead to honey production and the bees do not swarm. Discussions with the facilities management and logistics revealed that, contrary to initial assumptions, the roof would be the most challenging location for such a project. Although spacious, it required additional safety rails to prevent falls, an optical boundary around the bees and an emergency escape route across the roof at the planned bee site. Concerns about potential stings or allergic reactions to users or first aid responders led the building management to withhold approval for the project.

The SUB SWG explored alternatives and contacted the adjacent Alter Botanischer Garten/Old Botanical Garden, which supports wild bees specifically. The question arose as to whether the placement of honeybees would create bee conflicts. Indeed, this turned out to be the case. Wild bees can be easily displaced during their search for food. The greater the number of honeybees in the area, the more likely wild bees are to withdraw. However, wild bees play a unique role in pollination, especially for plants that rely on specific insect species due to their flower and pollen characteristics. While honeybees are often exclusively associated with pollination, they perform this task for only a portion of flowering plants. Wild bees are equally vital for ecosystem's pollination services, as some species specialise in certain plant types, genera, or families, collecting pollen exclusively from them. The disappearance of these wild bee species would result in the disappearance of the associated plants and vice versa. Wild bees often pollinate much more efficiently than other insects or honeybees. Honeybees complement wild bees but cannot replace them (Garibaldi et al. 2013).

According to a botanical scientist working at the Alter Botanischer Garten/Old Botanical Garden, a recent survey by the wild bee expert Thomas Fechtler identified 140 wild bee species in the gardens (Bathow 2023). This number represents approximately one quarter of the nearly 600 native wild bee species in Germany in the small area of the Old Botanical Garden alone. Offering suitable food sources has led to the successful settlement of some rare and spectacular species. In close cooperation with the Old Botanical Garden and the SUB SWG, insect-promoting plant species were planted on the grass areas at the SUB in spring 2024 (Figure 14.3). Most of the plants are climate perennials that, once established, do not require irrigation even in increasingly dry summers.



Figure 14.3: Above left, creation of the perennial bed; above right, the Old Botanical Garden delivers the plants; middle, planting campaign May 13, 2024; below, flowering perennial bed with many insects August 12, 2024. © Claudia Hake

The project had many objectives:

- SDG relevance: SDG 11, Sustainable cities and communities; SDG 13, Climate action; SDG 15, Life on land; SDG 17, Partnerships for the goals (United Nations n.d.a)
- Creation of food sources for wild bees and other flower-visiting insects and the promotion of biodiversity
- Sensitisation of visitors to sustainable engagement in their immediate environment, allowing them to observe numerous wild bees, butterflies, and other insects
- Provision of an enhanced social meeting place for students by introducing a flowering meadow. Students and visitors will be informed about campus-wide sustainability initiatives through information panels
- Promotion of sustainability activities and extension of visitor tours to the SUB facilities through collaboration
- Encouragement of individual reflection on potential sustainable contributions through visual appeal of the library's flowering meadow
- Campus-wide cooperation on sustainability leveraging synergies through effective collaboration with the Green Office and the Department of Studies and Teaching, and
- Collaboration with the Göttingen Seed Library which receives seeds from the perennials.

Suggested locations for the meadow were identified during a site visit, taking into account rescue and emergency exits for users, and ensuring the healthy growth of the perennials. In discussions with Göttingen University's Green Office, it was discovered that an entry to a student competition in 2022 had proposed a perennial planting to enhance biological diversity on campus. The ideas contained in the proposal were incorporated into the overall planning of the library project, including area sizes, prior excavation, soil development and perennial composition. Since the project was located next to the SUB Göttingen, it fell under the purview of das Infrastrukturelle Gebäudemanagement/Infrastructure Facility Management within the University (Georg-August-Universität Göttingen/Göttingen University n.d.e). The idea was approved; the University President gave the green light; and the SUB SWG and the Old Botanical Garden received support from the University's gardening team for the excavation work at the site (Georg-August-Universität Göttingen/Göttingen University 2023, 2024).

The total costs for the project have been minimised. The Old Botanical Garden contributed the perennials and expertise, and took oversight of the planting, while the University's facilities services arranged for the excavation. The SUB SWG applied for third-party funding of 4,000 Euros to cover costs related to substrate

delivery, excavating the hole, transporting the soil, creating an information panel and managing the long-term maintenance of the perennial bed such as weeding.

Waste Separation

ESD encompasses a holistic approach to education that fosters understanding and practices related to environmental sustainability (Oe, Yamaoka, and Ochiai 2022). Waste separation is a practical application of sustainable behaviour. Sustainable waste disposal has been practised but can still be optimised by the SUB. It requires close collaboration among facility management, cleaning staff, employees, and public users. Human beings are creatures of habit. As much as one may value sustainability, daily practices are often ingrained, and it is not always consciously recognised that one's actions may not be sustainable. Unfortunately, the library staff observe poor waste disposal practices and processes every day through inappropriate separation of waste. For example, plastic waste ends up in the bins intended for paper. Is this because of laziness or is it caused by a lack of awareness?

The SUB SWG lacks resources to investigate the reasons or to conduct training on such a basic topic. The SUB SWG must avoid appearing patronising when communicating the sustainability message. It is a delicate balance between seeking to raise awareness and encouraging good behaviour and overstepping the SUB SWG's remit and upsetting people through constant reminders. The working group has successfully implemented the use of reusable bags for collecting paper waste. The bags are used by China Post and produced by interweaving polypropylene strips into a fabric known for its tensile strength and durability. They replace the previous disposable blue plastic bags that were discarded despite being intact.

Additional waste separation systems have been procured for public areas after it emerged through conversations with the cleaning staff on site that two of four large waste separation systems in the cellar were not being used by visitors while there were no system bins on the upper floors of the building. As a first step, one of the separation systems was relocated to an upper floor as a trial and all twenty smaller bins located there were removed. Based on further feedback from cleaning colleagues it was evident that the change was accepted and well used, and it was implemented on other floors. As the other areas were more heavily used, more waste separation systems were needed than were available. The purchase of additional systems was made possible in close collaboration with departments with outstanding balanced in their funds at the end of the year.

With a substantial increase in library visitors of since the start of the 2023/2024 academic year, there has been a noticeable rise in waste. There is a tendency for

waste to be left at workstations and not properly disposed of in bins. The SUB SWG is exploring potential long-term solutions in collaboration with the User Services Department. To address the issue, the SUB SWG, in conjunction with SUB Public Relations Department, designed posters with a humorous touch to remind users of proper waste disposal practices. The posters follow a classic, well-known meme structure by showing a racoon, generally perceived positively, out of context in a library setting (Figure 14.4). The contrasting of the library's seriousness with the cuteness of a racoon and the use of simple appealing language that is ironic but carries a serious message, makes it memorable without feeling uncomfortable or directly referencing grand narratives like climate protection; nor does it try to induce feelings of guilt. The poster was designed in line with the following requirements: avoid negative associations; offer positive associations; make people smile; make the message easy to grasp and memorable.



Figure 14.4: Posters with a humorous touch, created with help of AI tool Magic Media. © SUB SWG

The range of separation systems for waste was well received. Users understood them immediately and even added their deposit bottles next to them. In the city, it is customary for deposit bottles to be placed next to the waste containers for collection rather than inside.

As already mentioned, SUB Göttingen comprises several libraries at different locations in addition to the Central Library. There is insufficient time and resourcing for all the sustainability ideas that could and should be implemented in all the divisional libraries. However, in the internal area of the SUB Historical Building, it has been possible to introduce yellow bags for waste disposal. The yellow bag system has long been used in the Central Library and is designed for collecting packaging waste made of plastic, metal or composite material for later separation and recycling. The approach had not been introduced in all other divisions of the library, but the SUB SWG was approached by a colleague from the Historical Building, who indicated an interest in adopting the scheme.

Another step in introducing sustainable behaviour to users in their daily library routines has been to address the issue of disposable coffee cups. The cups, made of coated paper with plastic lids, are completely at odds with sustainability and generate a significant amount of waste for a single use. Many users of the SUB café opt automatically for disposable cups which are conveniently placed adjacent to the coffee machine. However, ceramic cups are available but require a deposit. Additionally, there is a discount for people who bring their own reusable cups. The challenge is to change habits. In an excellent collaboration with the Studentenwerk/Student Services who runs the university cafés and catering, the single-use paper cups in the SUB café were removed from immediate view next to the coffee machine and a sign was put up drawing attention to the ceramic cups. Single-use cups were provided only on request, and their use was often accompanied by information encouraging sustainability. Discounts were also more actively promoted. A two-week trial revealed that twice as many discounted coffees were sold in reusable cups than usual. Reusable cups were purchased on-site, and the use of disposable cups decreased. Significantly the café experienced no financial losses. The trial was complemented by concurrently displayed posters that humorously promoted waste reduction. Given the supportive attitude of users towards the new system, the student services organisation decided to adopt the approach permanently.

Lessons Learned

This chapter has focused on ESD, and the work of a sustainability working group in educating themselves, library users, university support and administrative staff, and library staff in new ways of thinking and behaving. Education is about learning. Learning is contextual, social, and must be meaningful. There are many theories about learning and styles of learning. Many argue that learning is experiential; some contend that the best lessons are learned through making mistakes. In the

work undertaken by the sustainability working group at SUB Göttingen, lessons learned refers to the insights gained from the activities undertaken and reflects the experiences, observations, and communications with all involved including each other, individuals, groups, administrative staff, library staff, faculty, researchers, students, other institutions, departments, library users and visitors. Most of the learnings are grouped under the areas discussed in this chapter in the hope that others may benefit from their wider applicability.

Sustainability Policy

The goals of the policy must align with:
- Strategic directions of the library
- Strategic directions of the institution of which the library is part
- Everyday operations of the library
- Capabilities of the staff, and the
- Overall structure and regulations of the University.

The inclusion of policy clauses must be carefully considered with regard to the library's capacity and community needs; overly ambitious goals are often unattainable; targets must be set; and stretch targets should be set to drive the agenda forward. Like most activities, all work undertaken is time-consuming and takes longer than expected. Thorough content research and legally correct policy formulation must be undertaken. The time investment for drafting documents, meetings and implementation is substantial. Collaboration and discussion with all affected departments are vitally important, as the needs, responsibilities and scope for action are vastly different in differing contexts, but they take time. The SUB SWG works within the constraints of available time, striving to address priority initiatives suggested by staff or users.

A communication plan for the policy must be coordinated and established and constantly revised. The policy must be published openly; regular reference to it and consultation are needed at all times. Its open availability highlights its importance for the library and leads to increased awareness of sustainability topics among the library's users. Despite being labour-intensive, the creation and publication of the policy marks only the initial phase. The true work begins afterwards, encompassing the numerous steps necessary for implementation of actions and for targets to be met. For each initiative, the bridge between knowledge, awareness and feasible actions must be built. Numerous staff and library users inquire about sustainability initiatives and opportunities to be actively involved. There must be visible outcomes and measures in the policy's strategic implementation.

Green Mobility

The project undertaken in relation to securing changes in behaviour in use of transport led to several lessons. People must be kept informed, particularly about the availability of public transport discounts which contributed to raising awareness about sustainable transport options. Posters informing staff and welcome materials for new staff help communicate sustainable commuting options and improve understandings of what is possible. Suggested changes in behaviour must be based on a good understanding of present behaviour. Simply asking staff and visitors about their commuting habits provides an understanding of their needs and preferences. Any issues and concerns about timing and security are revealed. The community also learns that it must contribute and explicitly communicate any uncertainties, desires and questions so that problem-solving in relation to sustainability can be better addressed by the library. Times change and it is important to evaluate implemented initiatives to ensure they stay relevant and helpful.

Photovoltaics on the Library Roof

The initiative could not be realised on the Central Library´s roof, but much was learned during the process. Good relationships were formed between the energy department and the library's facility management which will contribute positively to future projects. Knowledge was gained of German industrial safety regulations and their implications for library activities in sustainability. Sustainable changes to library buildings must meet all safety regulation requirements and costs must be precisely calculated attempting implementation. One might argue that sustainability only truly works when it respects existing physical structures and buildings; such a concept presents a dilemma, especially when seeking to extend existing structures. Although the application of sustainability measures to buildings undoubtedly has a significant impact, the measures are not always easy to implement. Everyone must learn that while ambitious goals are crucial, one must also consider capacity to deliver a project. Perhaps the greatest lesson learned was that it is essential not to give up when ideas cannot be implemented.

Göttinger Saatgut-Bibliothek/Göttingen Seed Library

An early lesson in the project was the importance of the status of the organisation. No external sponsorship funding or donations were possible without a no-for-profit organisational status. The work involved collaborating with other organisations.

Networking is fun! Working with the eco-schools emphasised that engaging with the youth of today will protect the planet of tomorrow. Eco-schools reinforce sustainability content in their lessons and are open to accepting ideas to connect sustainability activities with education. By using existing networks and experience, the implementation of such an extensive project is possible within a short time frame, in this case, five weeks. The involvement of only a few people in a project keeps it agile and reduces the time taken for coordination. Low-threshold, citizen-oriented services in an academic library are ways to connect science and communities. The community learned that seed preservation is an important and political topic and that everyone can easily contribute to seed propagation. Creativity enhances the development of ESD and community engagement.

Encouraging Wild Bees and Pollinators

The best lesson learned was that the location of sustainable initiatives is vitally important. The meadow location directly in front of the library's central building is highly visible and educates the community in best practice; communication is also vital with appropriate placing of informational signs, the conduct of related seminars and the provision of guided tours. Another lesson learned was that many people outside one's group have similar ideas and common goals, highlighting the importance of exchange and networking. Choosing projects like a flowering meadow is ideal for bringing various sustainability stakeholders together. Concepts can be adapted for sustainability projects, both within an institution and in a region or city, given the numerous opportunities to leverage similar insects, spatial and landscape planning, garden design and plants. The willingness of partners and stakeholders to jointly realise a project such as this proved to be remarkably high. As was the case with other projects, even if initial sustainable ideas cannot be implemented, information acquired during the exploration phase can be translated into new strategies and the knowledge gained used. Further lessons were acquired in relation to facilities work. All building-related measures must be presented to facilities management; only with their approval can work proceed.

A wealth of new knowledge was gained on bees, honey harvesting, beekeeping, emergency exits, occupational safety, building structures, insects and flowering meadows, as well as the activities of the Old Botanical Garden, idea competitions and perennial planting: ESD includes the education of all the key players involved. Visible sustainable goals, such as flowering meadows, are highly motivating. Inviting community members into beautiful and useful project spaces supports those who need external inspiration to become actively engaged themselves.

Waste Separation

The lessons learned from the experiences with implementing changes in waste management related significantly to the nature of the activity undertaken. Changing human behaviour is challenging. Ingrained habits and a lack of awareness contribute to improper waste disposal. Constant reminder messaging is necessary to change routines. If good explanations are provided, and new ideas promoted appropriately, the community is ready to support them, especially if alternatives are clearly available and easy to use. When made aware of waste disposal options and their necessity, users actively support initiatives.

Conversations with colleagues who work and clean on-site can help significantly to identify potential improvements and save money. Communicating sustainable practices requires a delicate balance to avoid appearing patronising or autocratic. The increase in waste with the rise in visitor numbers emphasises the need for scalable waste management. Staff interest in sustainability, evident through improvement suggestions, can inspire successful initiatives. Some feasible ideas encounter financial or organisational barriers; identifying and addressing these is crucial for success. Waste disposal remains a persistent challenge, indicating the necessity for continuous attention and improvement. Educating individuals about the importance of waste separation, its positive impact on the environment and taking individual responsibility remain important and ongoing tasks. It is not sufficient to assume that information can be provided only once; continuous repetition and friendly reminders are needed as is support from the community.

Networking

The SUB Göttingen is constantly working to improve sustainability both within activities undertaken by the library and through education of its constituents. As the German Library Association states, all seventeen SDGs are connected to the work of libraries (Deutscher Bibliotheksverband/German Library Association n.d.). Ensuring educational opportunities, access to information and communication technologies and the preservation of cultural heritage by libraries are particularly significant. Goals related to climate and environmental protection are also advanced under the term Green Library which has been promoted by the Environment, Sustainability and Libraries Section (ENSULIB) of the International Federation of Library Associations and Institutions (2022). The Netzwerk Grüne Bibliothek/Green Library Network (Netzwerk Grüne Bibliothek n.d.) in Germany consolidates information on how libraries can more deliberately contribute to climate and resource protection and the SDGs. The SUB Göttingen is an active member of the Network

in which fourteen academic libraries from Germany are already represented. The Network collects information, resources, and best practices, offering libraries a platform for collaborative learning and idea exchange on sustainable initiatives. Participating libraries gain visibility and contribute to recognition within academic and library communities. Exchange and mutual support assist academic libraries in developing their green agenda. Networking is also important for the SUB SWG because the exchange of knowledge and best practices is inspiring. The SUB SWG can also share its experiences on sustainable practices, successful initiatives, and new ideas.

Conclusion

Academic libraries have a responsibility to drive ESD and they have opportunities to address this in various ways. The SUB Sustainability Working Group uses a multifaceted approach to enhance sustainability within the organisation, extending beyond the important provision of SDG-related information and resources. Guided by a well formulated and accepted policy, the group implements sustainability ideas proposed by colleagues and users, while also staying informed about practices in other libraries.

Sustainability can be optimised in internal work processes, but it can also be included as the subject of various library projects. As a point of contact, the library not only bears responsibility within its own organisation, but also demonstrates to users, other stakeholders of the institution it serves, and others throughout the community, that sustainable commitment is possible. Many ideas may seem small at first, but when coordinated, they create an extensive impact, a growing overall community understanding and action around sustainability. The SUB sustainability activities have become a showcase for new ways of doing things, bringing about a change in consciousness among those who engage with the various initiatives.

The SUB SWG's initiatives, including waste separation systems, bee-related activities, and partnerships like the seed library, exemplify a comprehensive approach to daily operations that involve leveraging staff enthusiasm, utilising staff suggestions and fostering an environmental awareness culture. Visible goals within the library not only mark progress but also motivate ongoing engagement. The lessons learned emphasise continuous attention to waste disposal, the importance of reminders about individual responsibility, the need for ongoing education and the value of networking to elicit sustainable ideas, build strong sustainability awareness, and make sustainability a natural part of everyday thinking and behaviour. Collaborative projects within the University and the region can offer

opportunities for expanding and promoting sustainability efforts. However, academic libraries could also jointly implement sustainability-related projects to strengthen their impact, an approach gaining tractions within the Green Library Network.

The SUB SWG has gained valuable insights from those steps that did not succeed. Lessons learned often revolve around better ways of delineating responsibilities, optimising communication pathways and navigating the complex structures of a large organisation like Göttingen University. Investigating different areas to bring a sustainability idea to life is very time-intensive. There has been substantial learning along the way through transcending usual domains, driven by an overarching aspiration to instigate sustainable changes. The SUB SWG often wishes its ideas could be brought to fruition more quickly, since it is not enough only to talk about the importance of sustainable change, it must be put into action. This commitment must be equally strong among all players at the University, as projects are best realised when everyone participates and helps.

To assess whether the SUB Göttingen will successfully integrate sustainable practice within its organisational routines and services in the future, it might be necessary to measure the practices and outcomes using KPIs or assessment metrics (Ochôa and Pinto 2014). Such measures are not currently in place for the sustainability activities covered in this chapter. Assessment metrics throughout all German academic libraries would allow comparison and improve the overall strategic development of academic libraries in relation to their sustainability contribution.

Educating the community in sustainability and developing a sustainability mindset has much to do with changing structures and habits. This requires practice, time, reminders and occasionally, persuasion. However, time is running out and sometimes efforts seem too small, ineffective, or insignificant in the face of the global challenge of climate change and biodiversity loss. Nevertheless, it is precisely these ideas and actions that must constantly be generated to mobilise as many people as possible to become actively involved and take responsibility. Sometimes, small first steps such as using reusable coffee cups in the library's café, set individuals on the path of sustainability, learning and thinking actively about ways to avoid waste. It is indeed the many small steps, the small actions that, together, ultimately become meaningful and life-changing.

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David Mercadal Cuesta

15 Inspiring a New Generation: Spanish University Libraries and Sustainability Education

Abstract: University libraries are repositories of knowledge which is not only stored and preserved, but also created, disseminated and evaluated. University libraries play a significant role in education providing information to a wide range of users, from students embarking on their studies to senior academics and researchers. Whilst all libraries play a part in educating the communities they serve, university libraries are pillars of education for their parent institutions. This chapter assesses the role of university libraries in Spain in delivering on the United Nations Sustainable Development Goals (SDGs), and the promotion of environmental education to harmonise with the UNESCO Education for Sustainable Development (ESD) programme. The chapter includes the results of a survey distributed to Spanish university libraries to collate responses on the activities and initiatives being undertaken in working on the SDGs. The survey focused on identifying and describing resources or collections specialising in sustainability education along with activities or initiatives that promoted the SDG and explored the impact of specific activities. The chapter provides a selection of good practices. In general, libraries were found to hold materials that could be used for sustainability education purpose. The libraries surveyed indicated moderate success in developing initiatives although there was a noted lack of training and few employed experts to deliver sustainability-related activities.

Keywords: University libraries – Spain; Sustainable development – Spain; Sustainable development goals; Education for sustainable development

Libraries and Sustainable Development

Since their inception, libraries have played a crucial role in collecting, preserving, organising and providing access to knowledge. Whether on parchment, papyrus, computer discs or in printed books, information has been stored and preserved in libraries. What is more, libraries disseminate information and make it available to the communities they serve and to the general public, usually free of charge, breaking down barriers and facilitating access to information in all its forms, helping to achieve equality.

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https://doi.org/10.1515/978-3-11-133646-6-016

In the 21st century, libraries are not only places where books are stored: they are living and breathing institutions, with a great power to engage their communities, and to spearhead many different initiatives. Sellés Carot noted that libraries are not only *lieux du livre*/places for books, but also *lieux du vivre*/places of life (2021, 18). In this sense, libraries, especially university libraries, can take the lead in highlighting specific subject areas, focusing on specific topics, and supporting the delivery of educational activities and training in different areas, either by creating specific courses themselves or through collaborating with educational institutions, designing and hosting programmes from which users can learn.

