

Journal of Peace, Development and Communication



Volume 07, Issue 02, April-June 2023
 pISSN: 2663-7898, eISSN: 2663-7901
 Article DOI: <https://doi.org/10.36968/JPDC-V07-I02-20>
 Homepage: <https://pdfpk.net/pdf/>
 Email: se.jpdc@pdfpk.net

Article:	To Be Green Or Not To Be: An Enduser Operational side Prioritization of Public Library Design with Focus on Energy and Environmental Design Selected Parameters
Author(s):	Jamshaid Ahmed Khan Architect & MSc ED Student, Dept. of Nutritional Sciences & Environmental Design, AIOU Islamabad.
	Nazia Iftakhar Lecturer, Dept. of Nutritional Sciences & Environmental Design, AIOU Islamabad.
	*Omer Shujat Bhatti Research Associate, Dept. of Nutritional Sciences & Environmental Design, AIOU Islamabad.
Published:	30 th June 2023
Publisher Information:	Journal of Peace, Development and Communication (JPDC)
To Cite this Article:	Khan, J. A., Iftakhar, N., & Bhatti, O. S. (2023). To Be Green Or Not To Be: An Enduser Operational side Prioritization of Public Library Design with Focus on Energy and Environmental Design Selected Parameters. <i>Journal of Peace, Development and Communication</i> , 07(02), 262–277. https://doi.org/10.36968/JPDC-V07-I02-20
Author(s) Note:	Jamshaid Ahmed Khan is an Architect & MSc ED Student at Dept. of Nutritional Sciences & Environmental Design, AIOU Islamabad. Email: jimsarc9999@yahoo.com
	Nazia Iftakhar is serving as a Lecturer at Dept. of Nutritional Sciences & Environmental Design, AIOU Islamabad. Email: nazia.iftakhar@aiou.edu.pk
	*Omer Shujat Bhatti is serving as a Research Associate at Dept. of Nutritional Sciences & Environmental Design, AIOU Islamabad. Corresponding Author's Email: omer.shujat@aiou.edu.pk

ABSTRACT

Public libraries in the developing world act as a hub of resources including online and offline to ensure people at large may have access to them. Pakistan being one of the most under developed country in Asia with respect to education also faces scarcity of such facilities. With rise in shortage of energy and water scarcity and higher cost of energy production, managing these facilities require environmental and energy prioritization. The current research explore the services point of perspective with focus on two public libraries with one certified in energy and environmental design while other had traditional architectural design. Interview based on structured questionnaire using open ended questions were used to collect data. The comparison highlighted the gaps in traditional design with respect to usage, operational optimization, energy demand gaps, environmental issues of thermal comfort, humidity and lighting and how these have been addressed through environmental design approach to develop better climate responsive and context sensitive solution. It also highlighted the anticipated future direction of the public library design for harnessing better end user friendliness and enhancing the experience of the spaces.

Keywords: Public library, LEED, Environmental Design, Climate sensitive design, Design interventions.

1. Introduction

Education lies at the heart of any society and hence developing resources that help to deliver quality education and centralized resources using modern day tools, techniques and technologies is vital in academic progress across any nation in the world (Dang & Chen, 2018). The world today faces a major turmoil causing less accessibility to education in developing countries due to poor socio-economic conditions and allied cultural barriers as well as non-availability and accessibility to public educational resources (Yang, 2017). Public library is one the major asset in this regard. By offering accessible, welcoming venues with a wealth of information, services, and opportunities for people from all backgrounds, public libraries serve a vital role in society (Kilic & Hasirci, 2018). Public libraries continue to be crucial institutions in today's dynamic society, where having access to knowledge and information is crucial (Jalaluddin Haider, 1998). In developing countries with poor literacy rate and educational accessibility, they have a vital role to play for social upliftment. Pakistan is no exception and with limited number of public libraries available, there was a need to explore how the recent climate change and energy crisis are impacting their usage from the operational point of view with exploration for future strategies and directions to make these spaces more user friendly, accessible and conducive for educational and academic purposes (Warraich, Malik, & Ameen, 2018). Hence the research exploration set forth the following two major research objectives:

1. To evaluate end user prioritization and issues from services end with respect to a green certified public library building vs a traditional library building.
2. Defining future directions and priorities for design and sustainable usage of the public library buildings in Pakistan with current energy and climate change crisis.

