

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Library Philosophy and Practice (e-journal)

Libraries at University of Nebraska-Lincoln

April 2019

Environmental Sustainability in libraries through green practices/services

Priti Singh (Junior Research Fellow)

DLIS, Banaras Hindu University, pritibhu2408@gmail.com

Rajani Mishra (Associate Professor)

DLIS, Banara Hindu University, rajanimishra5@gmail.com

Follow this and additional works at: <https://digitalcommons.unl.edu/libphilprac>

Part of the [Library and Information Science Commons](#)

Singh, Priti (Junior Research Fellow) and Mishra, Rajani (Associate Professor), "Environmental Sustainability in libraries through green practices/services" (2019). *Library Philosophy and Practice (e-journal)*. 2312.

<https://digitalcommons.unl.edu/libphilprac/2312>

Environmental Sustainability in libraries through green practices/services

Priti Singh¹, Dr. Rajani Mishra^{2*}

1 Junior Research Fellow, Department of Library and Information Science, Banaras Hindu University, Varanasi, U.P.

2 Associate Professor, Department of Library and Information Science, Banaras Hindu University, Varanasi, U.P.

1 email: priti@bhu2408@gmail.com

2 email: rajanimishra5@gmail.com

Abstract

This paper is an attempt to discuss the role of green practices/services which are incorporated within libraries towards environmentally sustainable. With continuous use and easy availability of new technologies like computer printers, faxes, and photocopiers etc. it is very important to protect the environment. Since, all these machines have an impact using paper, ink, and electricity on the environment. This paper begins with an explanation of sustainability, environmental sustainability, green printing, and copying etc. Further, demonstrates the various sustainable strategies for the libraries. And also highlights the strategies for overcoming the impact of paper use, ink use and electricity. This paper will also provide a different approach for librarians to achieve green practices/ services. The adverse impact of new technologies on the environment also increases the requirement of green practices/ services within libraries and reducing the carbon footprint, which will automatically enhance the environmentally sustainable practices, a valuable step for enhancing the lifestyle of society.

Keywords: Sustainability, Environmental sustainability, Libraries, Green printing, Green copying, Carbon footprint

Introduction:

Libraries are the most important source of knowledge for the posterity; they have been preserving knowledge in various forms like the leaf inscription, incunabula, stone inscription, and parchment to modern printed form. After that, in the 1950s, an invention of the computer brought a drastic change in this scenario, different application of ICTs started in the libraries' work. This also affected the mode of learning and publishing and developed a better form of digitized documents. The nature and number of users also changed from offline mode to online mode. That time, libraries were eco-friendly with printed documents and other reading materials but there were constraints of place in the development of libraries due to increasing research activities and publishing, that problem was solved by the use of electronic gadgets in the libraries. As every new advent has advantage and disadvantage, so this digitization to has an adverse effect on the environment due to the uses of imperishable electronic gadgets in the process of digitization that poses a hazardous impact on the environment. Sustainable development of the digitized libraries is a necessity for the betterment of the environment. At present, every government and non- government organizations, industries, institutions etc. are an endeavor for this problem. Libraries have also incorporated green practices to protect the environment through their green library initiatives. The need for greener services to the environment is also growing and becoming essential day by day. These greener services are printing and copying. Libraries can lead to eco-friendly or environmental sustainability practice, re-using and recycling of materials, reducing waste and toxic products and developing alternative technologies. This paper focuses the strategies and practices

*Corresponding author

for reducing the impact of these machines. The paper reviews the research on green printing and provides practical suggestions for achieving eco-friendly printing and copying. This paper will also discuss possible issues and challenges to be faced by future library and Institutions in developing countries. And also, it can be an example for librarians to achieve greener printing and copying in making the libraries greener for good and healthy environment.

