SDGs and the Scholarly Community

Barbie Keiser and Ruth Pagell

Whether you read scholarly articles or watch the daily news, you will probably be familiar with discussions on climate change, the green environment, and sustainability. The 2030 Agenda for Sustainable Development sets out 17 United Nations (UN) Sustainable Development Goals (SDGs). The 169 associated targets and 231 indicators underpinning the goals serve as a framework for countries, businesses and industries, and civil society organizations to address sustainable economic and social development (**Figure 1**). SDGs balance the three dimensions of sustainable development (the economic, social, and environmental), emphasizing human rights for all, gender equality, and the empowerment of women and girls (UN Department of Economic and Social Affairs, Sustainable Development, n.d.). This report highlights ways the scholarly community (publishers, educational institutions, and libraries) participates in sustainable development (SD) initiatives.

Researching SDGs: Finding Data, Analyzing Information, and Measuring Success

Progress made toward sustainable development is evaluated by words and actions. One approach is through scholarly output. The other approach uses metrics that evaluate country and university initiatives or highlight successful projects at an institutional level.

Members of the information supply chain—the LIS schools, individual librarians, and researchers—are responsible for disseminating unbiased information to

Figure 1   /   Sustainable Development Goals

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their parent organizations, policymakers, and the public. Besides using research tools to find articles related to the goals, librarians need to be able to answer the question, "Is my country meeting its SD goals?"

Using Databases to Research the SDGs

The number of articles on SDGs grew almost 700 percent in the past six years. Three major information providers—subscription services from Elsevier and Clarivate and free and subscription services from Dimensions—apply different algorithms resulting in different outputs. The pre-generated searches use the indicators and target terms; the results presented may not refer specifically to sustainable development.

> **Elsevier.** In 2019 Elsevier created a search strategy for each SDG that serves as one indicator of the Times Higher Education Impact Rankings (Pagell, 2019). Elsevier uses AI and user input to modify the search strings; the search strategies are available for use by researchers (Jayabalasingham, 2019). Elsevier's SciVal analytics solution uses thousands of prepared search strategies to delve into subsets of SDGs organized into Topics and Topic Clusters. The top journals for Topic 564, "Information Literacy, Instruction, Libraries," for example, are library publications. RELX, Elsevier's parent, has a robust SDG Resource Centre (sdgresources.relx.com), replete with research and news about SDGs and trends in SDG research.
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> **Clarivate.** In January 2022 Clarivate added SDGs as a Research Area for its research analytics tool, InCites, but not in Web of Science. InCites SDG search strategies are based on Eugene Garfield's original theory of using co-citations to create the Institute for Scientific Information's (ISI) citation indexes. "Navigating the Structure of Research on Sustainable Development Goals" (Nakamura et al., 2019) contains a detailed description of Clarivate's approach. Clarivate released its corporate Sustainability Report for 2020, outlining progress and its plans for the future.
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> **Dimensions.** Digital Science's Dimensions classification scheme covers "areas of research associated with one or more SDGs (the majority of the SDGs are interrelated). The scheme uses automated allocation of the 17 SDGs and their associated targets and indicators to all fitting documents in Dimensions thereby addressing research areas aligned to the goals" (Dimensions, n.d.). Researchers can browse papers for each SDG through the Dimensions site (app.dimensions.ai/browse/categories/publication/sdg). "Contextualizing Sustainable Development Research" (Wastl et al., 2020) explains how Dimensions created its SDG search strategies. An updated release of the search strategies will be available in 2022. The Dimensions website (www.dimensions.ai/webinars/discover-and-analyse-research-in-context-of-the-united-nations-sustainable-development-goals) features an on-demand webinar, "Discover and Analyse Research in Context of the United Nations Sustainable Development Goals."

Table 1 compares articles across the sources and rankings; arrows indicate changes in rank from the pre-SDGs output (2000–2015) to 2016–2021.

Performing comparable free-text searches on "SDGs or Sustainable Development Goals" in Web of Science, Scopus, and Dimensions generates a list of top entities in all three databases (**Table 2**).

Measuring Success

Two comprehensive reports with accompanying datasets measure country progress toward meeting the goals. The first is the official UN report, "Sustainable Development Goals Report 2021." It includes in-depth information about each SDG, country reports with infographics, and an accompanying interactive database (unstats.un.org/sdgs/unsdg). The dataset covers all indicators for all countries

Table 1 / Research Output of SDGs, 2016–2021

SDG		Web Of Science InCites Rank		Elsevier Scopus Rank		Dimensions	
1	No Poverty	16		16		14	
2	Zero Hunger	9	↓	8		9	
3	Good Health & Well Being	1		1		2	
4	Quality Education	14	↓	15		3	
5	Gender Equality	2		14		15	
6	Clean Water & Sanitation	8	↓	12		11	
7	Affordable & Clean Energy	7	↑	2		1	
8	Decent Work & Economic Growth	12		9		7	
9	Industry, Innovation & Infrastructure	10	↑	13		16	
10	Reduced Inequalities	13	↓	11		8	
11	Sustainable Cities & Communities	3	↑	5		6	
12	Responsible Consumption & Production	11	↑	10		10	
13	Climate Action	4		3		5	
14	Life Below Water	6	↓	7		13	
15	Life on Land	5	↓	6		12	
16	Peace, Justice & Strong Institutions	15		4		4	
	Highest Output	889,011	SDG3	4,488,726	SDG3	886,390	SDG7
	Lowest Output	12,670	SDG1	16,447	SDG1	14,024	SDG9

Note: Databases update on different schedules; searches conducted in January 2022.

dating from 2000, but a good deal of the data is missing. According to the report, SDG 4 has been lagging its targets even before COVID; one year into the virus, reading proficiency for children from first to eighth grade as well as school funding have fallen on all continents (p. 34), as depicted in **Figure 2**.