The research has a significant role to play as it defines the current issues of the modern day timeline with focus on the local climatic implication with respect to energy crisis as well as document the current issues faced which can be addressed through future environmental design interventions for the existing as well as to be built libraries in future.

Review of Literature

Public libraries in general are renowned for their dedication to diversity. In contrast to other organizations, libraries accept people from all backgrounds, regardless of their socio-economic backgrounds, race, ethnicity, or political views (Waheed, 2019). They provide public areas that don't demand payments, membership dues, or certain attire or even dress code apart from code of ethics which are applicable with respect to the sanctity of the space and the place (Bashir, Soroya, Soroya, & Khanum, 2015). All people can use libraries, therefore people can explore around there all day without having to spend any money. Numerous resources are available there, including books, e-books, periodicals, publications, research journals, help with job searches, computer stations, free Wi-Fi, and more. In a society where there are racial, ethnic, political, and social differences, inclusion is especially important (Mwanzu, Bosire-Ogechi, & Odero, 2022).

Public libraries act as one of the most welcoming spaces where everyone may congregate, study, and participate without hindrance or prejudice. The overall quality of community life is enhanced by the availability of materials and resources in public libraries, which act as important community hubs (Gupta, 2020). They enhance educational possibilities and provide everyone a chance to succeed by promoting literacy and prioritizing love of reading. Children's

activities, educational workshops, and cultural events are just a few of the services that libraries provide to meet the requirements of diverse demographics (Afacan, 2017).

Pakistan is a developing country from South Asia with one of the lowest literacy rate. Due to poor socio-economic conditions and existing cultural barriers, people access to education is very limited (Warraich, Haq, & Ameen, 2016). With being one of the most fragile country to climate change and facing its disasters at large scale over the last few years, education has already been superseded by survival priorities (Warraich et al., 2018). Hence the role of public library in Pakistan is of highly significant value towards adding its share to educational upliftment of the society. Due to lack of energy resources, water scarcity and too high cost of energy & electricity, managing a public facility for public availability with enabling a conducive environment is a major challenge for any public access building in Pakistan and public libraries are no exception (Bande et al., 2022). Hence their built form, their interior design and allied architectural & environmental design plays a vital role towards enhanced usability as well as operational optimization without major dependency on energy and allied parameters (Jalaei, Jalaei, & Mohammadi, 2020).

Based on the recent review of literature and exploring the existing body of knowledge focusing on current research exploration, following major parameters were baselined with respect to set forth objectives of the research to be completed (Gupta, 2020). These were as follows:

1. Basic demographics and general information.
2. Location.
3. Accessibility.
4. Sustainability.
5. Built form.

Research Methodology

The overall research methodology followed is shown below in figure 1.

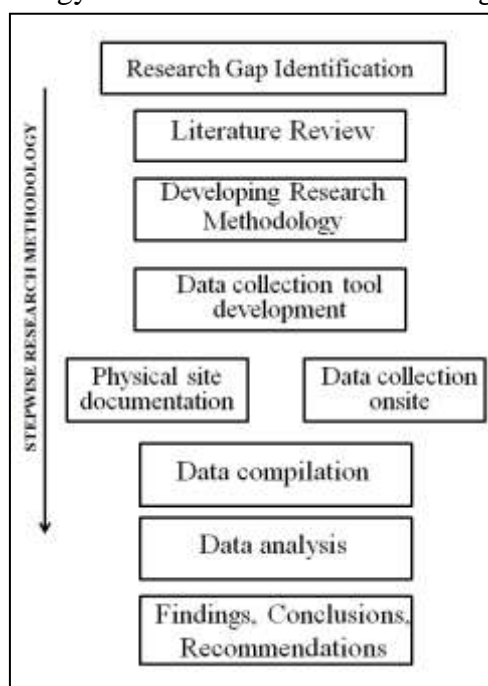


Figure 01 Research phases and major steps

In order to carry forward the research, a questionnaire based on the defined major parameters discussed was developed with the help of review of literature and then shared with two librarians with one whole library was LEED (Leadership in Energy & Environmental Design) certified while the other was a local traditional built library. Both were inquired about the ease to understand the questions so that formal discussion leading to answers in a structured questionnaire method could be followed but exploration may lead to discussion through interview. Both agreed once all the major modalities required were facilitated as part of an academic research and data was collected. Later it was analyzed and lead to research findings, conclusions and future directions.

