

A Study on Green Movements in selected libraries in Western Province, Sri Lanka

W. W. S. Thrishala Warnasooriya

Department of Library and Information Science, University of Kelaniya, Sri Lanka.

e-mail: warnasooriyathrishala@gmail.com

Abstract

A global interest on green concept has taken into consideration in today's world, as the environment has been drastically threatened by irresponsible human activities and modern technology for some decades. Therefore, going green has become a necessity in Sri Lanka at present as a country in which the number of environmental issues is dramatically increasing day by day. As a result of this, green implementations can be evident in some of private and government bodies in Sri Lanka. As community centers and knowledge hubs, the libraries also have a great part to play in this regard. In view of that, going green has become a goal of libraries in other countries, but very primitive in Sri Lanka.

Therefore, the main objective of this study was to examine the green movements in university libraries in Western Province, Sri Lanka. The population was the university libraries in Western Province. Therefore, Survey method was used to gather data from randomly selected 13 university libraries in western Province. Both state and private university libraries were included in the sample as 50% from each category. Conducting interviews with selected academic staff and self-observation were main tools used in data collection.

The study was conducted based on the research framework which consists of five areas namely, library building, operations and practices, programmes and services, information systems and library collection. Those five areas were covered by 23 indicators.

Basically, 14 green indicators could be identified in surveyed libraries. According to the data analysis, waste segmentation was the most popular green practice which functioned in 84% of libraries. Use of e – resources and gardening were practiced by 54% of the surveyed libraries. 23% of libraries produce bio gas and some libraries had a separate resource center for those activities. Composting, construction of solar panels and water purification systems, sharing

downloads, use of cloud-based applications, displaying green notices and posters were recognized as other green implementations.

Although 14 green practices could be noticed in the surveyed libraries, the tendency of going green is not a popular function in university libraries in Western Province. Policy statement of environmental management and green practices were followed by only one library. Hence, going green has not become a compulsory task and a popular function in Western Province. Therefore, the awareness programmes should be conducted to make green library concept popular among library staff, users and administrative staff of each university. A well -prepared policy statement can be effectively used by the libraries in order to enhance green implementations in the libraries.

Key word: Green concept, Green libraries, Green movements, University libraries

Research Problem

As a result of industrialization and renaissance in Europe, the environmental destruction began 5 centuries ago. But at that moment, the mankind could not realize that the environment in a threat. With the influence of modern technology, this situation has become more complex and critical. After the emerge of information technology, both advantages and disadvantages were experienced by mankind (Gamage & Halpin, 2007). Environmental impact was one of among those disadvantages (Carnegie Mellon University & Mind Controversy.com, 2018). On the other hand, the tap-root of today's environmental issues is the irresponsible human activities and behavior such as deforestation, failures in proper waste management systems, illegal construction projects etc. Eventually, it has been realized that the mankind has lost something important and have come to this digital era.

The number of environmental issues is increasing day by day in Sri Lanka. According to World Food and Agriculture Organization (FAO) Sri Lanka has been recognized as the country having the 4th worst deforestation rate of primary forests. Percentagewise it was 15.2%. (FAO, 2005). The global forest assessment (2005) states that each of country lost about 1% of its forests each year.

As a solution for the current environmental issues, a global interest on green concept emerged throughout the world. As a result, there is a tendency of going green in some institutions in Sri Lanka as well. As libraries can function as a place to stimulate the society on green library concept, the libraries should move towards green. Although, the green concept is not a much popular topic in Sri Lankan libraries, according to the research analysis of this research a slow green movement was evident among university libraries in Western Province, Sri Lanka.

Literature Review

The availability of research - based scholarly articles which were exactly focused on green library concept in Sri Lanka was less. But a number of research papers and some newspaper articles related to environmental issues and climatic changes were found in scholarly databases and newspapers. Thereby, majority of literature were grabbed from electronic media such as databases and web sites which mostly belongs to other countries. The research papers given below discuss green library concept and related topics.

In the very first research discusses not 'green concept' but the environmental issues of Sri Lanka and its causes. It was brought out here as the first body of literature to make an awareness of the current environmental condition and to emphasize the necessity of implementing green concept across the library system in Sri Lanka. Kariyawasam and Rajapakse (2014) have distributed a successful research outcome in their research 'Impact of development on deforestation in Sri Lanka'. They examine the factors of the origination of deforestation in Sri Lanka which belongs to the colonial period in which the commercial agriculture considerably developed. The most significant outcome of the research conducted by Kariyawasam and Rajapakse was the identification of the connectivity between the development projects and deforestation in Sri Lanka. They have given a descriptive analysis of physical development projects related to Mega City, highways, roads and tourism. If this crucial situation with regard to the development projects conducted by Sri Lankan government remained stable further, by the end of 2030 the forest covers will be less than 10% in the country. According to their analysis, government development projects are the main reason for the deforestation in Sri Lanka. Two authors have not proposed a better solution to overcome this environmental problem.

