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## Effective Design of Ideal Library Building to Increase Footprints of Users

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**Abstract:** Library and Information Centres are illuminated with glowing knowledge to cater wide spectrum of information to the users of varying needs. Users sometimes may face problems on their way to extract information. Librarians should take challenges to create a favorable condition so that users can swim effortlessly across the ocean of yottabyte of information. The paper hints at numerous environmental laws in Indian context. The authors also throw light on interesting concepts like - Green Library, Building Biology (BauBiologie), Vastu Shastra, Feng Shui, Barrier free building. Librarians are spending huge amount of money for the collection development of their libraries. However all the attempts will be futile if the resources as well as services be under-utilized. Librarians should take vital role in order to attract the patronage which will inevitably increase the number of foot prints within library premises. Finally concludes with the emerging role of librarians towards dissemination of information resources and services to library users irrespective of disabilities.

**Index Terms:** Assistive Technology, Carbon footprints, Sick Building Syndrome.

**1. Introduction:** Library and Information Centres are the store houses of knowledge, which are available in printed as well as in digitized formats. Available Documents cannot speak to the users about their content and qualities, Library professionals try to provide pinpointed, exhaustive and expeditious services to their users in order to bring fourth users satisfaction at its optimum point. Librarians should exhibit their treasure of knowledge in a very systematic and scientific manner. Building should be designed not only to allure the patronage but should be healthy enough for being used. Environment is getting depleted because of global warming, ozone layer depletion, biodiversity, loss of natural resources, accumulation of e-wastes etc. Librarians should think for sustainable development by deploying the concept of Green Library. Many users are spending lot of time within libraries. Library users may fall sick due to negative environmental impacts. This may be overcome adopting the concepts like of Building Biology, Vastu Shastra, Fenf Shui. The number of users having some disabilities is increasing because some seats have been made reserved for the specially abled users. Special facility should be given to them; otherwise they will be deprived from extracting information resources and services of a library. Librarians should develop barrier-free accessible library using sophisticated technology, so that even the specially abled library users can proof their ability and talent like those of able bodied persons. Hence an ideal library should have blended essence of Building Biology, Vastu Shastra, Fenf Shui, Barrier-free building.

**2. Environmental laws in India:** The World population is increasing exponentially. Human beings are responsible for polluting this world. In fact people should be careful enough to conserve the environment for themselves as well as for the future generation. Various abnormal environmental changes are being taking place because of Global Warming, Ozone Layer Depletion, Biodiversity, E-waste, Loss of Natural Resources etc. Countries round the globe have enacted legislations to protect their environment against possible destruction and also for sustainable use of natural resources. India too enacted several Environmental Laws to ensure better quality of life and living. Those laws are as follows:

- The National Green Tribunal Act, 2010
- The Air (Prevention and Control of Pollution) Act, 1981
- The Water (Prevention and Control of Pollution) Act, 1974
- The Environment Protection Act, 1986
- The Hazardous Waste Management Regulations, etc.

Many people round the globe are very concerned about Sustainable Development. Men will be extinct species if they don't think regarding Sustainable Development.

**3. Architectural aspects:** Library Architecture is changing from ancient times to modernity. With the passage of time new concepts have been replaced by old ones. However modern library should be designed in such a fashion so that it will not only attract the patronage but also prevail healthy atmosphere. Moreover there should not be any architectural hindrance for the specially abled library users to extract resources and services of library.

- a) **Vastu Sashtra:** Vastu Sastra is of ancient origin. The word Vastu has been derived from the word Vas which means to reside. It is a science of designing and constructing sacred houses or buildings. This science is giving stress on following five elements for building construction. These five elements - Earth (bhumi), Water (Jal), Fire (Agni), Air (Vayu) and Space (Akasha) are collectively known as Panchabhutas.
- Earth corresponds to geomagnetic energy
  - Water corresponds to gravitational energy
  - Fire corresponds to solar energy
  - Air corresponds to wind energy
  - Space corresponds to cosmic radiation

These elements affect our lives. Vastu Shastra is recommended for healthier life. This Vedic science follows five principles and those are as follows –

- Diknirnaya: The philosophy of Orientation.
- Vasthu-Pada-vinyaasa: Site planning; The VasthuPurusha Pattern.
- Maana: Hastalakshana: the relative measurement of buildings.
- Aayaadi-Sadvarga: The six canons of vedic subject.
- Pataakaadi- Sadschandas: The quality of the building, its aspect and prospect etc.