Data Collection & Analysis

In order to carry forward the research, both public libraries were physically visited and were documented through architectural plans, elevations, sections and allied details. It was necessary so that the respondents data may later be correlated with the observational study and be helpful in devising research findings and conclusions.

Public Library 01 – British Council Library (BCL), Lahore



Figure 02 Exterior view of BCL



Figure 03 Location & Context



Figure 04 Exterior passage

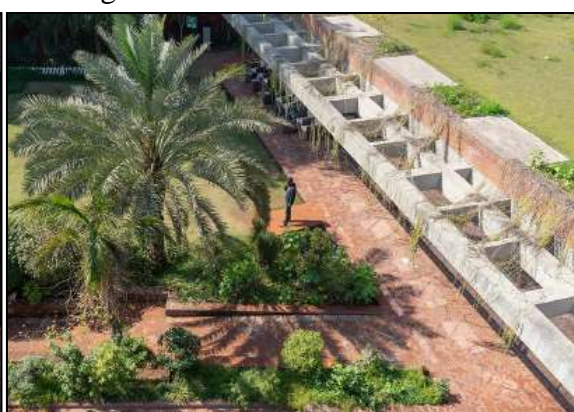


Figure 05 Green roof & shades

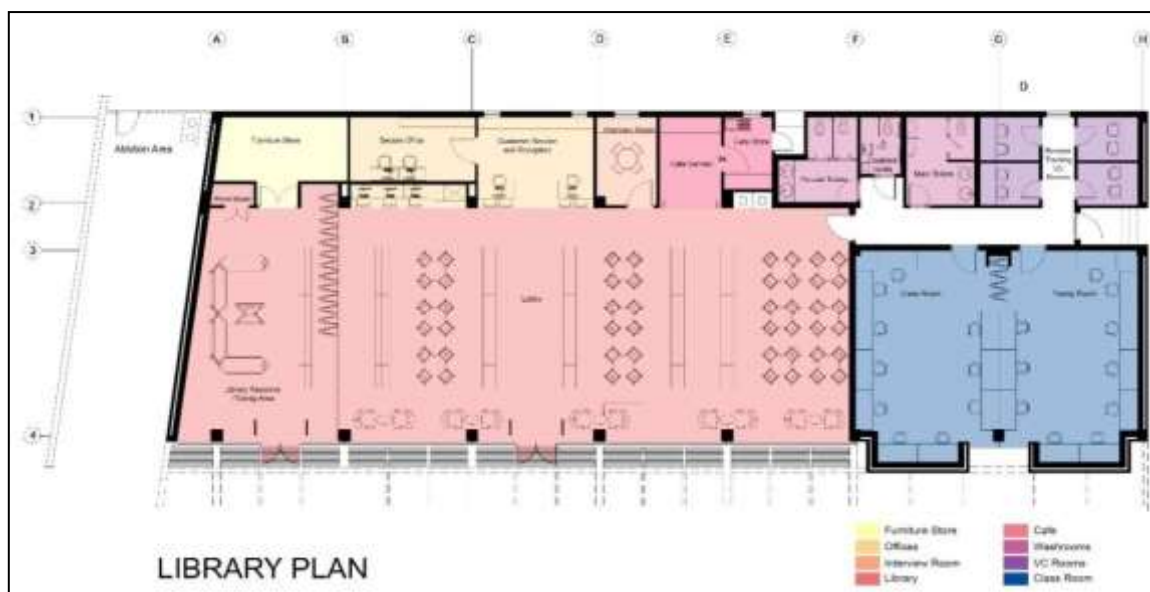


Figure 06 Architectural plan of the BCL



Figure 07 Interior Views

As shown above in the figure 02-07, the new British Council Library (BCL) is located in the city of Lahore, The capital of province Punjab, Pakistan. The project architects where one of the leading firms in architectural industry Nayyar Ali Dada and Associates. The building was aimed as a minimum intervention in the culturally rich city of Lahore. The building is a public building that is designed keeping in mind an existing structure on site. The building was built entirely on the concept of Energy efficiency and green buildings.

