

Greening libraries: a literature review for the Australian Library and Information Association

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Australian Library and Information Association



Greening libraries: a literature review

Introduction

"Founded on the principle of reuse, libraries have a long tradition of being environmentally friendly" (Griebel, 2012, p. 113).

The library and information science literature relating to sustainability practices is dominated by the greening libraries movement in the United States which began only in the 1990s. Sustainability can be considered a relatively new area of focus in the field of librarianship, and one where the literature calls for sustainable development policies to be specifically designed for library and information organisations (Khalid et al., 2021, p. 8). In much of the available literature that examines the greening libraries movement, sustainable development is based on the definition of sustainability provided by the United Nations, that being: "meeting the needs of present generations without compromising the ability of future generations to meet their needs" (United Nations, 1987, para. 1).

A "Green Library" refers to "any library that promotes sustainability through education, operations, and outreach" (Aulisio, 2013, p. 1). Similarly, Ephraim (2003, p. 161) states that "green library theory calls for a conscious awareness of the environment and devising strategies [for] administering library resources and services with environmental considerations at the forefront."

Besides the considerable body of literature from the United States, publications appeared in searches related to greening libraries in Aruba (Alders, 2018), China (Kang, 2020), Croatia (Dragaš,2017; Dragaš & Ercegovac, 2019; Vrana & Zečević, 2020), Hungary (Dubniczky, 2018), India (Suresh Kumar & Sofiya, 2019), Iran (Ghorbani et al., 2015), Nigeria (Oyelude & Alabi, 2013), Slovenia (Kebe & Podjavoršek, 2019), Turkey (Akbulut et al., 2018), and the United Kingdom (Matthews, 2013).

The International Federation of Library Associations and Institutions (IFLA) produced a *Statement on Libraries and Sustainable Development* in 2002. The statement echoes the language of the United Nations statement (1987) and acknowledges a commitment to sustainable development which addresses the needs of the present and future. This understanding is extended to recognise that library and information services promote sustainable development by ensuring freedom of access to information. In 2010, the American Library Association (2010) recognised sustainable development as a "core value of librarianship". Libraries' role and potential in sustainable development is affirmed in other publications such as Prasanth and Vasudevan (2019) who note the sharing and reusing of resources by the broader community make libraries "green" as well. Also, recognising the role of library collections in sustainabile Development Goals as a participant in IFLA's International Advocacy Programme built around the United Nations' *2030 Agenda for Sustainable Development* (2015). In particular, Goal 11 Sustainable Cities and Communities is considered relevant to libraries: "Libraries collect and preserve the nation's cultural heritage for future generations. Libraries are home to their own institution's documents and to local history collections" (ALIA, 2018, p. 20). The United Nations (2015) extends this view of sustainability to include creating sustainable cities through the provision of safe and affordable housing, investment in public transport, creating green public spaces, and improving urban planning and management in participatory and inclusive ways. In addition to strengthening efforts to protect and safeguard the world's cultural and natural heritage, targets involve environmental concerns such as air quality and waste. Libraries have a significant role in preserving cultural heritage and making it accessible. They need to strive to do this in ways that have a low impact on the environment. Reducing the impact on the environment has become increasingly important to how libraries function and in their role as educators.

Libraries are currently significant consumers of space, energy, paper and other resources, with studies showing increases in libraries' carbon footprints (Chowdhury, 2010; Jankowska & Marcum, 2010; Khalid et al., 2021). Libraries are one part of a general trend where paper consumption continues to increase around the world. Contrary to expectations, computers and the age of information technology have actually magnified demands on the need for paper, printer cartridges, and computers.

This review of the literature seeks to explore resources published since the year 2000 that relate to sustainable practices of libraries. These resources have been clustered into five groups: exploring the definitions of 'greening' in libraries, the importance of libraries committing to sustainability as one of their core values and reflecting these values in their policies and activities, the role of libraries in educating their communities about sustainable practices, and the opportunities for libraries to measure their sustainability practices with a view to continuous improvement.

Methodology

A literature search was conducted using the Library, Information Science & Technology Abstracts database (LISTA). Using the search term "green libraries" to search within just the Abstract field returned 787 results. It was apparent that the term "green" was also used to identify research relating to open access. The addition of the terms "sustainable/sustainability/eco-friendly" returned 104 results. The title of each returned reference was examined for relevance and suitability. All resources considered suitable for inclusion were downloaded to an Endnote library. Additional references were found through linking from reference lists in papers. The search strategy is shown visually in a PRISMA diagram in Figure 1 (adapted from Moher et al., 2009).



