https://proceedings.undip.ac.id/index.php/icocas/index ISSN: 3031-5794

Green Academic Library Design in Practice: A Case Study of Universitas Diponegoro's Sustainable Library Initiatives

Gani Nur Pramudyo[1*], Nur'aini Perdani[1], Sinta Taliya[1], and Dedy Dwi Putra[2]

[1] Library and Information Science Study Program, Universitas Diponegoro, Semarang, Indonesia
[2] Library and Information Science Study Program, Universitas Islam Negeri (UIN) Maulana Malik Ibrahim Malang, Indonesia

[*]E-mail: gani@live.undip.ac.id

Abstract. Environmental sustainability is becoming an increasingly important issue in Indonesia, although the implementation of green libraries is still in its early stages in the country. The lack of awareness and knowledge of green design, green buildings, and supportive policies are crucial challenges for libraries. However, research on green libraries is typically limited to small-scale initiatives, lacking their impact on broader sustainability goals. The aim of this study is to understand green academic library design in practice: a case study of Universitas Diponegoro's sustainable library initiatives. This study employed a case study with a qualitative approach. Data collected through interviews and observations were analyzed using thematic techniques such as open, axial, and selective coding. The study found that the Undip library has been redesigned and renovated with industrial and natural concepts. The green library practices have been implemented not only through environmentally friendly building features, such as natural lighting and open learning spaces, but also through operational management and library services, including the reuse of bookshelves, paperless use of library automation and repository, and digital access to electronic resources.

Keywords: green academic library; sustainable library design; library environmental practices; Indonesia; institutional sustainability

1. Introduction

Environmental conservation is essential for preserving, protecting, and caring for nature to ensure sustainability. Examples include reducing greenhouse gas emissions, preventing environmental pollution, and minimizing the impact of global warming. [1]. Conservation can also be achieved by implementing the 'Going Green' concept across various sectors, including libraries. In libraries, this concept is similar to that of a 'green library' [2].

A green library building is an environmentally friendly or sustainable building, defined as "a building that is designed, constructed, renovated, operated or repurposed in an environmentally friendly and resource-efficient manner" [3]. A 'green library' means reducing paper use, utilizing natural light, and ensuring natural air circulation. A 'green library' is an approach to managing

library facilities and programmes while considering environmental aspects. An environmentally friendly and sustainable library considers environmental, economic, and social sustainability [4].

To assess the implementation of green libraries, several guidelines can be used, namely Green Star (Green Building Council Australia), STEPS (Sustainable Tools for Environmental Performance Strategy), and SDS (Sustainable Design Scorecard) [5], IFLA ENSULIB green library checklist [4], Green Building Rating System LEED (Leadership in Energy and Environmental Design) [6], and GREENSHIP Rating Tools [7]. The IFLA ENSULIB and LEED standards can be used to assess green library initiatives in university libraries [2].

IFLA ENSULIB is used to assess the planning, implementation, and evaluation of green libraries. These guidelines contain checklists for environmentally friendly buildings and equipment, principles for environmentally friendly offices, sustainable economics, sustainable library services, social sustainability, environmental management, and a commitment to environmental objectives and programs in general [4,8,9].

The LEED standard is used to ensure that library buildings are environmentally friendly and sustainable [3]. The LEED standard applies not only to new buildings and major refurbishments, but also to the operation and maintenance of existing buildings. LEED v4.1 BD+C comprises seven assessment categories: integrated processes, location and transport, sustainable sites, water efficiency, energy and atmosphere, materials and resources, and indoor air quality [10,11].

In the Indonesian context, the GREENSHIP rating tools were developed by the Green Building Council of Indonesia, which is affiliated with the World Green Building Council [12,13]. There are six categories under which a building is classified as a green building, including appropriate site development, energy efficiency and conservation, water conservation, material resources and cycle, indoor health and comfort, and building environment management [7].

Academic libraries are community-oriented and provide an ideal setting for adopting the evolutionary ecology concept of the ‘Green Library’ [14]. Libraries act as catalysts in motivating individuals and communities to practise environmental conservation [15]. Unfortunately, research into the importance of green libraries for environmental conservation in Indonesia is limited to small-scale initiatives [16].