The second source is "The Sustainable Development Report 2021: The Decade of Action for the Sustainable Development Goals." Cambridge University Press publishes the report and data under the auspices of the Sustainable Development Solutions Network (SDSN), a global initiative for the UN. Countries have an overall score and a rank; all the indicators are available. Japan is the only "top 20" country not in Europe.

Table 2 / Top institutions listed in all three databases: Web of Science, Scopus, and Dimensions

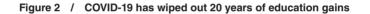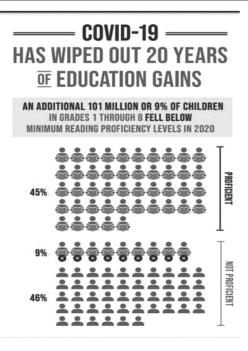| Institution	Country	Author	Publisher[4]	Publication
U College London[1]	US	Bhutta, A	MDPI	Sustainability
Oxford	UK[2]	Murray, CJL	Taylor & Francis	J Cleaner Production
Harvard	China[3]	Bartram, J	Elsevier	PLOS One
World Health Organization	Australia	Hay, SI	Taylor & Francis	Science of the Total Environment
London School of Hygiene and Tropical Medicine	Spain	Yaya, S	Oxford U Press	Int J of Env Res & Pub Health
	South Africa		Emerald	World Sustainably Series
	India		Wiley	

Clarivate:
1 - Also uses parent institution, University of London 2 - Includes UK and the individual countries
3 - Hong Kong and Macau are included in Clarivate's Chinese totals
Scopus: 4 – Does not have publishers

Search: "Sustainable Development Goals" OR SDGS in Title, Abstract Topic

Figure 2 / COVID-19 has wiped out 20 years of education gains

Source: "*Sustainable Development Goals Report 2021***," p. 11**

Users can explore and download "The Sustainable Development Report 2021" and country-level data via dashboards.sdgindex.org/downloads. The dataset includes color-coded composite data by SDG, indicating whether a country has met its goal (green), challenges remain (yellow), there are significant challenges (orange), and there are major challenges (red) for each SDG. Besides UN data, the report uses third-party data, such as the Times Higher Education Impact rankings and data from other international organizations. The download includes the codebook with URLs for each data source.

The report site features a dashboard of country profiles (dashboards.sdgindex.org/profiles). For the United States, there are also state-level profiles (us-states.sdgindex.org/profiles). Special reports include a 2019 ranking of 105 U.S. cities (sdsna.github.io/2019USCittiesIndex/2019USCitiesRankings.pdf).

The U.S. federal government has created an SDGs website (sdg.data.gov). A work in progress, the website provides data for the indicators at a national level. One positive aspect of this report is that it contains in-depth information about each metric (sdg.data.gov/reporting-status), including the source, a definition, and comparable information for the UN's data on the indicator. Despite lags in the data, there is adequate, accessible data to report progress for countries and individual U.S. states.

Publishers' and Information Vendors' Take on the SDGs

Almost every industry is tackling the 17 SDGs, and the publishing industry is no exception. Asfrid Hegdal of the Norwegian Publishers Association notes in "Publishers and the United Nations Sustainable Development Goals" that some publishers seek to drive progress by becoming agents of change, "giving a voice and platform to those who can shape society and our culture for the better." Others examine their business practices to ensure they operate sustainably and equitably (Hegdal, 2020, p. 1).

Some publishers concentrate on internal projects, such as creating awareness among staff of the firm's SDG commitments; others distribute research about sustainable development, including expanding the number of titles available via open access (OA) or creating resources to support instruction. Exchanges of ideas can be limited to academic scholars or address a broader audience, including policymakers and the public.

Academics, librarians, and publishers have been working together on SDGs since the run-up to the United Nations Conference on Sustainable Development (Rio+20) in 2012. As the final goal (17) is Partnerships for the SDGs, professional and trade associations assist their members in identifying potential approaches to meeting the world SDGs.

How Publishing Associations Encourage Their Members to Act

Together, the International Publishers Association (IPA) and the UN have identified ten challenges for action, known as the SDG Publishers Compact. The compact is a voluntary commitment to publish books and journals that accelerate progress toward achieving the SDGs. Signatories to the compact agree to actively acquire and promote content that advocates for SDG themes, reporting

on progress toward achieving these goals by raising awareness about them; advocating, promoting, and collaborating across boundaries; dedicating resources toward accelerating progress; and acting on at least one SDG goal (SDG Publishers Compact, n.d.).

The Higher Education Sustainability Initiative's (HESI) SDG Publisher Compact Fellows consists of publishers, librarians, and academics working in "groups to create useful tools and important outcomes for the academic international community":

- The Academic Societies and Textbooks group develops "ways for publishers to recognize and address the lack of SDG-related content in their education materials."
- The Connecting Academic Researchers and Practitioners group develops best practices to "foster and build strong relationships between research and those who use research," including businesses.
- The Impact and Reach group is "changing the traditional ways research impact is viewed, specifically looking at academic rankings and incentives."
- A Changing Culture subgroup "is taking steps to affect [sic] culture change throughout the academic and publishing ecosystem" (Martin, 2021).

