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Sustainable Green Initiatives and Practices in Academic Libraries: A Case Study of The Pgim Library

[1]Dilhani Munasinghe ✉ [2]Chandima Wadasinghe ✉

[1] Senior Assistant Librarian, Postgraduate Institute of Medicine, University of Colombo, Sri Lanka.
[2] Senior Assistant Librarian, Postgraduate Institute of Medicine, University of Colombo, Sri Lanka.

This case study investigates the strategic integration of green initiatives at the Postgraduate Institute of Medicine (PGIM) Library in Sri Lanka, documenting its transformation into a model of sustainable practice. It aims to document specific digital initiatives, analyse their impact on reducing the library's carbon footprint, and discuss their alignment with global sustainability benchmarks. Employing a multi-method approach, the study triangulates data from archival records, documentary evidence, digital artefacts, and system metrics. The findings reveal a synergistic operational shift driven by five core initiatives: the digitisation of administrative processes, implementation of a paperless communication ecosystem, a mandatory policy for digital academic submissions, development of an open-access repository, and the resultant indirect benefits of enhanced efficiency and access. The discussion frames this journey within green library theory, demonstrating how these targeted, low-cost digital interventions align with the principles of source-level waste reduction, fulfil key UN Sustainable Development Goals (SDGs 9, 12, 13), and offer a replicable blueprint for libraries in developing nations. The study concludes that the PGIM Library's experience provides empirical evidence that libraries can architect sustainability through strategic operational choices, positioning themselves as proactive agents in building an environmentally responsible and resilient future.

Keywords: Digital transformation; Green libraries; PGIM library; Sustainable Development Goals; SDGs; Sustainable practices; Academic Libraries; Sri Lanka.

Introduction

The adoption of green initiatives is a strategic imperative for the postgraduate library, fundamentally transforming its role from a passive repository into a proactive and responsible pillar of the institution's commitment to a sustainable future. This commitment ensures mission alignment by embodying the principles of sustainability taught within the institute, thereby upholding intellectual integrity. Furthermore, the library functions as a "living lab," cultivating environmental stewardship in future leaders and creating a powerful multiplier effect into their professional industries. These initiatives drive service modernization and economic efficiency, as digital transformation reduces environmental impact while enhancing 24/7 resource access, and energy-saving technologies lower operational costs, freeing funds for core academic priorities. This demonstrated leadership builds significant reputational capital by enhancing the institution's brand, attracting top talent, and satisfying key accreditation metrics. Ultimately, these efforts fulfill a profound ethical duty to minimize the ecological footprint and contribute to societal resilience (IFLA, 2018).

Libraries globally are redefining their roles beyond being mere repositories of knowledge to becoming leaders in institutional sustainability. The escalating demand for information resources incurs a significant environmental cost, primarily through paper consumption, energy usage, and waste generation. This necessitates a paradigm shift towards eco-conscious operations (Gregory, 2004). The Postgraduate Institute of Medicine (PGIM) Library in Sri Lanka has embraced this challenge, proactively integrating green practices into its core functions. These

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initiatives stem from a synergistic effort: some were developed internally by the library team, while others were adopted in response to or in partnership with broader sustainability mandates from the parent institute. By leveraging technology to minimise its carbon footprint, the library aligns its operations with the United Nations Sustainable Development Goals (SDGs), particularly SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), and SDG 9 (Industry, Innovation, and Infrastructure). This paper presents a case study of the PGIM Library's journey towards sustainability, detailing its specific initiatives and framing them within the broader discourse on green librarianship.

Objectives

This study aims to:

1. Document the specific green initiatives implemented by the PGIM Library.
2. Analyze the impact of these initiatives on reducing the library's carbon footprint and resource consumption.
3. Discuss the alignment of these practices with the United Nations Sustainable Development Goals.

Literature Review

The concept of "green libraries" encompasses both the dissemination of environmental information and the adoption of sustainable operational practices. Gregory (2004) identified key areas for library engagement, including waste management, energy reduction, and the use of eco-friendly technologies, noting that these efforts enhance institutional reputation. Bennett (2012) expanded this view, arguing that sustainability extends from architectural design to daily activities like promoting digital services to reduce paper use.

Research indicates that a major focus is on minimizing the greenhouse gas (GHG) emissions associated with the information lifecycle from creation to distribution (Smith & Jones, 2018). This often involves collaboration with external partners to implement cost-effective solutions, such as energy-efficient systems and waste separation programs (Turner, 2015). As Greenwood and Harris (2016) posit, libraries are thus positioned as essential advocates for ecological responsibility.