One of the libraries in Indonesia that emphasises the importance of ‘green libraries’ is the Undip Library. The Undip Library has been redesigned around a concept blending industrial and natural elements. This initiative began with the use of natural lighting, open spaces, the recycling and redesign of old shelving units, and the use of open-source software to reduce paper consumption [17,18].

Undip’s ‘green’ library promotes the Sustainable Development Goals (SDGs) through environmentally friendly building design, public education, energy efficiency, the use of recycled materials, and its contribution to reducing carbon emissions. The Undip campus also provides support through its Climate Action Plan (CAP) and participates in UI GreenMetrics [19].

This study focuses on the Undip Library’s ‘green library’ initiative, which is assessed against the IFLA ENSULIB guidelines, LEED standards [2], and to enhance assessment within the Indonesian context using GREENSHIP rating tools. The research questions for this study is what green library practices are implemented at the Undip Library and what environmental impacts do they generate?.

https://proceedings.undip.ac.id/index.php/icocas/index ISSN: 3031-5794

2. Method

This study uses a qualitative with a case study to examine how the green library initiative is implemented at the Undip Library. Qualitative methods are used to explore and understand the meanings that individuals or groups give to a social or humanitarian issue [20]. Case studies explore real-life situations [21].

Data collection followed Creswell's guidelines [20]. Semi-structured interviews, using an interview guide, were conducted with the Head of the Undip Library. The informant was selected using purposive sampling because of their strategic role in policy formulation, decision-making, and the planning and implementation of the Green Library initiative at the Undip Library. The informant was considered capable of providing comprehensive information regarding the planning process, implementation strategies, and institutional policies underpinning the Green Library initiative. As this study focuses on examining the implementation of Green Library from the perspective of institutional policy and organizational decision-making, the Head of the Library was selected as the key informant representing the management perspective. The interviews were recorded using a recording application on a smartphone, and field notes were taken to complement the interview transcripts.

Non-participant observation was conducted by directly observing the library's physical environment, documenting the building design, facilities, and Green Library practices through field notes and photographs. In addition, document analysis was undertaken using institutional documents, the official university website, and YouTube videos related to the Green Library initiative (see Table 1).

Table 1. Analysis of website source

No	URL
1	https://www.youtube.com/watch?v=6lMc2KIE9QA
2	https://digilib.undip.ac.id/2026/02/24/hidden-gem-jendela-hijau-di-perpustakaan-undip-area-belajar-estetik-anti-jenuh
3	https://lpmhayamwuruk.org/2021/01/upaya-undip-wujudkan-diri-sebagai-kampus-hijau-dan-berkelanjutan.html
4	https://sustainability.undip.ac.id/2021/12/21/penerapan-prinsip-gren-building-undip-2021/
5	https://sustainability.undip.ac.id/2021/01/02/gedung-sekolah-vokasi-undip-raih-sertifikat-green-building/

The data analysis technique, following the guidelines of Strauss and Corbin, comprised the stages of open, axial, and selective coding. Open coding was carried out to conceptualize and categorize the data, followed by axial coding, which aimed to group these codes according to conceptual categories reflecting similarities among them. During the final stage of selective coding, the author selected three core categories and identified several subcategories using the constant comparison method [22].

To ensure the validity and reliability of the research, triangulation of sources and methods was employed [23]. Triangulation of source is used to cross-check the accounts of different informants. Triangulation of technique is used to compare the results of interviews, observations and document analysis.

3. Result and Discussion

3.1 Results

3.1.1 The commitment of the Undip Library to realising a Green Library

To implement a green library, the Undip Library adheres to the regulations set by the university, particularly those of Undip's Technical Implementation Unit for Safety, Occupational Health, and the Environment (UPT K3L). K3L is responsible for creating a healthy, safe and environmentally friendly environment for the entire Undip academic community. K3L has an environmental sub-unit that oversees green initiatives at Diponegoro University. This is in line with an interview with the head of the Undip Library.