If a house is constructed following VastuPurusha Mandala, it will ensure enhance health, wealth and happiness. Vastu decorative items include – indoor plants, paintings, mirrors, indoor fountain or aquarium, blue curtains, soft lights. All these items help to usher in positive energies.

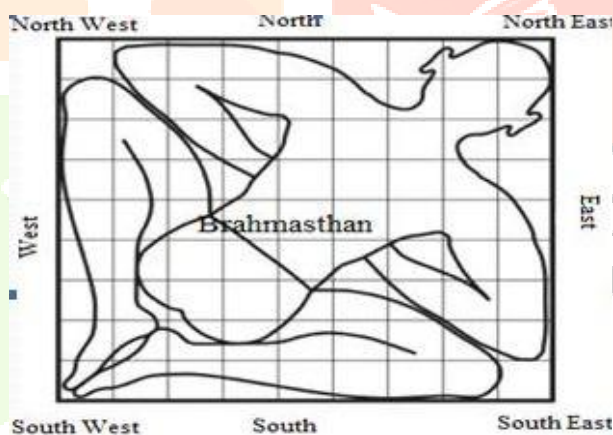


Fig.1: VastuPurusha Mandala

- b) **Feng Shui:** People should pay enough attention to their surrounding environment of their homes as well as their work place to create vibrant and successful energy for the sake of peace and better output. Library users are spending many hours within library for the purpose of extracting desired information. Feng Shui was formalized in China. Feng means wind and Shui means water in Chinese language. Feng Shui comprised of five elements and those are – wood, fire, earth, metal and water. Each element is represented by some specific colors. It is believed that feeling of relaxation, anxiousness, romanticism – depends actually on colour. According to Feng Shui, it is better to use light colours within study room. Hence soothing colours may be used on the walls of a library. Because of scorching heat of the sun, humidity, it would not be possible to keep open all the windows all the time. However oxygen producing plants may be kept inside, in order to purify the air. Feng Shui also exerts better impact with trees like Areca Palm, Bamboo Palm etc. Application of Feng Shui in library will create vibrant energy and will provide homely atmosphere. Feng Shui items include – lucky bamboo, Feng Shuie tortoise, three legged frog, laughing Buddha, Feng Shuie crystal lotus etc. Some Feng Shui tips are as follows –
- To keep oxygen producing plants (but not dead flowers/plants) at different corners
  - To keep a crystal sphere to absorb negative Chi
  - Windows are to be kept open for fresh air to help the chi to flow through the room
  - Proper lighting

- To create a nourishing View (by hanging good paintings or posters, painting the walls with soothing colors)
  - Five elements of Feng Shui i.e. wood (wooden potted pals), fire (candles), earth (ceramic/pottery), metal (metallic items) and water (fountain/fish tank) should be on the top of the desk or within the room.
- c) **Green Library:** A Green Library is a part of a Green Building. A Green Library is such a library which tries to minimize all possible negative impacts on the environment. This type of library tries to diminish Carbon Footprints (Total amount of Green House Gases, mainly carbon dioxide, emitted due to human activity). A Green Library should make provision for – natural ventilation, natural lighting, green roof, and green spaces. Emphasis is to be given - for the reduction of wastage of water and electricity, procurement of E collection in lieu of paper materials, introduction of buyback policy for the reduction of accumulation of E-wastes, use of biodegradable products, use of minimum waste for land filling, use of renewable materials etc. Fluorescent light may be replaced by LED lights to save the cost for electricity. Air purifying plants like Areca palms, Aloe Vera, Bamboo Palm, snake plants should be kept within library. Roof tops should be suitably designed to diminish the absorption of solar heat. Compactor machine may be installed to reduce carbon footprints. There are various Green Building Rating Systems. Green Rating for Integrated Habitat Assessment (GRIHA) and Leadership in Energy and Environmental Design (LEED) are used in India. The Energy and Resource Institute (TERI) has developed GRIHA. Librarians should make provision for following things, in order to keep their libraries clean and green.
- People in a workplace or inhabitants of a building are found to suffer due to Sick Building Syndrome. The factors for Sick Building Syndrome are as follows –
- Physical factor (artificial light, temperature, sound, inadequate ventilation)
  - Chemical factor (toxic chemical contaminants from indoor sources),
  - Biological factor (microorganisms)
  - Psychological factors are responsible for occurring such situation.
- d) **Building Biology:** The concept of Building Biology has been originated from German word “Bau-biologic”. According to the World Health Organization, 75% of total diseases are caused by environmental factors. Building Biology consider several environmental factors namely – Allergens, Chemicals, Electromagnetic Fields, Pathogens, , Toxins, Volatile Organic Compounds, Polluted air and water. Health problems are found to occur for some persons due to negative environmental impacts of buildings they are using. Building Biology focuses to prevail healthy indoor climate. Various educational institutes have started to teach Building Biology. This study enables one to understand regarding health hazards which exit in homes and work places. Building Biology is a science relating to healthy building. This is the study that investigate a wide spectrum of activities relating to building namely – construction process and materials, indoor air quality, electromagnetic field, radiation etc. in order to build building free from health hazards. Libraries are investing huge money for their collection development as well as to provide services to the users. Librarians are educating library users and converting them from novice users to potential readers. Users are spending times inside the four walls of libraries for the purpose of study and teaching. Library architecture should be very lucrative so that users don't feel any difficulty to study continuously. In fact there should not have any negative impacts of library building and surrounding environment upon the enthusiastic learners.