However, the application of these principles varies globally. In Sri Lanka, as noted by Premarathne and Bandara (2019), the green library concept is nascent, especially in public libraries. Many institutions lack strategic planning for sustainability, leading to high operational costs and inefficient resource use. Their study of Central Province libraries found that while some sustainable practices occur unintentionally, a conscious, strategic approach is lacking. This context underscores the importance of documenting deliberate, structured initiatives like those of the PGIM Library, which can serve as a guiding model for other institutions in the region (Wijerathne, 2024; Munasinghe, & Wadasinghe, 2025). Balasooriya, et al (2000?) Green Library Project (GLP) expected to establish Sri Lanka's first university-based "green library" prototype, aiming to significantly reduce carbon energy usage, create financial savings through

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lowered operational costs, and potentially contribute excess solar power back to the national grid. Beyond tangible outcomes, it intends to shift the conceptual and behavioural paradigms of library staff and the wider university community towards environmental stewardship. To realise this model initiative, the project requires secured funding from national bodies and the implementation of clear policy supports, including a dedicated technical management team.

Methodology

Data Collection and Sources

A multi-method approach to data collection was used to enable methodological triangulation, enhancing the credibility and trustworthiness of the findings (Patton, 2015). Data sources included:

- **Archival Records:** A targeted analysis of internal documents, including project concept notes, post-implementation review memos, and revised operational policy manuals, provided insight into the planning and official rationale behind the initiatives.
- **Documentary Evidence:** Process flowcharts and standard operating procedures (SOPs) from before and after digital transformation were compared to objectively identify reductions in steps and physical resource requirements.
- **Digital Artefacts:** The functional design and user interfaces of the implemented systems (e.g., the digital repository, MS Teams channels) were analysed as physical evidence of the paperless transition.
- **Low-Intensity Metrics:** Anonymised, aggregate system usage data (e.g., monthly digital transaction volumes, repository access logs) was incorporated to triangulate qualitative findings and provide evidence of behavioural change and adoption.

Data Analysis

The analysis proceeded in two concurrent phases:

1. **Within-Case Analysis:** Data was first subjected to a thematic analysis (Braun & Clarke, 2006) to generate codes and identify emergent themes related to operational efficiencies, environmental impact (e.g., reduced paper, optimized travel), and challenges encountered during the implementation process.
2. **Cross-Theoretical Analysis:** The emergent themes were then systematically evaluated against a pre-established analytical framework constructed from two pillars:

o Green Library Operations Theory (Jankowska & Marcum, 2010), focusing on waste reduction, energy efficiency, and sustainable resource management.

o UN SDG Indicators relevant to SDG 12 (Sustainable Consumption) and SDG 9 (Innovation), translating qualitative outcomes into contributions to global benchmarks.

This structured analysis ensured findings were not merely descriptive but were critically examined through established theoretical and normative lenses.

Findings

Thematic analysis of the multi-source data revealed five core initiatives as the

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foundation of the PGIM Library's sustainability strategy. The findings are presented below, with evidence from archival records, documentary comparison, and system metrics used to illustrate the implementation and outcomes of each theme.

1. Digitisation of Administrative Processes: A Shift in Practice

The transition from paper-based to digital systems for internal operations emerged as a primary theme. Analysis of archival records, specifically the project concept notes for the "Digital Office Initiative," cited "reducing annual paper procurement by an estimated 50%" and "eliminating physical storage of administrative documents" as key objectives.

- **Online Leave System:** A comparison of SOPs showed the previous process required 3 paper forms (application, approval, filing) per request. The new digital process, evidenced by the digital artefact of the system's interface, reduces this to zero, with automated routing and digital archiving.
- **Online Vehicle Request System:** Similarly, documentary evidence (old vs. new process flowcharts) identified the elimination of a 5-step paper form. The digital artefact includes a booking calendar that visibly optimises vehicle allocation.