Libraries can align their activities with the United Nations Agenda 2030 and its seventeen Sustainable Development Goals (SDGs), established in 2015 and signed by all Member States of the United Nations, which seek to protect the planet and aim for peace and prosperity in the near future by promoting sustainable initiatives (United Nations [2015]; United Nations n.d.a). Of the seventeen SDGs, the targets and indicators of three are most closely related to the work of libraries: SDG 9, Industry, innovation and infrastructure, SDG 11, Sustainable cities and communities, and SDG 16, Peace, justice and strong institutions:

- SDG 9: "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation Industry, innovation and infrastructure", "Target 9.c: Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in the least developed countries by 2020" (United Nations n.d.b)
- SDG 11: "Make cities and human settlements inclusive, safe, resilient and sustainable", "Target 11.4: Strengthen efforts to protect and safeguard the world's cultural and natural heritage" (United Nations n.d.c)
- SDG 16: "Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels", "Target 16.10: Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements" (United Nations n.d.d)

Preserving and facilitating access to information of all kinds, not only in books, but in multiple formats of information products, both digital and physical, and providing access remotely through the internet, are basic library services of libraries. By delivering their core services, libraries directly contribute to the SDGs mentioned above. Libraries store knowledge, traditionally in the form of books or documents, and now also in other formats like DVDs, CDs, and streaming services, to protect cultural and natural heritage, and preserve it for the future. Libraries provide access to information and communication technologies (ICT), allowing users to connect to the internet on their own devices to access information, or by lending users devices

including tablets or laptops not only to access the internet, but also to read content stored in electronic formats both locally and remotely. Libraries provide their communities with access to information in many ways, from the physical collections they house on-site, to the digital information services and products they provide through online catalogues, web pages, social media, interactive sites, and guides.

Libraries contribute to other SDGs in various ways that depend on the library's focus and strategic directions, and the nature of its users. The contribution is most visible in the case of libraries that specialise in specific topics such as the environment, or those libraries which focus on the specialised needs of communities, such as children in school libraries. Activities to promote SDGs can be of many kinds, while typically having a similar focus: to participate directly in sustainable development and to educate the community. Libraries have active research, service and educational roles within the university. University libraries are at the heart of the universities to which they belong, meeting and fulfilling the information needs of students, researchers and professors and serving as active advocates for the SDGs.

UNESCO's Education for Sustainable Development (ESD) programme and its *Roadmap* (UNESCO 2020) provide a framework for implementing ESD by integrating it into policies and learning environments and is key to developments in ensuring sustainability. The core concept of the ESD *Roadmap* is that educational activities are essential to making positive impacts on efforts contributing to attainment of the SDGs. The ESD programme raises awareness of the seventeen SDGs in education settings, promotes critical and contextualised understanding of the SDGs, and mobilises action towards their achievement (UNESCO 2020, 16). However, in the context of progress and transformation towards a better-informed society, nowhere in the 73 pages of the *Roadmap* are libraries mentioned as platforms for knowledge exchange and for education. Nevertheless, the ESD roadmap serves as a guide that all kinds of educational institutions and educators can follow to improve the quality of their actions relating to ESD.

University Libraries in Spain

University libraries in Spain have formed a network, Red de Bibliotecas Universitarias y Científicas Españolas/Network of Spanish University and Scientific Libraries (REBIUN), which promotes the sharing of experiences and knowledge, and the merging of individual catalogues of library holdings into a collective union catalogue (REBIUN 2022). It comprises the libraries of the 77 member universities of the Conferencia de Rectores de las Universidades Españolas/Conference of Rectors of Spanish Universities (CRUE) including 50 public universities and 27 private uni-

versities, and the Consejo Superior de Investigaciones Científicas/Spanish National Research Council (CSIC). REBIUN had in its IV Strategic Plan (2020–2023) a strategic goal focused on the 2030 Agenda and the SDGs, with the aim of promoting interest in the SDGs and providing guidance to libraries on how to contribute to them (REBIUN 2023). Currently, its V Strategic Plan (2024–2027) does not mention SDGs, although some areas are related, such as governance and international cooperation, the promotion of open science and digital transformation (REBIUN 2024).

In a recent initiative to understand sustainability at Spanish academic libraries, REBIUN distributed a survey to university libraries. Although only 26% of libraries responded, they identified 102 initiatives being delivered to promote the SDGs which were not restricted to educational outcomes (REBIUN 2021a). REBIUN has published guidelines listing actions university libraries might employ to promote the SDGs (REBIUN 2021b). With these considerations, it is evident that the network has been committed to supporting the SDGs. Integrating sustainability goals into library strategy and operations requires a change of mindset, with a greater focus on library users being seen as human beings and not just library users (Marraud González 2021).

In the context of networking among Spanish libraries, the Red de Centros de Información y Documentación Ambiental/Spanish Network of Environmental Libraries (RECIDA) (n.d.) should also be mentioned. RECIDA comprises over 150 Spanish documentation centres and libraries focused on the environment and protected natural areas and includes public, university, special, private and other types of libraries. It has been working on sustainability since its creation in 2004 (Toril Moreno and Pons 2022), and is closely aligned with the SDGs and the work undertaken by the International Federation of Library Associations and Institutions (IFLA) Environment, Sustainability and Libraries Section (ENSULIB) particularly its approach to environmental sustainability in libraries (Savahirta 2020).

Sustainability in Spanish University Libraries

The first study exploring sustainability in Spanish university libraries was conducted by Herrera-Morillas, Castillo-Díaz and Pérez-Pulido (2014). Focusing on social responsibility and sustainability, the study marked an initial exploration of the implementation of the SDGs. The authors concluded that there was an awareness among libraries of the need to promote sustainability, but the existence of courses and activities directed towards sustainability was minimal and that education on sustainability issues should be increased and improved (Herrera-Morillas, Castillo-Díaz, and Pérez-Pulido 2014). In a more recent study, Muñoz (2020) agreed

that university libraries could align with the 2030 Agenda, found that they were already doing so, albeit without proper recognition, and highlighted the importance of libraries in ensuring high quality education in relation to sustainability. The success of any library-hosted sustainability activities will depend on adequate alliances and partnerships, as well as an accurate and detailed identification and understanding of public interests.

In the last few years, there have been examples of sustainability activities focused on Spanish university libraries, either individually, for example at the library of the Universidad de Castilla-La Mancha/University of Castilla-La Mancha (Rincón Atienza 2021), or more generally (García 2020; García Rodríguez 2020; Larios Rodríguez, Rey Martín, and Balagué Mola 2021; Marraud González 2021; Rey Martín, Larios, and Vállez 2022). These studies examined best practice and initiatives that university libraries might implement to promote the SDGs, and provided specific examples. A distinction can be made between practical activities undertaken by libraries that support the SDGs by reducing environmental impacts including recycling stations, initiatives reducing energy consumption, or eliminating the use of plastic, and activities that share information with library users about the SDGs including exhibitions, guided tours, courses and seminars, special guides, brochures, and posters. All of the studies agree on the importance of information literacy, and education and training activities for both users and library staff. Sellés Carot (2021) additionally emphasises the idea that the library's function extends beyond raising awareness about sustainability to designing high-impact library services that contribute to sustainability.

At the international level, examples of examinations of library sustainability activities include works from Brazil (Cabral Nunes and Carvalho 2016), Sri Lanka (Mashroofa 2022) and Mexico (García Febo 2022). The results of all the studies are similar: university libraries are working step by step to implement the SDGs in their strategies and policies. The steps they are taking are small but they are beginning to create their own resources and develop activities.

Education for Sustainable Development in Spanish University Libraries

This chapter assesses the role of Spanish university libraries as educational institutions, with an emphasis on ESD and describes a survey undertaken to assess activities.

The Survey

A survey was created and distributed to investigate the sustainability initiatives carried out by libraries. The survey was divided into five sections and the questions used are contained in the Appendix to this chapter. The five sections were:

- Identification
- Resources and collections
- Educational initiatives
- Outreach and impact, and
- Observations

The survey was predominantly descriptive with some qualitative comments. It comprised a total of twenty-seven questions in four areas, and included space for final observations. In general it aimed to determine:

- Library involvement in ESD
- Existence and use of collections or spaces specifically designated for sustainability
- Level of awareness of the RECIDA network as a reference point for library sustainability
- Locations, people and time involved in delivering sustainability initiatives
- Impact of activities undertaken based on user perceptions and use of the library
- Extent of collaboration with other entities, from within the university or externally, and
- Identification of special initiatives and successful activities.

The survey was sent to Spanish public university libraries. Private universities were excluded because funding from endowments and high student fees as opposed to public funding changes the nature of services provided and the imperatives under which they operate. Public universities are more affordable and accessible to the general population and contribute through provision of equity more to the SDGs; public institutions are also obliged to contribute to the SDGs. Private institutions do not provide equal opportunity; they operate under different legal frameworks and are driven by different agendas. The Conferencia de Rectores de Universidades Españolas/Conference of Rectors of Spanish Universities (CRUE) register (n.d.) was consulted to obtain a list of the 50 public universities. A search was undertaken on each university website to locate the library or equivalent section resulting in a total of 451 university libraries. It should be noted that all general libraries were included, as well as those belonging to faculties and those of particular interest to teaching because of their collections. Libraries with special collections were excluded, such as European Documentation Centres, map libraries, newspaper

archives, and deposit libraries specialising in heritage collections which do not serve a specific field of knowledge or educational programme.

The survey was distributed during January 2024 by email or through contact forms available on the university libraries' websites. A significant limitation of the study was the low response rate of under 14%, and it should be noted that not all of the autonomous communities of Spain, which includes seventeen communities and two cities, were represented, which could lead to bias in the results. It is considered that libraries involved in support of the SDGS would wish to promote their initiatives and that the lack of participation by some libraries indicated their low or non-existent interest in the area. Failure to respond might indicate that no activities to educate their communities about sustainable development had been undertaken, and/or that they were not interested in doing so. Another limitation is that the survey was completely open, with no mandatory questions. Not all libraries answered all questions; the number of answers for each individual question is provided throughout the results of the study and marked as n=. Given the caveats and in some cases low responses, interpretations of the statistical outcomes including percentages are challenging.

The Responding Libraries

Only 63 of the 451 libraries identified responded to the survey, representing 13.96% of those libraries invited to participate. Figure 15.1 shows the number of university libraries located in each autonomous community, with a comparison of the number of responses received. It should be noted that one of the libraries did not indicate the location or the university to which it belonged, and is represented as (Blank) in the Figure. One of the universities responded as a single entity with a collective response from the library, rather than responding for each individual branch or section. The response has been counted as one single response and not as the sum of libraries that make up the university's library system, because it did not allow for the study of the individual characteristics of each library, such as individual collections and activities focused on the students of a discipline.

The autonomous communities with the greatest number of responses were Madrid and Galicia, with eleven and eight replies respectively, while the lowest number of responses came from Extremadura and the Region of Murcia, with only one reply. Of special interest is the case of Islas Baleares, where all seven libraries responded to the survey. It should also be noted that five communities were not represented, since none of the libraries responded. The universities of the autonomous cities of Ceuta and Melilla are part of the Universidad de Granada/University of Granada, in Andalucía, and are therefore not included separately in the graph.

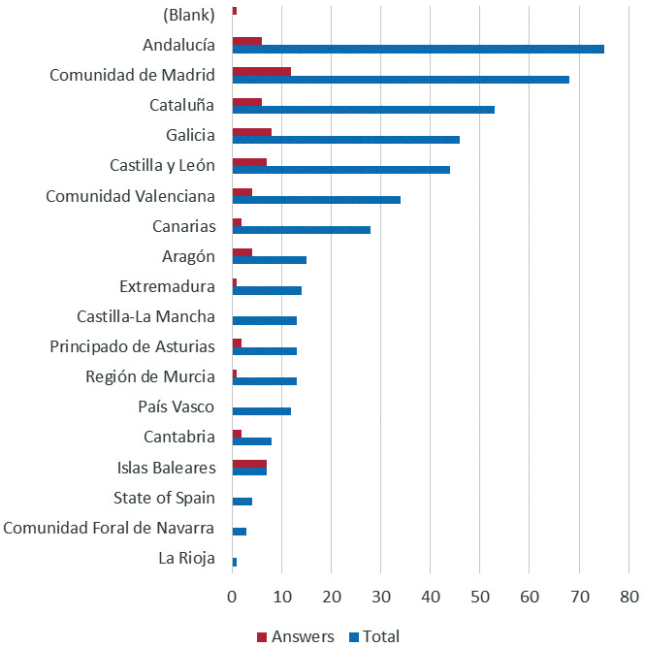


Figure 15.1: Number of responses compared to the total of universities

Figure 15.2 shows the different faculties or disciplinary areas to which the responding libraries belonged. Note that n=45 since some of the libraries did not specify the faculty with which they were associated, which means 29% of the libraries did not answer to this question, which inevitably skews the results. The disciplinary area featuring the greatest representation was Engineering, with eight libraries followed by seven in Education and four in Law. The remaining disciplinary areas included only one or two libraries, except for Arts with three libraries. Twenty disciplinary areas were represented, although one was General, and Arts and Sciences included disciplinary areas which might be separately represented by a single-faculty library elsewhere.

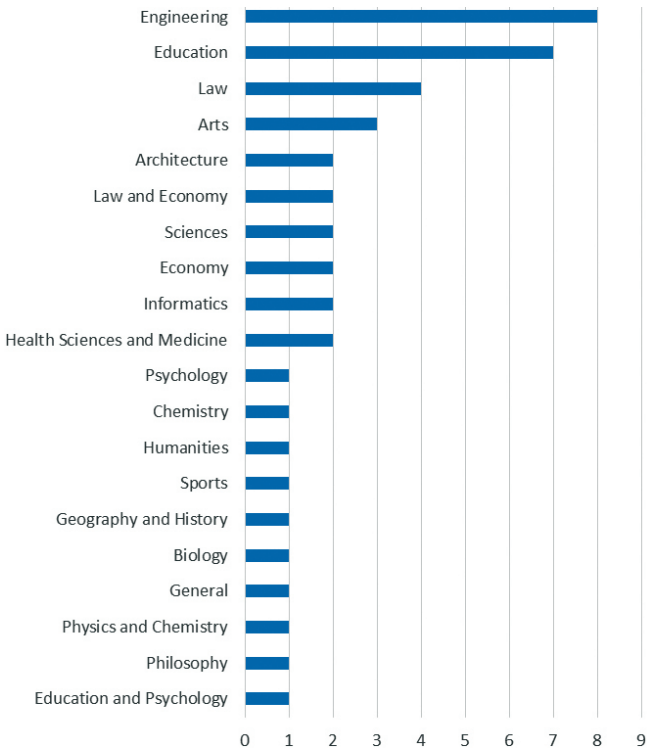


Figure 15.2: Distribution of responses by disciplinary area

Sustainability Resources and Collections in the Libraries and Network Affiliation

This section of the survey explored the existence and use of sustainability-related resources held by participating libraries. All libraries surveyed answered the question regarding a specific physical location for collections of information resources on sustainability. A positive response was received from 23.8% who answered yes. A small percentage, 4.8%, of the libraries indicated the absence of a dedicated space, but mentioned the existence of plans for one; most libraries, 71.4%, did not have separate physical collections relating to sustainability. In terms of digital collections, 23.8% of the libraries (n=63) responded that they had digital spaces for sustainable resources, whereas 74.6% indicated that they had no digital collection on sustainability. A comparison of the results is shown in Figure 15.3.

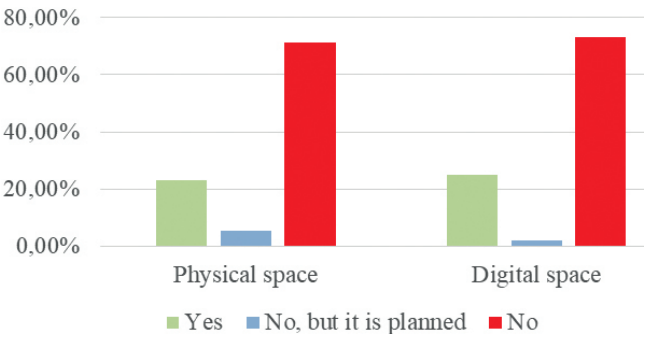


Figure 15. 3: Comparison between separate physical and digital collections specific to sustainability

However, 88.7% of the libraries (n=62) indicated they had information resources about sustainable development in their general collections, even if they were not part of a specific section on sustainable development, while 9.7% did not have any resources relating to sustainability at all. In total, 66.7% of responding libraries (n=63) provided their users access to sustainability-related digital resources or databases, and 3.2% had plans to do so, while 30.2% said they had no digital resources on sustainability. Figure 15.4 shows the comparison between the various collections of digital and physical resources available in the libraries surveyed.

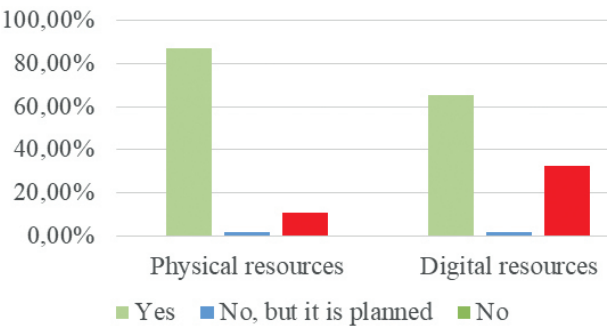


Figure 15.4: Comparison between physical and digital resources on sustainability that are not part of a specific collection

When asked if they produced their own guides, brochures and leaflets on sustainability, 30.2% of the libraries (n=63) said yes, and 3.2% said they were working on it. However, 66.7% of responding libraries did not produce materials that could be used for sustainability education.

It is worth mentioning the RECIDA network. Some of the university libraries are members, and could share and use resources provided by the network. Considering the specialisation of some libraries' collections, especially of universities teaching degrees related to the circular economy, environmental sciences, sustainable development, or any topic of interest to the SDGs, there is a great opportunity for the university libraries to join the network and collaborate, making it easier to share resources and optimise the use of materials that already exist.

Only 6.5% of responding libraries (n=62) belonged to the network; 33.9% of libraries replied that they were aware of the existence of the network but did not belong to it, and 59.7% of responding libraries were not aware of the existence of RECIDA. Regarding the use of the resources created by the RECIDA network (n=62), only 3.2% of the libraries used the resources and 96.9% did not, with 6.5% of these libraries being part of the network. The use of shared resources already created, designed, tested and ready to use, would mean a saving of time and money for the libraries and bring significant benefits to library users.

In summary, the libraries surveyed held targeted collections focused on sustainable development in the broad sense which included books, journals, digital resources, and databases, but they did not have a designated space to display them, either in a physical space, or on the website. It is a good sign that 34% of responding libraries were developing or planning to develop resources on the subject, but much remains to be done. Collaboration with others and the reuse of existing guides to sustainability resources and materials should be increased.

Activities and Initiatives Directed Towards Sustainable Development

Only 36.5% of responding libraries (n=63) indicated the provision of training or educational activities related to sustainability. One library referred to plans to do so, while the bulk, 61.9%, had no such initiatives planned. Some respondents indicated the reasons for not hosting or organising specific activities in the observations section of the survey:

- Lack of demand by library users
- The library is seen as a space for study and obtaining books, but nothing more
- There is no awareness of the opportunities for libraries as educational or training places
- Limited resources, both in terms of finances and personnel, are hindering progress, and
- Lack of interest by the leadership or governing bodies.

Some libraries mentioned that they had only recently commenced work on ESD; and others indicated that processes were ongoing. For libraries who conduct educational activities (n=23), 87% said that they delivered between one and five activities annually, and 13% responded that they delivered between five and ten programmes. As no responding library offered educational activities more frequently than ten times annually, the maximum frequency is less than monthly.

Considering that the SDGs were accepted by all United Nations Member States almost ten years ago, the provision of library educational activity in the sustainability space has been comparatively recent. The lag in library action is perhaps to be expected given that the emphasis on ESD through the development of a framework and roadmap by UNESCO has been a later phase. Of the libraries who responded, 66.7% (n=24) indicated they had been hosting educational activities for between one and five years with 20.8% conducting programmes for less than a year, and only 12.5% for longer than five years. The emergence of greater activity more recently could signify an increasing interest on the topic.

Just over half of sustainability education activities took place in the library itself with 55.6% (n=27); otherwise, they were mostly conducted in a room belonging to the parent university, 44.4%. Extensive collaboration was indicated with 39.3% of the libraries (n=28) working on sustainability education activities with faculties and departments, and 25% partnering with other libraries in the same university. A further 28.6% responded that they were collaborating with other libraries and departments, both within and outside of the university, while only 7.1% organised activities by themselves.

The results of the survey revealed that 46.4% of the teaching staff for library sustainability education activities (n=28) were sourced internally from within the university, which could indicate a significant commitment from within the institution itself, with 39.3% of the teaching staff drawn from the library, which could point either to a robust involvement of library professionals, or a lack of resources to hire other trainers. However, the relatively modest 14.3% representation of external trainers offers an opportunity for wider collaboration and engagement with external expertise.

An overall evaluation of libraries' self-perception of their contributions to SDG education (Figure 15.5), shows mixed results. Whilst 41.18% perceived their contributions to be positive, a significant percentage, 37.5%, (n=56) remained neutral on the topic, and surprisingly 21.4% had a negative perception. The reasons for the results are not clear; while university libraries want to support the SDGs, there is still room for improvement both in promoting the use of resources and collections about sustainability, and in the delivery of sustainability initiatives or related educational activities.

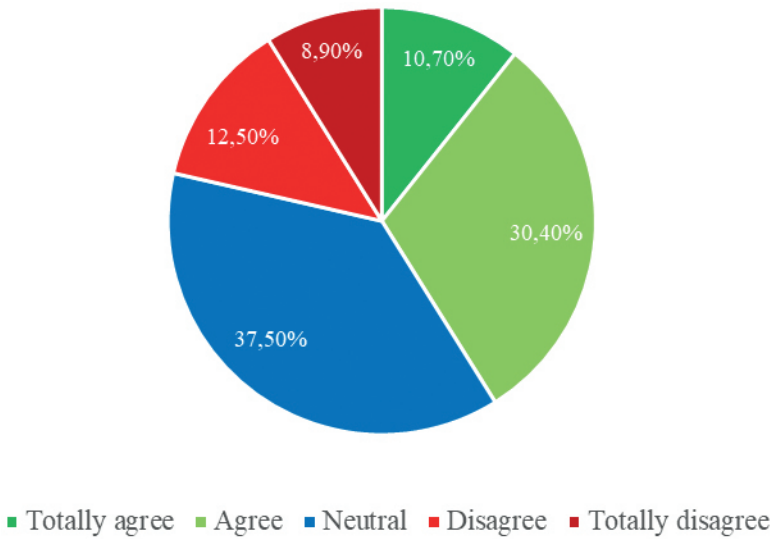


Figure 15.5: General sentiment about library participation in SDG education

Outreach and Impact of Sustainability Initiatives by Libraries

The sustainability activities reported by responding libraries appeared to receive good attendances which could be considered an indicator of their success. On average, between fifteen and thirty participants attended each scheduled activity provided by 46.2% (n=26) of respondents, with a further 23.1% reporting more than thirty participants. Attendances of fewer than fifteen participants were reported by 30.8% of respondents.