Public Library 02 – National Assembly Library (NAL), Islamabad



Figure 08 Location & Architectural map of NAL



Figure 09 Reading hall & offices of NAL

As shown above in the figures 08-09, the second building for comparative analysis taken was the public senate library in the national assembly of Pakistan located in the heart of the capital and in the prime location of national assembly Pakistan in Islamabad. The building of national assembly that was designed originally by an architect from USA Edward Durel Stone.

The five aspects based data collection using interviews based on the structured questionnaires are shared below in Table 01 -05 along with their respective discussion.

Table 01 - General Information & Demographics

Aspect 01 - General Information & Demographics			
S.No	Aspect / Question	British Council Library	National Assembly Library
1	Typology	Public with limited access	Public with limited access
2	Location	65 Mozang Road, Juiblee Town, Lahore	First floor , national assembly / senate building, constitution avenue, Islamabad
3	Type of development	New structure	Old, built in 1960
4	Gross building area	5177 SFT	7600 SFT
5	Number of floors	1	1
6	Number of users	12-14 per hour	20 -25 per hour
7	Number of staff	9	12
8	Size of collections	85,000	more than 85,0000
9	Total seating	100	50
10	Shelves	1392 SFT	880 SFT
11	Computer stations	7	6
12	Reading Desks	28	36
13	Group study tables	12	4
14	Meeting room	5	1
15	Lounge/s	4	8
16	Librarian Room	1	1

As shown above in the table 01, BCL is located in Lahore while NAL is in Islamabad. BCL is a new addition in the existing British Council Complex in Lahore while NAL was built in 1960. BCL has twice the seating capacity through its area is almost 68% of the NAL. However NAL has higher number of users per hour as compared to BCL and its count of reading desks and lounges are also higher though BCL leads in shelves, study tables and meeting rooms.

Table 02 – Location

Aspect 02 - Location			
S.No	Aspect / Question	British Council Library	National Assembly Library
1	How far is the location successful in its intended purpose?	Yes the area is well shaded with good green environment and just the right amounts of sunlight that facilitates reading.	Not currently since it part of existing structure hence faces limitations in regarding of sunlight, ventilation, hvac etc.
2	How far is the library integrated with the city context and its premises?	The library is access restricted but lies well in the heart of the city close to key location of Lahore zoo.	The library is part of national assembly building and senate and only accessible to government officials and especially to the members of national assembly.
3	How far site has any negative influence on the function and organization of the building itself?	NO, It actually supports the orientation of the building as it along with the sun path and sun exposure of the site meaning it allows the light to come in the building directly from the side towards the courtyard.	Yes, since it is part of a built structure means that it has lack of natural ventilation and natural light.
4	With reference to the environmental variables of light, noise and climate, how far is the building orientation well matched the needful?	Yes, the library is well lit and ventilated because of right cardinal orientation.	No it is located at an introvert courtyard so lack of natural sunlight, noise reduction is caused by the open courtyard buffer and the area need a lot of artificial heating and cooling.

With respect to location based exploration, BCL is well shaded and uses green environmental features along with sunlight while NAL faces utilization and usage limitations of sunlight, ventilation, HVAC, etc. BCL requires prior permission to access through prior appointment but for NAL is only accessible to government officials, public on special permission and especially to the members of national assembly. With BCL, shape of the site supports the orientation of the building as it along with the sun path and sun exposure of the site meaning it allows the light to come in the building directly from the side towards the courtyard while in NAL, it lacks natural light and cross ventilation integration. BCL extensively uses natural lighting while NAL lacks natural and environmental features integration.