National publishing associations and allied organizations, such as the Copyright Clearance Center (CCC), work to achieve sustainable development goals through initiatives at the association level and among their member companies:

- The Association of American Publishers' (AAP) commitments to diversity and inclusion consist of recruiting women and persons of diverse backgrounds to the industry and members to publish "works that represent the widest range of voices and perspectives" (Association of American Publishers, n.d.).
- In its "Responsible Sourcing of Printed Material," "the Norwegian Publishers Association (NPA) recommends that its members refrain from contributing to deforestation and practice zero tolerance for tropical deforestation" (Den Norske Forleggerforening, 2019, p.4).
- Established in 2020, the Green Book Alliance (GBA) is a joint effort of BISG (formerly known as the Book Industry Study Group), BookNet Canada, and Book Industry Communication to develop supply chain standards in the United States, Canada, and Great Britain. GBA promotes "information sharing, joint planning and research, events and other sustainability initiatives," including creating a central source for environmental information, hosting global green book supply chain events, and developing a green global supply chain award (Reid, 2021).

Efforts by Individual Publishers

Most publishers have a webpage announcing their commitment to the SDGs, mention the SDGs in their annual reports, or are otherwise transparent and accountable for their firm's progress. Relatively few provide sufficient data about the actions taken, implementation strategies, or how they measure progress.

Exemplary practice highlighting internally focused and outward-facing initiatives: Since 2018, Penguin Random House UK's Creative Responsibility Reports illustrate the progress made in reading, community, inclusion, and sustainability through book donations to school libraries, food banks, prisons, and homeless shelters (Penguin Random House, n.d.). The company's 2020–2021 report provides greater detail about its direct and indirect carbon footprint, presenting a detailed methodology for the calculated impact on raw material use, the value chain, distribution, and logistics (Penguin Random House, 2021).

Many publishers address SDGs as an extension of traditional publishing roles, such as issuing new OA journals dealing with SDGs, for example, three new academic journals for environmental research launched by the Institute of Physics Publishing. Other publishing companies curate collections covering the SDGs for classroom use. Taylor & Francis, for example, has mapped its digital content to the SDGs, creating a Sustainable Development Goals Online collection featuring book chapters, articles, essays, presentations, videos, case studies, teaching guides, and lesson plans for each SDG.

How Publishers Deal with Diversity, Equity, and Inclusion (DEI)

Aspects of diversity include a mix of race, ethnicity, religion, nationality, gender identity and expression, socioeconomic background, sexual orientation, disability status, marital or familial status, and geography. Publishers strive to balance perspectives by expanding the representation of previously unrepresented groups among authors, editors, and corporate executives. Organizations such as PublisHer encourage more specific groups, in this case, women, to participate in all aspects of publishing and help publishers address imbalances and inequities in the publishing world (PublisHer, 2019). The Elsevier Foundation supports women researchers from developing countries through New Scholars grants and capacity-building projects in developing countries (Elsevier Foundation, 2021). Publishers are also making their materials more accessible to other groups, such as the visually impaired, by committing to EPUB3 standards and using alt text descriptions, and to girls with depictions of females in nontraditional professions.

Examples of DEI collections offered from database vendors are:

- EBSCO's Diversity, Equity and Inclusion Resources (www.ebsco.com/products/diversity-equity-and-inclusion-resources)
- ProQuest's Diversity Collection (about.proquest.com/en/products-services/diversity-collection) includes Ethnic NewsWatch, GenderWatch, and Alt-Press Watch.
- Gale OneFile: Diversity Studies (www.gale.com/c/onefile-diversity-studies) is global in scope.
- Harvard Business Publishing has assembled cases and course materials to address diversity, inclusion, and belonging (hbsp.harvard.edu/diversity-resources-for-educators).

Publishers increasingly assist researchers from the Global South, helping them find funding for research projects or paying article processing charges (APCs). SAGE MILES (Manuscript Improvement and Language Editing Services, sagemiles.com) "includes copyediting, proofreading, formatting assistance, and expert advice in terms of context and logical flow within manuscripts submitted to SAGE Publications India" (Keiser, 2020, p. 18).

The target of publishers' SDG 3 initiatives (Good health and well-being) might be their employees, the researchers whose works they publish, or the public. One of many efforts by Taylor & Francis to support researchers is Knowledge Retreat (knowledgeretreat.taylorandfrancis.com). The site presents self-care tips and expert advice for exercising the mind and overcoming periods of brain fog, fatigue, or writer's block (Taylor & Francis, 2021).

Rethinking Raw Materials, Water Usage, Energy, Climate Change, and the Environment

Increasingly, publishers are actively reducing their use of materials that will harm the environment in products and production; using less electricity, water, and even plastic in their offices; and avoiding damage to the environment by redesigning waste disposal. Most have set targets to reduce their carbon footprints, some committing to net-zero emissions by a specific year. Publishers are also concerned about the environmental effects of shipping physical books and their packaging (Publiship, n.d.). Their commitments extend to reducing the amount of waste sent to landfills and the amount of water used in the pulping of books. Bertelsmann's ambitious targets to achieve climate neutrality by 2030 include changes to materials used, energy, water discharge, emissions, and waste disposal (Bertelsmann, 2022).