> *In any case, we will refer to the university. Therefore, we cannot design everything ourselves; these are the rules. Everything is already regulated by the K3L. However, the basic rules, such as those concerning the greening strategy, are already within K3L. We followed these guidelines (Interview data).*

The Undip Library, as a unit within the Undip community, is also striving to realize the concept of a 'green building', that is, an environmentally friendly building. This is also in line with Undip's vision, commitment, and policies, as previously explained, namely that Undip is an environmentally friendly campus. As stated in the following quote:

> *"The concept of 'Green'—yes, we must support the University of Diponegoro's vision that our buildings must be environmentally friendly." "One consideration we must not overlook is the vision and mission of the University of Diponegoro, including its commitment to environmental friendliness… whatever we do, we must align with the direction of the leadership's policy; only then can we proceed. Oh, if that's the case, then the renovation concept must be like this, I suppose."*[18].

Based on the above policy, the Undip Library has begun to implement the 'green library' concept. Examples include placing pots containing live plants in the library and work areas, optimising natural lighting, and reducing paper usage by utilising office software.

3.1.2 The Green Library Initiative at Undip Library

The design of the Undip Library embraces industrial and natural concepts. The modern industrial concept emphasizes open space, natural lighting, and greenery. From nature, library without walls. Users can view green nature from the library and must be comfortable accessing the collection. "In nature, there are no walls..So we have to tear these down. With this system, people will eventually look to nature—to green spaces" (Interview with informant).

The open-plan layout was achieved by removing solid walls and replacing them with glass, making the interior feel brighter and more spacious and allowing for optimal natural lighting. Transparent glass walls were used to allow natural light to enter (Figure 1). The use of glass makes the outdoor area and the trees surrounding the library visible. Wide glass walls were used to facilitate air circulation. Glass is also utilised by the library as a means of minimising the use of artificial lighting. As per the following quote from an informant: *"The modern industrial concept emphasises open spaces and natural lighting through the use of glass." "The use of wide glass walls and window designs that facilitate air circulation."* [18]. This is supported by the following observations.

> *"The refurbishment involved, amongst other things, removing the solid walls and replacing them with glass, so that the interior feels brighter and more spacious, and benefits from more optimal natural lighting. The ground floor serves as a reception area and public space with the highest level of activity. This zone has been designed to be open through the use of glass doors*

https://proceedings.undip.ac.id/index.php/icocas/index ISSN: 3031-5794

and walls. The Undip Library Unit has utilised a great deal of glass as a measure to minimise the use of artificial lighting."[24].



Figure 1. The use of transparent glass to allow natural light into the room

Referring to Figure 1, the seating area is situated directly in front of a large window that looks out onto the lush, green trees of the campus. The natural light and the green view outside the window.

The design of the library furniture has been adapted to suit the majority of library users, namely Generation Z. In addition, the old shelves have been redesigned and repainted to make them more attractive. Referring to the following observations. "*The furniture design at the Undip Library Unit has undergone significant changes due to an increase in visitor numbers, with the majority of library users being Gen Z students"* [24].

The Undip Library also has "the old shelves made of teak wood – they're sturdy – so we've redesigned them and given them a fresh coat of paint to make them look nice and attractive [17].

Outside the library, foot-friendly steps that follow the contours of the library grounds are used to provide access to the Undip library. This is explained as follows: "The construction of foot-friendly steps" [24].

To reduce paper usage, the Undip Library utilises office applications such as e-office, a digital repository and automation systems. Book borrowing and returns no longer require paper receipts, as the library now uses the SLIMS library automation system. Theses, dissertations and doctoral theses are also submitted solely as digital files to be uploaded to the repository application, namely Eprints Undip. This is in line with the following informant's explain.

'We've reduced paper use significantly. We use Office, you see… theses, dissertations and doctoral theses…are all digital now… uploaded to the Eprints Undip repository' (Interview with informant).