However, most libraries, 84%, did not observe any difference between the participation uptake in SDG activities and others not related to the SDGs (n=25). Only 4% noted an increase of participants in relation to SDG activities, and 12% indicated that the sustainability activities had fewer participants than other activities.

Concerningly, 62.5% of the libraries (n=24) claimed that the activities related to sustainability had not produced a change in user behaviour, such as increased interest in the sustainability collection, and only 37.5% of the libraries responding indicated positive changes. On the plus side, none of the libraries noted a negative change in sustainability-related user behaviour.

Responding libraries indicated that the participants engaging in sustainability activities were primarily from their parent universities, 86.2% (n=29), while 13.8% came from other universities or were noted as non-university users. Only three

libraries noted that Key Performance Indicators were used to assess the value and impact of their activities. Measurements were based principally on the number of participants and surveys conducted to determine satisfaction. It is worth noting that 57.1% of the responding libraries (n=28) received feedback from participants which was mainly positive at 81% (n=21), with 19% expressing no opinion. None of the feedback received was negative.

Based on these results, it can be concluded that the activities in which the libraries were engaged have been moderately successful. Sustainability activities receive approximately the same number of participants as other activities; feedback is mainly positive; but there is still work to be done to change the behaviour of users, promote the use of sustainable initiatives and, ultimately, change people's habits into sustainable ones.

Good Practices and Highlighted Initiatives

In addition to examining the data related to library-led sustainability activities submitted by survey respondents, it is essential to examine the initiatives undertaken qualitatively. Consequently, the descriptions of the resources, collections and initiatives undertaken by Spanish university libraries and provided in the survey were examined. The question "3.4. Has any of the activities been more successful than others? Please, describe which one or which ones" and the question "5. Observations" where libraries could provide reflections in their own words were analysed. Insights gained follow.

Activities

Whilst environmental sustainability was a topic present in most of the initiatives mentioned, other SDGs were also considered. Topics such as climate change, energy, biodiversity and protection of the planet appeared more popular in the activities highlighted in response to question 3.4 from the survey. Other topics such as gender equality, decent work, or good health and well-being had no reported presence within participating libraries' sustainability education programmes.

The Universitat de València/University of Valencia boasts a dedicated sustainability team tasked with overseeing all aspects of sustainability, including the design and implementation of actions, communication strategies, and outreach efforts. The team is actively developing a comprehensive sustainability plan tailored specifically to the university's libraries. The team conducts monthly aware-

ness campaigns using various channels such as social media, and physical posters within the library premises. While formal training activities for library users have not yet been organised, both university and library staff members have undergone training in the SDGs, underscoring their commitment to promoting sustainability within the university community. The Library has prepared a guide to the SDGs (Universitat de València 2024).

In a similar way, the Universidad de Castilla-La Mancha/University of Castilla-La Mancha (UCLM) has a working group dedicated to social responsibility that has focused on the 2030 Agenda and the SDGs since its creation and delivered more than 50 SDG-related activities during the period 2006–2020 including the internal course *Agenda 2030 y bibliotecas: oportunidades y desafíos/Agenda 2030 and libraries: opportunities and challenges* which has had a high rate of participation (Rincón Atienza 2021).

The Universidad de Zaragoza/University of Zaragoza library has a sustainability working group. Likewise, the Campus de Gandia/Campus of Gandia of the Universitat Politècnica de València/Polytechnic University of Valencia and the Universidad de Murcia/University of Murcia both have sustainability cooperation programmes, to which the libraries have contributed. Finally, the Green Campus initiative at the Universidade da Coruña/University of Coruña must be mentioned. It rewards university faculties for outstanding work on environmental education, with affects some of the SDGs. The response commented on the positive impact of the Green Campus initiative as motivation for improving sustainability not only of the Library, but of the whole institution.

Collections

Considering collections, the Campus de Gandía de la Universitat Politècnica de València/Polytechnic University of Valencia Gandia campus posts a blog presenting thematic collections, some of which are related to the SDGs (Universitat Politècnica de València/Polytechnic University of Valencia. Biblioteca Campus de Gandia n.d.a). Also highlighted is an online collection on sustainable development listing resources including books, films and guides, classified by the corresponding SDG (Universitat Politècnica de València/Polytechnic University of Valencia. Biblioteca Campus de Gandia n.d.b). The most remarkable collection initiative is the University's Monitor ODS/SDG monitor. The monitor is a tool to visualise the scientific publications of the University that are related to one or more SDGs (Universitat Politècnica de València 2024).

The Universidade da Coruña/University of A Coruña also has an online library guide specifically related to the SDGs. In addition to information about the SDGs, it

provides access to resources, infographics, links and different competitions, with a specific section for educational activities (Universidade da Coruña/University of Coruña 2024).

From the Universidad Autónoma de Madrid/Autonomous University of Madrid, the Library of the Facultad de Ciencias Económicas y Empresariales/Faculty of Economy also shares the catalogues from different thematic exhibitions they have organised, many of them related to sustainability, with one about the circular economy being a highlight (Universidad Autónoma de Madrid. Facultad de Ciencias Económicas y Empresariales. Biblioteca de Económicas [2022]).

The Universidad de Zaragoza/University of Zaragoza mentioned in answering question "5. Observations" of the survey that they organised monthly exhibitions in the Library, with a specific SDG highlighted each month.

Many libraries mentioned in response to question 3.4. of the survey that they shared news about the SDGs using various means including physical posters, social media and web pages. Some libraries, particularly those belonging to faculties such as engineering, referred to holdings of information resources on sustainability including principally books, journals and e-resources, and indicated that the resources had a strong connection to some of the subjects taught at the University. Libraries related to many disciplines have resources about sustainable development, climate change, energy and equity.

Actions

Many of the libraries surveyed mentioned actions taken to participate in various SDGs. The actions included:

- Installation of recycling points for different materials including paper and plastic
- Reduction of the use of paper, both by decreasing printing and investing in digital instead of physical resources, and
- Upgrade of lighting to low energy consumption devices.

Almost all libraries agreed that they were slowly commencing work on the SDGs, and while there were some educational or training activities being undertaken, the majority related to the provision of information. The actions taken, while not training-related, could be considered educational since they were helping to raise awareness among library users, and could contribute to changing daily habits.

Several libraries mentioned that they held exhibitions, either by displaying sustainability resources on book stands, or installing posters. While the exhibitions might not always be considered instructive, they could be used for teaching

purposes, and if used cleverly, lead to new knowledge by promoting the use of resources.

Additionally, a few libraries mentioned offering guided tours. The libraries of the Universidad de Salamanca/University of Salamanca indicated they took part in guided botanical walks through the parks of Salamanca and highlighted the initiative as one of their most successful. The Universidad de Sevilla/University of Sevilla offered guided visits for library staff relating to the cultural and natural heritage. While such guided tours or visits might not constitute traditional course or seminar training, they present innovative opportunities for participants to learn about the SDGs.

The Universidad de Salamanca/University of Salamanca mentioned a *Biofilm Film Series*. A variety of films was shown at different times, accompanied by experts that engaged in a roundtable discussion following the films. The speakers used the events to explain different topics, such as the origin of forest fires, or the role of women in rural life.

In terms of traditional education, few librarians mentioned receiving training in the SDGs. One of the libraries, Biblioteca de la Facultad de Ciencias de la Educación, Universidad de Sevilla/Library of the Faculty of Education Sciences, University of Seville, pointed to a specific internal course taught by experts on SDGs in University Libraries as being useful for the staff.

Lastly, of special relevance, the Research Cafés held at the Universitat Politècnica de Catalunya/Polytechnic University of Catalonia were highlighted. Open to researchers and university members, they are informal sessions where doctoral students and postdoctoral researchers share their work on different topics including the environment (Universitat Politècnica de Catalunya/Polytechnic University of Catalonia 2024). The Library mentioned that the research café on cities and sustainable communities was the most successful.

While the importance of education about the SDGs for library and university staff has been recognised, so they can implement actions and plan strategically, education delivered to library users did not appear in the survey to be a strong focus. Libraries reported undertaking many exciting initiatives with much potential, but there are opportunities for improvement. Libraries have the information resources, the space and the users; they have direct contact with professionals that could assist in creating specific courses, seminars and talks regarding SDGs; but lack of time, economic and human resources, and understanding among library leaders of the significant potential for libraries as educators are inhibiting developments. Nonetheless, the survey established that Spanish university libraries were seeking to raise levels of awareness on the topic of sustainability through various non-traditional activities. Libraries reported highlighting the SDGs in their ser-

vices, but greater impact would be achieved if they were more actively engaged in teaching about sustainability.

Conclusion

The findings of the survey revealed significant insights about the role of libraries in promoting ESD. Firstly, all responding libraries held in their collections a wide range of materials, including books, journals and digital resources related to sustainability that could be used for educational activities. However, there was a notable absence of dedicated physical or digital spaces to showcase the materials, resulting in a gap in the visibility of sustainability-related resources within the library.

While Spanish university libraries show proactive efforts in promoting education in sustainability within their institutions, the results suggested limited collaboration with external libraries or centres. The lack of sectoral engagement represents a missed opportunity for leveraging expertise and resources in advancing sustainability education through accessing a broader range of perspectives and resources. Despite the presence of networks like RECIDA or REBIUN which facilitate resource sharing and collaboration among libraries, a considerable proportion of surveyed libraries reported a lack of active participation in the networks with missed opportunities to reduce duplication of efforts.

The survey shed light on the limited offerings in sustainability education. Many libraries were not organising or hosting educational activities, and while some did so, the frequency of involvement and impact appeared to be relatively low. While it was reported that the number of participants was similar to those attending other activities, and the feedback received was predominantly positive, it appeared that the activities provided did not significantly influence users' behaviour, or increase the use of sustainability-related resources. There is a need for more effective strategies to create real change, rather than just raise awareness. The qualitative insights regarding the initiatives delivered by Spanish university libraries offer valuable depth to understanding their role in promoting sustainability education.

It is notable that several Spanish university libraries have established dedicated teams or working groups to lead the development and delivery of sustainability initiatives. These groups, even if recently established, constitute a model for all universities, which could, if adopted, over time, develop additional educational activities for library staff and users. Libraries have shown a commitment to resource development, with some efforts focused on curating thematic collections, primarily in digital resources. The collections are inherently educational since they

contain relevant information, but they could be used productively as the basis for enhanced training.

In terms of outreach and engagement, libraries employ diverse methods to raise awareness about sustainability within their communities through exhibitions, film screenings, guided tours and participation in community events. While the activities may not always be explicitly educational, they engage users and foster awareness and understanding of sustainability issues. Libraries also utilise traditional and digital communication channels, such as social media, physical posters and library websites, to disseminate information and promote sustainability-related resources and events.

Despite commendable efforts and achievements, challenges remain. The lack of formal educational opportunities targeted towards library users is a notable gap with a greater emphasis on staff training than on user education. Additionally, limited resources, both financial and human, pose barriers to the full realisation of libraries' potential as educational spaces for sustainability. A lack of recognition by university leadership of the role of libraries in promoting ESD underscores the need for greater advocacy and collaboration to overcome the challenges.

There is a moderate connection between the activities delivered by the responding libraries and the UNESCO ESD programme. The first key feature of the programme is to raise awareness, and it is true that the initiatives mentioned are oriented to this objective which is positive. The second key feature is to promote critical understanding of the SDGs. By providing collections and information resources, libraries play a significant role in education, since the materials can be used for a deeper and contextualised understanding of the SDGs. However, the last key feature of the programme is to mobilise action towards the achievement of the SDGs. Some good practices have been highlighted, but most of the initiatives such as creating online resources or physical exhibitions are comparatively passive. There is still work to be done in making a meaningful impact on society that will result in tangible actions.

In conclusion, Spanish university libraries play a vital role in promoting sustainability education through a range of initiatives and activities. By leveraging their resources, engaging with their communities and advocating for greater recognition and support, libraries can further enhance their impact in fostering awareness, developing understanding and inspiring action on sustainability, within their institutions and beyond.

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Appendix: Survey Used for the Study of Sustainability in University Libraries

1. Basic information
   - 1.1. Autonomous community
   - 1.2. University
   - 1.3. Faculty
   - 1.4. Library name
   - 1.5. Job title

2. Resources and collections
   - 2.1. Is there any specific collection, within the physical space of the library, about sustainability?
     - 2.1.1. Yes
     - 2.1.2. No
     - 2.1.3. No, but it is planned
   - 2.2. Is there any digital collection, specialised in sustainability, in the webpage of the library?
     - 2.2.1. Yes
     - 2.2.2. No
     - 2.2.3. No, but it is planned
   - 2.3. Does the library own monographs and journals about sustainable development, whether belonging to a specific collection or not?
     - 2.3.1. Yes
     - 2.3.2. No
     - 2.3.3. No, but it is planned to acquire them
   - 2.4. Does the library have access to databases or online resources about sustainable development?
     - 2.4.1. Yes
     - 2.4.2. No
     - 2.4.3. No, but it is planned
   - 2.5. Does the library elaborate its own resources (guides, pamphlets…) about sustainable development?
     - 2.5.1. Yes

2.5.2. No
2.5.3. No, but it is planned

2.6. Do you know the Spanish Network of Environmental Libraries (Red de Centros de Información y Documentación Ambiental, RECIDA)?
2.6.1. Yes, the library belongs to the network
2.6.2. Yes, but the library does not belong to the network
2.6.3. I do not know it

2.7. Have you used any of the RECIDA resources about sustainability (inter-library loan, online guides, seminars…)
2.7.1. Yes (I belong to RECIDA)
2.7.2. Yes (I do not belong to RECIDA)
2.7.3. No (I belong to RECIDA)
2.7.4. No (I do not belong to RECIDA)

3. Initiatives for education in sustainability

3.1. Have specific educational or training activities in sustainable development been carried out in the library?
3.1.1. Yes
3.1.2. No
3.1.3. No, but it is planned

3.2. If yes, how many of these activities are carried out annually?
3.2.1. 1–5
3.2.2. 5–10
3.2.3. More than 10

3.3. Since when have these activities been developed?
3.3.1. Less than a year
3.3.2. 1–5 years
3.3.3. More than 5 years

3.4. Has any of the activities been more successful than others? Please, describe which or which ones.

3.5. In general, do you consider that the library collaborates actively in education for sustainable development?
3.5.1. Completely agree
3.5.2. Agree
3.5.3. Neither agree nor disagree
3.5.4. Disagree
3.5.5. Completely disagree

3.6. Generally, where do these activities take place?
3.6.1. In the library itself
3.6.2. Other room, belonging to the university

3.6.3. Other room, not belonging to the university
3.7. Do you collaborate with other entities to carry out these activities?
3.7.1. Yes, with other libraries from the same university
3.7.2. Yes, with other libraries from other universities
3.7.3. Yes, with other libraries outside universities
3.7.4. Yes, with the departments and faculties of the university
3.7.5. Some of all of the above
3.7.6. No, these activities are entirely managed by the library
3.8. Usually, who is the training person in these activities?
3.8.1. Library staff
3.8.2. Professionals from the university
3.8.3. Professionals from outside the university

4. Outreach and impact
4.1. What is the average number of participants in these activities?
4.1.1. 0–15 participants
4.1.2. 15–30 participants
4.1.3. More than 30 participants
4.2. Are there differences in the number of participants in these activities, compared to others not related to the SDGs?
4.2.1. Yes, more than in others
4.2.2. Yes, less than in others
4.2.3. No differences are appreciated
4.3. Have you noticed any changes in user behaviour following these activities, such as an increase in the use of sustainability collections?
4.3.1. Yes, a positive change
4.3.2. Yes, a negative change
4.3.3. No changes are appreciated
4.4. Generally, what is the origin of the participants?
4.4.1. From the university
4.4.2. External, from other universities
4.4.3. Externalof any procedence
4.4.4. Mixed
4.5. Do you use any metrics or KPI (Key Performance Indicator) to measure the success of these activities? If yes, please describe which ones.
4.6. Have you received feedback from the participants on these activities?
4.6.1. Yes
4.6.2. No

4.7. If yes, what is the general sentiment?
   4.7.1. Positive
   4.7.2. Negative
   4.7.3. Neutral

5. Observations

Neyda Gilman, Jennifer Embree and Jacqueline Jergensen

16 Cultivating Change: Student-Driven Sustainability Projects

Abstract: This chapter discusses sustainability-focused student-run projects being used in the libraries at Binghamton University, part of the State University of New York system, as unique learning opportunities that encourage high quality engagement and act as a form of education for sustainable development. Two different examples are presented, both of which provide insights from two librarians as well as from a student employee. The first example highlights a grant-funded project resulting in the creation of an Equitable Sustainability Literacy Guide (ESLG). The project was a typical student project. Two librarians provided the idea, resources, basic outline, and overall guidance for the project and students successfully undertook the majority of the work. The second example highlights a non-traditional student-run project involving a Sustainability Hub Student Interest Group which has had its successes, failures, and multiple iterations. The concept of a broader Sustainability Hub is also discussed and suggestions given for ways in which other academic libraries can engage with students to promote and educate their communities about the United Nations Sustainable Development Goals, and help prepare future leaders of sustainability.

Keywords: Sustainability; Academic libraries – United States; Student library assistants; Student-centred learning; Education for sustainable development

Introduction

In higher education institutions, students can wield an incredible amount of power, often influencing administrators to enact policy and cultural changes in ways that faculty and staff cannot (Lee et al. 2022). In recent years, student involvement has manifested itself through sustainability activism, where students have been noted frequently to be major drivers of change and champions of aspects of the Sustainable Development Goals (SDGs) (United Nations n.d.a; United Nations [2015]) in academia (Lee et al. 2022; Murray 2018; Xypaki 2014). As academic libraries become increasingly involved in sustainability around the world, collaborating with students can strengthen the impact of sustainability initiatives on their campuses. It can also create meaningful leadership and educational opportunities for students passionate about sustainability that also fulfill the main objectives of UNESCO's Education for Sustainable Development (ESD) *Roadmap*: to raise awareness of the

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https://doi.org/10.1515/978-3-11-133646-6-017

seventeen SDGs, to promote critical and contextualized understanding of the SDGs and to mobilize action towards the achievement of the SDGs (UNESCO 2020).

In this chapter, the authors, two librarians and a student, present a case study detailing how the librarians created unique student-led sustainability opportunities at their mid-sized academic institution, with the student reflecting on project impacts and outcomes. The librarians discuss how they developed hands-off opportunities that allowed students to have more chances to see the impact of their decision-making processes, to learn to pivot and adapt approaches based on real-time experiences, and to enhance critical thinking and leadership skills. These experiences were not only beneficial for the students, but essential in empowering them to become effective climate and sustainable development leaders in the long-term (Steiner and Posch 2006).

While the authors hope the discussion of the project opportunities will inspire others to explore ways that students can run sustainability projects at their institutions, they acknowledge that not all libraries will be able to recreate similar experiences, particularly through direct student employment. Hence, the authors conclude the chapter with recommendations on how to engage students and provide opportunities for student-led initiatives that broadly encompass the objectives of the ESD.

The United Nations, UNESCO, and the Sustainable Development Goals

According to the United Nations, the SDGs act as "a call for action by all countries – poor, rich and middle-income – to promote prosperity while protecting the planet" (United Nations n.d.b). The seventeen transformative goals that make up the SDGs grew from the Millennium Development Goals (MDGs) (United Nations n.d.c), which led to substantial improvements in global poverty, child mortality, child education, and HIV/AIDs prevention and treatment between 2000 and 2015 (World Health Organization 2018). The successes and lessons learned over the fifteen years of the MDGs spurred efforts to expand the goals into the broader-reaching SDGs (United Nations Development Programme 2024). Many of the SDGs evolved from the MDGs, including eradicating hunger and poverty, achieving gender equality, ensuring quality education, and promoting well-being, which grew from the MDG of combating diseases.

SDGs including SDG 11: Sustainable cities and communities (United Nations n.d.n), SDG 12: Responsible consumption and production (United Nations n.d.o), SDG 13: Climate action (United Nations n.d.p), SDG 14: Life below water (United Nations n.d.q), and SDG 15: Life on land (United Nations n.d.r) expand on the MDG of ensuring environmental sustainability. In addition, SDG 17: Partnerships for the goals (United Nations n.d.t) developed from the global partnership MDG (United

Nations n.d.b, c). Several SDGs expand on the MDGs relating to the eradication of poverty and hunger, together with improvements in health and nutrition with SDG 1: No poverty (United Nations n.d.d), SDG 2: Zero hunger (United Nations n.d.e), SDG 3: Good health and well-being (United Nations n.d.f), and SDG 6: Clean water and sanitation (United Nations n.d.i). Other SDGs focus on activities which underpin prosperity with SDG 5: Gender equality (United Nations n.d.h), SDG 7: Affordable and clean energy (United Nations n.d.j), SDG 8: Decent work and economic growth (United Nations n.d.k), SDG 9: Industry, innovation, and infrastructure (United Nations n.d.l); SDG 10: Reduced inequalities (United Nations n.d.m) and SDG 16: Peace, justice and strong institutions (United Nations n.d.s).

It is evident that higher education aligns with SDG 4: Quality education: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (United Nations n.d.g). However, the importance of education goes beyond meeting this one goal. Education itself, including higher education, plays an important role in meeting all seventeen SDGs. This sentiment was shared by Qian Tang, UNESCO Assistant Director-General of Education, in his foreword to the *Education for Sustainable Development Goals: Learning Objectives*. Tang went on to emphasize that education "is not only an integral part of sustainable development, but also a key enabler for it. That is why education represents an essential strategy in the pursuit of the SDGs" (UNESCO 2017, 1). In 2016, two researchers examined this idea more closely by exploring United Nations flagship reports in depth. Their article found a link between education and sixteen of the seventeen SDGs. They listed explicit examples of how each SDG influences education, and how education influences each SDG (Vladimirova and Le Blanc 2016). The International Federation of Library Associations and Institutions (IFLA) in its Library Map of the World project collects stories from libraries around the world that work with the SDGs and maps their achievements. While most of the stories shared are connected to SDGs 4 and 17, Quality education and Partnerships for the goals, every single SDG had educational stories associated with it (IFLA n.d.a).

The essential part played by education in ensuring the acquisition of new skills, attitudes and knowledge to ensure more sustainable societies and the achievement of the SDGs is the reason that the UNESCO ESD learning objectives were created to encourage and guide education in relation to the SDGs (UNESCO 2017). UNESCO "has been the lead United Nations agency on Education for Sustainable Development (ESD) since the United Nations Decade of Education (2005–2014)" (UNESCO 2020, 3). In its role as a leader in ESD, UNESCO created the ESD for 2030 program to help bring about the changes needed to respond to climate change (UNESCO n.d.). With a vision of building "a more just and sustainable world through strengthening ESD and contributing to the achievement of the 17 SDGs" and the key objective: "To fully integrate ESD and the 17 SDGs into policies, learning environments, capacity-building of edu-

cators, the empowerment and mobilization of young people, and local level action" (UNESCO 2020, 14), it is evident that much of this influential program centers around the SDGs and the important role that education plays in meeting the goals.