Table 03 – Accessibility

Aspect 03 - Accessibility			
S.No	Aspect / Question	British Council Library	National Assembly Library

1	Is public transport available to the library premises?	Yes, but prior approval is required.	Yes, but access is only possible after prior security approval.
2	Are there sufficient parking spots for users (car, motorbike, bicycle)?	Yes, the library has sufficient parking that is shared with old British council building.	Yes. The national assembly parking is huge and sufficient.
3	With reference to any physical barriers for people (users and staff), how accessible is the inside of the library?	No, if prior approval is taken there are no limitations.	Yes the areas to archives since have important historic archives is not accessible to public.
4	How friendly is the building itself for the handicap and the special persons?	Yes, handicap ramps are there to assist the disabled.	The interior floor is relatively flat so maneuverability of disabled is good but no support in reaching tall shelves is there for disabled so a helper is appointed for them.
5	Is there any electronic alarm system or access control mechanism in place?	Yes, the whole assembly has an electronic and firefighting alarm.	Yes, the whole assembly has electronic and firefighting alarm.
6	How far the furniture acts as an architectural hindrance in the built form? Does it has any impact on movement or mobility?	No the furniture is customized according to the users need and designed according to re right ergonomic standards with very minimal yet modern touch.	Yes the furniture needs updating and is outdated since it has been in use since the beginning of the library.
7	Does there existed and information support system or mechanism in place?	Yes, a digital assistant is installed for any internal information.	No library staff is always there to assist the users.
8	Is the existing information system deployed over multiple languages?	The primary language of communication is English and most information available is English.	The primary language of communication is Urdu But most information available is English.
9	Is order to facilitate, with respect to multimedia usage is there any space or system for information and orientation?	Yes we have a conference room along with small study rooms and workstations with projector facility for any multi media requirement.	We have it in the corners for people who wants to use it.

As per table 03, Both libraries, though general & public in nature, require prior permission process, have ample parking spaces, special person accessibility has been considered in BCL while NAL lacks it in design though both have access for special persons and also have fire fighting systems deployed. BCL uses customized furniture while NAL follows typical market solutions, digital assistant is available in BCL while staff helps and guides in NAL, both uses English as the main common communication and information language and also have multimedia rooms available.

Table 04 – Sustainability

Aspect 04 - Sustainability			
S.No	Aspect / Question	British Council Library	National Assembly Library
1	How far building form and shape optimizes energy efficiency?	The building faces the courtyard and east to west orientation that allows light and air to directly penetrate the building on the longer side. This results in maximum saving in electricity and addition of green roof and sustainable materials clearly makes the project energy efficient.	The area facing the courtyard is covered by blinds to preserve archives so it faces less heat and the other sides are shielded by national assembly offices so net radiant heat gain is less. But this also causes lack of natural light and ventilation so we need more artificial, HVAC and lights.
2	How far is the local climatic conditions considered in the design of the building?	Yes Lahore has extreme summers so green roof and cavity walls with a sustainable HVAC, results in a sustainable design.	No as it have less access to natural surroundings.
3	Is there any renewable energy resource deployed in the design?	NO	NO
4	Is there any electricity saving systems or mechanism in place for spatial optimization?	We have occupancy sensors that turn off when the user is not there.	We currently don't have such systems
5	Is there any policy followed for energy efficiency and cost effectiveness in operations?	Yes the areas when not in use , the light and AC are turned off.	Yes the areas when not in use , the light and AC are turned off.
6	Any system or mechanism deployed for water conservation?	The baths have water saving faucets and the rainwater is collected in harvesting tank that recycles it as grey water for green roof and plants.	The water features are not sustainable as baths are built on old techniques.
7	Does the library use materials with low embodied energy?	Yes use of local materials with recycled crush and materials for acoustic panels makes them really sustainable.	Apart from brick walls all are high embodied energy materials.
8	How far is the insulation being part of the building design as a whole in itself through materials and design?	The walls are basic hence no insulation in walls and ceilings.	The walls are basic hence no insulation in walls and ceilings.
9	How far natural light is used in the building?	Yes, it has been used abundantly	Yes, there is access to natural light but we due to archives we have to close it. The artificial lights are old but are providing sufficient light.
10	What resources are used for natural light	We are using sunlight in the library to it full extent.	We are not using sunlight in the library.

	optimization and usage in building operations?		
11	Is the building conducive to the use of natural ventilation? (Use of Canadian/ Provencal wells, ventilation shafts or towers, solar chimneys, etc).	Yes the ground is used as a natural heat and light sink.	Yes the area along with courtyard can be equipped with such features.
12	Any other sustainability / green features in building design and operational side as well?	Yes recycled acoustic panels greatly add to the sustainable element of the building.	Yes we are using blinds to reduce heat energy and photo sensitive films on windows to further reduce internal heat.