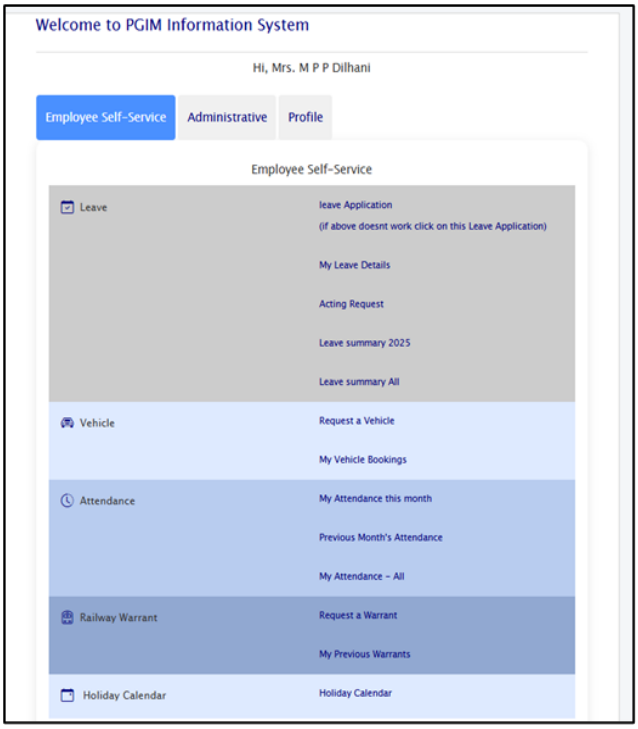

Figure 1: PGIM Information system leave, transport, and railway warrant

3. Implementation of a Paperless Internal Communication Ecosystem

The adoption of MS Teams as the central hub for collaborative work was a significant finding. The post-implementation review memo stated the goal was to "create a single source of truth for documents and reduce email-based attachments and printing."

- Thematic analysis of internal archival records highlighted challenges and successes. Initial resistance was noted, but low-intensity metrics showed over 95% of library staff actively using the platform for daily tasks.

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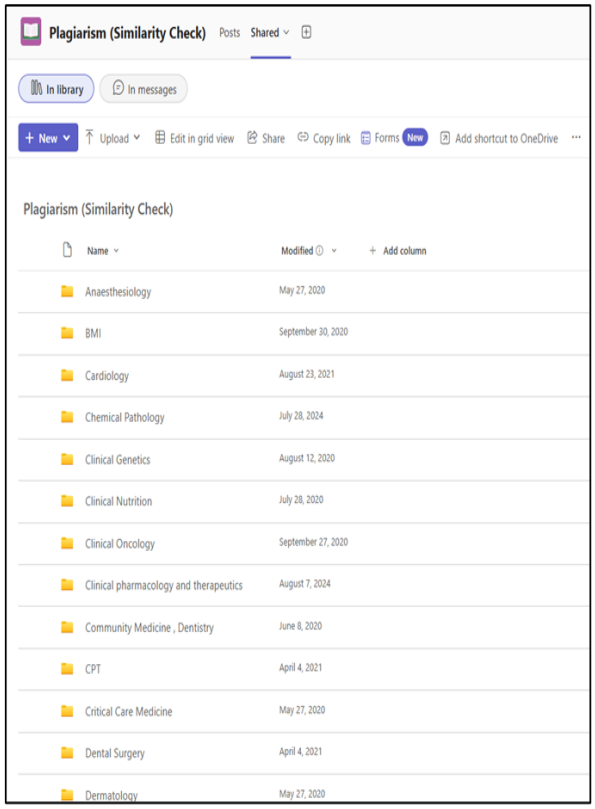

Figure 1: MS Teams as the central hub for collaborative work paper documented, circulation

3. Systemic Shift to Digital Academic Submissions

A pivotal finding was the institutional policy change mandating digital submission for all postgraduate academic work.

- **The documentary evidence is stark**: the previous methodology required 4-6 bound printed copies of a thesis for examination and archiving. The new SOP, titled "Digital Thesis Submission Protocol," reduces this requirement to a single PDF file. While the environmental impact is profound, the data most clearly shows the complete elimination of a resource-intensive, decades-old practice.

4.Development of an Open-Access Digital Repository as a Sustainable Service

The creation and maintenance of the library's digital repository (http://librepository.pgim.cmb.ac.lk) was analysed not just as a tool, but as a transformative service model.