Figure 1 PRISMA of Search Strategy

Additional searches were undertaken within the Charles Sturt University Library Primo catalogue, Google Scholar and Scopus for 'Greening Libraries' and/or librar* AND sustain*. All relevant resources published from 2000 to the present time were downloaded and added to the Endnote Library. The final Endnote library contains a total of 49 resources published between 2000-2021 and includes books, journal and magazine articles. Some reports were also included like certifications from the <u>Sustainable Libraries Initiative</u> in the United States and ALIA's report *Australian Libraries Support the Sustainable Development Goals* (2018). Eight resources were published in 2014, making this the most prolific year, followed by 2020 with six, and 2010 with five publications. Only five resources were published in the decade 2000-2010, indicating an increasing interest in sustainability issues over the most recent ten years (see Figure 2).



Figure 2 Number of publications by year

A range of literature was gathered with the majority being journal article papers from library journals such as *Libri:* International Journal of Libraries & Information Services, Journal of Library Administration, Library Journal, Progressive Librarian and Electronic Green Journal with national library journals and specialist journals such as Public Library Quarterly, College & Research Libraries, and Journal of Hospital Librarianship also represented. A limitation to this search strategy was the inability to explore literature outside of articles published in English so it is possible other useful resources were missed.

The meaning of 'greening'

The significant role of libraries as resource consumers and their efforts to reduce energy use and consumption are outlined in a number of publications. A review by Jankowska and Marcum (2010) states that "greening" is a process and a state of mind (p. 162). They identify four major categories where sustainability focus is required:

- 1. Sustainability of scholarship and collections;
- 2. Green library operations and practices;
- 3. Green library buildings; and
- 4. Measuring and improving sustainability. (p. 161)

When writing about academic libraries, Jankowska and Marcum (2010) recognise the continued growth of library collections as a threat to their sustainability. They identify academic libraries as significant consumers of computer paper, water, electricity and ink, and argue that unless libraries address their environmental impact, their role in providing access to holdings could be compromised (p. 165). Noting a fundamental contradiction within the framework of economy, ecology, and equity, they state a balance is needed between "the attributes of core sustainability in today's digital environment with the tradition of continued growth and the substantial environmental consumptions that growth requires" (Jankowska & Marcum, 2010, p. 165). Integration of sustainable strategies relating to library collections, buildings, resource digitisation and preservation, and use of finite resources is needed. Sustainability should be prominent in the work and thinking of library management, including a clear vision for improving library performance (Aldrich, 2019). These concepts are explored further in the following sections.

Organisational commitment, values, and policies

The literature suggests that institutional commitment is essential to advancing sustainability (Aulisio, 2013; Davis, 2014). Organisations such as universities, local and city councils need to have sustainability policies to enable libraries to work with and be supported by the assistance of their broader context. In the United States, Hendrick Hudson Free Library worked to put itself at the forefront of the sustainability movement with a series of green initiatives; Davis (2014, pp. 24-28) describes the role of the library in helping its community to implement various changes that can impact the environment. The library established a general environmental policy and added sustainability practices to job descriptions and employee reviews to initiate such changes. The library's mission and policies were supported by a Green Team, which included board members and volunteers who identified and promoted sustainable practices through example and education.

McBane Mulford and Himmel (2010) note that the first step to greening a library is to review its organisational values. Core values should align with becoming greener including a statement of values generated through strategic dialogue and a facilitated sustained discussion amongst staff and clients (pp. 83-84). The next step is to set goals and objectives encompassing research and data gathering, development of opportunities, constraints, and resources, followed by further research and analysis (p. 85). McBane Mulford and Himmel (2010) provide a Preliminary Green Assessment Checklist (pp. 57-58), a comprehensive guide on reducing and recycling solid waste, energy conservation, and water conservation (pp. 63-68).

To evaluate such steps, Norton (2007) suggests libraries conduct an environmental audit. Audits could include the annual usage of water, the annual amount of hazardous and solid waste, the percentage of publisher catalogues produced on recycled paper and the quantity of computer paper used per employee. Similarly, Salonga-Silverio (2011, p. 82) suggests measuring the environmental performance of libraries in an Environmental Performance Evaluation (EPE). The EPE can include variables such as the perception of librarians, types of waste produced, presence/absence of environmental management policies, presence/absence of sustainable practices, and barriers to implementing sustainable practices.