As shown above in the table 04 related to sustainability, BCL optimizes the sunlight and environmental design features. It results in maximum saving in electricity and addition of green roof and sustainable materials clearly makes the project energy efficient while in NAL poor natural lighting and cross ventilation resulted in higher HVAC and artificial lighting dependency. BCL has been designed considering the extreme hot climate of Lahore NAL lies in moderate climate and hence lacks any major climatic consideration. Both lacks to use any renewable energy resource while BCL leads with Building management systems and occupancy sensors to optimized spatial energy utilization which is lacking in NAL. BCL deploys water saving and rain water harvesting while the NAL lacks any such provisions. NAL only uses brick as the local less embodied material while BCL leads with local recycle concrete and crush used in acoustics panels. No insulation as per such was deployed in wall sin both buildings. Natural light and natural ventilation were used in BCL while they are not deployed in NAL. BCL leads again in the sustainability aspect domain.

Table 5 – Built Form

Aspect 05 - Built form				
S.No	Aspects	Questions	British Council Library	National Assembly Library
1	Entrance	Is it lit/visible enough?	Yes	Yes, there are many signs leading to the library in the building.
2		Is the door system ample/adequate and functionally optimized for all users?	Yes	Yes the doors are of pure wood and can easily be opened.
3		Is the size of the entrance area ample for multiple users?	Yes	No the entrance hall can be improved its too congested.
4		Is the library well organized/planned and is it easy to get to any designated or specialized area right from the entrance area itself?	Yes	No there is a hinderance In circulation due to arrangement of walls and furniture.

5		Is vertical circulation or vertical accessibility easily visible and accessible from the main entrance area?	Yes	No you need to follow the signs in corridors.
6	Materials	Are the building materials appropriate for the location where the building is built?	Yes, basic materials are brick and cement and cheapest available.	Yes, basic materials are brick and cement and cheapest available.
7		Are the materials used in the exterior envelope designed to be easily remodeled?	Yes the curtain walls can easily be remodeled.	NO, they have to be demolished in order to replace.
8		What material are public stairs made of (metal, concrete, wood, etc.)? Are they noisy?	There are no stair cases.	Yes, they are very noisy since hard marble and causes echoes.
9		Will the materials used for the building remain in good condition over time?	Yes the materials are durable	No, the materials need occasional renovation.
10		What kind of flooring is there at the entrance of the building?	Hard tuff tiles in courtyard and soft tiles in the interior	Soft porcelain tiles.
11	Flooring	What kind of flooring is there at the ramps and stairs?	Hard tuff tiles	Hard tuff tiles
12		What kind of flooring is there in the public areas of the library?	Tiles with carpet and rugs along the lounges and sofas.	Tiles with carpet and rugs along the lounges and sofas.
13		Has it remained in good condition over time?	Yes the materials are in perfect condition.	The tiles wear off with time hence need renovation.
14		Are the ceilings equipped with acoustic insulation material?	Yes , the ceiling is made of acoustic panels from recycled materials.	No, the ceiling is plane gypsum board used in offices mainly.
15	Ceiling	Is it a suspended ceiling or is it fixed?	It is suspended with chains anchored to the ceiling.	It is suspended with chains anchored to the ceiling.
16	Acoustics	Does the insulation of the building keep out noise pollution?	Yes the area is well insulated	The echoes cause a lot of disturbance and are caused mainly because of low insulation.
17		Do users complain about noise generation inside the building? If yes, what are the sources of that noise?	No the acoustics are well designed to maintain adequate sound levels.	Yes, the uses mainly face sound problems when to many people use the library and drag furniture, talk and main noise is from offices that are along the library.
18		Is the noise separation between areas well thought out?	Yes	There is no noise separation elements.