The role of higher education in the SDGs can be seen beyond the work of UNESCO. In 2021, the journal *Higher Education* published a special issue focused specifically on the SDGs in higher education. It includes nine articles on a range of topics including both positive and negative experiences with the SDGs. It also highlights that seventeen universities worldwide are designated as SDG Hubs for their commitment to addressing the SDGs and educating future generations about the biggest global challenges (Chankseliani and McCowan 2021, 2). A chapter in Garcia's et al. (2017) book makes similar points to UNESCO on the importance of education in meeting all of the SDGs and leading to a sustainability-minded population in general. They discuss how ESD not only teaches about environmental issues but also builds fundamental skills such as critical thinking, helping students to think about the future and learn to collaborate in decision-making. In late 2023, new frameworks were developed to aid in the integration of ESD in higher education (Ahmad et al. 2023). The experiences and skill-building that come from ESD also help change behaviors. It is evident that developing hands-on, creative, and actionable problem-solving skills in students ensures that they are taught to think and act creatively and steadily grow into effective creators, leaders, and change agents (Filho et al. 2020; Garcia et al. 2017).

Library Involvement with the Sustainable Development Goals

"An analysis of twenty case studies where libraries implemented pro-environmental measures concluded that sustainable development is now a new paradigm of librarianship" (Fedorowicz-Kruszewska 2020, 279) although the sample size was small. Sustainability has been a part of libraries for decades. While the green library movement started in the 1990s, sustainability-related activities in libraries, such as lending materials beyond books to benefit the community, go back to at least the late 1970s (Antonelli 2008). What is it about libraries that makes them good sustainability partners? SDG Target 16.10 "Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements" (United Nations n.d.s) explicitly acknowledges the importance of access to information which is what libraries do. Libraries provide information, ensure access, support, engagement, communication and in general work towards making an impact on the communities they serve. Missingham (2021) states a sentiment shared by most library workers: "libraries are a key element in the economic,

social, and educational structure within nations. They deliver public, educational, health, and state services that enhance community well-being and economic outcomes" (Missingham 2021, 391). This can be seen on all levels of library work, from small libraries to large global organizations. IFLA is instrumental in connecting libraries' work to sustainability and the SDGs. They state that "libraries support initiatives in a variety of fields, including health, agriculture, civic engagement, education... and have a powerful impact in the community..." (IFLA n.d.b). In 2019, then IFLA Secretary General, Gerald Leitner, commented, "I am convinced that there is a space for libraries in the world envisioned by the UN 2030 Agenda. Not just that there can be a space, but that there must be. We cannot achieve the SDGs without libraries" (IFLA 2019). OCLC, a worldwide library consortium, reported that the OCLC Global Council had selected the SDGs as its area of focus for 2020–2021 to explore libraries' contributions and opportunities to reach the goals (OCLC 2021).

Sustainability and the SDGs have been integrated into the activities and policies of library professional organizations for decades, with the American Library Association's (ALA) Task Force on the Environment (TFOE) being established in 1989 (Antonelli 2008; Charney 2014). The ALA TFOE morphed into the Sustainability Round Table (SustainRT) in 2012/2013 (ALA 2013). Internationally, IFLA is leading the way in connecting sustainability to libraries, adopting the UN 2030 Agenda and the SDGs and creating a "Global Vision of a strong and united library field powering literate informed and participative societies" (IFLA [2018]) in order to call libraries to action, and to assist them. In January 2024, a librarian started a thread called *Sustainability & Libraries Network* on the Association for the Advancement of Sustainability in the Higher Education member site, in order to ask specifically about networks for academic libraries and sustainability. All the organizations already mentioned were listed in addition to Archivists Responding to Climate Change and the recent involvement of academic libraries in the Sustainable Libraries Initiative Certification program. Anecdotally, there has been an increase in sustainability related webinars, workshops, and other professional development opportunities offered to librarians through these professional organizations and general interest groups.

Academic Libraries and the Sustainable Development Goals

What about academic libraries specifically? Much of the engagement and outreach that is discussed around the topic of sustainability and libraries tends to happen in public libraries. Is there a place for academic libraries, too? The answer is yes, both in ways that are similar to public libraries, and in different ways. Many of the

events and displays provided by public libraries can be, and are, also conducted in academic libraries, reaching a range of audiences. Academic libraries can integrate their work into coursework, student and faculty research, and student group activities on campus. Even ten years ago, there were already worldwide initiatives that encouraged sustainability in libraries (Hauke, Grunwald, and Wilde 2014). In 2011, an academic librarian explored sustainability LibGuides, online resource guides used by many academic libraries, and found that academic librarians were actively involved in sustainability work (Charney 2014). After examining the results of a survey sent to the creators of sustainability LibGuides, Charney concluded that academic librarians "already accustomed to communicating across disciplines, are uniquely positioned to build bridges and forge partnerships" (Charney 2014, 1) and emphasizes the importance of academic librarians' natural trans-disciplinary work in sustainability-related programs, pedagogy, scholarship, and community building.

Many academic libraries have been attempting to map their work to the SDGs. The University of Southern Queensland (USQ) in Australia outlined its approach in a case study, and indicated that they were able to map their current work to eight SDGs and that mapping the activities demonstrated the importance of the library in culture and society (Thorpe and Gunton 2022). In 2020, the ALA created the Task Force on United Nations 2030 Sustainable Development Goals which provides resources specifically to help libraries incorporate the SDGs into their activities (ALA 2020a) and launched the *Resilient Communities: Libraries Respond to Climate Change* pilot program ALA 2020b). In 2023, librarians from two South African universities surveyed academic libraries in the country about their community engagement initiatives, which are perceived as part of the social responsibility of academic institutions The survey found that the libraries in South Africa were already engaged in initiatives aligned with the SDGs, particularly SDGs 2: Zero hunger, 3: Good health and well-being and 13: Climate action, and that other libraries around the world were telling similar stories (Bangani and Dube 2023). A similar study in 2022 linked academic libraries directly to nine of the SDGs, 1: No poverty, 3: Good health and well-being, 4: Quality education, 5: Gender equality, 9: Industry, innovation and infrastructure, 11: Sustainable cities and communities, 12: responsible consumption and production, 16: Peace, justice and strong institutions, and 17: Partnerships for the goals (Mashroofa 2022).

As part of its 2021 focus on sustainability, the OCLC Global Council conducted a survey to determine library interactions with the SDGs. Libraries in almost one hundred countries responded and it was evident that: "Whether explicitly or implicitly, libraries are contributing to all 17 of the SDGs" (OCLC Global Council 2021). High percentages, 78% and 82%, of respondents from libraries in the Asia Pacific, Europe, the Middle East, and Africa indicated familiarity with the SDGs and even the lowest familiarity rate in the Americas was over 50%. Sixty-six percent

of academic librarians responding to the survey reported knowledge of the SDGs and referred to library activities in relation to SDGs 4: Quality education, 8: Decent work and economic growth, 10: Reduced inequalities, 16: Peace, justice and strong institutions, and 17: Partnerships for the goals.

However, while an ever-increasing body of literature explores how the SDGs can easily be woven into the operations, programming, and services of academic libraries, there is very little investigation of how student collaboration and student-led projects might positively impact SDG-related sustainability initiatives in libraries. Student-led activity is an area for further exploration in academic libraries, especially with the emergence of a growing body of evidence that points to positive outcomes of direct student involvement in sustainability on campus.

One example is the work by Shriberg and Harris who published an article (2012) outlining findings from a program they conducted at the University of Michigan to help students build leadership and change management skills in sustainability. Part of the motivation for running such a program was that "successful organizational transformation from piecemeal 'greening' efforts to deep institutional sustainability requires involvement and leadership from students" (Shriberg and Harris 2012, 154). One of the strongest findings from this study was that students and staff both have unique skill sets that can easily complement each other to create more effective and thoughtful changes on college campuses. They stated that students "benefit greatly from the 'real-world' view of university staff" while staff "benefit from the students' perspective, energy, enthusiasm, and elbow grease" (Shriberg and Harris 2012, 163). Partnerships between students and staff can benefit both parties, lead to more long-term, stable, and persistent sustainability efforts on campus, and provide opportunities for students to gain skills that will make them more effective leaders in sustainability after graduation. In a similar vein, Murray found in a literature review of student-led action projects that "students' campaigning for behavior changes is an effective tool to begin altering the campus culture and overthrowing entrenched behaviors, both of which have been identified as steps in the institutional change process" (Murray 2018, 1105).

Similarly, a study initiated by Mohamad, Mamat, and Noor (2021) examined three universities in Malaysia to determine how students involved in sustainability efforts perceived their own roles as change agents. Through the interviews conducted, the study determined that students "play a pivotal role in campus sustainability initiatives" and that support from management was "an important factor that motivates them to participate in the campus sustainability activities... Without a strong support system, these change agents would not only have difficulties in resolving the sustainability issues, but it could also hamper their motivation" (Mohamad, Mamat, and Noor 2020, 417). The authors stressed the importance of providing support for students that are agents for change who as a result become empowered

to seek significant transformation. Culture shifts, one of the core objectives of ESD, take place on campuses involving strong student agency in sustainability.

Going one step further, Lee et al. (2022) conducted a study to determine how student leaders were specifically able to impact the knowledge of SDGs on their college campus through a student-led program called the Sustainable Development Goals Alliance (SDGA). After interviewing twelve student leaders who had participated in the program, they concluded that several benefits resulted because of the focus on fostering student leadership skills. Students were able to enhance their peers' knowledge of the SDGs and encourage them to work towards their attainment because the students were much more suited to "attract, engage, and empower other students" (Lee et al. 2022, 543). Putting the students into the positions of change agents provided more opportunities to "nurture skills such as leadership, teamwork, communication, and project management" (Lee et al. 2022, 541) in sustainability-related endeavors.

Overall, literature highlights the power that can result from higher education institutions supporting student-led and student-empowered initiatives. A bigger, more collective change may be possible utilizing these methods. Because academic libraries are increasingly creating opportunities for their communities to engage in sustainability-related initiatives, including those linked directly to the SDGs, it is important to explore student-led opportunities that libraries may uniquely offer. In the case study described in this chapter, the authors provide information about two student-led initiatives undertaken in the last three years, particularly from the perspective of the student responsible for managing the projects. The authors hope that the account will bridge the gap in the literature between sustainability-related student-led projects and academic libraries and encourage other academic libraries to explore and create opportunities for students to have a stronger leadership role in sustainability endeavors and integrate ESD more directly into their efforts.

Student-led Projects through Binghamton University Libraries' Sustainability Hub

Binghamton University is a world-class public research university with over 18,000 students. It is part of the State University of New York system in the United States located in up-state New York and provides broad interdisciplinary education with an international perspective. Binghamton University Libraries have three locations on two of the three university campuses, plus an offsite storage facility. The Binghamton University Libraries' Sustainability Hub was created in 2020 to foster collaboration, bolster engagement, and provide active support for all sustainabili-

ty-related activities on campus and in the community (Field 2022). Many of the Sustainability Hub's projects and activities are tied to the SDGs and ESD more broadly. This section highlights two projects that were mostly student-led: the creation of the Equitable Sustainability Literacy Guide (ESLG), and the organization of the Sustainability Hub Student Interest Group. Both projects address several of the ESD initiative's main focal points by empowering youth, transforming learning environments, and initiating local level action.

In 2022, the ESLG was published as an online resource guide for environmental justice issues. The guide was funded by the American Library Association Carnegie-Whitney Grant, and its main purpose was to educate any and all individuals seeking to learn about the environment, climate change, and sustainability through a social justice lens. The initial background research for the guide's proposal was conducted in 2020. During this phase, it was determined that, while the field of librarianship had made great strides in developing resources to engage their communities with sustainability-related topics, the exploration of these topics through a social justice lens were still severely lacking. Sustainability resources that directly addressed issues at the intersection of race, class, and gender were not often seen at the forefront of sustainability conversations in the library literature which indicated that there was a strong need for the creation of resources to support equitable sustainable development education, literacy, and advocacy.

The original vision for the ESLG was of a resource that included introductory coverage on a variety of environmental justice topics and thoughtfully curated resource lists of books, articles, podcasts, videos, and additional interactive digital content. Some of the topics suggested in the proposal were food insecurity, indigenous land rights, industrial pollution, and housing, with the understanding that if the grant were awarded, the hired research assistant might adjust the topics based on further research for the guide. The overall goals of the project were to:

- increase the exposure and discussion of environmental justice and environmental equity in the broader sphere of sustainable development education, and
- truly instill a more holistic, balanced, and equitable understanding of the climate crisis.

The authors ultimately received the ALA Carnegie-Whitney Grant to create the ESLG in Spring 2021. Three student interns were hired and conducted extensive research to inform and create the guide. After the guide was published, the lead intern of the ESLG was hired as a part-time student assistant through the Binghamton Libraries Sustainability Hub. Around the same time, several active students on campus mentioned to the Sustainability Hub that it could be difficult to communicate or accomplish larger sustainability initiatives across the campus body. Several clubs and organizations were dedicated to sustainability or environmental causes, but were often

unaware of what the others were doing. From this feedback, the Sustainability Hub decided to establish the Sustainability Hub Student Interest Group. Its main purpose was to create a space where student representatives from any environmental club, organization, or campus initiative could learn, engage, and collaborate with each other. The student assistant hired after creating the ESLG was given the responsibility of organizing and facilitating the interest group and was able to harness the group's collective power to bring major, local level initiatives to fruition.

The two projects are explained in more detail from the student assistant Jacqueline Jergensen's perspective. She notes their achievements and how both projects helped to empower her, other students, and community members due to their focus on sustainability education and action. Her reflections provide insight and recommendations for anyone interested in launching similar ESD-focused and student-centered initiatives in other institutions.

The Equitable Sustainability Literacy Guide: The Student Intern's Perspective

Towards the end of my first year at Binghamton University, I found an internship application to work on the Equitable Sustainability Literacy Guide (ESLG). The project sounded like an incredible opportunity to research environmental justice and share knowledge with others, but it was recommended that applicants be upper level or graduate students. I decided to apply and was soon interviewed by the two librarians overseeing the project who were just as passionate as I was. A few weeks later, I was contacted by the two librarians and offered the position. I was thrilled to accept and started researching environmental justice.

Phase I: Research

The librarians overseeing the project had created a project timeline as part of the grant proposal (Figure 16.1). The first phase of the timeline was the research which is where I commenced my work with the project. The book *Climate Justice: Hope, Resilience, and the Fight for a Sustainable Future* by Mary Robinson and Caitríona Palmer provided a great overview of the topic and ideas about what to cover in the guide (2019). After taking notes from this book, a rough outline for the guide was developed with two main sections: *Issues*, which would explain the different instances of environmental injustices communities were facing; and *Resources*, which would provide useful books, articles, and more to the public.

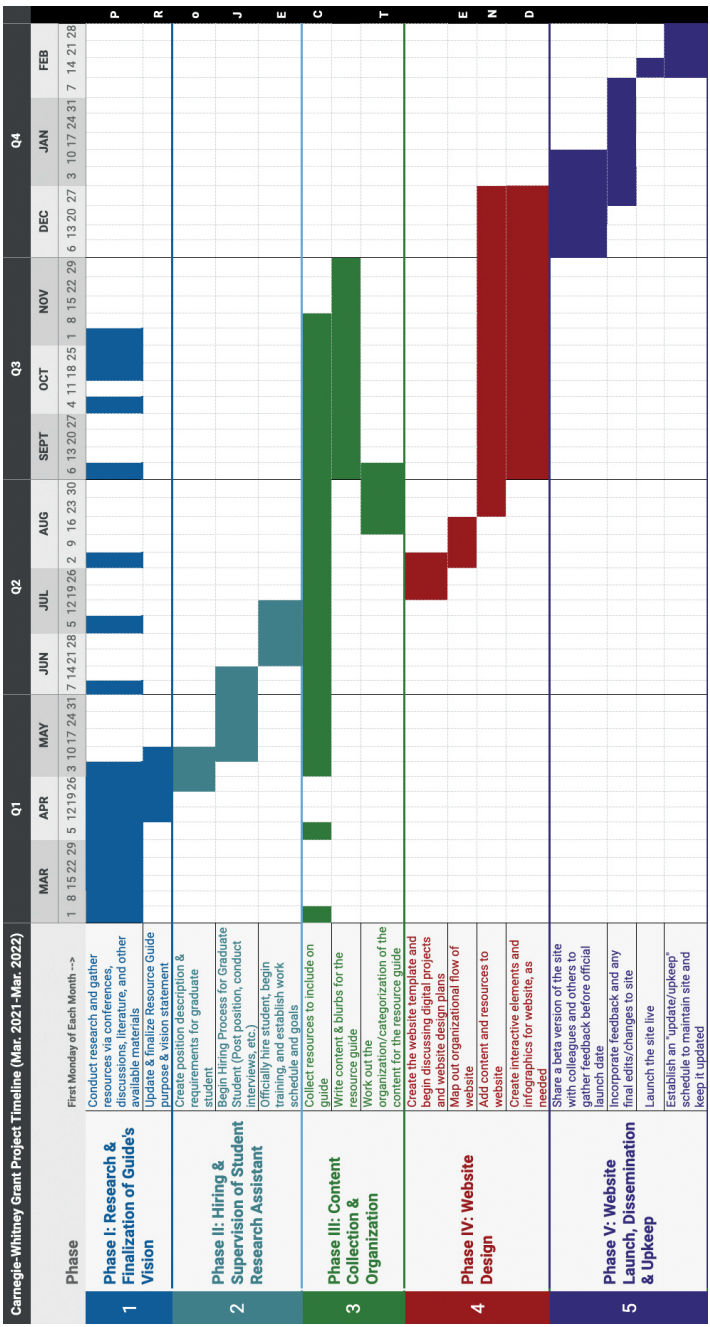


Figure 16.1: ESLG project timeline

More research was conducted to understand and communicate five environmental justice issues: environmental racism, indigenous rights, eco-feminism, climate migration, and food justice. To compile sources for each topic, the Binghamton University Libraries database was searched for scientific articles and books. Book lists and syllabuses from environmental courses were also consulted. Notes on each topic were taken and educational content was drafted. Each issue includes a subpage with an explanation of common themes, two examples of the injustice, and a list of sources.

After researching the environmental justice issues, several sources stood out as the best ones to highlight in the *Resources* section of the guide. This section was originally intended to include two subpages for *Books and Articles*, but *Vocabulary* and *Video* subpages were also added to *Resources*. At this point in the project, the two librarians suggested inviting two other students, whom they had interviewed, to join the team. They each had great ideas for the guide, including the compilation of environmental justice podcasts and debunking common myths. Both students agreed to join the team and began their own research for a *Podcasts* subpage of the *Resources* section, and the creation of a new *Debunking* section.

The research phase of the project took months of work but was essential to create original educational content that would "ensure public access to information" as stated in SDG 16.10 (United Nations n.d.s). The original outline evolved over the course of the project, but provided helpful direction in the early stages of the lengthy research process. Vast amounts of information on each topic were difficult to process but weekly deadlines helped move the project along. The ability to frequently consult both librarians involved in the project for direction and feedback throughout the process was invaluable.

Phase II: Website Design

The two librarians created a Google Site under a permanent Binghamton University email address. After a couple of months spent researching and drafting the content for the online guide, interesting and interactive ways to convey the information were then researched. The librarians provided many ideas, including the use of TimelineJS, an open source tool for telling stories. This online template helped generate an interactive widget, displaying how each example of injustice developed over time. BioRender and Canva were two other tools used to design infographics that visually explain environmental justice concepts and statistics. Figure 16.2 provides an example of a product created with BioRender.

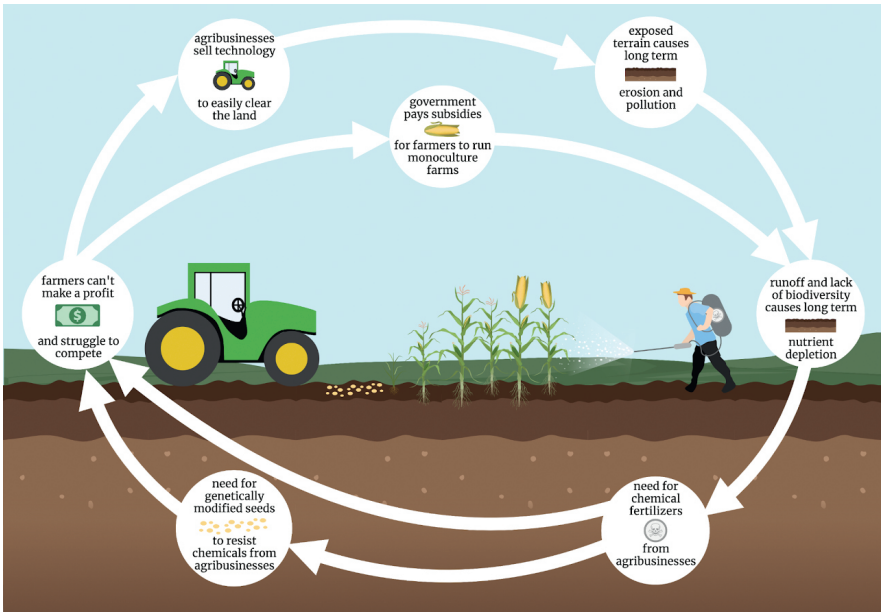


Figure 16.2: Infographic created for the Food Justice page of the ESLG using BioRender

On the Google Site, a color scheme and fonts were chosen for readability and consistency across the guide. A simple logo was created and other graphics for the guide were created to match the logo. Google Site templates were used to organize text, images, and widgets aesthetically for the public. Later, the *Homepage* was created. The librarians provided substantial direction about the details to include concerning the grant, project, and contributors. A *Get Involved* section was eventually added to highlight organizations mentioned in the *Issues* section and beyond. A *News* section was added as a place to include examples of injustices that did not fit in the *Issues* section. Adding a footer finally made the guide look like a real website. A URL was ultimately created and the finer details of the website polished.

Phase III: Publication

Substantial time was set aside for review of the resource created. During the initial research phase, many family and friends were asked to read and check the content to ensure that it was accurate and easy to understand. When the guide was mostly complete, the librarians recruited other Binghamton University staff to review the unpublished Google Site. The team committed to reviewing a few web pages each

week. Dividing up the tasks allowed time to find and correct the typos and grammatical errors before the site was published.