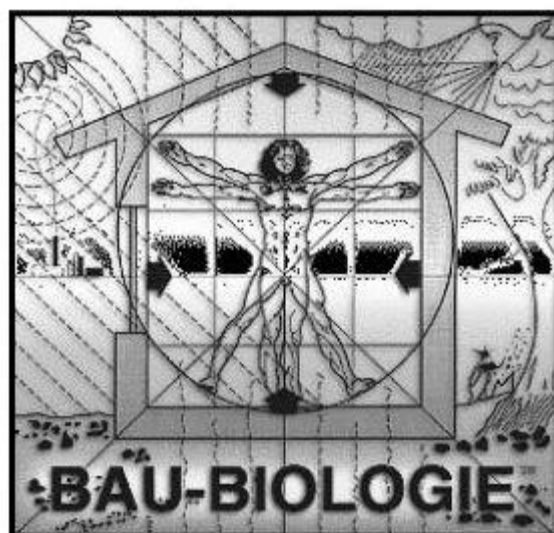


Fig.2: Bau-Biologie

- e) **Barrier Free Library Building:** Because of reservation some specially abled users are getting admission into various academic institutions. Such students are visiting library for their academic interest. Librarians should sufficiently gear up to provide support services for those students. Specially abled users may be broadly classified into four categories – Visual disabilities, Hearing disabilities, Physical disabilities and Cognitive disabilities. Specially abled library users cannot properly extract library resources and services unless and until very specialized technology (called Assistive Technology or Adaptive Technology) is made available for them. Library building should be barrier-free building. Provision for – automatic door opener, spacious entrance, ramp , tactile marking, lighting at stairs, accessible lift, accessible toilet, accessible car parking, accessible signage, elevators, handrails, anti-skid tiles etc. are found be seen within barrier-free library building. Indian Act, “The Rights of Persons with Disabilities Act, 2016” incorporates mandate for barrier-free environment.
- 4. **Architectural design considerations for modern library:** Many buildings are designed very nicely. However indoors will not be healthy if it is completely isolated from natural environment because of replacement of natural ventilation by air conditioning system, natural light by artificial light, pungent smell of chemical etc. Library users will not feel comfortable to study under such circumstances which will inevitably result health problems. India is a vast country. A library equipped with modern furniture, Internet connectivity, ultramodern facilities may not necessarily be healthy to be used. In order to improve the quality of life and for sustainable development implementation of concepts like Building Biology, Green Building, Vastu Shastra, Feng Shui etc are highly essential. Vastu Sashtra is of Indic origin and we should extract the knowledge nurturing this ancient concept and put into practice in the modern context.