19		Are there special acoustic absorbers in ceilings, wall cladding, flooring, draperies and/or furniture?	Yes	No
20	Openings	Do openings provide good and sufficient natural lighting?	Yes ample natural lighting is provided for reading spaces.	No there are no windows in reading areas.
21		Are there sunlit entrances that cause glare?	No minimum glare is observed.	No access to sunlight so no glares. Small glares on tables due to lights in ceiling.
22		Are there protection systems from sun rays (cornices, blinds, curtains, sun sheets, etc)?	Yes the glass protects the library.	Only blinds and color film is used in archive area on windows to reduce sunlight.
23		Do dimensions and location of openings cause thermal problems?	No	No the archives used less than other spaces.
24		Do dimensions and location of openings cause acoustic problems?	Yes	Yes noise in courtyard do disturb users.
25		Are the openings planned to be accidents proof?	Yes fire exits are well placed.	No since archives are locked in case of emergency in library the main door is the only exit.
26		Is it possible to have natural ventilation?	Yes natural ventilation is great.	No
27		Is there a sufficient level of lighting?	Yes there is sufficient lighting.	Yes there is sufficient lighting.
28	Lighting	Is it located in the ceiling and/or the walls or is it built into the furniture?	Its mainly in the ceiling above.	Its mainly in the ceiling above
29		What is the "color" of the light (warm, cold)?	Mixture of cold and warm.	Cold with warm lamps in MNA lounge
30		Is the system controlled by the stay or self reliant?	Yes most lights can be controlled by switches.	No most lights are connected and controlled by 3 main switches.
31		Is there some control system which depends on natural lighting?	Yes	No
32		Does lighting in the toilets work with occupation sensors?	Yes	No
33		Is it possible to switch all the lights on/off from a single point?	Yes, from the main distribution board	Yes, from the main distribution board
34	HVAC	What kinds of air-treatment are provided: heating/air-conditioning?	Split air condition systems are the main source of cooling and natural whereas heaters for heating.	Split air condition systems are the main source of cooling and natural gas heaters for heating.

35		How does these system get deployed in major spaces and allied spaces?	No the library is open hall so same hvac is used.	The reading space is connected to the central HVAC while archives and offices and MNA lounce has its own ac system.
36		Is the HVAC able to provide a conducive and comfortable environment?	It maintains good temperature over time.	It needs better cooling in peak summers.
37		What is the overall assessment of HVAC?	The current system is great.	The current system is good but can be improved for more comfortable environment.
38	Maintenance	Is the building easy to clean (flooring, toilets, etc.)?	Yes, the tiles provide easy cleaning options along with glass windows.	The floor are tiles and the gaps between tiles are very difficult to clean. The walls are white paint so does not need any cleaning.
39		Is the maintenance adequate (cleaning, replacements, checkups, etc.)?	Yes, maintenance is good.	The maintenance staff are good but since the materials are outdated not much can be done.
40		Any issues with operational maintenance of openings?	No they are perfectly placed.	No openings are usually closed.
41		Are the installations easy to access?	No many ceiling installations require a ladder to access.	No many ceiling installations require a ladder to access.
42	Conclusions	How will you conclude about the building overall	The library is well designed according to the LEED Gold certification and should be made an example of sustainable building technologies.	The interior of the library especially the circulation can be improved. The use of natural ventilation and light so that the user can study under natural light should be incorporated. The HVAC can be improved. The lighting can be replaced by energy efficient lights since old lights are places.

As shown above in the table 05, BCL has higher values in building entrance with respect to visibility, adequate door system, ample size, organized and vertical circulation. It also is higher with respect to the materials utilization focusing on energy and environment with local materials, remodeling, lacks staircases yet are having materials much more durable. Flooring was also better lead by BCL with local materials utilization, durability and sustainable optimization. BCL uses recycled materials in acoustic panels while it is not done in NAL. Acoustics was also optimized in BCL. Openings in BCL has value addition for natural lighting, cross ventilation and evacuation with much better value for the building design and utilization. BMS deployed had higher optimization and delivery in BCL which was completely lacked in

NAL. Maintenance was also better ranked and responded in BCL. BCL out ranked the NAL in all major energy and environmental design aspects explored in the context explored.