The Undip Library also provides electronic journals and e-books that can be accessed remotely via an SSO. Library users can search for and access resources—ranging from journals to books—remotely from outside the Undip campus, meaning they do not need to come to campus, thereby reducing the number of vehicles entering campus [25].

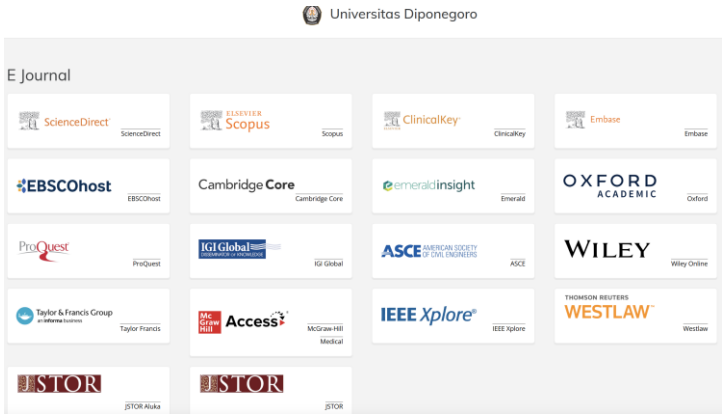

Figure 2. Access to Journals and E-books via Undip's SSO

3.1.3 The Assesment of Undip's Green Library

To evaluate the implementation of the Green Library at the Undip Library, the field findings were mapped against the indicators of the IFLA ENSULIB, LEED, and GREENSHIP. This mapping demonstrates the extent to which the Green Library initiatives implemented by the Undip Library correspond to internationally and nationally recognized sustainability frameworks. The results of the mapping are presented in Table 2.

Table 2. Mapping of Green Library Implementation at the Undip Library Based on the IFLA ENSULIB, LEED, and GREENSHIP Frameworks

IFLA ENSULIB	***LEED***	***GREENSHIP***	***Status***	***Field Findings***	***Evidence***
Green Buildings & Equipment	*Energy & Atmosphere; Indoor Environmental Quality*	*Energy Efficiency & Conservation; Indoor Health & Comfort*	✔	*Utilization of natural lighting through transparent glass*	*Observation, Interview*
Green Buildings & Equipment	*Indoor Environmental Quality*	*Indoor Health & Comfort*	✔	*Open learning spaces*	*Observation*
Sustainable Economy	*Materials & Resources*	*Material Resources & Cycle*	✔	*Reuse and redesign of existing bookshelves*	*Interview*
Green Office Principles; Sustainable Library Services	*Integrative Process*	*Building Environmental Management*	✔	*Open-source software and paperless operations*	*Interview*
Sustainable Library Services	*Transportation (reducing travel demand)*	–	✔	*Remote access to e-books and e-journals through Single Sign-On (SSO)*	*Documentation*

https://proceedings.undip.ac.id/index.php/icocas/index ISSN: 3031-5794

IFLA ENSULIB	***LEED***	***GREENSHIP***	***Status***	***Field Findings***	***Evidence***
Social Sustainability	–	*Building Environmental Management*	✔	*Environmental education activities in the library*	*Interview*
Environmental Management	*Integrative Process*	*Building Environmental Management*	✔	*Occupational Safety, Health, and Environment (K3L) policy*	*Interview*
–	*Water Efficiency*	*Water Conservation*	✔	*Drinking water refill facilities*	*Documentation*
–	*Energy & Atmosphere*	*Energy Efficiency & Conservation*	✖	*Renewable energy (e.g., solar panels)*	*Observation, Interview, Documentation (not identified)*

As shown in Table 2, most of the Green Library initiatives implemented by the Undip Library correspond to the indicators of the IFLA ENSULIB, LEED, and GREENSHIP. The findings indicate that sustainability practices have been implemented not only through environmentally friendly building features, such as natural lighting and open learning spaces, but also through operational management and library services, including the reuse of bookshelves, paperless operations, digital access to electronic resources, environmental education, and the implementation of the university's Occupational Safety, Health, and Environment (K3L) policy. However, the assessment also shows that the indicator related to renewable energy has not yet been identified based on the interview, observation, and documentation conducted in this study.