'Green libraries in academic institution: need of the hour' is a journal article by Shah, Kumar and Shah (2015) which defines the term green, and discusses the challenges faced by librarians in going green. Site selection, water and energy conservation, use of building materials and indoor air quality are pointed out as the important factors which should be focused on when an institution starts going green. Giving some examples of green initiatives, the authors discuss how those libraries are eligible to be green. The provision of a planning of green building with solar power and roof water harvesting is more important for the readers to get an idea of a green planning. Some of factors given in the list of suggestions for Indian libraries are possible to be functioned in Sri Lankan library environment.

Meher and Parabhoi (2017) highlight the conditions of environment, impact on society, green standards in India and outside India, initiatives in India, the role of librarian in going green. The paper is useful to have an idea on what green library means and the issues faced by the libraries on going green but its special reference is to Indian libraries. As India is also a developing country, the suggested green applications can be applied in Sri Lankan libraries.

According to the facts in the journal article 'green library: an overview' written by Madole (2014), green library is a part of the green building movement. Library 2.0 green design is a trend for the libraries in 21st century. He highlights that 'energy conservation' is an appraisable green movement in libraries. However, his suggestion for the librarians is to design more variety of facilitated spaces. If a library should have such kind of spaces in a library, more energy will have to be used. But even such library can go green by applying green implementations when designing variety of spaces. The given 5 criteria to design the green library building are site location, water conservation, use of energy efficiency materials, indoor air quality with innovations and designs. He mentions the challenges of designing a green building such as preservation problems. Sunlight, moisture and temperature change may be a threat for printed and other library materials.

Townsend (2014) examines how libraries promote environmental awareness among library users. 24 Canadian LEED- certified (Leadership in Energy and Environmental Design) libraries use 3 internal initiatives to inspire the awareness of users i.e. circulation-related initiatives, online resource pages and programmes / events. Accordingly, some of impressive programmes conducted by those libraries were gardening, composting, bees and chicken keeping, host farmer's market,

encouraging local food and pest management etc. Those programmes are really effective and also very new to the countries like Sri Lanka. As Canada is a developed country having modern technologies and facilities, it is easy for even public libraries to make people aware of environmental sustainability through such programmes mentioned above.

A project in the Duke University medical center library has been conducted. Peterson & others (2014) have published a research paper 'Going green: one libraries journey towards sustainability' based on that project. This paper discusses the sustainability plan implemented by a specific group of people, and how it contributes to the university goal of becoming carbon neutral by 2024. The dedicated group of people has already introduced a set of environmental practices, and they create the awareness of the project among the library staff. As this library is a certified green workplace, it suggests some green practices to other libraries such as recycling. The most important part of the paper is green archives, challenges and reflections from the library.

'Greening up library' is a research paper written by Woodland (2010) and it looks at the ability of library to spread environmental conservation efforts taken by in the society. The paper suggests the methods to explore environmentally friendly procedures and how to promote community interest and support within the society. The paper covers number of segments of green concept. It identifies the areas for improvements, ideas for changes, resources etc. Environmental audits and building procedures are discussed. Although the subject coverage of the paper is impressive, the matters discussed in the study is in USA perspective.

Recommendations and green star rating range provided by Binks & others (2014) can be seen in the article 'tomorrow's green public library'. The recommendations and concepts in the article are taken from a case study conducted in the Melton library and Learning Hub in Victoria. The range of these recommendations is from simple practices to large scale building development. A frame work purposely designed for library buildings is given in the article to be followed when designing a new building or refurbishing an existing one and raising community awareness of benefits. 3 key areas of sustainability namely, building or refurbishing, sustainable practices and education are discussed in the article.

The staff of the Worthington Public library, Ohio (2010) have built a strategic plan 2010-2012 which consists of staff ideas about possible actions with regard to 7 policy areas in which one of them becomes 'sustainability/ green initiatives.' Its application in the Worthington library, impact on both patrons and staff, sources or enrichment to be used for the suggestions are the scope of each area. Accordingly, the area of 'sustainability/ green initiatives' covers a wide range of green practices through 18 trends suggested by the staff members. Most of them are innovative particularly applicable in the countries like USA not fairly in Sri Lanka.