Many publishers have committed to the environment and climate change for a decade. Examples include Macmillan's pledge to lower its overall carbon emissions. The company's sustainability website (sustainability.macmillan.com) explains how it reduces carbon emissions, presenting data it has collected. The transparency of Macmillan's data is lacking in other publishers' reporting of progress.

Print on demand, which is closer to end users, is another way that publishers reduce transportation impact and costs, and greater reliance on recycled paper is making the supply chain greener (Publishers Weekly, 2021). Some booksellers and libraries commit to using recycled paper. RecycLivre (recyclivre.com) sells secondhand books over the internet, donating 10 percent of the profits to educational charities. Little Free Libraries (littlefreelibrary.org) make reading accessible to communities by establishing pop-up bookcases in convenient locations. Readers can take a book from the shelves and leave one in its place.

Industry, Infrastructure, and Innovation

Digital infrastructure allows progress toward SD goals, but energy consumption continues to rise as industry and academia rely on high-powered servers to store and deliver data to researchers. Several publishing companies, such as Otava in Finland, take a more holistic approach, converting the entire group to green energy.

Others purchase credits to offset their carbon footprint. The Penguin Group USA, for example, buys credits to offset 100 percent of the electricity used by its distribution center in Westminster, Maryland.

"Smart cities" and 5G mobile networks reduce the need to commute to the office or campus to access research from libraries that are able to deliver digital magazines, journal databases, and e-books cost-effectively. However, bandwidth continues to be a challenge for remote access in developed nations; unreliable electricity in the Global South remains an issue for access to academic resources and data analysis.

Institutions of Higher Learning

In addition to teaching and researching, many universities now have offices of sustainability with roles for building awareness about the SDGs and changing operations to support the goal of becoming net carbon-neutral campuses. Several offices fund projects led by student and faculty groups, such as Emory University's Office of Sustainability Initiatives (OSI). This year's OSI grant recipient projects "support biodiversity, save energy, reduce waste and increase engagement with climate action and racial justice at Emory" (McCormack, 2021).

The Association for the Advancement of Sustainability in Higher Education (AASHE) is home to the Sustainability Tracking, Assessment, & Rating System (STARS; reports.aashe.org/institutions/participants-and-reports/?sort=country). University libraries are featured in two indicators: Support for Sustainability Research and Waste Minimization and Diversion. Unfortunately, most of the 350 universities filing sustainability reports are in North America, which limits STARS's claim of global scope. Universities choose to participate by sharing initiatives with the Times Higher Education Impact Rankings or the UI GreenMetric World University Ranking. (greenmetric.ui.ac.id). UI GreenMetric evaluates universities according to 39 indicators in six groupings: setting and infrastructure, energy and climate change, waste, water, transportation, and education and research (Fourtane, 2022; Pagell, 2021).

Infrastructure, Energy, and Waste

Energy-inefficient buildings contribute to greenhouse gas emissions. Institutions constructing buildings or retrofitting existing structures are increasingly turning to renewable energy, decarbonizing heating systems, adding gardens on roofs, and making other changes to help them achieve carbon neutrality (Cities Today, 2022). Some have turned to architectural firms utilizing the Leadership in Energy and Environmental Design (LEED) certification, "a framework for healthy, highly efficient, and cost-saving green buildings" (USGBC, n.d.). Washington University in St. Louis, Missouri, "holds the most Platinum-level certifications among U.S. universities" (Grauerholz, 2021).

Alternative means of transportation on campus lower carbon emissions and pollution. Universities can encourage the use of electric vehicles by installing electric charging stations, rewarding carpooling, providing campus buses, and making the campus bicycle-friendly and pedestrian-friendly.

> **Exemplary Practice:** The University of Sao Paulo takes measures "to increase and enhance diversity in the student population by increasing under-represented minority groups and those students from lower socio-economic backgrounds. … The University has successfully implemented environ-mental sustainability policies and programmes to reduce energy use across campuses," fostering "carbon free transport through free bikes for students," establishing bike lanes, and working "with local communities on initiatives to protect biodiverse areas and native forests" (The RELX SDG Customer Awards 2021, n.d.).

Academic librarians and campus facilities engineers collaborate to make their libraries greener and eco-friendly. LEED architecture for new building design, and retrofits for existing structures, are becoming more commonplace as librarians provide input on library construction projects. According to the Green Libraries website (greenlibraries.org), there are 42 green libraries listed in the United States and Canada, with more under construction. A resource list is available on the site for librarians wishing to explore ways to make their library green (greenlibraries. org/resources). For those considering turning their library greener, the Association of College and Research Libraries (ACRL) LibGuide offers an extensive collection of resources for sustainable academic library building design (acrl.libguides. com/buildingresources).

Educating for Sustainability

SDGs expire in 2030, but the need for sustainable development does not. The Organisation for Economic Co-operation and Development (OECD) introduced a broader vision of "global competence" as "a multi-dimensional construct that requires a combination of knowledge, skills, attitudes and values successfully applied to global issues or intercultural situations." The only way to accomplish this is through education. Schleicher (2020) believes that education can reconcile the needs and interests of individuals, communities, and nations within an equitable framework based on open borders and a sustainable future. Only then will the underlying principles of the SDGs become a real social contract with citizens.