3.1.4 The environmental impact of Undip's Green Library

The 'green library' design essentially has an impact on both the environment and the students. Green buildings reduce carbon emissions and absorb carbon. For example, once training sessions organized by the library are finished, the room lights and air conditioning are switched off. Furthermore, it is important to maintain the trees around the library building. Trees absorb carbon, whether produced by motorbikes, cars, or other sources. More important than green buildings is ensuring their sustainability. For instance, once trees are planted, they must be looked after and maintained. This is in line with the following statement:

> *For example, after class, the lights and air conditioning are switched off. If this occurs automatically, it is beneficial. This is part of our efforts to reduce carbon emissions in the future. The next step is to look after and plant the trees. This is because trees absorb carbon. Therefore, the carbon emitted by motorbikes, cars, or other sources will, hopefully, be absorbed by the trees. Therefore, planting trees is also beneficial. More important than a green campus is ensuring its sustainability. If we just plant trees but our behavior does not support that, it is all for nothing* [19].

3.1.5 Challenges for the Undip Library in Initiating a Green Library

In its efforts to establish a Green Library, the Undip Library has encountered several obstacles. The lack of awareness regarding Undip as a green campus—including the Undip

Library as a green library—and the use of lighting and air conditioning in some rooms within the Undip Library. This is in line with the following quote:

> *There is still a lack of attention and awareness regarding Undip as a green campus* [19]*. Glass has been used to maximise natural light, even though it is partially blocked by the large trees surrounding the library building, The library's design is eco-friendly, but in reality it is not yet fully effective, as the library still uses artificial lighting and air conditioning* [24]*.*

3.2 Discussion

The green library initiative at the Undip Library is an integral part of Undip's commitment to and support for the creation of a Green and Sustainable Campus. This commitment is reflected in the vision, policies, and regulations implemented by Undip regarding green building initiatives (https://sustainability.undip.ac.id/universitys-policies-on-sdgs/). This policy is a key factor influencing libraries to embrace the green concept [2]. It also reflect K3L is responsible for creating a healthy, safe and environmentally friendly environment for the entire Undip academic community.

The Undip Library, as a unit within the Undip campus, is helping to realize the Green Building concept through the Green Library initiative. This effort involved the renovation of the Undip Library in 2022, adopting an 'Industrial Modern' concept. The library's design emphasizes the use of open green spaces, such as glass walls and large windows, and the reuse of bookcase furniture. Furthermore, the provision of off-campus access to e-journals and e-books helps to reduce the need for vehicle use.

The use of glass walls and large windows allows sunlight to enter the room [2]. Natural light can save electricity and replace the use of lights in the library. Switching off lights that are not in use in the room [8,26] This includes switching off the air conditioning, which can save energy [7].

Recycling teak shelves by repainting them to make them look more attractive. The shelves are not thrown away, but reused [4,7,8,11,26].

The provision of green services, such as access to and searching for e-journals and e-books, which can be accessed from anywhere via Undip's SSO. These services can reduce the use of vehicles by library users when visiting the library in person [11].

The 'Green Library' initiative at the Undip Library has an indirect environmental impact. These environmental benefits include energy savings and a reduction in the number of vehicles travelling to the library; the cultivation of trees helps reduce carbon emissions and absorb carbon. The use of natural lighting, architectural innovations and renovations, windows, and the internet are some of the key initiatives at university libraries that have adopted environmentally friendly practices [2].

Although the green library initiative has been implemented at the Undip Library, several obstacles have emerged, such as budget constraints, a lack of awareness-raising by the library regarding the green concept, and the continued use of air conditioning and lighting in certain rooms.

Beyond identifying the implementation and impacts of Green Library practices, this study also provides several theoretical and practical contributions to the development of Green Library research. The mapping presented in Table 2 demonstrates that Green Library implementation at the Undip Library fulfills indicators from the IFLA ENSULIB, LEED, and GREENSHIP frameworks across multiple dimensions. The findings indicate that Green Library implementation is not limited to environmentally friendly building features but also

encompasses sustainable library services, environmental governance, operational management, and digital transformation.