A role in education

Several studies reveal that libraries have a role outside their buildings in creating environmentally literate communities (Aulisio, 2013; Binks et al., 2014; Jankowska et al., 2014; Miller, 2010). Ephraim (2003) argues that university libraries have a role in encouraging green habits amongst users by teaching all students how to care for books (p. 162). Similarly, Miller (2010) notes public libraries as organisations that can develop environmental literacy in their local communities (p. 13). In the same vein, Jankowska and Marcum (2010, p. 166) highlight the role of libraries in supporting global sustainability by promoting and disseminating literature on this topic and providing environmental information literacy.

Over the past decade, research on environmental sustainability in libraries notes that ecological education is seen as an important task for various types of libraries (Binks et al., 2014, p. 302; Ghorbani et al., 2015, p. 215; Miller, 2010, p. 63–75). Libraries have become "green educators" or "green teachers" with the goal of environmental education to "raise ecological awareness, disseminate knowledge about the natural environment, develop sensitivity and promote pro-environmental attitudes and behaviours" (Fedorowicz-Kruszewska, 2020, p. 280). Kurbanoglu and Boustany, (2014, pp. 54–55) discuss that green information literacy and the greening of information literacy form an important component of the Green Library Movement and can contribute in different ways to the creation of a greener community. This view is supported by Fedorowicz-Kruszewska (2020), who labels environmental literacy as "green information literacy", leading to "sustainable thinking that considers how our information behaviours, including searching, using and transmitting information, affect the environment" (pp. 282-283).

Sustainability activities in libraries

Internationally, there are numerous examples of libraries making considerable efforts to reduce their waste and energy use and still provide comfortable and accessible environments. Research on academic libraries in Australia and New Zealand suggests the increase in e-books and decreased in print books is reducing greenhouse gas emissions and the university's carbon footprint (Chowdhury, 2012b). The book *Greening Libraries* (Antonelli & McCullough, 2012) offers exemplars and models of practice in North America that other libraries can use to build their own sustainability plans and activities. One chapter describes the greening efforts at the West Vancouver Memorial Library (WVML) housed in a 1950s building that has had various additions made over the last 50 years (Backer, 2012). A Green Team of WVML volunteers was formed in 2007 inspired by a new building manager with ideas about how this older building could increase energy efficiency. The Calgary Public Library's Eco-Action Plan outlined in another chapter resulted from the formation of a team by the CEO to develop an environmental action plan focused on eco education and using an "environmental lens" to examine all areas of the library system (Griebel, 2012, p. 114). The Denver Public Library has a strong interest in educating the public about sustainable living through outreach education and partnerships with other groups in Denver dedicated to sustainability (Lawrence, 2012, p. 119). Another chapter highlights the academic library at Concordia University in Portland, Oregon, as a community learning space (Reynolds, 2012). With much student activity moving online, the library was constructed as a gathering place supporting social interaction and intellectual exploration (p. 18).

The Hendrick Hudson Free Library's efforts to push itself to the forefront of the sustainability movement by a series of green initiatives is reported in Davis (2014). The process involved organisational commitment from the library's governing body, establishing a general environmental policy and making sustainability practices central to employees' work (p. 25). A Green Team conducted energy and waste audits including simpler ways to shut down computers at the end of the day and to reduce paper use. A commitment was made to buy products with at least 30% post-consumer recycled materials and the library stopped using chlorine-based cleaners or aerosol cans (Davis, 2014, p. 26).

Despite various practical examples in the professional literature, there is only a small body of empirical research studies relating to sustainable and environmental performances of libraries. In one study by Jankowska et al. (2014), a survey of 149 North American libraries explored engagement in sustainability-related activities and initiatives. The study found that 26% of libraries were minimally engaged, 49% were somewhat engaged, 22% were moderately engaged, and only 3% were highly engaged. Some of the reported sustainability-related activities and initiatives included:

- Information literacy classes incorporating topics related to open access, use of institutional repositories, the environment, retaining author rights, social equity, and community engagement (71%);
- Collaborating on sustainability-related activities with other units on campus (62%);
- Creation of subject guides related to sustainability (46%);
- Efforts to build collections devoted to sustainability-related topics (40%); and
- Involvement in sustainability research (23%) (Jankowska et al., 2014, p. 53).