The conference paper entitled 'from green libraries to green information literacy' presented by Kurbanoglu and Boustany (2014) is mainly concerned the fact of information literacy and how it contributes to green library movement. It gives a detailed description on the terminology, definitions and evolution of green libraries. They point out 5 parameters of green building, green operations / practices, green programmes / services, green information systems and green collection. Although the research is subjected to green information literacy, the context includes the details of the 5 areas mentioned above. Those parameters are ideal to be selected as the criteria to conduct the research on green library concept.

The research paper on 'going green as a marketing tool for libraries: environmentally sustainable management practices' by Hauke and Werner (2013) combines the concepts of marketing and green in one platform. It describes how a library can do its best to set an example for other libraries through green practices. According to the authors, simple actions can do more for the library's image. This provides number of examples around the world describing how to make a marketing image in the library through the following areas. They are traffic and transport (use of public transportation / electronic vehicles / bicycles), management (eco - action plan / creation of an institutional green profile / green projects), services (use of information technology, green activities and events, use of fair-trade and sustainable food and drink, special lending tools and equipment), communication (signs, labels, telling the institutional green story in mass media and electronic media) etc. Although most of other research papers are based on green concept, the authors of this paper have deepened their view into the depth of the concept rather than taking it just as a concept or a practice.

Although, the global interest on green library concept is conspicuous, it has not yet become a popular discussion among the libraries in Sri Lanka. But private and state university libraries have taken the efforts discussed in the analysis to go green.

Therefore, the key objective of the study was to examine the green movements in university libraries in Western province, Sri Lanka. The following research questions were expected to be answered through this research.

- How many green practices can be identified in university libraries in Sri Lanka?
- What is the most popular green practice functioning in libraries?
- What is the least popular green practice functioning in libraries?
- What are the green implementations under each category of research framework?

Methodology

Population

The outcome of this research is to be generalized for the population of state and private university libraries in Western province, Sri Lanka. Therefore, the population of the study was all university libraries in Western province. Both state and private universities in Sri Lanka were recognized through the official web site of University Grant Commission (UGC). The population is shown in the tables given below.

Sample of the study

The sample was randomly selected. In that, there were 6 libraries of state universities and 20 libraries of private universities in Western province, Sri Lanka.

The reason to select university libraries in Western province was the majority of universities were located in the vicinity of Western province. Out of fifteen, 6 state universities and out of twenty-one, 20 private universities are situated in Western Province. (i.e. 40% of state universities and 95% of private universities).

Selection of the sample from state universities:

- Step 1: All 6 state universities in Western province were numbered from 1- 6.
- Step 2: The numbers were written in small chits.
- Step 3: Three (3) chits were randomly selected.

Selection of the sample from private universities:

- Step 1: All the 20 private universities in Western province were numbered from 1- 20.
- Step 2: The numbers were written in small chits.
- Step 3: Ten (10) chits were randomly selected.

Accordingly, 3 state university libraries and 10 private university libraries in Western Province were randomly selected as the sample of the study. A list of all universities is given below.

Table 1: State Universities in Western Province

State Universities in Western Province
1. University of Colombo
2. University of Sri Jayawardhanapura
3. University of Kelaniya
4. University of Moratuwa
5. The Open University of Sri Lanka
6. University of the Visual and Performing Arts

Source: prepared by the researcher, 2018

Table 2: Sample selected from State Universities in Western Province

State Universities in Western Province
1. University of Sri Jayawardhanapura
2. University of Kelaniya

3. University of Moratuwa

Source: prepared by the researcher, 2018

Table 3: Private Universities in Western Province

Source: prepared by the researcher, 2018

Private Universities in Western Province		
Table 6: selected State	1. Sri Lankan Institute of Information Technology (SLIIT)	Sample from
	2. Sri Lankan Institute of Development Administration (SLIDA)	
	3. National Institute of Fisheries & Nautical Engineering (NIFNE)	
	4. National Institute of Social Development (NISD)	
	5. National Institute of Business Management (NIBM)	
	6. South Asian Institute of Technology & Medicine (SAITAM)	
	7. National School of Business Management (NSBM)	
	8. Colombo International Nautical & Engineering College (CINEC)	
	9. Sri Lanka International Buddhist Academy	
	10. The Institute of Chartered Accountants of Sri Lanka (ICA)	
	11. Horizon Campus	
	12. KAATSU International University (KIU)	
	13. Nagananda International Institute for Buddhist Studies	
	14. Sri Lankan Institute of Technology	
	15. Aquinas College of Higher Studies	
	16. Institute of Technological Studies	