This study contributes to the development of Green Library research, particularly in the context of academic libraries in Indonesia. Unlike previous studies that primarily focused on environmentally friendly buildings or library services separately, this study demonstrates that Green Library implementation at the Undip Library is shaped by the integration of the university's Green Campus policies, Green Building principles, library operational management, and digital service transformation. In addition, this study evaluates these practices using three complementary frameworks namely IFLA ENSULIB, LEED, and GREENSHIP, thereby providing a more comprehensive assessment of Green Library implementation. The integration of these frameworks enables the evaluation of not only the physical building, but also library services, environmental governance, operational efficiency, and organizational sustainability. Therefore, the findings provide a practical reference for academic libraries in Indonesia seeking to implement and evaluate Green Library initiatives.

Despite these contributions, this study has several limitations. This study is limited to investigating Green Library practices at the Undip Library as a case study of an academic library. In addition, the interview data were obtained from a single key informant representing the management of the Undip Library. Although the interview findings were strengthened through observation and document analysis, the perspectives of librarians, technical staff, and library users were not included. Therefore, the findings of this study should be interpreted as representing the management perspective on the implementation of the Green Library at the Undip Library.

Considering these limitations, future research is encouraged to involve multiple stakeholder groups and expand the scope of Green Library studies in Indonesia. Diponegoro University, Gadjah Mada University, Semarang State University, IPB University, Sebelas Maret University, Airlangga University, Bandung Institute of Technology, Padjadjaran University, and Raden Intan Lampung State Islamic University, could serve as comparative case studies using qualitative methods. Future studies could also employ quantitative approaches to evaluate Green Library implementation using assessment tools such as Green Star, STEPS, Sustainable Design Scorecard (SDS), the IFLA ENSULIB, LEED, and the GREENSHIP rating system. In addition, public, special, school, and national libraries may serve as alternative research settings.

4. Conclusion

The Green Library practices at the Undip Library represent an initiative to support the realization of a green and sustainable academic library. These initiatives are closely aligned with the university's commitment to sustainability through institutional policies and regulations promoting Green Campus and Green Building principles. The implementation includes the use of glass walls and large windows to maximize natural lighting, open learning spaces, the reuse and redesign of existing bookshelves, digital library services through the Single Sign-On (SSO) system, reducing paper with using automation library dan institutional repository, and operational practices such as turning off lights and air conditioning when not in use. These initiatives contribute have potential to energy conservation, carbon emission reduction, and environmentally sustainable library services.

The assessment of IFLA ENSULIB, LEED, and GREENSHIP, the renewable energy on Undip library has not yet been identified. Several challenges remain, including the absence of a

dedicated Green Library policy, limited awareness and promotion of the Green Library concept among librarians and library users, budget constraints, and the continued use of artificial lighting and air conditioning in certain areas. Therefore, the Undip Library should strengthen institutional policies, expand environmental education and awareness programmes, and periodically.

