

Buildings for Life: Creating the Future, Conserving the Past

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Abstract—*The interaction with nature is critically important for human well being and development, but sadly has become compromised and diminished in modern times. The deficiencies of modern life can be ameliorated through an innovative approach to the design and development of the human built environment i.e. Restorative Environmental Design. Restorative Environmental Design focuses on how can we avoid excessively consuming energy, resources, and materials; generating massive amounts of waste and pollutants; and separating and alienating people from natural world. By adopting the alternative design and development approaches- also known as ‘Sustainable’ or ‘Green’ Design, we can successfully achieve goal of providing healthy living spaces. Thus, restorative environmental design through sustainable built environment incorporates the complimentary goals of minimizing harm and damage to natural system and human health as well as enriching the human health and mind by fostering positive experiences of nature in the built environment.*

1. INTRODUCTION

Modern buildings are designed in opposition to the natural world. Modern, especially urban, construction and development has resulted in adverse impacts on natural systems and human health which has further increased people’s separation, isolation, and alienation from beneficial contact with the natural environment [4]. Unfortunately, modern society has become confused about the role of the natural environment in people’s physical and mental health.

People spend majority of their time indoors. The quality and type of building one inhabits in considerably affects his or her physical and mental health. There are researches which show positive impact of integrated elements of nature inside the built environment on inhabitants. Yet, for children as well as for adults, modern society has produced an increasingly compromised and degraded natural and built environment that offers far fewer opportunities to experience satisfying contact with nature as an integral part of ordinary life. These deficiencies of modern life can be ameliorated through an innovative approach to the design and development of the human built environment. This new paradigm is called Restorative Environmental Design. Restorative Environmental

Design focuses on how to avoid excessively consuming energy, resources, and materials; generating massive amounts of waste and pollutants; and separating and alienating people from natural world [4].

The current environmental crisis is a design failure rather than an unavoidable aspect of modern life. Both the knowledge and the technology exist to better reconcile and even harmonize the natural and human environments. However, meeting this enormous challenge will require two conditions. First, we must minimize and mitigate the adverse environmental effects of modern construction and development. Second, and just as important, we must design the built environment to provide sufficient and satisfying contact between people and nature.

Through deliberate design, the lost connection between nature, built environment and its inhabitants can be repaired and restored.

2. SUSTAINABLE BUILDINGS- A PARADIGM SHIFT

In recent years, alternative design and development approaches- commonly referred to as ‘Sustainable’ or ‘Green’ Design- have emerged that focus on minimizing adverse effects of the built environment on nature and on human health. Architects are trying to minimize the damage caused by modern construction to natural and human health through many strategies, which includes achieving energy efficiency in buildings, using renewable energy, reducing consumption, reusing and recycling products and materials, lessening waste and pollution, employing nontoxic substances and materials, protecting indoor environmental quality and avoiding habitat destruction and loss of biodiversity. This overall objective is called Low Environmental Impact Design, a necessary but by itself insufficient basis for true sustainable design and development. Low environmental impact design ignores the equally important need to restore beneficial contact between people and nature in the built environment. The human contact with nature must also be integral part of sustainable built environment to make buildings sustainable in true sense.

Hence, an ultimately successful approach to sustainable design must accomplish more than just avoiding or minimizing harmful impacts on natural systems and human health and should also focus integrating nature with built environment.

2.1. Sustainability aspects of built environment

Sustainability, in context of built environment, needs to be economically viable, environmentally benign and socially acceptable [7]. Just like in the field of cricket – batting, bowling and fielding- all three elements are important for a team to be successful on the ground. Similarly all the three pillars of sustainability i.e. environment, economy and society are equally important to attain goal of sustainable habitat.



Fig. 2: Sustainable aspects of habitat design

The design and development of new buildings based on sound concepts of sustainability, and application of suitable retrofit options to the existing buildings could substantially improve efficiency of buildings in terms of its impact on environment.

2.2. Basic principles of sustainable buildings

The Sustainable building refers to a structure and processes that are environmentally responsible and resource-efficient throughout a building's life-cycle: from design to construction, operation and maintenance, renovation, and demolition stage.