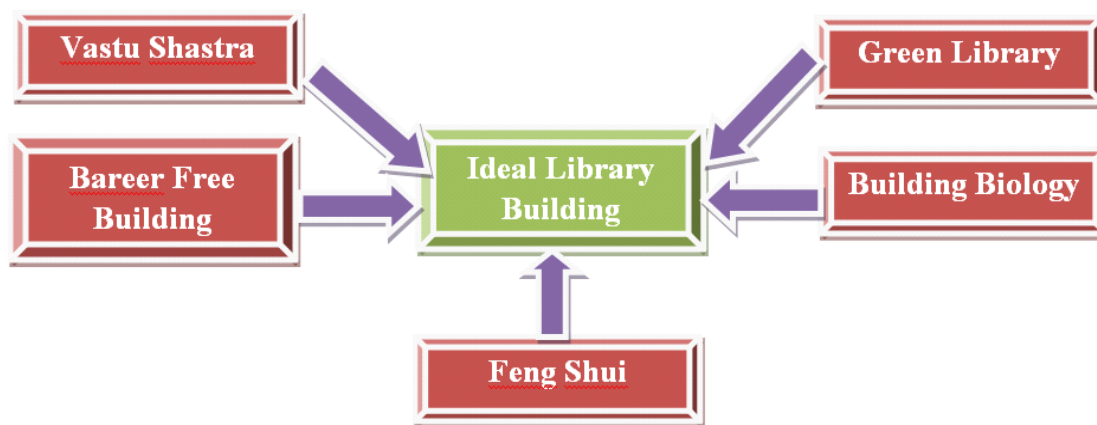


Fig.3: Attempt to build an Ideal Library Building

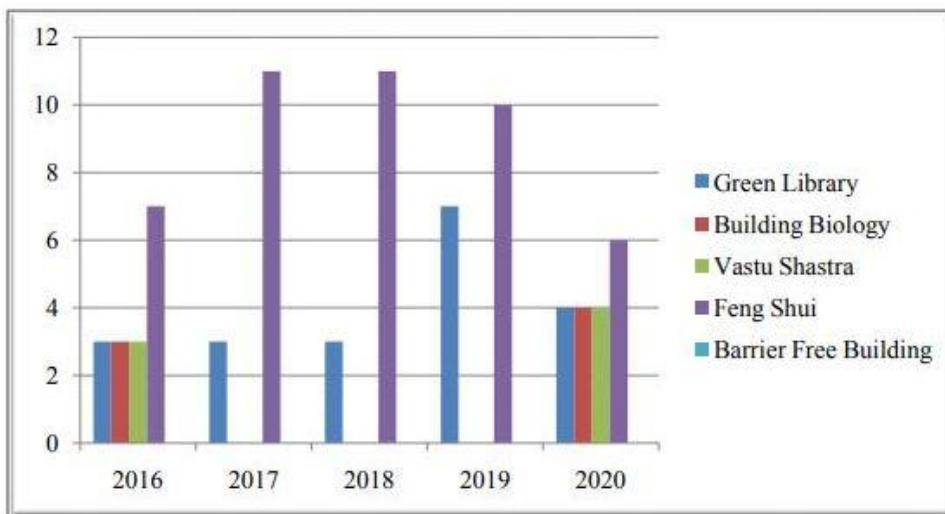
- 5. **Analysis from Scopus Database:** Searching from the Scopus database with the key words – Green Library, Building Biology, Vastu Shastra, Feng Shui and Barrier Free Building, following results are obtained.

Articles in Scopus Database (Year)					
Key Words	2016	2017	2018	2019	2020
Green Library	3	3	3	7	4
Building Biology	3	0	0	0	4
Vastu Shastra	3	0	0	0	4
Feng Shui	7	11	11	10	6
Barrier Free Building	0	0	0	0	0

Table 1: Articles published on Scopus Database



The corresponding Line Graph has been shown in Graph 1.



Graph 1: Articles published on Scopus Database

The number of articles indexed in Scopus database on the above mentioned topic is very poor. Budding library professionals should come forward to write more and more papers on those blooming concepts in standard journals, in order to disseminate their valuable knowledge for the people with varying interest.

**6. Conclusion:** Library is a place of connection and collection. Modern librarians should deeply think about effective library design and space planning. Librarians are to consult with architects, builders, decision makers and also with potential library users. Sincere library users are spending good amount of time for the purpose of their study and teaching. Library buildings should be designed in such a fashion so that there should not be any negative environmental impacts among library users. Library authority should be careful enough to address those issues. Under favorable condition; quality of academic output, research, teaching etc. will increase at its optimum level. If the library resources and services be underutilized, then it is of no use. In order to draw more patronage; the internal as well as the external library environment should be very lucrative and healthy, so that users became more and more interested to spend times within the library for absorbing knowledge from dynamic waves of ocean. Everybody should have equal access to information irrespective of any disability. Library professionals should work hard in order to create barrier-free library atmosphere for the specially abled library users so that later can contribute something for the benefit of the mankind.

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