References

[1] Koons E. Environmental Issues In Indonesia: A Growing Concern 2024. https://www.climateimpactstracker.com/environmental-issues-in-indonesia-a-growing-concern/.
[2] Mwanzu A, Bosire-Ogechi E, Odero D. The Emergence of Green Libraries in Kenya: Insights From Academic Libraries. J Acad Librariansh 2023;49:102601. https://doi.org/https://doi.org/10.1016/j.acalib.2022.102601.
[3] Antonelli M. The Green library movement: An overview of green library literature and actions from 1979 to the future of green libraries. Electron Green J 2008. https://doi.org/10.5070/G312710757.
[4] IFLA Ensulib. IFLA Guidelines for Green Libraries. IFLA Environment, Sustainability and Libraries Section (ENSULIB); 2026.
[5] Binks L, Braithwaite E, Hogarth L, Logan A, Binks L, Braithwaite E, et al. Tomorrow ' s green public library. Aust Libr J 2014;63:301–12. https://doi.org/10.1080/00049670.2014.969417.
[6] U.S. Green Building Council. LEED rating system 2026. https://www.usgbc.org/leed.
[7] Green Building Council Indonesia. GREENSHIP Rating Tools Existing Building 2026. https://gbcindonesia.org/greens/existing.
[8] Narendra AP. IFLA Agenda of Green and Sustainable Library : a Literature Study. Lentera Pustaka J Kaji Ilmu Perpustakaan, Inf Dan Kearsipan 2023;9:1–10. https://doi.org/10.14710/lenpust.v9i1.50038.
[9] Laybats C. The importance of the green library in today ' s environment. Bus Inf Rev 2024;41:154–5. https://doi.org/10.1177/02663821241301609.
[10] Karioja E. How to evaluate libraries' sustainability? An approach to an evaluation model and indicators. BiblioPolis 2013:40–9.
[11] U.S. Green Building Council. LEED v4.1 Building Design and Construction. 2019.
[12] World Green Building Council (WorldGBC). Green Building Council Indonesia 2026. https://worldgbc.org/gbc/green-building-council-indonesia/.
[13] Green Building Council Indonesia. GBC Indonesia Partners 2026. https://gbcindonesia.org/about/partner.
[14] Gupta E, Natarajan R, Gulati A, Batcha MS. Implementation of Green Library Techniiques at C.S.J.M. University Library: A viability study. Int J Res Eng IT Soc Sci 2018;8:46–50.
[15] Babare AA, Aute GP. Green Library: An overview. An Int Peer Rev Biling E-Journal Libr Inf Sci 2018:218–221.
[16] Putra DD. Exploring Green Libraries Innovation toward Environmental Sustainability in Indonesia : A Systematic Literature Review. 14th Int. Conf. Green Technol. (ICGT 2024), IOP Conf. Series: Earth and Environmental Science 1439; 2025, p. 0–10. https://doi.org/10.1088/1755-1315/1439/1/012023.
[17] UPT Perpustakaan & Undip Press. "Hidden Gem" Jendela Hijau di Perpustakaan UNDIP, Area Belajar Estetik Anti Jenuh 2026. https://digilib.undip.ac.id/2026/02/24/hidden-gem-jendela-hijau-di-perpustakaan-undip-area-belajar-estetik-anti-jenuh/ .
[18] Perpustakaan Undip. Transformasi Perpustakaan Undip : Dulu dan Sekarang 2025. https://www.youtube.com/watch?v=6lMc2KIE9QA.

[19] Airell. Upaya Undip Wujudkan Diri sebagai Kampus Hijau dan Berkelanjutan 2021. https://lpmhayamwuruk.org/2021/01/upaya-undip-wujudkan-diri-sebagai-kampus-hijau-dan-berkelanjutan.html.
[20] Creswell JW. Research Design: Pendekatan metode kualitatif, kuantitatif, dan campuran. 4th ed. Yogyakarta: Pustaka Pelajar; 2016.
[21] Creswell J. Penelitian Kualitatif dan Desain Riset: Memilih di antara lima pendekatan. 3rd ed. Yogyakarta: Pustaka Pelajar; 2015.
[22] Strauss A, Corbin J. Basics of qualitative research techniques. Sage Publication; 1998.
[23] Sugiyono. Metode Penelitian Kuantutatif, Kualitatif, dan R & D. Bandung: Alfabeta; 2017.
[24] Shobihah N, P. FAA, S. NAS, Rustina N, Monica. Laporan Hasil Observasi Desain dan Pembangunan Interior Perpustakaan UPT Universitas Diponegoro. 2025.
[25] Universitas Diponegoro. Rencana Aksi, Mitigasi dan Adaptasi Perubahan Iklim (Climate Change Action, Mitigation And Adaptation Plan) Universitas Diponegoro. 2019.
[26] Afacan Y. Sustainable Library Buildings : Green Design Needs and Interior Architecture Students ' Ideas for Special Collection Rooms. J Acad Librariansh 2017;43:375–83. https://doi.org/10.1016/j.acalib.2017.07.002.