OECD, UNESCO, and the Sustainable Development Solutions Network (SDSN) contribute to promoting education for sustainability by providing tools for educators and learners through conferences, surveys, webinars, and learning academies. SDSN offers free, self-paced classes open to learners at any educational level (unsdsn.org). In addition to SDSN's Global Schools Program, the SDG Academy (sdgacademy.org) creates and curates free massive open online courses (MOOCs) and educational materials on sustainable development and the SDGs (usdsn.org/sdg-academy or edx.org/school/sdgacademyx). In 2015 SDSN launched an all-volunteer network of youth hubs (sdsnyouth.org).

In response to COVID, UNESCO formed the Global Education Coalition (globaleducationcoalition.unesco.org), a group of 275 organizations from the public, private, and nonprofit sectors to protect the right to education during unprecedented disruption, from response to recovery. The coalition has 233 projects in 112

countries. An important initiative is its Global Skills Academy (globaleducation coalition.unesco.org/global-skills-academy), which offers free, online technical and vocational training by its select members, such as IBM and Dior.

The Australia, New Zealand & Pacific SDSN site (ap-unsdsn.org/regional-initiatives/universities-sdgs) offers links to events concerning actions on SDGs in various educational settings as well as guides such as Getting Started with the SDGs in Universities (ap-unsdsn.org/regional-initiatives/universities-sdgs/university-sdg-guide) and Accelerating Education for the SDGs in Universities (ap-unsdsn.org/regional-initiatives/universities-sdgs/university-sdg-guide). The guides are available in multiple languages; the most recent addition is a guide supplement with new case studies.

The Global MDP Master's in Development Practice program (mdpglobal.org) is a consortium of 35 institutions from 24 countries on all continents. The program consists of a core curriculum tailored to individual and institutional needs; a Global Classroom, including students communicating remotely; and a field training overview. At Emory University (https://web.gs.emory.edu/mdp/about/index.html), the librarian for sociology, African studies, and development studies teaches the Research Methods class.

TeachSDGs (teachsdgs.org) is a volunteer organization providing official UN resources for teachers and students, supported by the United Nations Foundation.

Many education conferences emphasize the need for integrating sustainable development into curricula. Examples include:

- The 10th International Conference on Sustainable Development (ICSD) 2022, Creating a Unified Foundation for the Sustainable Development Research, Practice, and Education (ecsdev.org/conference/10th-icsd-2022)
- The 3rd World Higher Education Conference (WHEC2022), Reinventing Higher Education for a Sustainable Future (en.unesco.org/news/unesco-world-higher-education-conference-2022), sponsored by UNESCO, in partnership with OECD

Sustainability Courses for LIS and iSchools

According to the International Association of Universities' (IAU) "2nd Global Survey Report on Higher Education and Research for Sustainable Development," 65 percent of 352 universities responded that they have specific courses on sustainable development or integrate SDGs into other courses. An example of a standalone course's approach is the "University of Auckland's three SUSTAIN courses, which teach what sustainability means, its underpinning values, and the role individuals and organisations play in creating solutions at the local and international level. The courses are available to arts and science students, with the first-year course available to all students as a General Education option" (India Education Diary, 2022). The University of Technology Sydney (sustainability.edu.au) embeds sustainability into the curriculum for all courses. It also maintains the national Teaching and Learning Sustainability website for Australia, including lists of educators, courses, and teaching materials.

The IAU report includes an extensive bibliography and sample university strategic plans (Mallow, Toman, and van't Land, 2020). Noticeably absent are courses

or programs in schools of library and information science (LIS) or iSchools. The American Library Association (ALA) lists areas of concentration/career pathways within ALA-accredited programs (www.ala.org/CFApps/lisdir/index.cfm); none include sustainability.

> **Exemplary Practice:** The University of Florida (UF) created a resource for developing greater global awareness and sustainability literacy: Sustainable Development Goals in the Classroom: a UF Faculty Guide for Using the United Nations SDGs (https://dcp.ufl.edu/sbe/wp-content/uploads/sites/32/2021/02/UN-SDGs_InTheClassroomAtUF_2021-01-00.pdf).

Chowdhury and Koya (2017) argue that one essential element to achieving SDGs is access to information. Their article, "Information Practices for Sustainability: Role of iSchools in Achieving the UN Sustainable Development Goals (SDGs)," includes a recommended framework for teaching and research in iSchools for promoting SDGs:

1. Sustainable information systems and infrastructure
2. Sustainable information practices
3. Sustainable information policies and governance
4. Essential user education, training, and literacy

The article does not mention libraries. There is agreement on the importance of education in achieving the SDGs; however, LIS and iSchool programs have been slow to integrate sustainability into their curriculums.

Pre-Tertiary Education

The long-term future of the planet depends on Generation Z and those who come after. The OECD survey of 15-year-olds' accomplishments in reading, math, and science, known as PISA (Programme for International Student Assessment), asks questions about student awareness of the global environment. According to the 2018 results, 78 percent of the students across OECD countries agreed or strongly agreed that looking after the global environment is important to them and that they know about climate change and global warming. However, they are not being proactive in their actions (OECD, 2020). Ninety percent of school principals reported that their curriculum covers climate change and global environment.