The Equitable Sustainability Literacy Guide was published on March 30, 2021. Soon after the guide went live, it was promoted through flyers and brochures by the Binghamton University Science Library. It was also linked to the Sustainability Hub online Libguide. On April 21, 2021, the three student interns participated on a panel that showcased the ESLG while providing them with experience in talking about their work. In its first year, ESLG reached over 3,000 different users from several different countries. Besides the *Homepage*, the most popular pages visited were *Resources*, *Environmental Justice*, *Articles*, *Debunking the Myths of Plastic Recycling*, and the *News* subpage called *Former IBM Campus to Lithium-Ion Battery Plant*. The *Articles* subpage had the highest overall views per user, with each user viewing the page about five times.

Reflection

Overall, it was extremely valuable to meet frequently with others involved throughout the development process. Although most work was completed individually, meetings helped maintain motivation and accountability within the team. Collaborating with the two other students worked well. I was nervous at first since both were graduate students, but they were great to work with and brought much to the project that I could not have done on my own. Regular meetings ensured consistency was maintained.

Although Google Sites can be limiting in terms of web design, they are ideal because of their ease of use. The platform allows use of textboxes, images, and widgets throughout the site. It also allows the content to be continually edited and updated. In retrospect, I would change how the infographics were created. Using both BioRender and Canva may have created inconsistencies across the website. I would recommend that only one digital platform be used for all graphics. Although I wish more time had been available to add to the guide myself, a student group on campus called Binghamton Policy Project (BPP) volunteered to write more articles for ESLG. They worked closely with the librarians to produce two more pages, one for the *Debunking* and the other for *News*. This activity fostered partnerships and supported SDG 17: Partnerships for the goals (United Nations n.d.t). The ESLG also advanced the ESD for 2030 priority action areas of transforming learning environments, empowering and mobilizing youth, and accelerating local level actions (UNESCO 2020, 28, 32, 34). The work by our team was empowering because it allowed us to bring attention to local issues. In addition, the research we did particularly to prepare the news and debunk articles enhanced our learning

experiences on campus. The ESLG itself continues to act as a learning tool for those who interact with it.

Looking back on the project, I am extremely proud of the hard work we all put into creating the guide and I still use it as a resource today. I am grateful to have been trusted with the work and to have received considerable guidance and support. I learned so much from the project about environmental justice and educating the public that has positively affected all the other work I do in the field. The research and collaborative work on the project gave me a broader understanding of the SDGs in general and highlighted how certain issues, such as SDG 5: Gender inequality (United Nations n.d.h), that might not immediately be seen as issues of sustainability, are in fact closely related.

The Sustainability Hub Student Interest Group: The Student Perspective

The Sustainability Hub Student Interest Group commenced in 2021, before I worked at the Science Library at Binghamton. The group was originally begun by representatives from various sustainability student groups on campus who collaborated to reintroduce reusable takeout containers called OZZIs to the University dining halls after the pandemic (Hudson 2019). While only the Binghamton chapter of Intellectual Decisions on Environmental Awareness Solutions, IDEAS for us, and the Binghamton chapter of the campus sector of the New York Public Interest Research Group (NYPIRG), were fully committed to the Interest Group, there was a long list of potential members that could represent different organizations and departments with similar interests at Binghamton University.

Commencing and Growing the Sustainability Hub Student Interest Group

At the beginning of the 2022–2023 academic year, I was encouraged by the two librarians who supervised me in my new role as Sustainability Hub student assistant to revive the Interest Group. The past meeting minutes and project notes were provided as a guide. I contacted each sustainability student group listed to explain the purpose of the group and encourage them to send representatives to meetings. Over the first semester, the Interest Group grew to ten different student groups. At every bi-weekly meeting, each group shared its projects and initiatives and began collaborating on sustainability goals and events which focused primarily on improving accessibility to sustainability groups, composting, and plant-based foods.

In the following spring semester, a goal was set to grow the Interest Group. Outreach and marketing efforts were expanded to recruit Binghamton University students from all programs and groups (Figure 16.3). Although few students outside the original participating organizations attended the bi-weekly meetings, the Interest Group began to develop a larger presence. The meeting notes were posted and guest talks were hosted based on the members' interests.



Figure 16.3: Flyer advertising the Sustainability Hub Student Interest Group for spring 2023

The Interest Group organized an initial Sustainability Fest. It was an exhibition event to connect students with sustainability-focused groups and resources. Twelve on-campus programs, student groups, and local off-campus organizations exhibited

at the event. Through the Interest Group, the Binghamton Food Co-op, Students for Ethical Living and Food (SELF), the Student Culinary Council, Zero Hour Bing, and the Binghamton Policy Project worked with the Binghamton Student Association (SA), and Off-Campus College Transport (OCCT) to charter buses to the local farmers market for three Saturdays in April. Towards the end of the semester, members of the Interest Group visited Big Yield Growers, a local indoor vertical farm. A few weeks later, the Sustainability Hub, Plant Based Bing, the Food Co-op, Zero Hour Bing, and Citizens Climate Lobby (CCL) for a Growing Workshop invited Big Yield Growers to conduct a Growing Workshop on campus. Attendees of the event received free pots, soil, and plants, and plenty of great advice from the growers.

At the beginning of the 2023–2024 academic year, the Interest Group meetings were promoted much more effectively, with about thirty students attending the first meeting. Although the numbers dwindled as the semester progressed, there was a more balanced mix of student group officers and unaffiliated students. In an attempt to maintain the momentum, a second Sustainability Fest was arranged at short notice, within about two weeks. Although it took place outside of classes on a Friday, the event did not have a good turnout. Later in the semester, a student group successfully hosted its own exhibition with sustainability groups. It was hosted in a dining hall during dinnertime with free pizza and activities, which incentivized students to stop by and learn from the exhibiting student groups.

Progress felt much slower than the previous semester as many ideas were discussed without any decisive action towards solutions. However, one committed member applied for and received a grant for the Interest Group over a break to fund bus charters again. At the end of the semester, students suggested that the Interest Group could begin assigning small tasks to volunteers and offer different activities at each meeting to keep members engaged.

Reflection

Working with the Sustainability Hub Student Interest Group for two years has significantly improved my communication and marketing skills. I made many connections with students, faculty, and people off-campus who are all working to improve our planet. Similarly to my involvement with the ESLG, the work with the Interest Group expanded my knowledge of the SDGs and sustainability issues. The Interest Group brought together different people and groups with similar goals and ideas, and facilitated collaboration and action. Members have stated that the most valuable part of the meetings was getting to know other students and learning to become more involved in sustainability. The initiatives themselves have also been successful. The buses to the farmers market were extremely popular with on-cam-

pus residents because there was no direct bus route to the local farmers market and student groups were able to continue providing the bus throughout this semester. About twenty students benefited from using the charter every Saturday. Although I feel really proud of our accomplishments and our growing presence, I am sometimes disappointed that the participation has been limited and progress slow and insufficient. However, there is a learning curve to achieving sustainable change, and it is important to remain passionate, hopeful, and flexible.

Now in my last semester at Binghamton University, I am determined to use everything I have learned to make greater progress and teach the next student assistant to manage the Interest Group effectively. As recommended by SDG 17: Partnerships for the goals (UNESCO n.d.t), we must foster partnerships to build the capacity for sustainable change. Collaboration between students, on-campus groups, faculty, and off-campus stakeholders through the Interest Group has facilitated participation in discussions and projects, and I hope the partnerships will continue and improve our world. I also hope that the Interest Group continues to be available for future students. It supports the Sustainability Hub's contribution to the ESD for 2030 priority action areas, particularly in empowering and mobilizing youth which is a primary goal of the group.

Overall Impact of the Equitable Sustainability Literacy Group and the Sustainability Hub Student Interest Group Projects

From the student assistant's reflections, it is evident that both the ESLG and the Sustainability Hub Student Interest Group have positively impacted not only the student involved personally but also the campus and the broader community as a whole. The ESLG resource has received over 3,700 unique site visitors in the past two years from 39 different countries. The pages with the ESLG have been viewed over 8,000 times. The information within the guide has reached a diverse, global audience. In addition, the guide continues to excite and involve students within the Binghamton student community. A group of students who are members of a policy writing club reached out to the Sustainability Hub in the Spring of 2024 and expressed interest in collaborating on a project that involved environmental policy. The students were shown the ESLG, considered it an amazing resource, and agreed to write two new pieces for the guide: an article on debunking myths about electric vehicles and an article on sustainability-related infrastructure projects on college campuses. Both pages were published on the website in May 2024.

Similarly, the impact of the Sustainability Hub Student Interest Group has been substantial. It has fulfilled its purpose as a place where students interested and active in sustainability on campus can come together to brainstorm and create new

initiatives. As the student assistant shared in her narrative, several of the Interest Group's club representatives came together to fund chartered buses from the campus to the local farmer's market. The local level action allowed the students to receive access to fresh, locally grown produce. It also provided an opportunity to educate the campus community about the importance of eating locally, and to engage in more sustainable practices. The chartered buses ran for three weekends during its first year in spring 2023, and as already noted, the activity continued in the following year. One club involved in chartering buses through the Interest Group was able to secure a grant to continue the service with bus charters to the farmers market for six weekends in spring 2024. At least twenty students used the buses to attend the farmers market every Saturday.

The Interest Group achieved its goal of providing a safe, open forum for students to discuss any concerns, interests, or potential ideas for the campus. During the open discussions, students often shared issues that they faced or brainstormed solutions. Casual conversations often lead to collective action. A student noted that some of the cafes on campus were offering deals to customers who brought their own reusable mugs for coffee, but the policy was not widely advertised. She volunteered to create signage that could be shared with participating coffeeshops to make their environmentally friendly offer more visible and the sign is now used by participating coffeeshops.

On a similar note, during another meeting in the fall of 2023, another student shared a desire to grow food on campus and expressed frustration that there was no opportunity on campus to engage in this practice recreationally. The Chief Sustainability Officer on campus was present and she stated that she would look into the possibility of setting up community gardens for the campus if enough students were committed to helping with the process. Several months later, the university's administration approved the establishment of Binghamton's first community garden in the summer of 2024.

These are just a few instances that demonstrate how the Sustainability Hub Student Interest Group succeeded in giving students a powerful platform to voice their passion for a more sustainable world. They were able to utilize the group space to enact change in their local communities, learn from each other, and move Binghamton University towards more sustainable practices and policies. The group provided the students with opportunities that allowed them to learn more holistically about climate change, develop solidarity amongst their peers, and take action in meaningful and realistic ways and shared the major goals and objectives of the ESD 2030 Roadmap.

Reflections and Recommendations Going Forward

The Sustainability Hub's commitment to empowering and providing personal growth opportunities for students around the broad topic of sustainability has contributed to greater awareness and eventual achievement of the SDGs. Both the ESLG and the Sustainability Hub Student Interest Group provided additional ESD related opportunities for the library and the students on campus. The student involved was able to learn more herself and cultivate her personal leadership, management, and collaboration skills as well as share her knowledge with others. The learning and growing opportunities contributed to various SDGs including 8: Decent work and economic growth, 11: Sustainable cities and communities, 12: Responsible consumption and production, and 13: Climate action. The student is better prepared for the workforce, has learned more about creating sustainable communities and responsible consumption, and actively worked towards climate action. She also used the activities undertaken to provide others with equivalent opportunities.

Students associated with the Sustainability Hub, both employed or engaged in other ways, referred to enhanced skills and knowledge as a result of their experiences. The Group is almost entirely operated by the students themselves and provides a way for all to engage in their own sustainability projects. In under a year, the members leveraged involvement in the network for class projects involving the campus nature preserve, climate anxiety, and creating community gardens on campus. The group was intentionally formatted so that the students doing the work would have opportunities to appreciate how their decisions impacted outcomes. They took on areas of responsibility and gained problem-solving and critical thinking skills and experiences that are essential for sustainability leaders (Steiner and Posch 2006). The connection between these skills and successful sustainability leaders is why the Sustainability Hub prioritizes students and actively works towards providing opportunities for as many students as possible. It is why grant funding was directed toward hiring two additional students for the ESLG project rather than paying for librarian conference fees, why the student assistant has been granted as much independence and influence as possible, and why Interest Group members have been encouraged to share their thoughts and take charge of tasks.

It often takes some trial and error for any new project to succeed and that has also been the case for the Sustainability Hub, particularly the Sustainability Hub Student Interest Group. The exploration phase for the Interest Group is ongoing. While keeping it mostly in the hands of the students and out of campus bureaucracy as much as possible is causing some things to move slowly or fall through the cracks, the benefits are worthwhile. Almost all students who participated in the Sustainability Hub have experienced the challenges associated with sustainability work but remain positive and passionate. They, as well as the librarians overseeing

it all, are proud of the outcomes they helped achieve despite the struggles. Even students whose only interaction with the Sustainability Hub has been through attending events have had the opportunity to learn from experts and become empowered to acquire some sustainable practices, such as growing some of their own food, composting rather than throwing food away, mending or swapping their old clothing, or turning a piece of junk into something worth keeping. Navigating the intricacies has been a learning experience and confidence builder for everyone involved.

While not all libraries have the same flexibility, funding, and/or opportunity to have an official Sustainability Hub with its associated projects, there are still ways for academic libraries to engage students in promoting and contextualizing the understanding of the SDGs and preparing students to be sustainability leaders. Working with existing student groups on co-hosting events or to allow them to use library space for their meetings are two low commitment examples that have benefited the Sustainability Hub and could be used in many libraries. For example, collaborating with the student group Students for Ethical Living and Food (SELF) for several semesters to co-host clothing swaps has not only encouraged more discussion and action on sustainability but also led to the group feeling more invested in outcomes. Heightened engagement inspired the creation of a sustainability officer position dedicated to working with the Sustainability Hub. Casual conversations inviting students, faculty, and staff already interested and engaging in sustainability to participate in library events is a great first step, and was the basis for the Sustainability Hub.

Partnerships for the goals is one of the SDGs and essential to the longevity and effectiveness of sustainable development. Other ideas include hosting mending or upcycling events, climate cafes, or other low-demand events that bring people into the library to discuss and learn from each other. Students are regularly seeking to volunteer for sustainability-related projects, or work with the Sustainability Hub to advance their individual projects. Other academic libraries can have similar successes in locating and developing interested and energetic students. In addition to students expressing interest in using the Sustainability Hub for class projects, the librarians associated with the Hub visit classes to inform students about available resources and opportunities for involvement. It is through interaction and engagement with students, that volunteers for involvement in expanding the ESLG, in particular its debunking section, are being identified. Other academic librarians visiting classes may be able to use those opportunities to recruit students and faculty.

Conclusion

The tie between academic libraries and ESD and the SDGs is multifaceted. Libraries provide information on the SDGs, support related research, engage individuals in acting towards the SDGs, and help educate and prepare the sustainability leaders of tomorrow. Students, who are future leaders, do not always realize the influence they have both on and off campus. Libraries can engage with students, offer a range of opportunities, foster interest and prepare the students for future challenges. The case studies discussed in this chapter present examples of how academic libraries can develop and empower students to become change agents through projects and initiatives that emphasize using quality information and community engagement. Not only are there benefits to the students through collaboration and student-led projects, but libraries also benefit by creating opportunities that allow students to be more thoroughly engaged in working towards the SDGs from a library's perspective. Even when the SDGs are not explicitly stated in an activity or project, they are woven in. The authors hope that sharing their experiences will encourage other librarians and information professionals to explore ways in which they can create sustainability-related student-led projects that create positive, sustainable change within their campus communities.

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17 Leveraging Open Educational Resources to Foster Sustainable Educational Development in Switzerland

Abstract: Open Educational Resources (OER) are defined by UNESCO as "teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions" (UNESCO 2012, 1). OER are closely linked to the United Nations seventeen SDGs (United Nations n.d.a), especially to SDG 4, Quality education: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". At Zürcher Hochschule für Angewandte Wissenschaften/Zurich University of Applied Sciences (ZHAW), the OER team is based in the Hochschulbibliothek/University Library and has established an OER Policy and an OER community. An innovative approach to OER was taken in a project Students4OER, funded by the University's Sustainable Impact Program. Students were invited to create materials, videos, blog posts, interviews, quizzes, podcasts, or posters, in connection with at least one of the SDGs for publication as OER for worldwide visibility. In a subsequent project, Students4OER II, a collaborative project between the ZHAW University Library and the teaching staff of the ZHAW School for Life Sciences and Facility Management, the creation of OER with and by students became part of a master's degree module. This chapter explores the nature of OER and their connection to Education for Sustainable Development (ESD) and the seventeen SDGs and examines how openness in education goes beyond mere access to free resources to link with new, and more open didactic approaches like open pedagogy. The role of the Library and its services related to the creation of OER as well as the implementation of open pedagogy is explored through presenting the outcomes of the OER projects.

Keywords: Open educational resources; Open pedagogy; Collaboration; Sustainable development goals; Academic libraries – Switzerland

Open Science and Open Education

Open science is a movement that aims to make scientific outcomes more transparent, accessible, inclusive, and equitable (UNESCO 2021, [2024]). Two of the many aspects of open science are often anchored in the library; the first is open access

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https://doi.org/10.1515/978-3-11-133646-6-018

which is the practice of making scientific research and publications available to the public free of charge, with no restrictions on access or reuse (Max Planck Society 2003); and the second refers to open research data which is the analogous practice of making research data available for public access and reuse, aiming at a high transparency of the research process and findings as well as generating synergies in data collection (UNESCO n.d.a).

Although research is frequently considered the more prestigious area of university activity, teaching is a main function of any university. Open education is the natural corollary of open science in the evolution of openness in higher education institutions and has seen the development of open educational resources (OER) as "teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions" (UNESCO 2012, 1). OER can help make education more transparent and excellent teaching more visible. They are related to the idea of making educational and research materials more accessible and affordable to people around the world. In summary, OER are an important part of open science, because they promote open access to educational resources in a sustainable way.

In 2019, UNESCO adopted a recommendation on OER which reaffirmed the United Nations 2030 Agenda for Sustainable Development, recognised the importance of SDG 4: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" and underlined the importance of adequate resourcing for educational institutions, learner-centred pedagogical approaches, and the availability of open educational materials to all learners (UNESCO 2019). Subsequent work by UNESCO has emphasised the role of OER in other SDGs SDG 5: Gender equality, SDG 9: Industry, innovation and infrastructure, SDG 10: Reduced inequalities, Target 16.10: Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements, and SDG 17: Partnerships for the goals (UNESCO n.d.b).

Open Educational Resources

Open access has already been mentioned and refers to research material that is freely available and usually found in open access journals and institutional repositories. OER on the other hand are freely available teaching and learning resources made available under an open licence with a focus on re-use and re-distribution by others. The two concepts are closely related and not completely divergent. OER materials come in many formats including open textbooks, photographs, images

and videos on Wikimedia Commons, videos on YouTube or Vimeo, as well as whole courses of study such as Massive Open Online Courses (MOOCs). However, not all materials published on the web with free and open access can be regarded as OER. UNESCO (2012) regards open licensing as a clear requirement for OER. Copyright restrictions frequently inhibit sharing of information resources and vary from country to country. Creative Commons (CC) licences have been established as a global standard and are the primary tool of choice for use with OER. "Creative Commons licenses give everyone from individual creators to large institutions a standardised way to grant the public permission to use their creative work under copyright law" (Creative Commons n.d.b).

In a global community of educators and learners, the importance of CC licences becomes evident as they offer a standardised solution to overcome restrictions to disseminating knowledge and provide legal certainty. Once attached to a work, CC licences grant permission to distribute and republish the work without consulting the author. However, the licences come with certain conditions ranging from open, only requiring attribution to the author, original source and the licence (CC BY), to restrictive, stipulating that no derivative or adaptation is permitted (CC BY-ND) (Creative Commons n.d.b). Wiley's Open Education 5R framework exemplifies a set of permissions that are granted by the Creative Commons. These 5Rs of openness are: Retain, Reuse, Revise, Remix, and Redistribute (Wiley 2014).

The benefits of OER and Creative Commons are manifold. They allow educational resources to be shared across national or legal borders without additional barriers to distribution. OER support lifelong learning and promote global equity because reuse is free. In addition, OER support sustainability, the circular economy, improve the diversity and quality of educational resources through cooperation and exchange, and optimise efficiency (Muuß-Merholz 2020). For a university or school, OER provide an opportunity to showcase the expertise of the teaching staff, and of the whole university in specific subject fields. Adapting and reusing OER creates synergies and saves time.

OER can play a crucial role in advancing Education for Sustainable Development (ESD) in several key aspects (Braßler 2024; Roeder et al. 2017; Walsh 2022). Firstly, OER fit seamlessly with the policy objectives of ESD by making quality resources available to diverse learners worldwide to make informed decisions about interconnected global challenges (UNESCO n.d.b). Secondly, OER can transform learning experiences and learning environments for a lifelong learning journey (UNESCO n.d.b). OER-enabled class settings, in which students create their own materials for an open publication on the web in collaboration with their teachers, encourage active participation and collaboration and improve learning (Wiley 2013). In open pedagogy class settings, students engage with real-world sustainability challenges, co-create content, and explore interdisciplinary connections. Additionally, OER can

empower and mobilise youth by amplifying their voices. Youth-led OER projects can focus on challenges in the 21st century and how to tackle them, with for example a podcast that focuses on insects as a food source, or a paper challenging the idea of green economic growth (Zenodo 2022). OER serve as starting points for new didactic formats that support co-creation and student self-learning competencies, while also contributing to ESD which seeks to enable the achievement of the SDGs (United Nations n.d.a) through raising awareness, promoting critical and contextualised understanding, and mobilising action as outlined in the UNESCO *Roadmap* for ESD (UNESCO 2020, 16).

Open Educational Resources as Foundation of an Open Pedagogy

One of the core advantages of OER is, undoubtedly, expanding the pool of freely available teaching and learning materials worldwide. The introduction of OER can be seen as a core component of achieving SDG 4, Quality education, which aims to increase no- or low-cost access to high quality education and educational material, and thereby foster lifelong learning and equitable education worldwide (United Nations 2024). OER allow teachers to adapt instructional materials to address local contexts and meet the needs of particular students more effectively. Adaptations of existing OER can be published and shared with a wider audience under a CC licence. Sharing material more widely has the capacity to promote diverse and targeted individual learning opportunities in the classroom and to support lifelong learning. Open licensing facilitates collaboration among teachers beyond the borders of the classroom or school. The important role OER can play in advancing various SDGs has been widely discussed in the literature (Drevensek and Urbancic 2022).

OER can, however, be viewed as much more than providing content. When talking about OER, people mostly assume an end product such as a completed learning resource that can be shared with teachers and learners alike. But what if the concept is turned on its head and the focus is placed on the process rather than on the finished product? The emphasis on process rather than outcome is the basis of open pedagogy.

> Open pedagogy is the practice of engaging with students as creators of information rather than simply consumers of it. It's a form of experiential learning in which students demonstrate understanding through the act of creation. The products of open pedagogy are student created and openly licensed so that they may live outside of the classroom in a way that has an impact on the greater community (University of Texas at Austin Libraries 2024).