Research Findings & Conclusions

As shared above, BCL was a LEED Gold certified building as a set forth example for future of the built form in the public and national level library. NAL on the contrary lacked major environmental and energy considerations in its design. BCL was a major addition in the overall built form to set a precedence for future design directions of the public library to ensure these become user friendly while still being able to cope with the energy, climate, water and allied environmental crisis. NAL needed major design interventions with focus on the environmental design parameters and reprioritization and internal planning and optimization of spatial configurations for future sustainable usage.

Research Future Direction

The existing research should be carried further along with respondents from the two selected public libraries from the end users and visitors to explore their user friendliness and ease of usage with focus on these environmental considerations and future needs of the public libraries to keep them populated and fertile to play their critical role in social and community upliftment and educational enhancement.

References:

- Afacan, Y. (2017). Sustainable Library Buildings: Green Design Needs and Interior Architecture Students' Ideas for Special Collection Rooms. *Journal of Academic Librarianship*, 43(5), 375–383. <https://doi.org/10.1016/j.acalib.2017.07.002>
- Bande, L., Hamad, H., Alqahtani, D., Alnahdi, N., Ghunaim, A., Fikry, F., & Alkhatib, O. (2022). Design of Innovative Parametric/Dynamic Façade Integrated in the Library Extension Building on UAEU Campus †. *Buildings*, 12(8). <https://doi.org/10.3390/buildings12081101>
- Bashir, F., Soroya, S. H., Soroya, M. S., & Khanum, A. (2015). Emerging trends of acquisition in public libraries of Pakistan: Challenges and issues. *Library Collections, Acquisition and Technical Services*, 39(1–2), 40–44. <https://doi.org/10.1080/14649055.2016.1170471>
- Dang, T. H., & Chen, W. (2018). The importance of physical elements and their influences on users' concentration of academic library. *Advances in Intelligent Systems and Computing*, 588, 382–389. https://doi.org/10.1007/978-3-319-60582-1_38
- Gupta, S. (2020). Green library: A strategic approach to environmental sustainability. *International Journal of Information Studies and ...*, 5(2), 82–92. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3851100
- Jalaei, F., Jalaei, F., & Mohammadi, S. (2020). An integrated BIM-LEED application to automate sustainable design assessment framework at the conceptual stage of building projects. *Sustainable Cities and Society*, 53(November 2019), 101979. <https://doi.org/10.1016/j.scs.2019.101979>
- Jalaluddin Haider, S. (1998). Public libraries and development planning in Pakistan: a review of past efforts and future needs. *Asian Libraries*, 7(2), 47–57. <https://doi.org/10.1108/10176749810368937>
- Kilic, D. K., & Hasirci, D. (2018). Daylighting Concepts for University Libraries and Their Influences on Users' Satisfaction. *Journal of Academic Librarianship*, 37(6), 471–479. <https://doi.org/10.1016/j.acalib.2011.07.003>
- Mwanzu, A., Bosire-Ogechi, E., & Odero, D. (2022). The Emergence of Green Libraries in Kenya: Insights From Academic Libraries. *Journal of Academic Librarianship*, (August), 102601. <https://doi.org/10.1016/j.acalib.2022.102601>
- Waheed, Z. (2019). The British Council Lahore's Green and LEED-certified Library Building. *Green Behavior and Corporate Social Responsibility in Asia*, 17–25. <https://doi.org/10.1108/978-1-78756-683-520191004>
- Warraich, N. F., Haq, I., & Ameen, K. (2016). Status of Public Libraries in Rawalpindi District, Pakistan. *Public Library Quarterly*, 35(1), 72–82. <https://doi.org/10.1080/01616846.2015.1106902>
- Warraich, N. F., Malik, A., & Ameen, K. (2018). Gauging the collection and services of public libraries in Pakistan. *Global Knowledge, Memory and Communication*, 67(4–5), 244–258. <https://doi.org/10.1108/GKMC-11-2017-0089>
- Yang, Z. (2017). Research on natural lighting in reading spaces of university libraries in Jinan under the perspective of energy-efficiency. *IOP Conference Series: Earth and Environmental Science*, 94(1). <https://doi.org/10.1088/1755-1315/94/1/012181>