The "Think Green Education and Climate Change: Trends Shaping Education #24" report summarizes the PISA report, recommends steps for universities to take through changing pedagogy and working with other organizations, and incorporates supporting data (OECD, 2021). The OECD 2008 Workshop for Sustainable Development included a curriculum guide for education for sustainable development for primary, secondary, and tertiary levels (www.oecd.org/greengrowth/41078703.pdf) that remains relevant today.

The Sustainable Development Goals and Libraries

Libraries partner with other libraries and library associations to learn about and participate in sustainable development efforts and activities. Academic libraries collaborate with other departments to promote SD across their campuses, participating in SD events and initiatives.

Library and Information-Related Associations

International, regional, and national library and information-related organizations conduct surveys, issue reports, and hold events related to sustainable development. For example, the global membership organization OCLC, known to many librarians as the provider of WorldCat, has a productive research team. In 2020 it conducted a survey of library staff to determine how aware they are about SGDs and how libraries are using SDGs "to inform their strategic directions" (OCLC, 2021). The survey found that awareness concerning SDGs was lowest in the Americas. Also, explicitly incorporating SDGs into library strategic planning was below 15 percent in all regions. Links to the survey findings and a series of on-demand webinars are available at https://www.oclc.org/research/publications/2021/sustainable-development-goals-study-2021.html.

The International Federation of Library Associations and Institutions (IFLA) has been among the most active organizations at the global level. As part of the 2020 United Nations SDG Action Week, IFLA listed eight ways to promote SDGs:

1. Use IFLA's posters on websites and social media.
2. Contribute a story to the Library Map of the World.
3. Organize and present your own advocacy resources.
4. Take the message to decision-makers and influencers.
5. Access your capacity to advocate around SDGs by using IFLA's SDG cap. acity grid.
6. Build relations with decision-makers.
7. Build advocacy partnerships.
8. Evaluate advocacy (IFLA advocacy capacities grid, 2020).

IFLA's Environment, Sustainability and Libraries (ENSUBLIB) section is now in charge of the association's Green Library Award, presented since 2006. There is an award for the best library building and the best library project. In 2021 the Edmonton Public Library's revitalization project was the 2021 building winner, and Finland's Oulu City Library received the project award (https://www.ifla.org/news/ifla-green-library-award-2021-winners-announced). Past winners and runners-up are listed at https://www.ifla.org/g/environment-sustainability-and-libraries/ifla-green-library-award.

As of February 2022 31 countries have submitted stories to IFLA's Library Map of the World Sustainable Development Goals and Stories (https://librarymap.ifla.org/stories), highlighting ways in which their libraries reach out to their communities about sustainable development. Noticeably absent from the map are the United States and the U.K. One story represented on the map is the Charles Darwin Research Center's (darwinfoundation.org) traveling library, which is designed

to increase conservation literacy and awareness across the four Galapagos Islands (SDGs 4, 11, 13, 14, and 15). The center's library staffers support primary teachers and students through email and social media.

Regional Library Associations

Giuseppe Vitiello, director of the European Bureau of Library, Information and Documentation Associations (EBLIDA) clarified the European Union's (EU) approach to Agenda 2030 and the role of EBLIDA (personal communication January 20, 2022). The EU takes a holistic approach to the SDGs (https://ec.europa.eu/info/strategy/international-strategies/sustainable-development-goals/eu-holistic-approach-sustainable-development_en), creating a set of 100 indicators bundled into six priorities: European Green Deal, economy that works for people, Europe fit for the digital age, European way of life, stronger Europe in the world, and European democracy.

EBLIDA supports library associations and libraries in the 47 countries of the Council of Europe (www.coe.int/en/web/portal/home), encouraging libraries to see beyond education, culture, and the environment. The association partners with European organizations, sharing resources and ideas for integrating the SD goals into libraries' core mission, such as:

- EBLIDA Matrix (www.eblida.org/Documents/ELSA-WG-implementation-SDG-Indicators-in-EU-Libraries.pdf), which presents in-depth information on each SDG and how libraries can relate to them
- The SDG-KIC-Knowledge Information Centre (www.eblida.org/activities/sdg-kic), a resource for politicians, library policymakers, and staff implementing SDGs in libraries
- The European Libraries and Sustainable Development Implementation and Assessment (ELSIA) Expert Group (www.eblida.org/about-eblida/expert-groups/eu-libraries-sustainable-development-implementation-assessment.html), which deals with the implementation of the 2030 Agenda in European libraries
- The December 2021 EBLIDA Newsletter (mailchi.mp/316f692cdbdd/eblida-newsletter-4870162?e=[UNIQID]), which provides summary data from the "Second European Report on Sustainable Development and Libraries"

Australia, its universities, and library associations have been active in SDG initiatives. The Australian Library and Information Association (ALIA), the Australian Libraries and Archives Copyright Coalition, Blue Shield Australia, the Council of Australia University Librarians (CAUL), and the National and State Libraries of Australia have worked together to identify 10 targets covering the six different goals listed, referred to as "Stretch Targets." The 10 targets and the SDGs they support are:

1. Libraries contribute to literacy, including media literacy, and are embedded in national strategies (SDG 4.6).
2. Adopt open access practices and principles (SDG 16.10).

3. Achieve copyright reform (SDG 16.10).

4. All Australians have access to public library services online, and 90 percent have access to a public library service point (SDG 16.10).