The basic principles of sustainable development in building design are:

- Maximizing the use of renewable and natural resources in the building environment.
- Minimizing energy and water use and the negative environmental effects of buildings.
- Ensuring protection to occupant health and improving occupant productivity [7]

3. SUSTAINABLE BUILDINGS: CREATING THE FUTURE, CONSERVING THE PAST

Though the concept of sustainable and green buildings has gained momentum in the recent years, its roots exist in the ancient times. Sustainability is like old wine in the new bottle. Along the journey of modernization, traditional ideas and indigenous knowledge got diluted or lost through the changing eras. Due to increasing irreversible damage caused by

construction sector on environment, the need has aroused to look back at those ideas and knowledge prevalent from ancient times but forgotten under the cover of modernization. Sustainable architecture became popular in recent times because of the dire necessity to correct what we have damaged in the pursuit of development or modernization. A green or sustainable building can be modern but all Green Buildings are inspired by traditional principles of ventilation, shading and day-lighting. Principles of traditional architecture always respected nature and were climate conscious, user friendly, reflected the culture and traditions of the community at large. So it is obvious that all these so called sustainable or 'alternative' eco-friendly techniques of construction are not new inventions. Rather, they are the rediscovery of traditions rooted in our culture; not as myths and legends but as time-tested methods and ways of dwelling, building and thinking [3].

3.1. Traditional / Vernacular architecture

Traditional or vernacular architecture refers to buildings and landscapes that foster an attachment to place by connecting culture, history, and ecology within the geographical context. Indian vernacular architecture is informal, functional architecture of structures, often in rural areas, built with local materials and designed to meet the needs of the local people. The term vernacular is derived from the Latin word '*vernaculus*' which means domestic, native and indigenous.

Most vernacular buildings are well lit and ventilated/climate responsive as to avoid or minimize the use of artificial devices. Some of the examples of techniques used in vernacular architecture are- use of 'Jaali' to modulate light inside the building and main air flow, use of water to cool the building envelop, trees to shade walls, use of light colour on exterior walls to reflect back heat etc. Even during the Mughal era, such techniques were heavily adopted in building construction [1].



Fig. 3: Use of evaporative cooling through water channel inside the building at red fort, Delhi
(source: <https://www.academia.edu/3571042>)

The connection between humans and nature was also considered important in the past. Presence of courtyards and

verandah in almost all houses in the past provided people space to sit, work, interact, relax; at the same time connect with nature.

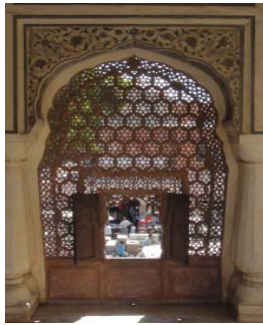


Fig. 4: Jaali wall ensures privacy and provides diffused light and view, Hawa Mahal, Rajasthan
(source:<https://www.google.co.in/search?q=picture+of+hawa+ma+hal+jaipur>)

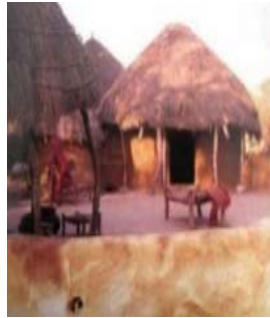


Fig. 5: Mud Houses at Rajasthan

3.2. Contemporary Sustainable buildings

The term 'Sustainable building' is an emerging concept in the rapid growing Infrastructure Industry. Contemporary sustainable buildings mainly focus on reducing impact of buildings on environment. Low environmental impact design has become the primary approach of sustainable design and development today which ignores the equally important need of restoring beneficial contact between people and nature in the built environment. Though majority of the methods and techniques used in contemporary sustainable buildings are somewhat similar to traditional techniques of construction, buildings today have become more like small boxes/packages without any connect with natural surroundings. Culture of vertical buildings in the cities has become a common phenomenon resulting in massive concrete jungles and restricting contact with natural surroundings. Hence there is a need to restore and rethink about how the vernacular architecture can be brought back and inculcated in modern buildings to achieve holistic building design. Thus, restorative environmental design must be adopted which incorporates the complimentary goals of minimizing harm and damage to natural system and human health as well as enriching the human body, mind, and spirit by fostering positive experiences of nature in the built environment.



Fig. 6: Red stone 'Jaali wall' used for external facing at TERI Retreat Building at Gurgaon
(source: <http://www.confoss.com/projects-teri-retreat.html>)

4. CONCLUSION

While Sustainable design is the use of new methodologies or industrial techniques, traditional architecture is the use of least "*industrially processed materials*" and time tested methodologies that do not need modern resources like electricity or chemicals. Still both, Sustainable design and Vernacular architecture focus on cost-effective, environment friendly buildings providing ambient living conditions to its occupants.

The principles of traditional architecture which provide solutions to achieving sustainability in built environment must be respected, adopted and conserved. Traditional architecture cannot be replicated the way it was built by our ancestors. However, the fundamentals of traditional architecture should be adapted to suit modern building design. Before actively considering energy intensive techniques of building construction, one must follow passive strategies like orientation, use of water bodies, harnessing daylight, use of locally available building materials and traditional ventilation methods. There is a need to construct buildings which have lower impact on environment, provide healthy living spaces at the same time restore connection of inhabitants with nature which might have greater impact on mind and health of occupants.

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