Universities in Western Province

17. Sri Lanka Technological Campus (SLTC)
18. Saegis Campus
19. British Computer Society
20. Sri Lanka Institute of Architects

Private Universities in Western Province
1. Sri Lankan Institute of Information Technology (SLIIT)
2. Sri Lankan Institute of Development Administration (SLIDA)
3. National Institute of Business Management (NIBM)
4. National School of Business Management (NSBM)
5. Colombo International Nautical & Engineering College (CINEC)
6. The Institute of Chartered Accountants of Sri Lanka (ICA)
7. Horizon Campus
8. KAATSU International University (KIU)
9. Nagananda International Institute for Buddhist Studies
10. Aquinas College of Higher Studies

Source: prepared by the researcher, 2018

Data collection

Because of the ability to collect most reliable data, survey method was chosen to investigate the green movements in libraries. The following framework was used to form the questions to be asked in the interview and to conduct the self - observations.



Figure 1: Research framework

Source: Prepared by the researcher, 2018

The data was gathered based on 5 areas displayed above. The factors discussed under the following headings, each area was taken into consideration when observing the libraries. Those factors have been explained below.

1. Green Building

- Site location
- Indoor quality
- Efficient use of energy sources (water and electricity)
- Use of sustainable materials and resources
- Interior out fitting or design
- Innovations

2. Green Operations and Practices

- Waste management
- Green practices related to paper usage
- Reduction of plastic usage
- Effective use of machinery items and equipment
- Usage of quality materials
- Effective use of electricity

- Effective communication
- Encouraging the local purchasing
- Effective use of other materials

3. Green Programmes and Services

- Workshops
- Lectures
- Seminars
- Community awareness programmes
- Exhibitions
- Poster presentation
- Walk
- Green week

4. Green Information Systems

- Decline of CO₂ emission
- Standardization in processes and practices
- Reusing content and tools
- Green user behavior
- Cloud computing
- Location of servers
- Use of mobile apps instead of OPAC
- Resource sharing
- Green IT

5. Green Collections

- Purchasing reading materials related to green education
- Sharing downloads (to minimize the number of downloads)
- Effective weeding practices

The collection and the collection development can be organized as a support for going green. According to Connell (2010), 3 factors of green collection development are,

- Selection

The easy access to green information by acquisitioning green resources related to environment, green computing, green trends, organic gardening, energy conservation, individual contribution in going green should be facilitated.

- De-selection

Green de-selection or weeding emphasizes about reusing and recycling materials. Multi- media resources such as DVDs, CDs, cassettes and audio books made out of plastic and metal are difficult to recycle. But, a regular e- waste management should be implemented in the library.

- Selection of material format

Basically, libraries tend to select e – resources which drops down the paper usage and eventually supports to deforestation. But the librarian should concern about CO₂ emission produced by the computers, servers and other electronic items when using e - resources. Therefore, format of the material should be decided before purchasing. Selection of either printed or digital version depends on how rich the selected material is eco-friendly.

Collection of Primary Data

Structured interviews and self- observations were used to collect primary data. The questions asked in interviews were purposive based on the objectives of the study.

Structured Interviews

Structured interviews were conducted with librarians. In the absence of the chief librarian, the deputy or a senior assistant librarian was interviewed. Percentagewise 100% of interviews could be conducted successfully.

Collection of Secondary Data

Secondary data were collected through literature such as scholarly e- journals, e- repositories, reports, seminar proceedings and newspapers.

The study is both quantitative and qualitative. The conclusions from previous studies and theories, main definitions, plans of data collection, choosing of respondents, tables and making conclusions based on statistical data could be identified as the quantitative characteristics and the attitudes, awareness about the phenomena were qualitative characteristics of this study.

Data Analysis

The collected data from surveyed university libraries were separately analyzed based on the research framework. Tables, charts and statistical methods were used to analyze data comparatively using ‘Microsoft excel’.

Results

The following table shows how many of libraries have extended their cooperation to make this survey a success. Accordingly, majority of libraries have enthusiastically participated in the survey.

Table 7: The percentage of surveyed libraries

University Category	No: of libraries in Western Province	No: of selected libraries (%)	No: of surveyed libraries from the sample (%)
State	6	50	100
Private	20	50	80%

Source: Prepared by the researcher, 2018

The collected data related to current green movements in the library were more important for three different personalities.