5. In collaboration with indigenous people, adopt practices to collections and services that are culturally informed and respectful (SDG 4.7).

6. ALIA has an open and transparent position on climate change (SDG 13).

7. Public libraries are acknowledged as centers for personal development and well-being (SDG 3).

8. Library collections and services reflect the diversity of Australia's population, including asylum seekers and refugees (SDG 4.7).

9. We commit to lifelong learning for our own workforce and provide opportunities for all Australians to pursue lifelong learning (SDG 4).

10. Australian library and information sector professionals are actively engaged with libraries and library associations in the region and internationally (SDG 17) (Sustainable Development Goals: Stretch Targets for Australian libraries 2020–2030, n.d.).

ALA established its International Relations Round Table (IRRT) in 1949. In 2002 IRRT launched the International Sustainable Library Development (ISLD) interest group. ISLD acts as a clearinghouse of sustainable library-based projects in developing areas of the world. In 2020 ALA created the ALA Task Force on United Nations 2030 Sustainable Development Goals (www.ala.org/aboutala/ala-task-force-united-nations-2030-sustainable-development-goals), which is still in the formation stage. The site provides links to archived webinars from a variety of sources.

Exemplary Practice: A university library, library association, and publisher supporting SDG 17, Partnerships for the Goals (www.las.org.sg/wp/blog/announcements/why-should-i-care-libraries-advocacy-and-the-un-sdgs)

In September 2021 Singapore Management University Libraries hosted the webinar, "Why Should I Care: Libraries, Advocacy, and UN SDGs," co-hosted by the Library Association of Singapore and Taylor & Francis. The speakers included Loida Garcia-Febo, chair of the ALA Task Force on United Nations 2030 Sustainable Development Goals, and Don Low, journals sales director at Taylor & Francis.

These are examples of professional organizations supporting libraries' involvement in sustainable development. As Vitiello tells us, "Professional organizations and librarians' associations have a great role to play in raising librarians' awareness about SDGs."

Libraries Large and Small

Libraries address sustainable development through traditional activities and innovative SD initiatives. As librarians consider the inclusive nature of their

collections, they turn to independent booksellers and small presses to find more diverse titles. Academic libraries are examining catalog records for the use of outdated and inappropriate terminology in subject headings (e.g., replacing "Aliens" with "Noncitizens"). Some libraries are examining their archival holdings for collections to share about historical injustice, such as the Syracuse University Libraries Special Collections Research Center's new digital exhibition, A Courageous Stand: The Story of the Syracuse 8, about "a group of Black student-athletes who boycotted the University football program until it addressed their allegations of racism in 1970" (Hatem, 2021).

> **Exemplary Practice:** Academic libraries are creating research guides dealing with the SDGs, such as the University of Michigan's effort to document resources for conducting SDG research (guides.lib.umich.edu/sdg). Other libraries develop research guides for individual SDGs, such as the University of South Florida LibGuide on DEI (guides.lib.usf.edu/diversity) and the Resisting Racism Research Guide from the University of Washington (guides.lib.uw.edu/resistingracism).

Library-led SDG awareness campaigns include hosting in-person events and online webinars that feature expert speakers from their faculty and using the library blog to post articles about the SDGs. Using SDGs as examples during library instruction classes is another way librarians integrate sustainable development into the curriculum.

> **Exemplary Practice**: Hong Kong University of Science and Technology (HKUST) works closely with university researchers through its blog, "Research Bridge" (library.ust.hk.sc/adg). Gabi Wong described a library-led project to put HKUST research output in context and raise researchers' awareness of SDGs (personal communication, January 18, 2022). HKUST's publishing profile was compared to the Scopus dataset.

Library Services beyond the Traditional

Libraries are known as social agents for promoting the good health and well-being of their communities (Schofield, n.d.). During the pandemic, libraries assumed information-adjacent roles, including distributing food and masks and acting as COVID testing and inoculation sites.

The public turns to libraries for accurate information, often beyond the training of library staff. Social workers can help patrons access resources and services beyond what is available in the library ("Davenport Library Becomes Iowa's First to Hire Social Worker," 2022). Libraries benefit when there is a social worker to address the psychosocial needs of library patrons, including the homeless and mentally ill (Wahler et al., 2020).

Exemplary Practice: The Sustainable Libraries Initiative (sustainablelibrar iesinitiative.org) creates awareness of the library ecosystem and libraries' role as sustainability leaders in their communities. The project offers professional development opportunities for library staff to become certified Sustainability Coordinators. The website features libraries that have found ways to reduce energy, redirect waste, and increase collaborations with other groups in their communities.

Programming at the public library might feature cooking demonstrations and nutrition classes. Libraries participating in the USDA's Summer Food Service Program (SFSP) provide meals and nutritious snacks to children and teens in low-income areas during the summer. "Offering meals and snacks through the federal meal programs not only allows libraries to become key allies in eliminating childhood hunger and promoting healthy foods, but it helps attract children to the libraries' resources and activities" (Food Research & Action Center, p. 1).

According to a survey conducted in 2020 by the Hope Center for College, Community, and Justice, 39 percent of student respondents at two-year institutions and 29 percent at four-year institutions were food insecure (Hope Center for College, Community, and Justice, 2021). Each campus and library customizes a response to meet the nutritional needs of its students and the institution. Some colleges locate their food pantries in the library "because of the library's expansive hours and student traffic" (Wood, 2020). The College & University Food Bank Alliance (CUFBA) has a toolkit and other resources to help libraries when considering opening a food pantry (cufba.org/resources).

