

GREEN BUILDING CONSTRUCTION USING NATURAL ENERGY REOURCES**P.B. Daigavane¹ and A. Ansari²**¹Professor and Dean (Infra & Liaison), Department of Civil Engineering, Government College of Engineering Nagpur, Nagpur – 441108²PhD Research Scholar, Department of Civil Engineering, Indian Institute of Technology Delhi, Hauz Khas, New Delhi - 110016¹prashant.daigavane@gmail.com, ²aamomin183@gmail.com**ABSTRACT**

The purpose of green building technology is to lessen the significant impact that the construction industry has on the environment, society, and economy. It is one of the most well-liked topics in the world. The globe desperately needs sustainable and smart development as pollution and global warming spread over the entire earth. The effects of climate change are also significant. Dramatic climatic changes have been seen and felt around the world as a result of an increase in Green House Gases (GHGs). This essay explores the significance of sustainable development worldwide, with a focus on developing nations like China and India, which have vast landmasses, are growing quickly, and have the potential to soon become new global superpowers. It also includes linkages between economic and sustainability study.

Keywords: GRIHA (Green Ratings for Integrated Habitat Assessment); IEQ (Indoor Environmental Quality, LEED (Leadership in Energy and Environmental design).

1. Introduction

There are many definitions of a Green building as per different researchers. It is also worth noting that the term green building is now days used as an interchangeable word with the high-performance buildings or a sustainable buildings or structures. The concept of Green Building basically stands on four main points which are Reduction of the effects or rather the side effects of the structure on the environment (Daigavane & Ansari, 2021, 2021a). Improving and strengthening the health of the people who live in a building. Investors and the society benefit from savings and investment returns. Considering the life cycle within the planning and development process. The construction sector is one of the fastest growing industries on the planet. Simultaneously, the construction sector has substantial economic, environmental, and social consequences for society (Ansari & Daigavane, 2021). These effects are most noticeable over the lives of built structures. Construction operations also have both beneficial and harmful effects on society. Some of the beneficial efforts include providing structures and habitats, as well as facilities, to meet human needs, providing jobs for the people of the country, and contributing to the country's economy. Waste disposal during construction activities, dust, noise pollution, water pollution, traffic congestion, and other negative effects are also included. Furthermore, the unfavourable effects persist throughout their entire life cycle. According to the World Business Council for Sustainable Development, a building block consumes 40% of overall energy use.

2. Material Characteristics**Compressed Earth Block:**

A compressed mix of dirt, non-expansive clay and aggregate. It is fire resistant, sound resistant and non-toxic in nature.

Piezoelectric Sensor:

A piezoelectric sensor is a device that uses the piezoelectric effect to measure changes in pressure, acceleration, temperature, strain, or force by converting them to an electrical charge.

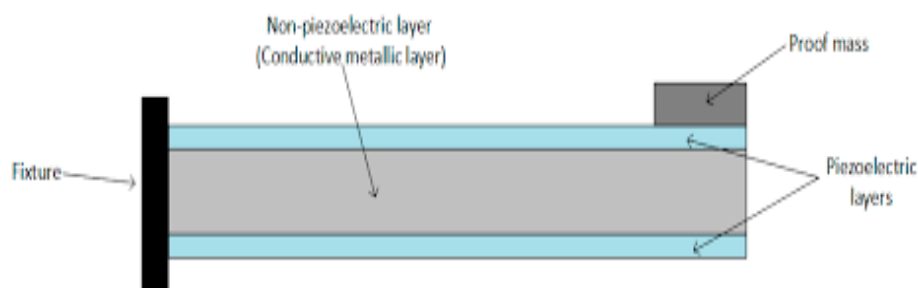


Figure 1. Piezoelectric sensor for green building(modified after Li &Strezov, 2014)

Fly Ash Block

Mixture of fly ash and lime. It possess high strength, good finishing and uniformity in size which reduced quantity of plastering.

Low VOC Paints

Low VOC stands for low Volatile Organic Compounds. It provides better indoor air quality, protects ozone layer, less allergic, quick drying and low odour.

Daylight Harvesting System

Daylight harvesting systems use daylight to offset the amount of electric lighting needed to properly light a space, in order to reduce energyconsumption. This is accomplished using lighting control systems that can dim or switch electric lighting in response to changing daylight availability.

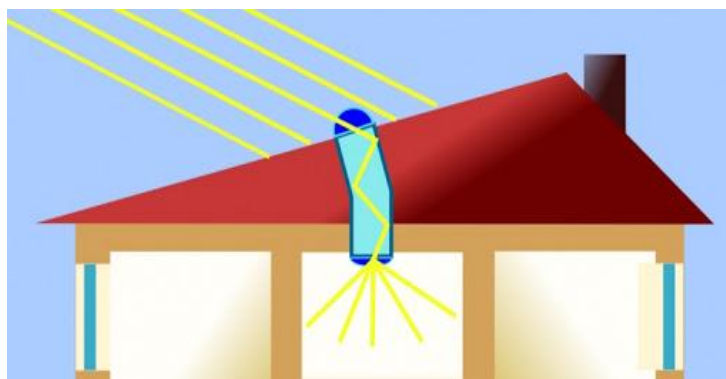


Fig. 2Daylight harvesting system for green building (modified after Lim et al. 2017)

3. Methodology

Three distinct operations can be recognized in the process of soil-cement block production using manually operated machines. They are (a) soil preparation (b) block pressing, and (c) stacking and curing.

This study is aimed at research, study and development of the green building construction techniques in order to save our planet from pollution and global temperature rise. Also, it aims at spreading awareness among the people all over the world, about the advantages and also the long term cost savings from green buildings.

- Plan is oriented facing east for maximum utilization of natural light and ventilation.
- Larger opening of windows.
- Onsite rainwater harvesting and compost generation is proposed in the plan.
- Onsite generation of Renewable Energy through Solar power, Wind power, Hydro power can be considered to minimize dependency on fossil fuels.
- Proper ventilations and air filtrations can be included to ensure sufficient flow of fresh and clean air.

4. Conclusion

This paper study reported all the technical and also the economic aspects related to green buildings worldwide. Also, through this live case study of a small residential bungalow in a small town of India it is expected to attract at least the researchers all over the world, particularly in India, and to all readers in developing their own homes or retrofitting their odd ones with simple adjustments and converting them into a green or sustainable structure for future long-term savings (economic aspects) and for environmental preservation (environmental aspects). The research conclusions can be divided into three categories: affirmative, negative, and neutral. Most literature evaluations, it has been found, focus on environmental aspects of sustainability, such as energy consumption, water efficiency, and greenhouse gas emissions, as well as technical solutions. Also, the life cycle assessment approach, which is widely used in green building's environmental elements, might be a beneficial tool for social sustainability. New rating tools are rapidly emerging all around the world. However, further research in these disciplines is needed to support these new rating methods and to aid investors and developers in their decision-making. Also, public knowledge of green construction concepts and their long-term benefits should be spread. People in nations such as India are currently ignorant of this notion, and there is also a lack of awareness. The government's initiative will go a long way toward raising awareness.

References

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