- For the librarian
- For the institution
- For the government

Those three phases can identify the current situation and make decisions or new implementations or changes individually or together.

For an example, a librarian can refer the data given in this study and apply green concept in their libraries. A university can rethink about this green concept and its current situation in the university system and apply this in their institutions. As a country, the ministries and government or private sector can study this concept further and promote this concept among general public by developing a national green policy.

Green movements in university libraries

Table 8: Green practices in surveyed libraries

Research areas	Identified green practices
Green Building	Effective use of natural daylight
	Construction of Solar panels
	Gardening / cultivation
	Bio gas production
	Composting
	Water purification system
Green Operations and Practices	Waste segmentation
	Displaying energy saving notices
	Following a policy statement

Green Collections	Displaying posters
	Purchasing e-resources
	Sharing downloads
Green Information Systems	Use of cloud-based applications
	Resource sharing through LMS
Green Programmes and Services	-

The following chart shows that how many numbers of green implementations were evident in both state and private universities in the province.

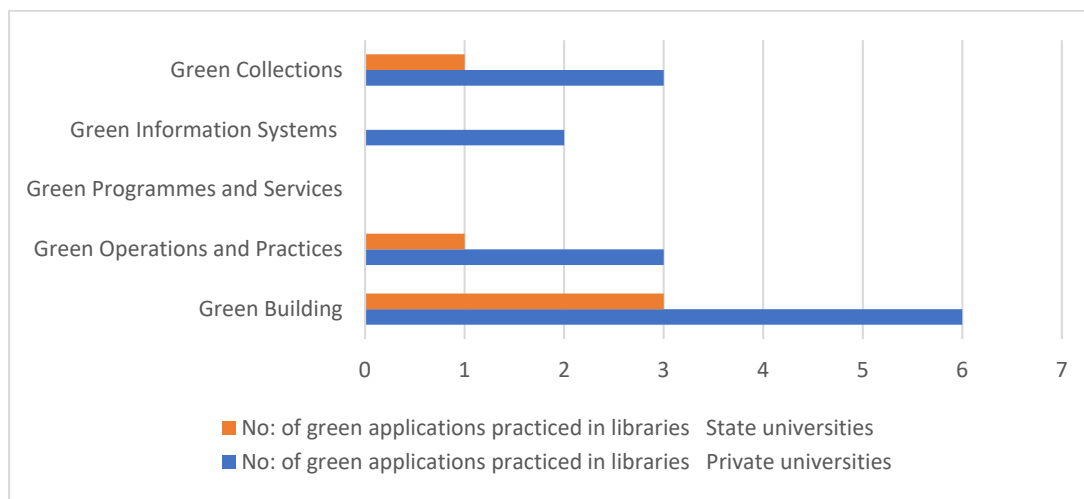


Figure 2: Categorization of green applications under each area

Source: Prepared by the researcher, 2018

The highest number of green implementations was evident with regard to library building. According to the above chart and the table, the practices related to green programs / services could not be found in any of the libraries. As going green is a quite new concept to university libraries in Sri Lanka, they have not conducted any workshops, lectures, seminars or community awareness programmes. Due to the lack of green awareness among library staff, the topic of green concept has not become an important title in their annual plans too.

A detailed description on how university libraries implement green concept related to five main areas has been given below. The percentage given in each chart shows how many libraries have applied green concept in their libraries.

How university libraries practice green concept related to library building.

The following bar chart shows how many libraries are engaged in six green practices related to library building. According to the chart, some practices related to green building were in an adequate level.

- Percentagewise, 50% of private university libraries and 100% state university libraries have applied green concept by cultivating or gardening. Although, most of the libraries did not have enough space for gardening, they have been successful in cultivation by having potted plants inside their libraries.
- In the meantime, 38% of private university libraries have taken the effective use of natural daylight while the percentage of state university libraries is 66% in this indicator. On the other hand, both types of libraries have to use air conditioners or ceiling fans as more electricity power is needed for the comfort of the users and the staff as well. As a result of that a high amount of electricity bill have to be paid by the universities. According to the collected data through observations, it was noticed that majority of libraries have failed to save the energy and cut down the cost as they have not considered how they can use natural daylight and ventilation when the library building is planned.
- 25% of private university libraries contributed for bio gas production with the use of food wastes and other degradable wastes. The amount of state university libraries which produce bio gas is 33%. This is one of the benefits derived by green library practices. The generated bio gas was used for cooking purposes in cafeterias of the universities.
- Composting, construction of water purification systems and solar panels were other innovations of green concept. Composting has become an income generating method in some private institutions (percentage wise it is 13%).
- Although some of libraries preferred in use of solar energy, insufficient budget allocated for the libraries has become an obstacle in this regard. However, 13% of private university libraries has established solar panels.