The Cape Town Open Education Declaration arose from a meeting in 2007 and can arguably be viewed as the starting point of the global OER movement. The Declaration notes the emergence of new pedagogical approaches made possible using OER:

> ... Educators worldwide are developing a vast pool of educational resources on the Internet, open and free for all to use... They are also planting the seeds of a new pedagogy where educators and learners create, shape and evolve knowledge together, deepening their skills and understanding as they go (The Cape Town Open Education Declaration 2024a).

In contrast to the current situation, where the use of the Internet and personal computers, laptops or mobile devices is ubiquitous in higher education in most parts of the world, many learning and teaching formats were still analogue when this declaration was developed. Before the widespread adoption of the Internet by educators and learners, the concept of open pedagogy was almost impossible to put into practice. It took time for the idea of sharing resources via the Internet to take root and develop. The Internet facilitates easy collaboration among learners and teaching staff through platforms such as collaborative workspaces, online discussion forums, wikis, blogs, and social media. Learners can now actively participate in the content creation process and students have the opportunity to showcase their knowledge to a broader audience beyond the classroom.

In 2018, a revised version of the Cape Town Declaration referred more explicitly to open pedagogy: “Some of the most exciting frontiers in open education are in open pedagogy, widely understood to consist of teaching and learning practices enabled by the ability to retain, reuse, revise, remix and redistribute educational materials” (The Cape Town Open Education Declaration 2024b).

OER are sometimes perceived as tools for addressing copyright issues that might limit teachers and learners from freely reusing and sharing educational content. Using OER makes the management of teaching materials more sustainable and increases accessibility. However, the concept of sharing can be further explored. OER can be used in a classroom setting to offer enriching learning experiences. Simply put, open pedagogy aims to incorporate OER into learning and teaching practice that considers students not as consumers but as shapers of knowledge. Open pedagogy recognises that students can be included in the global process of production and sharing of knowledge. Student output produced in class can be openly licensed and provided as OER to a wider audience outside the classroom.

Students can deepen their understanding of a subject through the creative process and then demonstrate it publicly. In addition to acquiring subject-specific skills, in producing a learning resource, students gain important competencies relating to digital communication, information literacy, media creation, and copyright including the use of CC licences. The act of producing and publishing resources

can be strongly motivating. Students have a voice in public discourse, a sense of self-esteem and self-efficacy and can add value to the world by sharing knowledge, instead of hiding it away. By sharing work undertaken and knowledge gained with a broader audience, students contribute to the collective creative commons in its original sense, providing building blocks to others for mutual benefit.

In more traditional teaching scenarios, students fulfil numerous tasks during their university careers to earn certificates of achievement for completing specific university modules of study; however, the teacher is usually the only person who examines the output. In many courses students spend countless hours creating reports, papers, and presentations, but after a module concludes, the effort is quickly forgotten, or the student output deleted. David Wiley coined the term "disposable assignments" to describe this outcome.

> These are assignments that students complain about doing and faculty complain about grading. They're assignments that add no value to the world – after a student spends three hours creating it, a teacher spends 30 minutes grading it, and then the student throws it away (Wiley 2013).

When creating these so-called disposable assignments, students must focus mainly on memorising and repeating already well-established facts. In the context of 21st century education which advocates moving away from memorisation of declarative knowledge or facts towards an increasing emphasis on information and media literacy, social and cross-cultural interaction, as well as communication and collaboration in learning, such disposable assignments provide limited added value for learners (Trilling and Fadel 2009). Focusing on procedural knowledge is not completely new. However, the open pedagogy approach aims to equip a teacher with a toolkit to envision and design a new type of teacher-learner interaction, as well as a broader teacher-learner-community interaction, and in most cases the student output can function as a performance record for a specific seminar or module. This new teaching approach requires that students are given the chance to produce OER in a course.

Open pedagogy might not be applicable in every setting. In some courses, or in some instances, such an approach might be challenging to put into practice and in many scenarios a standard lecture format, where students have to memorise and process a lot of factual knowledge, might still be the most appropriate way of teaching and learning. Research shows that some ideas from the Open Pedagogy Toolkit and the incorporation of OER aspects into teaching are beneficial to learners. Studies have noted that students' critical thinking skills increased (Hilton et al. 2020, 6), that it was motivating and rewarding to produce an output which a broader audience outside the classroom could access and utilise (Al Abri, Humaid,

and Dabbagh 2019) and that the creation of OER helped students improve their communication skills in giving and receiving feedback (Masterman 2016).

There are numerous ways to introduce open pedagogy assignments into the classroom and to transform a disposable assignment into a renewable assignment (Wiley 2016). An example often cited is writing new, or editing already existing, Wikipedia articles. Wikipedia is often a primary resource for students to obtain a basic introduction to a topic. In a sense, Wikipedia can be seen as a large open pedagogical project, where countless individuals share, correct, and expand knowledge globally. The platform serves as an ideal canvas for building the intellectual potential of students, engaging them in actively contributing to global knowledge generation through the creation or revision of Wikipedia entries and promoting dialogue with others who review and provide feedback on their input. The OER team tried to encapsulate this idea of giving ZHAW students a platform to take a stance in a public dialogue, while providing them with a sense of self-efficacy in the projects Students4OER I and II.

Establishment of Open Educational Resource Structures at ZHAW

Zürcher Hochschule für Angewandte Wissenschaften/Zurich University of Applied Sciences (ZHAW) is a leading university of Applied Sciences in Switzerland, located in Winterthur, Zurich and Wädenswil. It seeks to be scientific in its basis, practical in its orientation, and emphasises digital transformation along with sustainable development. ZHAW is committed to a culture of sharing which is embedded in its "Strategie «Bildung und digitale Transformation» 2018 bis 2029/[Strategy Education and Digital Transformation for the Years 2018 to 2029]" which makes specific reference to Open Educational Resources (ZHAW 2019, 4). An OER Policy was developed and approved by the ZHAW Executive Board in 2020 (ZHAW 2020). It highlighted the benefits of OER in impacting positively on the reputation of teaching staff and the synergies created by the use and reuse of shared learning materials among instructors. The OER Policy developed at ZHAW outlines two important points.

Firstly, the Policy aims to promote the use of OER in teaching and learning activities and encourages the creation and sharing of OER by faculty and students, and secondly, it stresses the importance of ensuring that OER are of high quality, accessible and compliant with legal and ethical standards (ZHAW 2020). The Policy encourages university staff members to release their learning materials under either the CC BY or CC BY-SA licences provided by Creative Commons (ZHAW 2020). These licence options are considered the most open, allowing easy adaptation

by people who want to reuse or repurpose the learning material. Content can be shared, copied, and redistributed in any format and adapted through remixing or transformation, provided appropriate attribution is given, and, with a share alike licence, using the same distribution licence as the original.

What conditions needed to be in place for the successful implementation of OER at ZHAW following the release of the OER Policy? Firstly, a dedicated team of people was required. The University Library's OER team has been in place since 2019 and has grown steadily since then. In 2024, there are 2.3 full time equivalent positions, distributed among four staff members, focusing on three key areas: training, one-on-one coaching sessions, and e-learning materials on OER and copyright; managing an OER community where faculty members can meet and network on projects and other OER developments within the ZHAW; and the establishment of an OER repository, which will be launched in 2024, for the publication of OER from ZHAW and other higher education institutions in Switzerland and for providing worldwide access to OER materials.

There are several reasons why the ZHAW OER team is based in the University Library. The University Library has always been an institution that collects, organises, preserves, and provides literature and educational materials to members of the university and to the public. The Library is a separate yet integral part of the University, serving all schools and disciplinary areas at ZHAW. It offers centralised services ranging from information provision to information literacy, open access and open data services, and provides learning and research infrastructure for students and faculty across ZHAW. The mission, values, strategic directions and staffing structures of the library make it an appropriate place for developing and implementing OER within the University.

The First Open Educational Resources Student Project at ZHAW

The Students4OER project at ZHAW had two main objectives: to inspire students about open educational resources (OER) and educational equity, and to enable them to create high-quality, legally-compliant OER on sustainability topics. The overarching goal was to increase the number of OER related to UNESCO's seventeen SDGs and to raise awareness about the SDGs among the students. The project sought to integrate sustainability aspects more deeply into teaching and learning environments at the University while enhancing the visibility of sustainability topics beyond the University.

To initiate a cultural change towards a culture of sharing, it is crucial to include students in the process and introduce them early in their careers to the concept of openness, addressing copyright restrictions associated with traditional educational materials and the limitation they pose for global equity in education and lifelong learning. Furthermore, emphasising the connection between openness in education and the promotion and development of the seventeen SDGs is essential. In the Student4OER project, the ZHAW OER team of the ZHAW University Library aimed to encourage students to reflect on and experience the creation of OER and the culture of sharing in education in practice.

A project proposal called "Students4OER: Sustainability through Sharing" was submitted to the ZHAW Sustainable Impact Program (SIP) (ZHAW n.d.a). SIP is a funding body that supports the initiatives of university staff and students which are linked to sustainable development. The financial support allows for collaborations between staff and students, between projects and with external research-oriented partnerships with an inherent sustainable development ethos.

The first Students4OER project ran during the 2021/22 academic year with preparations starting in October 2021. The implementation took place during the Spring term of 2022. It was set in a competition format to entice students from all eight schools of the ZHAW to take part, with prizes being awarded for the creation of high-quality OER under CC licences. The submitted OER had to be related to at least one of the seventeen SDGs from the UN 2030 Agenda. By publishing OER on a sustainability topic, students had the opportunity to contribute directly to Goal 4, aiming for "inclusive and equitable quality education and promote lifelong learning opportunities for all" (UNESCO n.d.a), and to actively engage as promoters and players in connection with any of the UN's goals. In addition, they could participate in public dialogue, sharing their perspectives and methods of knowledge presentation, in this way enriching the diversity of existing teaching materials on their chosen topic.

As a starting point, a website for the Students4OER project was set up, intended to serve as a landing page that included information about the competition, SDGs and further details about training and information on OER and the CC licences (ZHAW n.d.b). It outlined participation conditions for the competition, the process of submission, evaluation criteria for successful contributions, use of data, and details about the award. The students were required to upload their submissions via a Moodle course. Moodle is the University's learning management system, and all members of ZHAW have access to it. However, it is a closed environment, and the course was not open to the public, as the submissions had to be checked for quality and technical requirements. Successful submissions that demonstrated a high academic quality and could be legally published as OER were accepted and published on Zenodo.org, Group: Students4OER ZHAW Winterthur (Zenodo 2022).

Choosing the right publishing platform was not an easy task for the OER team as there was a lack of available public repositories for OER at the time. There are existing Open Access repositories, such as the University's own ZHAW digitalcollection (ZHAW n.d.c); however, the diversity and nature of OER, its data and file formats, required a different sharing solution. Another important factor was compliance with Swiss regulations and data protection laws. Therefore, a platform needed to be chosen that was open and accessible to the public, could manage CC licences and a diverse range of file formats, was compliant with local laws and regulations, and well-established in the academic community. Although Zenodo focuses mainly on open science content and less on educational materials, it proved to be the best solution for the students' OER at that time.

Engaging Student Interest: The Campaign and the Competition

As a first step to gaining support for the competition and to promoting it among students across ZHAW, the OER team reached out by email to over 140 lecturers from all schools. The lecturers contacted were either involved in the ZHAW OER community (ZHAW n.d.d), had been identified as participants in the sustainability working group, or were lecturers in programmes with sustainability-related topics. The marketing campaign focused on the distribution of printed postcards and stickers with QR codes to enhance the visibility of the competition (Figure 17.1). The promotional materials were sent to the lecturers who were willing to distribute them to students during their lectures and seminars. The initiative proved successful. With the support of the teaching staff, the OER team distributed 1,200 postcards and 1,100 stickers to students. In addition, the team was invited to make brief presentations about the competition in seminars and lectures, which resulted in approximately 250 additional students being reached.







Figure 17.1: Marketing materials in the competition. CC BY 4.0 ZHAW University Library 2022. Postcards based on photographs from: Bernt and Bernt 2015; Seattle Parks and Recreation 2011; Slitho 2015

A further 200 students were reached by distributing croissants at school entrances and providing brown bag lunches across the University's three campuses to raise awareness and provide brief details about the competition, OER and the SDGs. The various events gave students the opportunity to discuss societal and global challenges, plan their submissions, and engage with the OER team. The discussions undertaken with students while providing them with a free bag lunch on campus or during lectures, were extremely valuable for the library team to gain insights into students' knowledge of OER, copyright, Creative Commons (n.d.a), and the SDGs. The students were unaware of copyright restrictions but had a very positive attitude towards sharing materials and showed a keen interest in the concept of

the CC licences. While they were all well-informed about challenges such as climate change and food waste, not all of them were aware of the whole spectrum of the seventeen SDGs. The OER project contributed to promoting the SDGs among students in a broader sense.

Although the marketing campaign focused on distributing printed materials offline, it also efficiently utilised online channels. In the competitive field of social media, campaigns often struggle to reach their intended audiences. The postcards with their recognisable images that were used in the campaign minimised the risk of being dismissed as irrelevant online. The team received support from ZHAW students' union, Alias, used social media channels frequented by students, and in addition disseminated information on display screens across the three campuses. Project funds provided the funding for advertising materials.

The competition commenced on February 10, 2022, and gave students over two months during the Spring term to complete and submit their OER by April 18, 2022. The time frame aligned with semester dates, avoided exam periods and included time students could use during breaks to work on their materials. Throughout the competition, students took the opportunity to send email enquiries, allowing the OER team to provide additional input and feedback on Creative Commons and OER.

By the end of the competition, twenty-one contributions had been submitted by twenty students across five schools using the Moodle platform. The formats ranged from videos, podcasts, article, posters, presentations, maps to games. The judging panel consisted of lecturers from the ZHAW schools as subject experts, who supported the OER team in shortlisting the entries. Fifteen works were deemed excellent in terms of content, while six works required substantive revisions before potential publication. The assessment influenced the selection of the winners. Another consideration was reference to at least one of the seventeen SDGs (United Nations n.d.a) in the content. One submission explored difficulties and barriers associated with achieving sustainable economic growth which related to SDG 8: Decent work and economic growth (Camenisch 2022). Robin Portman (2022) submitted a paper exploring how education influences the professional identity of social workers who view themselves as key players in achieving social sustainability and developed the argument in the context of SDG 4, Quality education, and, particularly, the ESD *Roadmap*, which offers a potential approach including five key areas of action: advancing policy, transforming learning environments, building teaching capacity, empowering and mobilising young people, and accelerating local action (UNESCO 2020). These areas can serve as starting points for social work interventions (Portman 2022, 5). Simona Flühler and Alexa Strahm, a student team, collected and reinterpreted twelve of the seventeen SDGs for potential implementation in specific areas of facility management (Flühler and Strahm 2022). References

to SDGs were evident in all twenty-one submissions. Further evaluation criteria included compliance with copyright regulations and the application of a CC licence.

The judging panel selected the best OER from the initial submissions in Moodle and the OER team supported the students in preparing their materials for publication on Zenodo. Extensive guidance on the application of the CC licence was still required. Creating and releasing resources as OER require technical knowledge of copyright and CC licences as well as the correct process of applying the open licences. Third-party materials used in some instances were not under open licences and usage rights needed to be clarified. In the case of student group work, permissions from co-creators needed to be sought. The publication process is complex, and the extent of guidance required from the OER team for the students cannot be underestimated. Ten of the twenty-one submissions met all the criteria and were published on Zenodo under CC licences (Zenodo 2022).

Award Ceremony and Closing Reflections

A closing event was held on Friday, May 20, 2022, at the cafeteria of the University Library in Winterthur (Klein 2022). Students from the School of Applied Linguistics were actively involved in its preparation. The student team involved comprised six students who were completing an event management module and the Students4OER project gave them valuable insights into project and event management. OER team members had the opportunity to design the event with and for students. It was important to hold a roundtable discussion with participating students, staff involved as subject experts, members of the judging panel, those involved in the OER community as active OER champions, and library staff. The discussion highlighted the students' desire for assessments and student work which resulted in a visible impact on the public and engagement with the SDGs. The students thought that creating and sharing OER could be the answer to making an impact beyond the classroom. From the lecturers' point of view, not all material created during the project was academically sound or relevant to third parties. Further subject expert input was required which often increased academic workloads.

Nevertheless, the OER project provided the opportunity for students to become experienced with publishing on social media and open platforms, which is vital for emerging scholars. At the end of the night, four winners were given prizes between CHF 500 (€ 515) and CHF 200 (€ 206). All other successful candidates received a voucher for an outdoor store. The prizes, as well as the vouchers, were funded from the project funds provided by ZHAW SIP.

Overall, the project was received well by students and lecturers involved and supported strongly across the board by the ZHAW SIP, ZHAW digital, the Univer-

sity Library and, not least, by teaching staff across ZHAW schools. The project's challenges lay in the complex mix of academic subject matter, copyright restrictions, open licences, and the full range of SDGs. The OER team's expertise and resources helped resolve copyright-related questions and the proper application of open licences. However, the level of support and financial funding for the project exceeded normal allocations to services typically offered by libraries. The existence of an established OER community enabled the OER team to leverage contacts already in place through extensive outreach efforts. Another aspect highlighted in the discussion roundtable showed that developing OER in a module with first-year students who are at early stages of their academic journeys can be resource-intensive for teaching staff. The project provided the team with valuable insights into growing OER in an institution such as the ZHAW. The reflections on the outcomes and challenges led to a comprehensive reconsideration of the initial project, resulting in a new project proposal based on the findings and insights gained from the first iteration.

The Second OER Student Project in Cooperation with ZHAW Teaching Staff

The first Students4OER project was solely managed by the University Library. The Library's OER team managed the project from the initial proposal through to posting of content on the Zenodo site. The team mobilised the broader ZHAW OER community and involved faculty who played crucial roles as facilitators. The Library organised the project as a student competition, organized the judging panel, as well as the closing event with a roundtable discussion and award ceremony, and communicated the project outcomes in blog and community posts, and conference presentations.

The initial project Students4OER focused on the creation of OER by students and on increasing the availability of learning materials related to the seventeen SDGs for learners globally. The primary goal was to introduce the students to the culture of sharing early in their academic journeys, encouraging them to reflect on and carry the concept into their future work environments. The concluding roundtable discussion among students, teaching staff, and the Library, highlighted that students wanted to create and co-create meaningful learning materials in their courses of study, instead of merely taking exams or writing assignments "for the bin" (Wiley 2013). A valuable insight gained by the OER team and the Library was that open education extends beyond the preparation of materials; it is deeply rooted in the learning process. Another learning for the OER team was that the

competition Students4OER came with a high workload and needed project funding for marketing materials, snacks in lunch break lectures and for the closing event, as well as student awards. Due to the need for additional funding and resources, keeping the project running over an extended period for new students entering the University each year, would not be feasible. Following these insights and the student feedback during the project, the OER team focused constructively on more sustainable ways to support the creation of OER by students and to make them aware of the culture of sharing without reliance on additional project funding in the long run. A new project idea was developed in which the creation of OER was integrated into existing teaching scenarios and courses at ZHAW.

Cooperation with Stakeholders at ZHAW

It was clear that the Library could not continue to manage such a project on its own which was a key learning for the OER team. The Library is not able to advance topics like OER and open pedagogy by itself. Open education is a cause which teaching staff must embrace personally and individually for it to thrive at the University and beyond. The Library can, however, initiate the discussion, launch projects, create awareness, and teach both faculty and students about copyright issues, CC licensing, and publication platforms, and create infrastructure and networks among university teachers.

The Library's search for a cooperative partner for a follow-up project to Students4OER benefitted from the previous outreach work and networking activities by the OER team. Introduction to OER in lunch lectures at the ZHAW schools, educational meetups and similar events, the establishment of an online OER community at ZHAW, and regular visits to networking events held by University sections like the Digital Futures Lab all laid a solid foundation for reaching out to potential project partners. The OER team found early adopters and OER champions from the ZHAW School for Life Sciences and Facility Management who had been working with open-source software for the development of their own teaching materials for some time. In addition, as teaching staff of the ZHAW Institute of Natural Resource Sciences (IUNR), they were already engaged with ESD and had already worked with students on topics such as movement patterns of wild boar in Swiss agricultural landscapes (Laube et al. n.d.).

Project Details, Open Source and Co-creation

The ZHAW Sustainable Impact Program accepted a second project proposal in September 2023. The follow-up project entitled *Students4OER II: Working with Open-source Tools and Co-creation as Part of the Curriculum* was led by the teachers of the ZHAW School for Life Sciences and Facility Management. That teaching staff took over the lead was exactly what the Library had been hoping for; it represented a significant step forward in putting OER and open pedagogy into practice and actively living the culture of sharing at ZHAW.

In the second project, the collaborative team included members from the Library and the School for Life Sciences and Facility Management, and sought not only to create OER within the classroom, in co-creation with the students, but also to promote the use of open-source tools for teaching and in the learning process, rather than relying on proprietary software. Open source is an equivalent to open science and open education in terms of sharing materials on the web free of charge for other users and refers to computer programmes in which the code is made available for use or modification and released under a licence which determines its use by others who can download, modify or reuse the code, and return it to the community for wider use.

The collaboration with the teaching staff proved to be highly beneficial for the OER team to develop a new perspective on opening up education and expanding educational opportunities. The teachers not only focused on open licensing and making teaching materials available as OER for reuse and redistribution by third-party users, but also concentrated on tools for creating learning materials. These tools enabled technical accessibility, met the technical requirements for reuse and facilitated cooperation in the creation of learning materials with the students. Open-source tools can be a valuable instrument in bridging the gap between students and teachers since they are specifically designed for co-creation in a truly democratic manner. They can empower students to improve learning materials, granting them equal status with teachers. Open-source tools enable students to create modern, dynamic, and engaging reports for their own projects and provide platforms for instant publication and the development of project outcomes.

The second Students4OER project comprised three parts:

- Inviting students to comment on an existing textbook on GitHub, an open platform for building and distributing software
- Enabling students to create materials themselves, making use of open-source tools like GitHub or Quarto, a scientific and technical publishing system. The students were required to address the SDGs not only in terms of making available quality educational materials to all specifically in relation to SDG 4, Quality education, but to create materials on one of three topics on ecological

sustainability: biodiversity involving the movement of deer, counting visitor flows in a wildlife-park, and urban agricultural ecology, and
– Achieving a broader and more long-term implementation of open-source tools for open knowledge creation and open pedagogy in courses at ZHAW by offering training to facilitators and a group of teaching staff, equipping them with the necessary skills and knowledge to apply open-source tools effectively in their own courses.