Sustainability:

The term “sustainability” was introduced as an international issue by the book “The World Conservation Strategy” in 1980 (IUCN et al., 1980). Since that date, the term begins to be used with increased frequency and its economic, social and environmental aspects were argued as well as its significant value in the search for a new form of development. This concept was deeply discussed in a study prepared for the World Commission on the Environment of the United Nations known as the “Brundtland Report” (World Commission on the Environment and Development, 1987). This report, among different things, concludes that it is very important to make a large change in the concept and approach towards human development since all the ecological systems of the earth are suffering dangerous and irreversible damage.

Definitions of Sustainability

There may be different definitions of sustainability and sustainable development as there are many groups and person trying to define this term. All the definitions have same meaning and approach as:

- Living with limitation
- Understanding the inter-relations among economy, society, and environment
- Equitable distribution of resources and opportunities (sustainable measure)

“Sustainability is the capacity to improve the quality of human life while living within the carrying capacity of the Earth’s supporting eco-systems.” This definition has been provided by the International Union for Conservation of Nature (IUCN), the work of which is driven by the fact that global production and consumption patterns are destroying nature at persistent and dangerously high rates.

There is no universally agreed definition of what sustainability means. There are many different points of views on this term and how it can be achieved or maintained. The idea of sustainability roots from the concept of sustainable development which became common language at the World's first Earth Summit in Rio in 1992. (From global footprint)

The original definition of sustainable development is usually considered to be: *"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."* As stated in Brundtland Report for the World Commission on Environment and Development (1992).

The important quotes below will provide some ideas on what constitutes sustainable development and sustainability. *“A process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations”* The World Commission on Environment and Development.

The definition for sustainability from Forum for the Future is definitely more inspirational: *“A dynamic process which enables all people to realize their potential and to improve their quality of life in ways that simultaneously protect and enhance the Earth’s life support systems.”* This definition realizes our responsibility and duty towards betterment of

*Corresponding author

environment because it makes explicit the fact that we all are dependent on the earth, so we have to better look- after it, whilst making the link to all people realizing their potential – we (collectively) will have a better life if we (collectively) take care of the environment. There is an aspirational element rather than just ‘we should do this because we must’.

Environmental Sustainability:

The term itself was probably first coined by scientists at the World Bank. Originally, the term “environmentally responsible development” was used (World Bank, 1992). Subsequently, “environmentally sustainable development” was employed (Serageldin and Streeter, 1993). Finally, the concept of environmental sustainability was developed (Goodland, 1995). According to Goodland, environmental sustainability “seeks to improve human welfare by protecting the sources of raw materials used for human needs and ensuring that the sinks for human wastes are not exceeded, in order to prevent harm to humans”. Goodland’s conceptualization of environmental sustainability fits into the resource-limited ecological economic framework of “limits to growth”.

An important contribution to the concept of environmental sustainability was made by the OECD Environmental Strategy for the First Decade of the 21st Century (OECD, 2001). The Strategy defines four specific criteria for environmental sustainability: regeneration (renewable resources shall be used efficiently and their use shall not be permitted to exceed their long-term rates of natural regeneration), substitutability (non-renewable resources shall be used efficiently and their use limited to levels which can be offset by substitution with renewable resources or other forms of capital), assimilation (releases of hazardous or polluting substances into the environment shall not exceed their assimilative capacity) and avoiding irreversibility. It identifies five inter-linked objectives for enhancing cost-effective and operational environmental policies in the context of sustainable development:

- Maintaining the integrity of ecosystems through the efficient management of natural resources
- De-coupling environmental pressures from economic growth
- Improving information for decision-making: measuring progress through indicators
- The social and environmental interface: enhancing quality of life
- Global environmental interdependence: improving governance and co-operation.

Environmental sustainability is defined as a responsible interaction with the environment to avoid depletion or degradation of natural resources and allow for long-term environmental quality. The practice of environmental sustainability helps to ensure that the needs of today's population are met without jeopardizing the ability of future generations to meet their needs. Herman Daly, one of the early pioneers of ecological sustainability, looked at the problem from maintenance of natural capital viewpoint. In 1990 he proposed that:

- For renewable resources, the rate of harvest should not exceed the rate of regeneration (sustainable yield);
- For pollution, the rates of waste generation from projects should not exceed the assimilative capacity of the environment (sustainable waste disposal); and
- For non-renewable resources, the depletion of the non-renewable resources should require the comparable development of renewable substitutes for that resource.