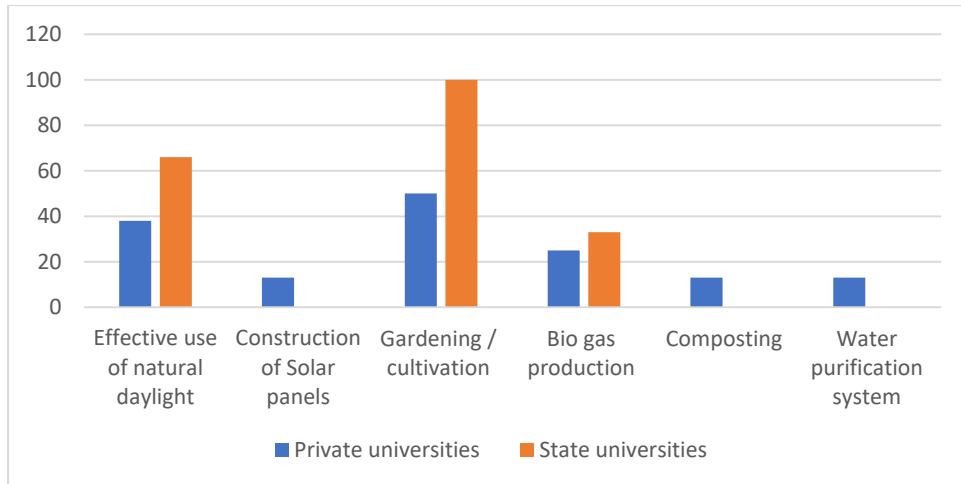


Figure 3: green practices related to library building

Source: Prepared by the researcher, 2018

According to the above bar chart, it is clear that some of green practices such as solar panel construction, composting, water purification systems etc. were not put into practice by state university libraries.

How university libraries practice green concept related to library operations and practices

The green practices related to this category are the basic green practices which can be applied by any library at the very beginning of going green. Three main applications related to library operations and practices were evident in surveyed libraries. The percentage of library participations in those three practices are given in the following chart.

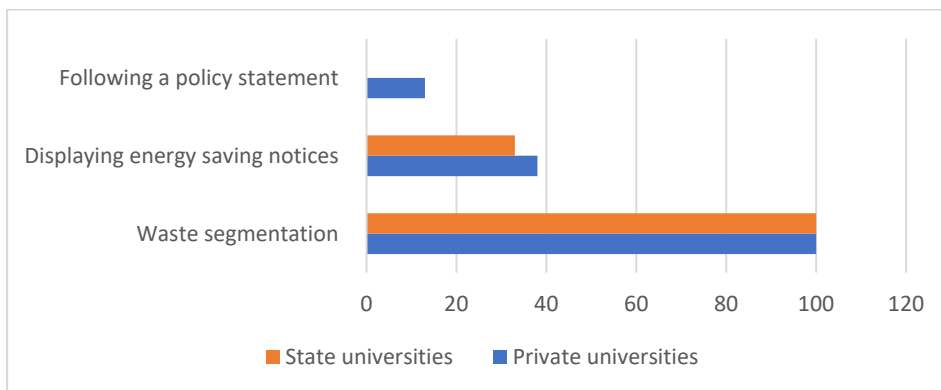


Figure 4: green practices related to library operations and practices

Source: Prepared by the researcher, 2018

- Waste segmentation was the most popular activity done by all of libraries (i.e. 100% of private and state university libraries). As university libraries located in urban areas, waste segmentation has become a compulsory task in every institution.
- 38% of private university libraries and 33% of state university libraries display various notices to make users and staff aware of energy saving such as water and electricity. The notices mainly were displayed nearby air-conditioned areas, wash rooms, sinks and IT laboratories.
- Following a green policy is a timely necessity for every library to maintain green practices regularly and to create a systematic approach for green implementations in libraries. Unfortunately, only 13% of private university libraries had a green policy.

How university libraries practice green concept related to library collection

As the sample of the study was university libraries in Western province, the collection of those libraries was mainly developed focusing on the subjects related to the syllabuses of degree programmes conducted by universities.