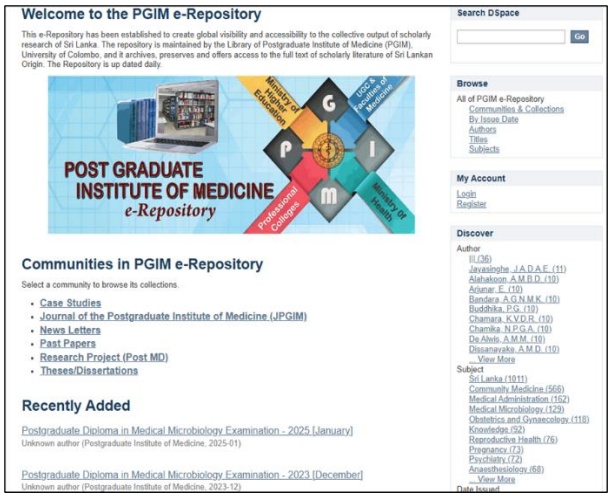

Figure 3: Digital Repository as a Sustainable Service

- Low-intensity metrics from the repository's backend provide clear evidence of its impact and reach. The data logs show over 15,000 items downloads in the past year and a 35% increase in remote access after-hours and on weekends. This directly supports the finding that the repository reduces the need for physical visits to the library and the subsequent printing of materials by users. The digital artefact, the public-facing repository interface is the primary evidence of this sustainable and accessible resource platform.

5. Thematic Emergence of Indirect Benefits: Efficiency and Access

Beyond the core environmental focus, the data analysis consistently revealed emergent sub-themes of improved operational efficiency and enhanced access. Archival records like meeting minutes and internal

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reports frequently cited time savings, faster approval cycles, and improved record retrieval as key outcomes of the digital transition. This finding, while secondary, strengthens the case for the initiatives' overall sustainability by demonstrating a synergy between ecological and operational benefits.

6. Orientation Programme on Library Resources and Services

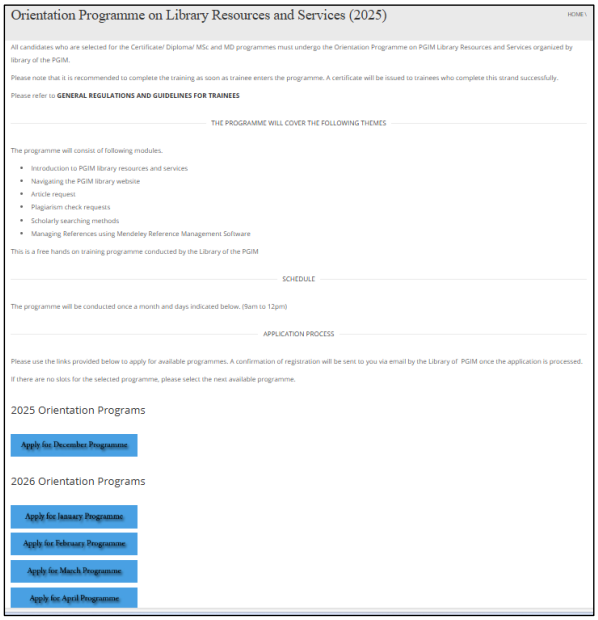

Figure 4: Reservation through Google Form library orientation programme enrollment throughout the year

The monthly Library Orientation Programme has been strategically redesigned to embed the principles of sustainable librarianship into its core curriculum. As outlined in the case study Green Initiatives for Sustainable Libraries, the session now explicitly demonstrates how the library's digital transformation including the mandatory e-thesis submission policy, paperless administrative systems, and the open-access repository, constitutes a foundational green initiative. Trainees are instructed on utilising these specific services, thereby directly engaging with and reinforcing the library's sustainable operational model. This integration transforms the orientation from a mere service tutorial into an experiential component of the library's "living lab" for environmental stewardship. The streamlined, digital booking system for these sessions further operationalizes the commitment to efficiency and reduced resource consumption.

Discussion

This study sets out to document and analyse the green initiatives of the PGIM Library. The findings reveal a deliberate and strategic digital transformation that moves beyond the ad-hoc or unintentional practices observed in other Sri Lankan libraries (Premarathne& Bandara, 2019). The evidence from project concept notes, SOPs, and system metrics demonstrates a conscious shift in operational philosophy. This shift aligns with established principles for sustainable libraries (Gregory, 2004) and finds practical expression in contemporary execution models like the GREEN model for university libraries (2018/19), as it strategically targets waste reduction at its source and integrates green technologies.

The digitisation of administrative processes and the implementation of a paperless communication ecosystem (Themes 1 & 2) provide a potent validation of Bennett's (2012) focus on the importance of daily operational changes. The data shows that these were not merely technological substitutions

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but fundamental process re-engineering. The elimination of steps in leave and vehicle requests, coupled with the high adoption rate of MS Teams, demonstrates a systemic reduction in the library's resource footprint. This directly minimizes the greenhouse gas (GHG) emissions associated with paper production, consumption, and waste management, as highlighted by Smith and Jones (2018). Furthermore, the emergent theme of improved efficiency underscores a critical point: environmental and operational sustainability are often synergistic, not competing, goals.