Green Printing and Copying:

Green printing is described as the movement in the printing industry wherein reducing, recycling and reusing are done to overcome the burden of resources used for printing, copying, and advertising. This method involves the use of low-VCO (Volatile Organic Chemical) inks, recycled paper, energy-efficient computers and equipment, remanufactured laser toner cartridges and ink cartridges for printers, paperless or electronic information dissemination, and attempts to educate and aware the people on green printing. Environmentally-friendly or Green printing combines sustainability with the printing of paper products. It involves several practices that prove less harmful to the environment than customary printing practices. There are some eco-friendly printing tips include as:

- Using digital formats than print formats whenever possible
- Using recycled paper
- Using recycled printer cartridges
- Purchasing chemical free ink (soy-based ink)
- Printing on both sides of the paper

Green Printing

Globally paper consumption is constantly growing rapidly; paper use has reached almost 400 million tons of paper per year. Even the rapid advancement and development of modern technologies for information transfer and information storage centres cannot overcome ever-growing consumption of paper. Digital and Electronic archives, electronic-mail, and the Internet cannot compete without printed documents being produced out in every library and information centre. Environmental sustainability and preservation of natural resources are becoming a priority and an effective initiative for libraries of all sizes and types. Some benefits of green printing-

- Green printing has many benefits for the environment and also for the savings on printing costs. When fully achieved in a library or even at home, the expenses can be reduced by up to 70% or more depending on the eco-friendly strategies applied. When the point comes to environmental concerns, green printing can help in preservation and conservation of the natural resources.
- YSoft SafeQ delivers comprehensive management and administrative control of all printing, copying and scanning operations. It provides high levels of security for all documents, cost savings, conservation of environmental resources, and greater convenience for users.

Reducing the impact of printing

The printing of publications and production of paper both use large amounts of natural resources, such as water, tree, and energy, as well as potentially hazardous materials. The printing process itself also involves numerous inks, solvents, acids, lacquers, dyes, driers, varnishes, shellacs, and many other solutions, that can be hazardous to both humans and the environment. Chlorine bleaching of paper can release chemicals and pollutants into the water. Bindings, adhesives, foils, and other items used in printed items can also make recycling of publications difficult. And going completely electronic is not always possible or desirable in libraries and information centres. But several strategies can be used to reduce paper use, ink use, and other resources.

- Paper scheme
- Ink scheme

*Corresponding author

- other resources like Printers, Copiers, and Faxes

Paper Scheme:

Paper is something that virtually every library uses in large quantities. As we know libraries are the storehouse of books and printed documents. And the use of paper is so familiar that it generally goes unquestioned. In the same way that using paper has hidden but negative effects on the environment. Paper can be made from virgin wood, pre-consumer waste meaning waste from paper mills and manufacturing plants, or post-consumer waste meaning paper that has been collected during recycling programs or paper waste from printing processes, etc. All the steps involved in creating paper as wood extraction, processing, production, transportation, use, and disposal contribute to significant environmental challenges. We can overcome the paper use through the recycling process. Paper recycling pertains to the processes of reprocessing waste paper for reuse. As we all know the paper is one of the materials that can be easily recycled. Recycled paper is paper that was made from paper and paper products that have already been used and recovered. Recycled paper is the greenest option as it uses less energy, water, and produces lower carbon emissions than the manufacturing of non-recycled paper. Therefore, recycled paper use is essential for sustainability. It benefits the environment in following ways-

- Conservation of natural resources: Every ton of recycled paper saves 17 trees.
- Energy saving: Recycling 1 ton of paper saves 4,200-kilowatt hours that are enough to power an average-sized home for two years.
- Protection and conservation of our clean water supplies: Every ton of recycled paper conserves 7,000 gallons of water.
- Safety of landfill space: Every ton of recycled paper saves 3.3 cubic yards of landfill space.
- Protection and conservation of our clean air: Manufacturing 1 ton of paper from virgin wood pulp creates an additional 60 pounds of air pollution.