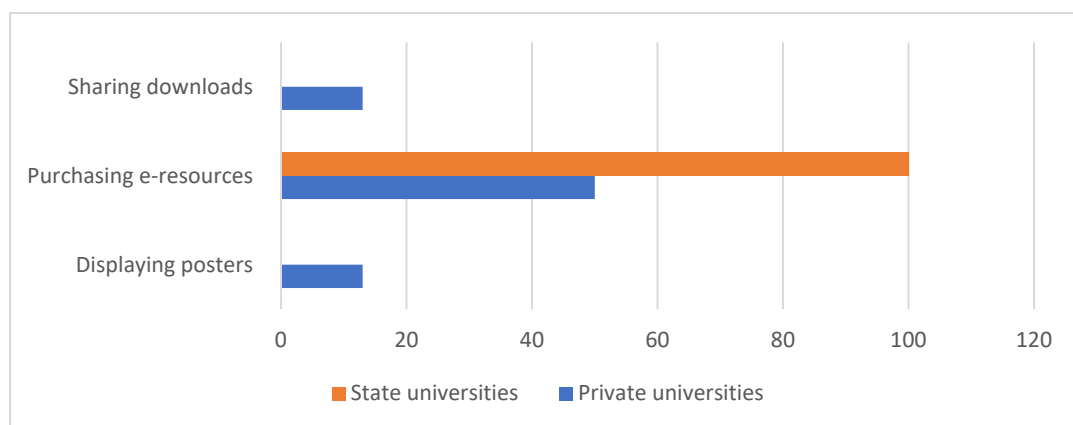


Figure 5: green practices related to library collection

Source: Prepared by the researcher, 2018

- Only 13% of private university libraries have used their notice boards to display some green ideas in the library. In the same way some of libraries had used their social networks to give green messages to its users.
- Although the annual budget allocation for e- resources is considerably high, it contributes to minimize the number of deforestations, as well as the number of purchases on the book racks, library space which requires to store printed materials. Therefore, 50% of private university libraries have subscribed electronic databases. As all the state universities are privileged with e-databases purchased by university CONSORTIA, all of them have e- resources.
- Sharing downloads is another way to minimize the number of downloads. As each google search generates 0.5 CO₂, keeping downloads and sharing them among users is a very fruitful way of saving energy which was practiced only by 13% of private university libraries.

How university libraries practice green concept related to library information systems

Modern technology has become a reason responsible for environmental issues. However, use of mobile apps for catalogue searching and use of cloud applications instead of having number of server machines which generate CO₂ for 24 hours are not common practices in Sri Lanka. Therefore, the green practices related to ‘green information systems’ were not much evident in the surveyed libraries.

- According to self-observations, none of the libraries used mobile apps to search OPAC.
- None of the libraries used cloud computing system to save the space and energy which they had to allocate to locate huge servers although 13% of private university libraries tend to use cloud-based applications.
- The resource sharing practices have been done by 47% of private university libraries and 100% of state university libraries through their Learning Management System (LMS). Some of the teaching – learning activities and information gathering were based on online activities.

Discussion

Although going green has become a trend in the field of library science in foreign countries, Sri Lankan university libraries are slowly moving towards it. But with the rapid increase of the environmental issues and climatic changes, taking more environmentally friendly decisions as soon as possible (i. e. going green) is a timely necessity in Sri Lanka. In that sense, university libraries are also responsible as community service centers to make their contribution in this regard. As green concept has not become a popular topic in the field of libraries in Sri Lanka, green movements are not conspicuous. But some of green practices are functioned by some libraries.

In order to measure current green movements of university libraries located in Western province, the study was conducted based on the research framework which consists of five criteria namely, library building, operations and practices, programmes and services, information systems and library collection. Survey method was used to gather data from randomly selected 13 university libraries in western Province. The main tools used for data collection were conducting interviews and self- observation.

In the study, the following was the main limitation faced by the researcher. According to table 1.6, 10 private universities in Western Province were randomly selected. But out of 10, two libraries were not able to extend their cooperation in this regard. Reasons responsible for this were shifting the library to another location and administrative barriers.

According to the data analysis, the findings of the study were as follows.

- Basically, 14 green practices could be identified.
- waste segmentation was the most popular green practice which was functioning in 100% of libraries.
- Use of e – resources and gardening were the next important indicator which were practiced by majority of private university libraries among the surveyed libraries (i.e. 50%). All state university libraries contribute in these two practices.
- 25% of private university libraries and 33% of state university libraries produce bio gas and some libraries had a separate resource center for those activities.

- Composting, construction of solar panels and water purification systems, sharing downloads, displaying green notices and posters were recognized as other green implementations.
- Policy statement of environmental management and green practices were followed by only one library.
- Although above green practices could be noticed, university libraries in Sri Lanka has a slow green movement.