Libraries help students with childcare while they attend class or study. At Monroe Community College in Rochester, New York, the libraries have family-friendly study rooms replete with educational toys and books to keep children occupied (Ithaka S+R).

"More than 90 percent of academic institutions have affordable learning initiatives" (*Library Journal*, p. 9). At the institutional level, these initiatives include reduced tuition and greater flexibility in the time allotted to complete courses required for graduating with a degree. Libraries participate by assuring fair access to resources and eliminating fees for access to research and fines for the return of overdue material. "The coronavirus pandemic has taken a financial toll on college students and sped up the process of going fines free" (Chung, 2021).

During the pandemic, academic libraries were the logical choice to spearhead efforts by colleges to lend laptops, iPads, Chromebooks, and hotspots to students whose classes had shifted online. Since libraries already lend books, it was simply a matter of sourcing the technology from information technology departments.

Academic libraries recognize a need to place greater emphasis on DEI initiatives. Responding to a *Library Journal* survey, libraries indicated they would use

unexpected increases in budgets to purchase more electronic resources (65 percent of respondents), increase staff (44 percent), fund digitization (42 percent), and fund DEI initiatives (37 percent). Funding DEI initiatives placed higher on the list of priorities than building/facilities improvement (36 percent), OER initiatives (32 percent), or pay increases (31 percent) (*Library Journal*, p. 29). While there were some regional differences, both Europe and North America included DEI among their top priorities (*Library Journal*, p. 30).

Whether taking a comprehensive approach to sustainable development or targeting their efforts, libraries strive to make their communities more sustainable. Some libraries are leading the way; others are just beginning. There is no end to the opportunities to participate.

A Prescription for Progress

The UN SDGs provide a framework for addressing the many complex and systemic challenges facing the world today. A sustainable future requires innovation, with all segments of the scholarly community working together: teachers and scholars, publishers and database providers, libraries and professional organizations. There is no one right path for achieving sustainability. Each member of the scholarly community can follow internal best practices to support individual SDGs and communicate the importance of SDGs to their stakeholders. They may have already been doing many of these activities but have neither connected nor integrated them into sustainable development initiatives. The following recommended practices supporting sustainable development provide entities with practical ideas for beginning their SD efforts.

Recommendation #1: Make others aware of your organization's commitment to sustainable development.
- Enumerate the actions your organization is taking toward SDGs.
- Use multiple channels to inform, describe, and convince others to participate in your SDG-related initiatives or events.
- Encourage and amplify the SD initiatives of your organization (and those of others).
- Help researchers promote their work to scholarly and non-academic markets.
- Create mechanisms to assure effective transfer of knowledge ("lessons learned") from one program to another, one institution to another.

Recommendation #2: Encourage and support research that creates new knowledge about SD.
- Work with your university to incorporate the SDGs in its research framework.
- Support efforts to integrate SD across the curriculum.
- Create targeted workshops, drop-in sessions, meetups, webinars, seminars, and conferences for researchers; expand the subjects covered in these sessions; and increase the number of participants from your community and beyond.

- Assist researchers to deal with intellectual property rights.
- Embrace the future of open access, including the underlying data for research output, by adopting the FAIR (Findable, Accessible, Interoperable, and Reusable) data principles and making informed decisions about where to publish.
- Coordinate with relevant departments in your institution to create a repository for research and data to maximize discovery.

Recommendation #3: Educate your staff, students, instructors, and community about SD.
- Use a mix of SDG learning opportunities (e.g., lectures by experts, webinars, and podcasts) to extend your reach about SD to those in and beyond your community.
- Develop research guides, conduct literature reviews and arrange for subject experts to create systematic and/or scoping reviews, create annotated bibliographies related to the SDGs, and make alerts on each topic available to interested parties.
- Examine your collections for SD-related materials, highlight SD in exhibitions, and acquire SD-related materials to be included in classroom instruction to excite the next generation of researchers.

Recommendation #4: Be deliberate about sustainable development by including SD in your strategic plans. Commit resources to each effort, including financial and human resources.
- Identify SDG opportunities as part of your organization's planning session.
  - Include your staff in the planning to increase chances for success.
  - Identify potential partners within and outside your organization whose resources could help you reach the goals.
  - Set priorities by selecting high-impact and highly visible projects.
- Holding a staff member accountable for SD activities will help the department achieve its targets.
- View SDGs through the lens of organizational activities, connecting existing activities to the SDGs.

Recommendation #5: Use the scholarly supply chain to collaborate and communicate with other libraries, library organizations, and publishers.
- Inform publishers, database vendors, and platforms of SD gaps in their offerings.
- Encourage interdisciplinary collaboration on SD-related projects, with multiple institutions and countries.

Recommendation #6: Identify key performance indicators (KPIs) for specific goals.
- Track and disclose historical data to be used as a benchmark for assessing progress.

- Work with departments in your institution to align targets and coordinate assessments.
- Provide transparent progress reports.
- Report for impact by making reports meaningful and accessible to others as models.
- Take responsibility for following and understanding the national and international third-party rating of SD research and activities to inform the organization and its researchers on how to improve their visibility and positions.

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