Ink Scheme:

Ink printers and their inks are made up of several ingredients, most of the chemicals that have the potential to be damaging to us and the environment. Manufacturing just one single toner cartridge emits around 4.8kg CO₂ Greenhouse Gases per cartridge. This is an important point to have in mind that this is just for the cartridge, and this figure does not take into account the toner inside. The Life Cycle Assessment of toner evidence that the GHG emissions are in the region of 16 metric tons per 1 metric ton of toner produced. Generally, a cartridge that yields five thousand pages contains 200 grams of toner, which means that the CO₂ emission per cartridge is 3.2 kg. There are many adverse effects of just throwing away an old ink or toner cartridge. The heavy metals and chemicals which present in these inks or toner cartridge will pollute the soil and water when they reach landfills. This large abundance of waste can be reduced, or practically eliminated by reusing and recycling. If we recycle our printer cartridges, we conserve energy and natural resources, as we reduce the energy needed for the materials.

Soy ink is more sustainable than petroleum-based ink. Soy ink now has only limited availability for computer printer cartridges. Petroleum-based ink dries quicker than soy ink, which is a significant advantage in printing. Even inks with the “SOYINKA” trademark of the American Soybean Association (American Soybean Association, n.d.) have significantly less than 100 percent soy content especially when printing on coated papers. On the plus side, soy inks are easier to de-ink reducing recycling costs.

Therefore, it is a necessary point for every person to understand that recycling paper is important, but there is still a ways to go before the same behaviour about recycling printer cartridges seeps into people's consciousness. With the advancement and popularity of mobiles and e-readers, the need for printing has been greatly reduced, but there is still a vast need for it in home and office environments. Printing still plays a major role in our daily lives, so awareness must be raised to minimize the environmental damage in the future. So, we need to use soy ink in printing at large level. Soy ink has several advantages as-

- Soy ink is more sustainable than petroleum-based ink.
- Soy ink now has only limited availability for computer printer cartridges. Petroleum-based ink dries quicker than soy ink, which is a significant advantage in printing.

Recycling and remanufacturing of toner cartridges is another sustainable strategy.

Reducing the burden of other resources like Printers, Copiers, and Faxes:

We can reduce the burden of other resources as printers, copiers, and faxes with the help of following measures-

- When buy printers, copiers, or faxes, look for a model with the lowest available power level in "sleep" mode.
- When buying fax machines that can scan double-sided pages and Copiers/Printers that have duplex (two-sided printing) capabilities
- Strategies applied for reducing Paper Consumption
- Always make double-sided copies when possible
- Recycle and reuse envelopes and file folders
- Reformatting option for articles and announcements to use space more efficiently
- Try to make scratch pads from used paper
- Always set our printer in the duplex mode so that it automatically prints documents on both sides
- Use central files for hard copies
- Proof documents on a screen when possible and use print preview and spell check before printing
- Get off unwanted mailing lists
- Strategic planning for purchasing to eliminate unnecessary purchases

What is a carbon footprint?

It is a measurement of the emissions given off by a person and their lifestyle. The carbon footprint can be defined as "the total set of greenhouse gases (GHG) emissions caused by an organization, event or product". For generalization, it is often expressed in terms of the amount of carbon dioxide, or its equivalent of other GHGs, emitted. Greenhouse gases are made out of water vapour, carbon dioxide, methane, nitrous oxide, ozone, and chlorofluorocarbons. They are all different kinds of natural gases, but excess greenhouses gases can be made by humans polluting activities.