The most impactful findings, however, concern the systemic shift to digital academic submissions and the development of the open-access repository (Themes 3 & 4). These initiatives directly attack the most resource-intensive aspects of a traditional academic library's workflow. The policy mandate for digital theses entirely disrupts a cycle that requires producing multiple, voluminous physical copies. Similarly, the repository's significant download metrics and 24/7 accessibility provide tangible evidence of how libraries can fundamentally re-engineer the information lifecycle. This achieves a dual mandate: drastically reducing environmental impact (SDG 12) while simultaneously enhancing equitable access to knowledge (SDG 4) and building resilient digital infrastructure (SDG 9), making the library's services more robust and pandemic-proof.

Crucially, this case study supports Turner's (2015) assertion that substantial progress does not necessitate massive capital investment. The PGIM Library's model relied on strategic focus and process optimization using existing, often low-cost, digital tools. This makes its blueprint highly replicable for libraries in developing nations, proving that budgetary constraints are not a barrier to meaningful environmental action. The library's journey demonstrates that sustainability is achievable through the collective, scaled application of strategically chosen digital solutions.

Conclusion

This research confirms that the PGIM Library has successfully embedded sustainability into its operational DNA. Through a series of targeted, technology-driven initiatives, evidenced by a clear trail of internal documents and system data, the library has achieved a significant reduction in its carbon footprint and resource consumption. This case study moves beyond theory to provide an empirical example of a green library in action within a developing world context.

The findings lead to a compelling conclusion: libraries are not just advocates for a sustainable future but can be active architects of it through their own operational choices. The PGIM Library's experience offers a powerful, practical, and replicable model. It demonstrates that environmental responsibility is an achievable standard for any institution willing to embrace digital transformation strategically. By doing so, libraries can fulfil their mission as knowledge centres not only by preserving the past but also by protecting the future.

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Recommendations

Based on the empirical findings of this case study, the following actionable recommendations are proposed for stakeholders at various levels:

1. For the PGIM Library:

- **Develop a Quantitative Impact Dashboard:** Move beyond anecdotal evidence by instituting a system to formally track and measure key performance indicators. This should include metrics such as the volume of paper avoided (calculated from digital form and thesis submission rates), estimated reduction in vehicle miles traveled, and hours of staff time saved through streamlined digital workflows. This data will be invaluable for internal advocacy, budget justification, and annual sustainability reporting.
- **Formalize and Share the Digital Transition Playbook:** Document the specific steps, challenges, and solutions encountered during the implementation of each initiative (e.g., change management strategies for MS Teams adoption, technical specifications for the digital submission portal). This internal guide will ensure institutional memory and provide a concrete resource to share with other libraries.

2. For Other Library Directors and Practitioners:

- **Conduct a High-Impact Process Audit:** Prior to implementation, follow the PGIM model by conducting a detailed audit of internal workflows. Map out processes like leave requests, document approvals, and thesis handling to identify the steps with the highest paper consumption and redundancy and prioritize these for digitization.
- **Control Existing and Low-Cost Technologies:** Emulate the PGIM approach by first maximizing the use of existing institutional subscriptions to platforms like Microsoft 365 (Teams, SharePoint) or Google Workspace to achieve paperless goals before seeking funding for new, bespoke software.

3. For National Library, Professional Associations (e.g., SLLA) and Policymakers:

- **Champion a National Digital Submission Policy:** Advocate for and help develop a standardized policy for the digital submission and preservation of academic theses and dissertations across all higher education institutions in Sri Lanka. This would amplify the environmental and access benefits demonstrated in this study on a national scale.
- **Propose a Sri Lankan "Green Library" Award Scheme:** Building on the visibility provided by international award systems, develop a tailored national programme to incentivise sustainability in Sri Lankan libraries. Using the PGIM Library's initiatives as a benchmark, this scheme would address local operational challenges and opportunities, encouraging broader institutional commitment and contextual best practices.

4. For the Academic Research Community:

- **Undertake a Life Cycle Assessment (LCA) Study:** Future research should employ a

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rigorous LCA methodology to quantify the full carbon footprint reduction achieved by digital initiatives. This involves calculating the emissions saved from reduced paper production, printing, physical storage, and transportation, providing a powerful, data-driven argument for investment.

- **Conduct Comparative Case Studies:** Researchers should apply this study's framework to analyse libraries in different contexts (e.g., public libraries, university libraries in other regions) to identify common success factors and context-specific challenges, building a more comprehensive theory of green library operations.

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