In the United States, the Duke University Medical Center Library created and implemented a sustainability plan as a way of contributing to the University's institutional goal of becoming carbon neutral by 2024. The library created workshops titled "Leading for Sustainability" in which sustainability staff explained the process for obtaining Duke Green Workplace Certification which requires completion of 40 out of a possible 58 action items on a checklist (Peterson et al., 2014). Examples from the checklist include:

- Eliminate unnecessary electronic equipment (e.g., desktop printers);
- Purchase recycled paper and office supplies;
- Use of videoconferencing/conference calls instead of travel;
- Recycle all paper, plastics, metals, glass, and cardboard;
- Donate used supplies to the Duke Free Store; and,
- Provide reusable dishware and cutlery in the staff lounge (p. 15).

Another example of supporting sustainable practices in libraries comes from the United Kingdom where the <u>Environmental Association for Universities and Colleges</u> (EAUC) was founded in 1996. This association is responsible for supporting educational institutions, including libraries, with sustainability initiatives and education. Also from the United Kingdom, Matthews (2013) reports on a range of sustainability initiatives in British academic libraries with a strong focus on green building design and architecture. Matthews extends his focus to Australia and includes the University of Tasmania in his writing. The University is used as an example of an organisation with advanced sustainability practices within its daily services and operations. The University focuses on basic initiatives like using Energy Star Ratings as a selection criteria for the purchase of technology; using recycled paper for printers and copiers; offering facilities and pickup for the recycling of toner cartridges, batteries and mobile phones as well as waste recycle bins for glass and metal (Matthews, 2013, p. 195).

Measuring performance

A systematic review by Khalid et al. (2021) identified major obstacles in sustainability development processes. These obstacles included a lack of guidelines to reduce printing waste management (Dempsey & Palilonis, 2012), a lack of institutional support for creating sustainability policies for library collections (Brodie, 2012; Marcum, 2009), and an absence of frameworks for estimating or reducing greenhouse gas emissions resulting from the use and disposal of IT infrastructure required to operate information retrieval systems (Chowdhury, 2012a). With an escalation in the number of digital projects and networking functions, libraries face increasing energy costs, and the need to recycle unwanted equipment like obsolete computers, CDs, disk drives, and used computer paper. There is a need to develop or adopt indicators related to these areas (Jankowska & Marcum, 2010, p. 165). Chowdhury (2013) developed the model of sustainability of digital information systems and services which is useful to consider in this context.

Energy and waste audits are recommended as one way to embark on library greening (Davis, 2014; Hauser, 2014). Energy audits involve recording kilowatt-hours used and the cost per kilowatt-hour. For recording levels of waste created by libraries, measuring garbage, paper and recyclables as well as the cost of disposal over a period of time can be established. These audits can form baselines of energy and waste use and then ways to decrease these amounts can be sought with reductions noted. Audits can also include examination of the building envelope and systems for lighting, space heating and cooling, and water heating, including an inventory of equipment (Hauser, 2014, p. 9).

Hauser (2014) notes sustainability certification can be pursued through frameworks and tools like the Sustainability Tracking, Assessment & Rating System (STARS). <u>STARS</u> is a global sustainability standard created by and for the higher education sector, including academic libraries. It is a transparent, self-reporting framework for colleges and universities to measure their sustainability performance. In Australia, there is the <u>National Australian Built</u> <u>Environment Rating System</u> (NABERS) which rates buildings from 0 to 6 stars, with 6 stars representing exceptional greenhouse performance and resource efficiency. NABERS is run by the NSW Government on behalf of the Australian Government and state and territory governments. The <u>Sustainable Libraries Certification Program</u> in the United States also offers a plan to support academic, public, and school libraries in developing their "commitment to environmental stewardship, economic feasibility, and social equity" (Sustainable Libraries Initiative, n.d.b, para 1.)

In the United Kingdom, <u>People and Planet's University League</u> include a biennial ranking of universities according to areas like their environmental policies, carbon management, sustainable food, education, and waste and recycling. While this ranking is focused on the whole university, there is potential for libraries to be sustainability leaders within their educational institutions.

Conclusion

A study of published literature regarding sustainability and 'greening' practices in libraries shows us that there is an increasing interest and growth of knowledge in these ideas. While dominated by resources from the United States, the more recent literature includes contributions from across the world. Common to the resources that make up this body of work is the idea that sustainable practices in any organisation must be mindful of both the needs of the present generation, and those of the generations to follow us. The literature shows us various strategies libraries around the world are using to support environmental initiatives and make sustainability a priority. From developing eco-friendly policies to playing an educative role by offering environmental literacy classes, the greening of libraries takes place in different ways depending on the community and type of library. Our final report will look in more detail at some library exemplars to create flexible and practical frameworks for other libraries to go green.

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