The Role of the Library, Challenges, and Status Quo

In the collaboration between teaching staff of the ZHAW School for Life Sciences and Facility Management and the OER team, the role of the library team was to ensure that legal matters in copyright and open licensing with CC licences were taught to, and considered by, students as well as teachers when publishing teaching materials and producing outcomes using open-source tools. The inclusion of the OER team facilitated a transfer of project results across schools and disciplines within the University. Importantly, the OER team initiated the project, identified suitable funding sources at ZHAW, and collaboratively created the project outline and proposal with the teaching staff.

The main responsibility and workload in the project lay with the teachers, and still does. They opened up their own textbook material on GitHub (Dengler et al. 2022) and included the students as editors. The students were able to comment, develop materials, and provide direct feedback. A challenge proved to be that answers to tasks should not be visible to students within the textbook before they solved the tasks, but as editors they could not be excluded. Alternative material was identified and converted from PDF to markdown language on GitHub. Three vouchers for fair trade and ecological supermarkets were awarded in a raffle to motivate students initially to undertake editing on GitHub, watch the tutorial on collaborative editing of textbooks (Ratnaweera 2023), and comment on the textbook. A successful response with forty-four comments and suggestions, more than expected, was received within three months.

A major challenge in the project has been the tight schedule and limited amount of time with the students. In the master's module, students already face a substantial workload with new subject matter to process, even before being introduced to additional learning content on open-source tools, CC licences, and OER. The OER team was pleased to be invited to a class of fifty students to introduce the concepts of opening up content for redistribution with CC licensing, and OER as solutions for challenges posed by copyright restrictions on the web. Beyond learning about platforms and ways to make content public, students were able to discuss the reuse

they would allow for their work along with the importance of open licensing for reuse and distribution as well as the adaptation of the materials by others.

A next step in the project will be to offer a course on the open-source tool Quarto to facilitators from the School for Life Sciences and Facility Management. This course will be organised by the teachers as project leads. A further step in the project for the OER team involves the dissemination of project outcomes across ZHAW.

Conclusion

According to UNESCO (n.d.b), OER contribute to the United Nations Sustainable Development Agenda 2030 by addressing several SDGs connected to learning, research and innovation, equality, and the protection of fundamental freedoms. Open pedagogy can be a starting point for new approaches to teaching and learning in which students become co-creators and develop their own projects for open publication on the web. OER provide the opportunity for the introduction of ESD into the classroom and make information on the SDGs from diverse perspectives more widely available and accessible.

At ZHAW in Switzerland, the OER team is embedded within the University Library and is in an excellent position to promote the use of OER across the institution. The OER Policy strategically anchors the issue of openness in education at ZHAW; additional staff resources have been provided; and the positive response from teaching staff at ZHAW is helping move the topic forward. The community's support and involvement were crucial in implementing the two Students4OER projects. Without the support, the projects would not have been possible. Networking and awareness raising are vital starting points for any library seeking to foster openness in education within its institution.

In the process of dialogue with its community, the OER team's thinking about openness in education evolved from focusing on OER as learning materials, to open pedagogy as a vital teaching and learning process, which eventually led to the creation of new OER. The change of perspective represents a user-centred approach inspired by the roundtable discussion of the OER projects among students, teachers, and librarians, and by reflections on project developments, requirements, and outcomes. For librarians it may seem natural to focus on content to be stored and made available to users free of charge. For teachers and students, theories of teaching and learning and the creation of effective, timely teaching and learning opportunities are more relevant drivers of openness in education.

During the second OER project, the Library's OER team learned that the teaching staff focused on publishing content using open-source tools, and that open licensing played a rather minor role. Reflecting on the use of open-source tools for truly democratic co-creation of learning materials in the classroom and granting technical accessibility and reuse, was extremely valuable for the OER team for future OER projects and for the support of ZHAW teaching staff. The OER team recognised, however, the need to explain licensing and to promote CC licences as tools for adaptation and distribution of materials into different cultural, technological, or language settings. OER materials that, according to the UNESCO definition (2012, 1), contain open licences, can make stronger contributions to the SDGs and to equity in education than material that merely grants open access to resources.

The Library operates as an independent, neutral entity within the University and is strongly positioned to advance the theme of openness in education. It advocates for the topic both university-wide and beyond and provides essential support services for teaching staff which include knowledge transfer about copyright and licences, publishing OER, and maintaining and organising the OER community.

Handing over the lead on OER projects to faculty seems to be the right way to progress openness in education and ESD. While the Library's role primarily relates to facilitation and support, it also serves as a central hub for OER within the University and should promote and embrace openness in education along with education for sustainable development and encourage teaching staff and students to do the same to achieve long-term success on a major scale.

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18 Integrating Education for Sustainable Development into Philippine Library and Information Science Education

Abstract: The adoption of the UNESCO Education for Sustainable Development (ESD) for 2030 *Roadmap* (UNESCO 2020) aims to fulfil the United Nations Sustainable Development Goal 4: Quality education (UNESCO n.d.b), in all education systems globally. This chapter presents how higher education plays a vital role in the achievement of the United Nations Sustainable Development Goals (SDGs) and how Philippine Library and Information Science (LIS) education aligns with the ESD framework (UNESCO n.d.a) in its curriculum, pedagogy, research and community extension. The chapter also demonstrates that Philippine LIS education provides courses within its programmes that constitute avenues for the achievement of the SDGs without formal acknowledgement in the curriculum. Service to diverse communities, among other values, is one of the tenets of librarianship, and the strategies used to embed such service within the Philippine LIS curriculum are outlined, with a focus on the unique position of the University of the Philippines School of Library and Information Studies (UP SLIS) as the leading library school in the country.

Keywords: Sustainable development – Study and teaching – Philippines; Library education – Philippines; Information science – Study and teaching – Philippines; University of the Philippines School of Library and Information Studies

Introduction

In a knowledge-driven society, education stands as the key factor to navigating the complexities of a highly technological and interconnected world. In 2015, the United Nations created the seventeen Sustainable Development Goals (SDGs) (United Nations n.d.a; United Nations Development Programme 2024; York University [2024]). In 2020, UNESCO as the United Nations' specialised agency for education adopted the Global Education 2030 Agenda and put forward *Education for Sustainable Development: A Roadmap* (UNESCO 2020) with the aim of fulfilling SDG 4, Quality education (United Nations n.d.b) in all education systems globally. With the shift to online services during the pandemic, the rapid development of technology, globalisation, climate change, and the threats of misinformation and disinforma-

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https://doi.org/10.1515/978-3-11-133646-6-019

tion, the importance of education became even more apparent and has never been more pronounced.

Higher education plays a vital role in the achievement of the SDGs. Education in library and information science (LIS) can align its curriculum, pedagogy, research and community extension with the education for sustainable development (ESD) framework. The University of the Philippines School of Library and Information Studies (UP SLIS) plays a prominent role in LIS education in the Philippines. Its programmes emphasise the longstanding tradition of serving diverse communities within the librarianship profession.

In 2023, President of the International Federation of Library Associations and Institutions (IFLA), Barbara Lison, underlined once more that libraries play an important role in achieving the SDGs: "None of these goals can be achieved without access to information" (Lison and Hinz 2023). This call for libraries to participate in achieving the SDGs was not the first. IFLA has long advocated for measures towards sustainable development. IFLA President Glòria Pérez-Salmerón remarked in the Foreword to the 2018 *Global Vision Report*:

> I truly believe that universal access to information has to be the key goal for humanity today. If we achieve this, we will see benefits across the board, around the world. We will reach the UN Sustainable Development Goals (IFLA 2018, 2).

In line with the IFLA efforts towards contributing to the achievement of the SDGs, the Philippine Librarians Association (PLAI) conducted the second Leadership Convergence in June 13–14, 2018. The Leadership Convergence is a venue for the discussion of issues and concerns faced by the profession and a forum for finding solutions. In 2018, the activities included the discussion of the professional and research agenda, reviewing the amendments to RA 9246, the Act "modernizing the practice of librarianship in the Philippines" (Philippines 2004) and providing a workshop relating to the IFLA Global Vision, which validated the direction of Philippine libraries and LIS schools in incorporating multiculturalism, ethics and community engagement (Raquiño 2018). At that time, the curriculum of the Bachelor of Library and Information Science (BLIS) at the University of the Philippines School of Library and Information Science (UP SLIS) was being updated, and the revisions reflected the goals of the IFLA *Global Vision* and the UN SDGs. IFLA's focus is on how libraries are able to meet the SDGs, and various studies have been conducted on the participation and roles of libraries. However, only a few have documented the role of LIS education in shaping library leaders who are able to fulfil such goals. This chapter adds to the literature about how LIS schools contribute to the fulfilment of the SDGs.

Education for Sustainable Development in Higher Education

The achievement of the seventeen SDGs within a timeframe of ten years is the main goal of the ESD framework. By 2030, it is hoped that a more just and sustainable world will be achieved (UNESCO n.d.a, n.d.b). The implementation of the ESD framework begins with kindergarten, primary, and secondary education and continues all the way through higher education. It is embedded in pedagogy, and in the knowledge, skills and values that learners acquire in their lifelong education. The aim is that by 2030, the education sector will have produced learners who are able to adopt sustainability practices themselves and promote sustainability programmes, projects and policies within and across all sectors in society. Higher education is the final phase of formal education before one enters society (Y. Li, Liao, and J. Li 2023), and provides the opportunity for students to engage in multidisciplinary learning and community involvement which are key to enabling learners to become leaders and central to understanding global challenges to which they can provide solutions.

UNESCO's ESD *Roadmap* described education for sustainable development as:

> ESD is a lifelong learning process and an integral part of quality education that enhances cognitive, social and emotional and behavioural dimensions of learning. It is holistic and transformational and encompasses learning content and outcomes, pedagogy and the learning environment itself (UNESCO 2020, 8).

ESD is general in its implementation at a basic education level; a different perspective operates at a higher education level. Sustainable development is a complex and broad term, and concerns about sustainability differ across countries and sectors of society (Hofman 2015, 214). Integrating sustainability into education involves a change in the way one views the goals of education and a change in focus from what students learn to how students learn and why instructors teach what students need to learn, with a focus on human and moral responsibility (Hofman 2015, 216–217).

Since sustainable development requires people to change their ways, education must develop students who can think for themselves and decide how to choose and act responsibly to effect the needed change. An action-oriented approach to teaching and learning is required to support behavioural change, whether teaching environmental concerns, economic issues, or societal injustice. Enabling students to take constructive actions toward making a difference in relation to such issues will create a positive and lasting effect on them that transcends the classroom setting. Regardless of the discipline or specialisation, sustainability can be integrated into discussions or in-class activities. For ESD to be effective, it must be

integrated not only into the topics under discussion but also into pedagogy and it must also embody an integrative and interdisciplinary approach to learning.

> In order to overcome the problems and challenges facing society, cooperation between different disciplines and methods is required. It would be worthwhile for education to formulate an aim at a meta-level that advocates a form of learning that raises awareness of individual, social, economic, and environmental perspectives in societal development (Hofman 2015, 219).

ESD in higher education is implemented in various ways: incorporating sustainability literacy into the curriculum; developing and promoting ethical and critical thinking; enabling learners to have a global and multicultural perspective; empowering learners for leadership roles and community engagement; and developing capacity for lifelong learning.

Sustainability Literacy

Sustainability literacy "indicate[s] the skills, attitudes, competencies, dispositions and values that are necessary for surviving and thriving in the declining conditions of the world in ways which slow down that decline as far as possible" (Stibbe and Luna 2009, 10–11). A comprehensive discussion of sustainability including both environmental and societal concerns provides learners with a holistic perspective. With an all-inclusive rounded approach, learners gain greater insights into environmental concerns, hunger, poverty, inequality, economic development and gender issues, and appreciate the inter-relationships. A broad view of sustainability can be incorporated into discussions within general education courses as well as specialised or major courses, and foster a deep understanding across multidisciplinary fields.

Critical, Reflective and Ethical Thinking

Sustainability literacy should be coupled with critical and ethical thinking. "In the process of developing both sustainable development and action competence, reflection and critical thinking are important aspects" (Hofman 2015, 220). Higher education institutions must encourage a mindset that considers others more than oneself and enables learners to analyse complex issues critically. Learners will consequently be able to craft solutions to sustainability concerns rooted in ethical considerations. Developing critical thinking ensures the ability of learners to navigate the intricacies of environmental and societal concerns regardless of the context

or locale. In addition to critical and ethical thinking is reflective thinking, where learners explore current systems, frameworks and structures to consider and evaluate them, asking the question why, in order to devise means to introduce change.

Global and Multicultural Perspective

Related to critical and reflective thinking is the development of a global and multicultural perspective. Taking a worldwide open view is vital in achieving worthwhile solutions while acknowledging differences across society. By providing students with a variety of perspectives and experiences through public relations work, internships and immersion in both local and global environments, institutions can enable learners to appreciate the complexities of sustainability on a global scale. Through engagement with a wide range of challenges, students can develop solutions that are inclusive and culturally sensitive.

Leadership and Community Engagement

By encouraging students to engage actively with their communities and by building leadership capacity through multidisciplinary learning, higher education can build the leaders of tomorrow who have the capacity to provide solutions which will achieve the SDGs. Through community initiatives, students develop practical skills, empathy and a sense of responsibility which prepare them to lead sustainable initiatives.

Lifelong Learning

Higher education institutions must prepare graduates who want to continue their learning throughout their lives and stay informed. Universities foster a culture of continuous education and adaptation. Encouraging students to think outside the box within the classroom will enable them to think of innovative solutions in the real world and take action for people and the planet.

Library and Information Science and Education for Sustainability

Libraries promote universal access to information. Having equitable access to information promotes a democratic, just society and a sustainable planet. To echo the call of former IFLA President Glòria Pérez-Salmerón:

> We, librarians, have the utmost responsibility to use all our skills and efforts to open these gateways ever wider for the benefit of our societies. We do not need to follow change; we can drive it; we can be the motors of change (IFLA 2018, 2).

The education of librarians must be grounded in principles of facilitating information access to enable societal structural change. Libraries must be transformed to become not just keepers of books but also gateways to information.

Information access and effective use of information are important for the achievement of the SDGs. Libraries promote equity of access, and LIS education lays the foundation for librarians who are able to provide library services that deliver such access. Green literacy initiatives have been around for decades, and with their implementation, libraries have flourished. The IFLA Green Library Award commenced in 2016 and has encouraged libraries all over the world to develop library spaces, facilities, programmes and services that contribute to solutions for environmental problems (IFLA ENSULIB 2024). Despite the lack of formal sustainability courses in LIS programmes, librarians have responded to the call; they have incorporated the discussion of sustainability in information literacy programmes, and have participated in greening library initiatives (Hauke 2018, 2–3).

The green library movement supports SDG 11, Sustainable cities and communities (United Nations n.d.e). This SDG is supported by the Philippine government, and is geared towards making cities and human settlements inclusive, safe, resilient and sustainable, for example by providing access to "inclusive, accessible, green and public spaces" (Philippines. National Economic and Development Authority n.d.).

Library Education and Sustainability

Even if librarians personally take the initiative to equip themselves with the knowledge and skills to address the SDGs, it is important that LIS schools make it their responsibility to educate future library leaders. In LIS programmes, the education and training of students are typically geared toward inculcating the importance of community building, diversity and multiple perspectives in problem-solving (Jan-

kowska, Smith, and Buehler 2014, 52). Whether these topics specifically mention SDGs or not, they are geared toward addressing at least some of the SDGs and sow the seeds for positive societal impact.

The iSchools were formally established as a group in 2005. They comprise the library schools or library science programmes that have focused on the study of information beyond books and libraries (Zuo, Zhao, and Eichmann 2017, 52). Their main goal is to bridge information, people and technology (Chowdhury and Koya 2017, 2131), a transformative move that ensures the development of information professionals who can lead the changes needed to deliver the SDGs.

The focus of librarianship used to be on collections and services within libraries, but with the emergence of the iSchools, the emphasis was placed on how people used information in their daily lives. The development of information systems, informatics, information ethics and information and technology for communication and collaboration have been included in LIS curriculum and research (Zuo, Zhao, and Eichman 2017, 1271). The inclusion of humans in the mix of information and technology impacts the role of information professionals in conducting sustainable information practices. A sustainable information practice involves the use of appropriate technologies in the creation, storage, access and dissemination of data and information available for all sectors and processes within an organisation or community. The iSchools framework for teaching and research for promotion of the SDGs includes:

- sustainable information systems and infrastructure
- sustainable information practices
- sustainable information policies and governance, and
- sustainable user education, training and literacy (Chowdhury and Koya 2017, 2134).

Library and Information Science Education in Southeast Asia

The development of LIS education in Asia has experienced three stages: library science, information science, and information/knowledge management (Khoo, Majid, and Lin 2009, 196–198). The third stage has involved the use of information and communication technologies (ICT) as tools for managing information and serving the needs of the community and transformed the focus from the confines of the four walls of the library to immersion in the community. The changes in direction have prompted the expansion of the curriculum, alternative pedagogical approaches, new research endeavours and community outreach to meet

the evolving demands of the digital age. The role of information professionals has expanded to include harnessing the potential of ICT to address the diverse needs of society. LIS education plays a dynamic role in nurturing future leaders able to develop programmes and services aimed at achieving the SDGs. By equipping students with information management skills, technological skills and community involvement, LIS education is positioned to become an instrumental agent in cultivating and providing impetus to sustainable development projects and initiatives.

The change in perspective from traditional to informational has catapulted LIS education into interdisciplinary collaborations and cross-sectoral partnerships, resulting in projects and services that are embedded in the community. While the changes run parallel to the iSchools framework, only a few library schools in Asia have joined the iSchool group. Nevertheless, there has been an increase in the development of information services and information research in specific community sectors. The past two iterations of the Asia-Pacific Library and Information Education and Practice (A-LIEP) Conference in 2021 and 2023 showcase research from LIS educators and practitioners on topics such as the information needs and behaviours of the elderly (Yi, Bingyu, and Lu 2021), internally displaced people (Martinez and Obille 2021), indigenous persons and indigenous knowledge (Jarusawat 2023), sexual information behaviour (Sacramento, Sipin, and Trovela 2023), emotional healing (Sheih and Tsai 2023) and learning spaces and user needs (Yue 2023). These research studies sought to determine how specific community sectors can be understood and problems alleviated by information systems solutions. From the published curricula of some LIS schools in Southeast Asia, it can be seen that LIS schools support research activities relating to information services for different communities and details on various countries in Asia are provided in the following.

Indonesia

The emergence of library and information science education in Indonesia can be traced back to the 1950s when training for library staff was initiated by the Indonesian government, developing into the Library Sciences Study Program in the Faculty of Humanities, at Universitas Indonesia, Jakarta (Priyanto 2016, 260). LIS is offered in various universities and at different levels, such as diploma, undergraduate and master's.

While online and publicly accessible descriptions of LIS programmes in Indonesia do not mention the SDGs, some courses include community engagement, for example, *Kuliah Kerja Nyata (*KKN)/Community Service and *Praktek Pengalaman*

Lapangan (PPL)/Field Practice (Labibah et al. 2023, 185). The research activities at Universitas Indonesia for the Department of Library and Information Science give prominence to the SDGs. At some library schools, students are given the opportunity in their field work to work through community engagement to "develop or 'renovate' libraries that do not run well" (Labibah et al. 2023, 188) and become involved in identifying the community's social needs, and the teaching of information literacy skills. Community engagement programmes, in their varying formats, are guided by the following principles expounded by others (PennState College of Agricultural Sciences n.d.): "planning and preparation; inclusion and demographic diversity; collaboration and shared purposes; openness and learning; transparency and trust; impact and action; and sustained engagement and participatory culture" (Labibah et al. 2023, 185–186). Focusing on inclusion and demographic diversity promotes SDG 10, Reduced inequalities (United Nations n.d.d), by enabling students to understand the different economic, societal and cultural backgrounds of their clients, and to address their information needs (United Nations n.d.). Equipped with such knowledge, students are able to develop holistic libraries and services for their clients.

Malaysia

Library and information science education in Malaysia commenced in 1955 through the Malayan Library Group (MLG) now known as the Persatuan Pustakawan Malaysia (PPM)/Librarians Association of Malaysia, which conducted classes to prepare trainees for librarianship (Edzan and Abdullah 2003, 1). Formal courses were offered by the Institut Teknologi Mara (ITM) now known as the Universiti Teknologi Mara for "students sitting for the United Kingdom Library Association examinations" (Mohd Saad, Mohamad, and Mohd Nadzar 2012, 69). LIS education began slowly in Malaysia and developed gradually with programmes being offered at various levels from bachelor's to doctorate. Similar to trends elsewhere in Asia, the development of Malaysian LIS education was initially traditional, but then developed into a technology-oriented programme. Surveying publicly available curricula among LIS schools in Malaysia shows that the programmes still adhere to the core LIS curriculum, such as management, information storage and retrieval, information services, user needs, information seeking behaviour, ICT and research. While seemingly traditional, LIS education in Malaysia has developed to align with professional, governmental, national and societal needs. "As in many Asian countries, globalisation and networking [have] required LIS education in Malaysia to keep up with trends worldwide as a means to respond to the changing information environment" (Mohd Saad, Mohamad, and Mohd Nadzar 2012, 73).

Singapore

The Wee Kim Wee School of Communication and Information (WKWSCI) of the Nanyang Technological University (NTU) offers a Master of Science in Information Studies, which is the only professional LIS programme in Singapore (Khoo et al. 2004, 38). Its Master of Information Science programme incorporates courses that partially address the SDGs, such as Information Professions: Heritage, Values and Ethics; Disinformation and the Information Professions; and Research Methods in Human Information Behaviour (Nanyang Technological University 2024). The course on disinformation, for example, can help enhance critical thinking skills, enabling students to be more disciplined in discerning credible information from disinformation, thus contributing to a more informed society.

Thailand

Library and information science education in Thailand began in 1951 through the auspices of the Fulbright Program with American professors offering library management education for Thai scholars. The initiative led to the establishment of the Department of Library Science at Chulalongkorn University in 1955 (Premsmit 2004, 1). Several universities followed suit, and Thailand offers both undergraduate and graduate programmes in LIS. Over time, Thai LIS programmes have developed from traditional approaches through library and information science to more technical emphases and also include archives programmes. Chulalongkorn University provides comprehensive information about its bachelor and master's LIS programmes. While there is no mention of SDGs on the website, research outputs that aim to address the SDGs appear to be encouraged. For the master's and doctoral programmes, Chulalongkorn University welcomes a variety of research approaches, and the topics have the potential for an ESD focus. Research topics like Change Management for Information Organizations can yield outcomes that have meaningful impact.

Sustainability Offerings in Library and Information Science Research

Table 18.1 provides a summary of course offerings related to research from LIS Schools in Singapore, Malaysia, Thailand and Philippines (described in detail in the next section) which have the potential to address the achievement of the UN SDGs.

The programmes included are from Nanyang Technological University (2024), Chulalongkorn University (n.d.a, n.d.b, n.d.c) and the University of the Philippines (UP SLIS 2021a, 2021b, [2023a] and [2023b].