Conclusion

As some researchers contributed to enhance the new concepts with regard to library and information science, they have hardly considered for green library concept and its relevance to libraries in Sri Lanka.

In view of that, many library professional even chief librarians and para- professionals in library Science field are not perfectly aware of green library concept, its application and its benefits. So that, it is needless to talk about consumers. The outcome of this research will be an indicator which shows the contribution of green libraries to Western province.

Although many researchers have attentively engaged in researches related to new library concepts, only a few Sri Lankan researchers have completed some researches on green concept in their studies. Few degree holders in Sri Lanka has paid their attention at least on one study in connection with green library concept. There will be good news for the forthcoming researchers to identify the conspicuous research gap in this disciplinary. They can conduct the same research in other provinces in Sri Lanka. Accordingly, this study will definitely be a better platform for library professionals, library consumers and generally for everyone in the world who are seeking a green world in near future.

References

Antonelli, M. (2008). The Green Library Movement: An Overview and Beyond. *Electronic Green Journal*, 1(27). <http://escholarship.org/uc/item/39d3v236>

Binks, Lisa (2014). Tomorrow's green public library. *The Australian Library Journal*, 63(4), 301-312, DOI: 10.1080/00 04 9670.2014.969417

Carnegie Mellon University (2018). Green computing : Environmental issues. <http://www.carnegiecyberacademy.com/faculty/Pages/environment/issues.html>

Environmental protection and Sustainable development in Sri Lanka (2012), *Sunday Leader*, 08 July. www.thesundayleader.lk

Gamage, Premila (2007). E –Sri Lanka: bridging the digital divide, *The Electronic Library*, 25(6), 693- 710. <https://doi.org/10.1108/02640470710837128>

Green Wiki (2018). List of environmental organization. http://green.wikia.com/wiki/List_of_Environmental_organizations

Hewage, Thosapala (2016). Good governance and environment, *The Island*, 14th June, www.island.lk

Higgins, Dan (2018). How are you taking the advantage of the technology at your fingertips?. <https://consulting.ey.com/taking-advantage-technology-fingertips/>

Kariyawasam, Ravindra K. M. H. and Rajapakse, Chinthak (2014). Impact of development on deforestation in Sri Lanka. *IOSR Journal of Environmental Science*, 8(7), 2319-2399. <http://www.iosrjournals.org/iosr-jestft/papers/vol8-issue7/Version-2/G08723539.pdf>

Kurbanoglu, Serap & Boustany, Joumana (2014). From green libraries to green information literacy, *Communications in Computer and Information Science*. <https://www.researchgate.net/publication/284731109> DOI: 10.1007/978-3-319-14136-7_6

Malode, Amit, V. (2014). Green library: an overview. *Research Journey*, 1(4), 13-17

Meher, Puspanjali & Pharaboi, Lambodara (2017). Green library: an over view, issues with special reference to Indian Libraries, *International Journal of Digital Library Services*, 2(7), 62-69, ISSN 2250-1142

Ministry of irrigation and water resources and disasters Management, (2018). Situation report: Government Disaster Management Center. <http://www.re liefweb.int>

Mulford, M. S. & Himmel, N. A. (2010). How Green is My Library? Libraries Unlimited, Santa Barbara, California. <https://www.abc-clio.com/ABC-CLIOCorporate/ produc t.as px?pc=F2353P>

Shah, Leena, Kumar, Sudhir and Shah, Mukesh Kumar (2015). Green libraries in academic institutions: need of the hour. *Social issues and environmental problems*, 3(9), 1-5. <http://www.granthaalayah.com> DOI: 10.1007/978-3-319-14136-7_6

Townsend, Andrea K. (2014). Environmental sustainability and libraries: facilitating user awareness, *Library Hi Tech News*, 31(9), 21-23. <https://doi.org/10.1108/ LHTN-07-2014-0059>

University of California (2018). Barkley library guides: non-governmental organizations Environment. <http://guides.lib.berke ley.edu/c.php? g=496 970&p =34 2 7176>

United Nations Environmental Programme (2018). List of accredited organizations. <https://www.unenviro nment.org/civil-society-engagement/ accreditat ion/list-accredited-organ izations>

University of Kelaniya (2018). Center for Sustainability Solutions: greening the university for a sustainable future. www.units.kln.ac.lk

5 bad effects of technology in Environment. <https://www. mindcontrove rsy.com/effects-of- technology-in-environment/>