Reducing the Carbon Footprint

- We should use environmentally friendly/ recycled materials
- Digital and electronic user services for information dissemination
- We should practice energy-saving options and increase dependency on renewable energy options
- Reduce waste and arrangement for waste separation

*Corresponding author

- Eliminate the use of plastic bags
- No more plastic cups but recycled clay cups
- Fair-trade coffee
- Suppliers with ISO 9001 and ISO 14001 (or working to get one of those)
- Through different Green events within the library

Conclusion:

This discussion could be very helpful for conceptualizing the social responsibility of libraries as they are the most important source of knowledge for the society. As we know that most people want to sustain (maintain) the aspects of the environment that produce renewable resources such as water, air, forest and solar energy. Environmental sustainability is an urgent need for all at present. Sustainability is the ability to continue a defined behaviour indefinitely. Environmental sustainability is the capability to maintain the level of living that is valued in the physical environment without any compromise. To become as sustainable, libraries can play their important role by performing well on all aspects of green practices. Every individual, students and workers, the employed and the publishers, we all that are directly or indirectly involved in print-related tasks must be aware and be responsible for our daily paper consumptions. We do not need to do it just because we can save money, but we have to know that at the same time we are saving our planet. Libraries can create greener printing by changing some operations right now. Green printing is all about environmental awareness, the impact a printing task can bring about. As information specialists, librarians should be aware of what environmental labeling really means and be a resource for their user communities for this information.

References:

American Soybean Association (n.d.), Soy Ink Agreement. American Soybean Association, available at www.soygrowers.com/resources/SoyInkLicAgmt.pdf (accessed January 19, 2017).

Bedřich Moldan, S. J. (2012). How to understand and measure environmental sustainability: Indicators and targets. *Ecological Indicators*, 17, 4-13.

Daly, H. (1990). Toward some operational principles of sustainable development. *Ecological Economics*, 2, 1-6.

Goodland, R. (1995). The concept of environmental sustainability. *Annual Review of Ecology and Systematics*, 26, 1-24.

Hauke, P., & Schubert, S. (2013). Designing the Green Library: environmental sustainability in Library space, Library management, and Library service. *BOBCATSSS*. Ankara: Turkey.

Kruse, T. (2002). Recycling opportunities: laser printer cartridges. *Green Library Journal*, 45-61.

Kruse, Ted (2011). Greener library printing and copying. *The Bottom Line*, 24(3), 192-196. Available at: <http://dx.doi.org/10.1108/08880451111186053>. Assessed on 26 February 2017,

OECD. (2001). *OECD Environmental Strategy for the First Decade of the 21st Century*. Paris: OECD.

Reference (UCN et al., 1980) IUCN, UNEP, WWF. **The World Conservation Strategy** WWF, Gland, Switzerland (1980)

Serageldin, I., & Streeter, A. (1993). Valuing the environment: proceedings of the First Annual Conference on Environmentally Sustainable Development. *Environmentally Sustainable Development* (p. Series No. 2). Washington, D.C.: The World Bank.

World Commission on Environment and Development (1987). *Our common future*. Oxford: Oxford University Press. Retrieved 17 June 2017 from <http://www.un-documents.net/wced-ocf.htm>. (Archived by WebCite® at <http://www.webcitation.org/5qaK3FWsA>)

World Bank (2006). *Where is the Wealth of Nations? Measuring Capital for the 21st Century*. Washington, D.C.: WB.

<http://www.slideplayer.com/slide/4767874/>

<https://www.vanderbilt.edu/sustainvu/what-we-do/printing/>

https://en.wikipedia.org/wiki/Green_printing

<http://gogreenplus.org/nuts-and-bolts-guide/planet-nuts-and-bolts-guide/waste-reduction-responsible-disposal/environmentally-friendly-printing/>

<http://scs-india.com/solutions/green-printing/>

<http://www.broward.org/LIBRARY/MYLIBRARYONLINE/Pages/MyLibraryOnline.aspx>

<http://www.theenergycollective.com/bobbyg/2401395/ink-waste-environmental-impact-printer-cartridges>