Table 18.1: Selected courses in three Southeast Asian LIS schools that address research and ESD

LIS School	Programme	Course
Wee Kim Wee School of Information and Communication, Nanyang Technological University	Master of Science in Information Studies	Research Methods in Human Information Behaviour Critical Inquiry Information Professions: Heritage, Values and Ethics Management of Information Technologies in Organisations Disinformation and the Information Professions
Department of Library Science, Chulalongkorn University	Bachelor of Arts in Information Studies	User Studies Information Society Archival Management Cultural Heritage Information Management Knowledge Management in Organizations
	Master of Arts in Information Studies	Foundation of Information and Information Studies Concepts and Tools of Digital Humanities Information Ethics Information Literacy Theory and Practice of Archives Management
	PhD Programme in Information Studies	Foundation of Information and Information Studies Concepts and Tools of Digital Humanities Information Ethics Information Literacy Theory and Practice of Archives Management

LIS School	Programme	Course
School of Library and Information Studies, University of the Philippines	Bachelor of Library and Information Science	Special Topics: Multiculturalism and Indigenous Knowledge Special Topics: Theories in Information Behaviour
	Master of Library and Information Science/Master of Science in Library and Information Science	Critical Theory in Library and Information Science Special Topics: Diversity and Multiculturalism in Libraries Special Topics: Advanced Topics in Data and Information Ethics Theories in Information Research

Library and Information Science Education in the Philippines

In the Philippines, tertiary education is regulated by the Commission on Higher Education (CHED). Based on professional licence examination data, there are over 60 LIS schools currently operating in the Philippines that offer either undergraduate or graduate programmes or both (Philippines. Professional Regulation Commission 2023). The prescribed courses, library collections, faculty qualifications and physical facilities, among others, are mandated through a set of policies, standards and guidelines for each degree programme offered. For LIS education, the most recent standard is stated under the "Revised Policies, Standards, and Guidelines (PSG) for the Bachelor of Library and Information Science (BLIS) Program" (Philippines. Commission on Higher Education 2015).

The standards, while not specifically citing the UN SDGs, recognise the role of the information professional in sustainable development. Like most other undergraduate programmes in the country, the BLIS programme aims to "act in recognition of professional, social, and ethical responsibility" and "preserve and promote Filipino historical and cultural heritage" (Philippines. CHED 2015, sec 6.1). These aims are reflected in the implementation of the courses, including related activities and projects. The outcomes unique to the BLIS programme concerning sustainable development are principally directed toward the effective management of information resources, the development of information technology solutions to enhance systems and processes and the promotion of learning and information literacy to achieve social goals. The BLIS programme is designed to train and cultivate citizens who have awareness of the need for ensuring effective information access

and use, and a sense of responsibility for managing and taking care of information resources, including historical records, cultural documents, and intellectual property (Philippines. CHED 2015, sec 6.2).

Recognising libraries as social institutions (Chowdhury et al. 2008) and the information professions as key players in the information society, the education and training of information professionals have the potential to shape the knowledge base and values of the next generation. Beyond information organisation and access, information professionals contribute to a flourishing society by enabling critical thinking, information literacy and a sense of community.

The competency standards for the CHED-promulgated BLIS programme include personal competencies that are to be developed in students, not only through their LIS courses but during their entire degree programme. Aside from CHED, the Council of Deans and Heads of LIS Schools (CODHLIS) and the Philippine Association of Teachers in Library and Information Science (PATLS) ensure the implementation of the "Policies, Standards and Guidelines" by cooperatively developing the syllabi for the core LIS courses. Since CHED also requires the implementation of competency-based standards and an outcomes-based education framework (Philippines. CHED 2012, sec. 13 and 14), CODHLIS and PATLS, along with the CHED Technical Committee on LIS (TCLIS), have converted all LIS core course syllabi to become compliant with the outcomes and competencies specified. The course outlines are common to all LIS schools but differ in their implementation.

Six out of the seven sets of personal competencies specified for the BLIS programme align with the goals of sustainable development:

- Customer service orientation
- Leadership skills
- Lifelong learning skills and personal development
- Ethics and values
- Interpersonal competencies, and
- Cultural competencies (Philippines. CHED 2015, sec. 6.4)

In the Philippines, the most popular graduate programme in LIS is the Master of Library and Information Science. No higher education institution in the country is currently offering a doctoral programme in LIS. No set of CHED-promulgated policies, standards and guidelines for graduate programmes in LIS has yet been issued. Graduate schools in the Philippines adhere to the general policies, standards and guidelines for graduate programmes, issued as CHED Memorandum Order No. 15 (Philippines. CHED 2019).

As distinct from baccalaureate programmes, graduate programmes are expected to include "the mastery of a specialised field of study, the development of original and critical thinking, and the demonstration of problem-solving skills"

(Philippines. CHED 2019, sec. 2). Graduate programmes prepare students for higher-level teaching, research or creative work and leadership in professional practice (Philippines. CHED 2019, sec. 2). Among other advanced competencies, graduate programmes in the Philippines prompt and perpetuate the following:

- Leadership and innovation
- Scientific and technological growth
- Creative and effective learning and teaching…
- Inclusive economic development and environmental security…, and
- Cultural and religious diversity… (Philippines. CHED 2019, sec. 3).

University of the Philippines and Sustainable Development

Among the universities in the Philippines that offer LIS is the University of the Philippines (UP) in Diliman, Quezon City. The University of the Philippines is the country's national university and, according to Republic Act No. 9500 (Philippines 2008), known as the University of the Philippines Charter of 2008, is mandated to lead in higher education and countrywide development. Its philosophy of education centres on cultivating in its learners a sense of responsibility towards fellow Filipinos and the progress of the country (University of the Philippines 2019). Graduates are expected to have "the skills and mindsets to improve human life…possess breadth of mind, strength of character, and generosity of spirit" to complement the depth of knowledge in their respective areas of specialisation, all with the ultimate goal of enabling students to "inclusively engage with society… mindful of their people's needs and capabilities" (University of the Philippines 2019). This statement on the philosophy of education guides the development and implementation of the university's teaching, research and extension programmes.

The University of the Philippines leads the nation's universities in terms of sustainability, as evidenced by its placement in the 2024 QS Quacquarelli Symonds sustainability rankings The university ranked 231st out of almost 1,400 universities worldwide in its activities "to tackle environmental, social, and now, governance challenges" (Lontoc 2023). Several of the university's programmes are recognised as Centres of Excellence by CHED, and the SLIS is among these. The status of Centres of Excellence and Centres of Development is awarded to a "department within a higher education institution, which continuously demonstrates excellent performance in the areas of instruction, research and publication, extension and linkages and institutional qualifications" (Philippines. CHED 2024).

University of the Philippines School of Library and Information Studies Programmes and the Education for Sustainability Framework

The UP School of Library and Information Science (UP SLIS) is the pioneer LIS school in the Philippines. From 1914, when courses in library economy were offered (Faderon et al. 2016, 278) to the present, UP SLIS has evolved to become a driving force of change in Philippine LIS education. UP SLIS's membership of the iSchools network in 2016 heralded further transformation through innovative pedagogies, multidisciplinary perspectives, technical and digital knowledge and expertise, as well as theoretical and practical explorations through research. In prioritising SDG 4, Quality education (United Nations n.d.b), UP SLIS has extended its efforts to train future librarians who are able to tackle complex issues like environmental concerns, poverty, and inequality within the ESD framework (UNESCO n.d.a, n.d.b). Recognising the imperative of transformative actions for sustainability, UP SLIS has aligned its pedagogy with the ESD *Roadmap* which puts the question: "How can we encourage learners to undertake transformative actions for sustainability to shape a different future, before it is too late?" and answers it by stating:

> To ensure individuals are able to understand sustainability challenges, to be aware of their relevance to the surrounding realities, and take action for change,
> To trigger structural transformations in today's economic and social systems by promoting alternative values and contextualized methods,
> To address the new opportunities and risks on sustainable development posed by emerging technologies,
> Education needs to transform itself (UNESCO 2020, 9).

As stated in the School's Mission and Vision (UP SLIS 2021a), the programmes, research and activities of the school revolve around the development of effective information professionals and the provision of solutions to information issues, problems and concerns. The introduction of issues and problems within all information settings is one of the ways by which the programme aligns with the ESD framework.

> What ESD requires is a shift from teaching to learning. It asks for an action-oriented, transformative pedagogy, which supports self-directed learning, participation and collaboration, problem-orientation, inter- and transdisciplinarity and the linking of formal and informal learning" (UNESCO 2017, 7).

Table 18.2 shows the courses offered by the School. The LIS and Archives and Records Management (ARM) courses comprise a set of core and elective courses for

their respective programmes and are supplemented by non-LIS/ARM electives from the three master's programmes. In the latest curricular revision pending approval, UP SLIS's graduate programmes include electives, where students have the freedom to choose courses, preferably from a single department, as their specialisation.

Table 18.2: UP SLIS courses and ESD implementation

Programme	Sustainability literacy	Critical, Reflective. and Ethical Thinking	Global and Multicultural Perspectives	Leadership and community engagement
Bachelor of Library and Information Science (BLIS)	Information and Society Information Literacy Foundations of LIS	Information Ethics	Special Topics: Multiculturalism and Indigenous Knowledge	Information Resources and Services I Library Management I Library Management II Field Assignment
Master of Library and Information Science (MLIS)/ Master of Science in Library and Information Science (MSLIS)	Foundations of Library and Information Science Seminar on Information Literacy	Critical Theory for Librarianship and Information Science Legal and Ethical Issues in Library and Information Science Special Topics: Advanced Topics in Data and Information Ethics	Comparative Librarianship Special Topics in Library and Information Science: Diversity and Multiculturalism in Libraries	Reference and Information Services Management of Libraries and Information Units Public Relations and Libraries Project Management for Library and Information Professionals Special Problem
Master of Archives and Records Management (MARM)	Archival Theory and Practice	Law and Ethics for Archives and Records Management	Archival Access and Advocacy: Theories and Practice	Management of Record Centers and Archival Institutions

Sustainability literacy is incorporated into the School's foundation courses, especially in the topics of information access, the values of the profession and the roles of people in the processes of information creation, storage, dissemination and use. The courses offered raise awareness of the digital divide, diversity, social justice, and gender equality. The Philippines has a varied population in terms of library clients and there are pronounced differences in people's economic, social and cultural conditions and also in equity of information access and information literacy.

The differences became more pronounced during the pandemic which heightened the need for access to mobile devices, for familiarity with information sources and for critical information literacy skills, especially with social media. Sustainability literacy is developed in the courses, and information access is discussed along with themes of inequality and the digital divide to determine how the students might contribute to reducing gaps and inequalities. A particular examination is made of the creation of programmes for library clients to determine whether the programmes are limiting and/or inclusive.

Critical, reflective, and ethical thinking are embedded in almost all courses but are most strongly emphasised in the ethics courses which encourage the students to make reasonable choices among competing options. Sensitivity and awareness of cultural and societal aspects are emphasised, and students are encouraged to be reflective and aware of how their own personal socio-cultural perspectives might impact decisions made. Rather than adopting a narrow mindset that promotes digital systems as the sole solution, students explore more nuanced and sustainable approaches. Shifting perspective promotes critical and contextual understanding, encourages the consideration of diverse needs and capacities, the creation of alternatives, and the identification of inclusive and equitable solutions to problems identified.

Global and multicultural perspectives are emphasised in almost all courses but are more pronounced in the multiculturalism course which has been adapted from an IFLA Guidelines for Professional Library and Information Science (LIS) Education Programmes (IFLA 2012) and was incorporated into the CHED curriculum for BLIS. Multicultural topics are interwoven with diversity concerns and provide students with opportunities to engage with global perspectives while delving into the unique cultural dynamics and heritage of the Philippines. By fostering an understanding of cultural pluralism and intercultural communication, students develop the skills and sensitivity necessary to navigate diverse cultural landscapes both locally and globally. By incorporating global and multicultural perspectives into the curriculum, LIS programmes prepare students to become culturally competent information professionals capable of serving diverse populations with sensitivity, respect and inclusivity.

Leadership and community engagement are evident in the management and fieldwork courses. Similar to the LIS curriculum in Malaysia and other countries, LIS fieldwork in the Philippines enables students to work within communities, perhaps in a school or in a barangay, the smallest political unit in the Philippines. At the undergraduate level, students have the opportunity to be in touch with LIS practice and information issues through their fieldwork, and the Civic Welfare Training Service under the National Service Training Program which is required of all undergraduate students in the country. They are given opportunities to work

with different segments of the community and apply what they have learned from the technical and theoretical courses. They are encouraged to design projects for the community or develop specific libraries. In the fieldwork assignment, the students are tasked to maintain a journal to document what they have learned and accomplished constituting not only a mere repository of activities but also an opportunity for reflective thinking.

At the graduate level, the LIS Special Problem (UP SLIS 2023a) and ARM Capstone Project (UP SLIS 2021c) courses provide students with immersive experiences in their selected communities, investigating solutions to information-based problems related to information organisations or library developments. At the conclusion of the project, students submit documentation, including a project charter, project management plan, progress report and close-out report. The completed documents provide guides for others implementing similar projects and extend the impact beyond the initial communities served.

Lifelong learning is embedded in all courses and in the faculty's pedagogical practice. As part of the university's commitment to academic freedom, faculty members are given the opportunity to be creative and autonomous in shaping students' learning experiences. Faculty members embody themselves the essence of lifelong learning by engaging in continuous professional development through research productivity and extension activities.

University of the Philippines School of Library and Information Studies Programmes and the iSchool Framework Supporting the Sustainable Development Goals

The Bachelor of Library and Information Science (BLIS) programme of the UP SLIS is aligned with the University's objectives and focuses on equipping graduates to manage information effectively. The programme's learning outcomes emphasise inclusivity, problem-solving, and ethical principles in information management. The UP Diliman General Education (GE) Framework is a comprehensive set of guidelines that outlines the goals, objectives, and structure of the GE program at the University of the Philippines Diliman and it emphasises a broad foundation of knowledge and skills across various disciplines, fostering critical thinking, creativity, and a sense of social responsibility. Alongside core and elective LIS courses, students in the UP SLIS also engage with Framework to enhance fundamental skills and explore broader academic contexts.

Graduate programmes in library and information science, archives, and records management further develop expertise in respective fields, emphasising leadership, advocacy, and ethical principles. Recently introduced programmes like

the Master of Science in Library and Information Science (MSLIS) (UP SLIS 2023b) and the Master of Archives and Records Management (MARM) (UP SLIS 2021c) provide specialised knowledge and skills for advanced practice and research, reflecting UP SLIS's commitment to producing responsible information professionals contributing to nation-building. The programmes also align with the four characteristics previously discussed as part of the iSchool framework supporting the SDGs: sustainable information systems and infrastructure, sustainable information practices, sustainable information policies and governance, and sustainable user education, training, literacy.

Sustainable Information Systems and Infrastructure

BLIS and MLIS programmes offer ICT courses focusing on practical skills development for creating information systems. Through hands-on projects, students learn to design and manage efficient systems, aligning with the ESD framework to "respond to the opportunities and challenges brought about by technological advances" (UNESCO 2020, 18). During the pandemic, students collaborated with UP SLIS librarians to provide online LIS resources, enhancing remote learning. Free online open access LIS materials were obtained and repackaged for easy access either online or offline and made available online or via courier to accommodate students who had limited or no connectivity in the spirit of supporting flexible learning (Obille 2021, 19). Students working with the librarians of the UP SLIS Library were able to enhance their classmates' library experiences even with the limitations of remote learning.

Sustainable Information Practices

At the core of the foundation courses provided by UP SLIS are the values and principles of library and information science and archives and records management which are integrated into teaching and learning sessions, expressed in industry policy guidelines, and manifest in professional practice resulting in sustainable information practice.

Michael Gorman has noted the values of librarianship as stewardship, service, literacy and learning, equity of access and the greater good (Gorman 2015, 35–37) which are directly related to sustainable development. Stewardship underscores the care and protection of information resources aligning with SDG 9, Industry, innovation and infrastructure (United Nations n.d.c), specifically regarding support for research and innovation, and access to information and communications tech-

nology. In the foundation courses, the students are taught to exercise stewardship of the collections under their care and to ensure that the information resources are cared for and retained because of their value as products of human intellect and creativity (Gorman 2015, 35, 75–90). Akin to S. R. Ranganathan's first law of library science "Books are for use" (Ranganathan 1931, xxviii), service is also core practice because stewardship of collections is futile if the resources are not being utilised (Gorman 2015, 36, 91–107).

Service provision, literacy and learning align with SDG 4, Quality education (UNESCO n.d.b). Service focuses on the importance of making collections accessible to library clients while literacy and learning emphasises enabling library clients to navigate information collections and use information resources effectively to make educated decisions. Libraries support educational institutions and communities in delivering quality education. Equity of access supports SDG 10, Reduced inequalities, by instilling in students the awareness that social institutions, including libraries, must be responsive in alleviating the negative effects of inequality by enabling the disadvantaged to gain access to information and information tools. Providing ways and means to deliver equity of access contributes to achieving SDG 10.

Gorman's "greater good" is "the overarching principle" (Gorman 2015, 211). It emphasises the library's role in benefiting all users and communities and underscores that libraries serve a noble purpose beyond profit, aiming to contribute to societal development through their services. This value permeates discussions in all courses at different academic levels which also cuts across all SDGs because of the principle of the greater good.

The graduate level foundation courses, Critical Theory for Library and Information Science and Law and Ethics for Archives and Records Management, aim to instil the ability to analyse various library and information processes and practices using critical lenses. The main goal is for students to reflect on situations, recognise their positions, and think of ways in which they can make changes. The university allows inclusion of special topics courses in degree programmes to serve as vehicles to address current concerns for which no other course is offered. An elective recently offered was Special Topics: Advanced Topics on Data and Information Ethics, which focused on enabling the students to analyse data and information science issues through ethical, critical and legal lenses. It directly addressed achievement of the SDGs through the development of data-driven solutions. As a final output, the students were tasked to select one SDG along with a specified target, and provide a solution, develop a tool, or show a proof of concept towards achieving the target. Students were made aware of the various SDGs and targets; aligned their projects with the required outcomes; contributed in their own ways to solutions through policy formulation or applications of various kinds; enhanced their "awareness of

the 17 goals in education settings" and mobilised "action towards the achievement of the SDGs" (UNESCO 2020, 16).

Sustainable information practices are also developed in courses about research, including data and information management practices and open data practices. Through a critical and ethical lens, students are able to develop capstone projects that address LIS concerns. The Special Problem course is the final requirement for the MLIS programme and was revised in 2017 to a student community or institutional engagement targeted at developing an information process or system to address a particular process, event, or concern. The activity is differentiated from the thesis because of its community engagement, which may occur in parallel with data gathering for the thesis. The initial projects built barangay or community libraries, and gained community support and acceptance demonstrating "action-oriented and transformative pedagogy" (UNESCO 2017, 7) inherent in the ESD framework. While community projects were not without difficulties, they constituted real-life experiences and the learning that occurred transcended the classroom setting.

Sustainable Information Policies and Governance

With the enactment and implementation of the Data Privacy Act of 2012, UP SLIS engaged in various training events and workshops in relation to the Act's implementation. Internally, processes and practices were examined and improved to align with the principles of data privacy and freedom of information. The principles and practices were discussed in ethics, research, management, IT and records management courses. Concepts of privacy, sharing, security and open access are incorporated in courses such as collection development and management of libraries and tangibly demonstrate how educators "develop competencies to foster societal transformation" (UNESCO 2020, 23). The workshops building capacity provide training not available in the basic and tertiary education levels.

Comparative librarianship was offered at the graduate level during the pandemic. Since online conferencing applications were available, the class included guests invited from neighbouring libraries in Malaysia, Thailand, Indonesia and India. The experiences broadened their minds and led to detailed examination of the policies and services planned for implementation in their workplaces or communities, and some amendments. Learning environments can be transformed to align with the ESD framework by creating settings for interdisciplinary as well as intercultural learning and action (UNESCO 2020, 28).

Sustainable User Education, Training, Literacy

UP SLIS offers courses addressing contemporary challenges in the information landscape, including information disorder, access to reliable information, privacy rights, and the implications of emerging technologies. The content expands horizons, deepens knowledge of contemporary information issues in keeping with the goals of ESD, and develops normative, critical thinking, and self-awareness competencies (UNESCO 2017). The Information and Society course serves as a General Education course and fosters awareness and understanding of information issues among non-LIS students. The course achieves its objectives effectively by cultivating engagement and informed decision-making regarding information. It should be noted that no other university in the Philippines offers a GE course within its LIS programme (Dar Juan 2023, 438–439).

Similarly, Information Literacy introduces BLIS students to the importance of information literacy for personal and societal development, supplementing prior education in Media and Information Literacy. Graduate-level courses like Seminar on Information Literacy deepen students' comprehension of information literacy principles and practices through seminar papers and discourse. Research methods courses encourage critical thinking and service-oriented research inquiry, preparing students to contribute to knowledge advancement. UP SLIS distinguishes itself through its prolific research output that relates to sustainable development.

Some of the outputs include:

- Exploring information flow and dissemination practices of internally displaced persons in San Jose Del Monte Heights (Martinez 2019)
- Understanding grassroots-level initiatives including setting up LGBT community archives (Masilungan 2019)
- The social return of investment method as a tool for evaluation and impact assessment for libraries (De Leon 2019)
- A study on the green library practices of selected science high school libraries in Metro Manila (Azul 2016), and
- An expanded post-disaster needs assessment about the effects of Typhoon Yolanda on the University of the Philippines Tacloban College Library towards the development of a disaster management plan (Plimaco 2017).

Conclusion

In conclusion, LIS Education in Southeast Asia plays an important role in advancing the SDGs by empowering students to think critically and act responsibly in driving

positive change. Through a diverse range of course offerings, students are equipped with the necessary skills to address contemporary social and environmental challenges and contribute to sustainable development. The programmes actively engage students with communities, fostering a deeper understanding of societal issues and encouraging the development of innovative information solutions.

In the Philippines, the UP SLIS exemplifies its commitment to the SDGs by aligning its curriculum, research endeavours, and community outreach initiatives with the UNESCO ESD framework and *Roadmap*. From mission and vision statements to the attainment of specific learning objectives within its programmes, UP SLIS demonstrates a clear dedication to supporting the SDGs. By nurturing a generation of informed and socially conscious information professionals, UP SLIS and other LIS Schools within Southeast Asia are instrumental in advocating for a more sustainable and equitable information future. Librarians and information professionals who are aware of varying social, economic, and political issues, and who have developed the necessary skills and knowledge for the achievement of these goals, will contribute significantly to the realisation of the SDGs.

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https://doi.org/10.1515/978-3-11-133646-6-020

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