A Review Paper on Green Building Research

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ABSTRACT
One of the most common issues on the word right now is green building technology, with the goal of reducing the development industry's various negative effects on the environment, society, and economy. Because pollution and global warming are quickly expanding over the planet, the world urgently requires a sustainable and reasonable development. Because of the increase in Green House Gases (GHGs), dramatic climatical differences occurring everyday have been noted and are being faced by almost everyone all over the world. Within settled countries such as the United States of America, Russia, Australia, and the United Kingdom, there have already been rigorous steps taken to achieve workable development, as well as rules and regulations enacted by their respective governments to assist and accomplish a workable and environmentally approachable development of their countries. However, emerging countries such as India, China, Sri Lanka, Pakistan, and others are dragging in terms of founding supportable growth and environmentally friendly structures. In addition, there is a deficiency of public understanding about this worldwide issue in these emerging countries. According to surveys and study, these countries are also far behind schedule the established nations of the world. This article discusses the need for maintainable growth around the world, particularly in emerging countries such as India and China, which have enormous land-living masses and are fast emerging, with the potential to become new global superpowers in the near future. It also includes sustainable and monetary research with connections to Indian contexts, as well as a recent live instance study of a freshly built and constructed luxurious housing home in a densely populated area of India. The case study is a inhabited house that is planned and built as a sustainable and green structure in an extremely community inside the state of Maharashtra, India, as India is also known as a country of villages with the world’s second largest population. According to India’s 2012 census, 69.84 percent of the population, or 869.17 million people, live in 6,47,861 distinct villages. By using straightforward, simple, and cost-effective strategies, this study will assist Indian communities and residential buildings in becoming more sustainable and greener.

Keywords-- GRIHA (Green Ratings for Integrated Habitat Assessment), IEQ (Interior Eco-Friendly Quality), LEED (Leadership in Energy and Environmental Design), (Leadership in Energy & Eco-Friendly Design)

I. INTRODUCTION

Referring to various studies, a green building can be defined in a variety of ways. It's also worth mentioning that the phrase "green building" is increasingly synonymous with "high performance buildings" or "sustainable buildings or structures." The concept of green building is based on four points:

i. Reduction of the structure's consequences, or rather side effects, on the environment. Reduction of the structure's cost to the environment. Reduction of the structure's cost to the environment.

ii. Refining and growing the health of the people who live in a building.

iii. Reserves and asset return to both investors and the community.

iv. Thoughts for the life sequence during the design and expansion process.

v. The creation sector is one of the most quickly growing trades on the planet.

The development sector has major economic, environmental, and social repercussions on society at the same time. These effects are most noticeable over the lives of built structures. Additionally, construction operations have both beneficial and harmful effects on society. Providing houses and territories, as well as amenities to meet human needs, providing pay to the people of the state, and finally contributing to the state's economy are just a few of the positive consequences. Waste disposal during development activities, dust, pollutants, pollution, delays, and so on are all negative effects. Furthermore, the complimentary effects persist throughout their entire life cycle. According to the Global Business Council for Sustainable Development, a building block consumes 40% of overall energy use. In addition to energy use, buildings emit Green House Gases (GHGs), which contribute to global warming. According to the experts, global carbon emissions from buildings will reach 43.4 billion tons in 2034, an increase of 44 percent over 2008. These doings will also involve the use of natural properties and energy.
sound and other kinds of pollution, and garbage creation following building deconstruction, all of which provide a significant problem to any or all countries with land scarcity.

There are numerous research projects dedicated to various aspects of green building in various situations, but none of them include systematic reviews of the existing information. Systematic research is critical for identifying common research issues and highlighting long-term research methods. This research will be crucial in focusing on the current state of the art and future needs in this area for our nation, India, as well as other emerging countries interested in creating green construction. This study article will aid in the expansion of green buildings and eco-friendly homes in India because it contains simple and easy-to-implement methods for obtaining environment-welcoming homes, as well as the importance and future profits associated with eco-friendly homes.

II. RESEARCH BACKGROUND

1). Mr. Jiau Zuo and Mr. Zhen Yu Zhao presented their study findings on eco-friendly construction technology, as well as the position and long-term goals for the same. They delivered a paper that was based on a critique of the existing body of research on green building. They identified similar study themes and approaches before disseminating their findings. They concentrated on common study subjects such as the definition and hence scope of green building, quantification of green building advantages over regular buildings, and diverse techniques to achieving green building. They also discovered during their investigation that the majority of studies focused on the environmental aspects of green architecture. In their study, they discuss long-term opportunities such as the influence of climatic circumstances on the usefulness of green building evaluation methods, validation and real-world performance of green buildings, and future proofing. In their research, the author made a criticism of previous studies on green buildings around the world. According to their findings, these studies can be divided into three categories: definition and scope of green buildings, advantages and costs of green buildings, and methods for achieving green buildings. The authors also suggested that particular populations such as the elderly, students, and instructors, as well as teachers, should be given more attention when it comes to indoor environmental quality. Long-term practitioners' attitudes and behaviors will be shaped, and students will soon become green building idea practitioners.

2). Ignacio Zabalza (Bribian); Antonio Velvo Capilla (Capilla); Alfonso Aranda (Aranda). Uson produced a paper on construction and the environment in which they showed the findings of a lifespan presumed research that compared the most commonly used construction materials with the same eco products using three different effect categories. The authors' main goal in printing this study is to improve their understanding of the energy and environmental standards of construction materials. They also encouraged research and analysis of their potential for improvement, as well as providing guidelines for material selection in both new construction and rehabilitation of existing structures. The scientists found that so as to avoid the assembly of materials impacting the natural resources, it's vital to promote the simplest use of those techniques available and innovation in production. Plants and garbage generated in numerous production processes are used to replace finite natural resources as much as possible, closing the product cycle. This also entails a dedication to reuse and recycle, as well as limiting the transportation of raw materials and finished goods, which may encourage the use of locally available resources.

3). Ries, Robert Bilec, Melissa M Gokhen, Nurvi Mehmet Needy, and Kim Lascola released a comprehensive analysis on the financial profits of green buildings, which included a case study. They claimed that in building design and construction, both green and traditional construction approaches are taken into account for a variety of projects. Their decisions are frequently made entirely on the basis of schedules and budgets, with future impacts frequently neglected. Their premise is that the benefits of green building outweigh any additional expense. Their study looked into the relationship between conventional and green building elements that could influence the development of green building metrics. Their findings were divided into four sections: productivity, health and safety, which included absenteeism, energy, and IEQ; and before and after move responses were examined using paired t-tests to see if there was any motionless momentous alteration in the mean values of the variables.

In their published research, they also concluded that green building contributed to increased productivity.

4). T. Rameshvari and Prakash k.k Shukla produced a paper in which they outlined their life cycle energy study of structures, stating that structures require energy throughout their life cycle, from construction to demolition [4]. Furthermore, their research included both residential and commercial structures, with the results revealing that functioning (81-92%) and embedding (11-21%) stages of energy consumption are substantial contributions to total life cycle energy requirement. According to the study, the life cycle energy primary need of ordinary residential structures is 150-400 kwh/m2 each year, while that of office buildings is 250-550 kwh/m2 per year. Whether or not it results in a minor increase in embodied energy, the energy demand of a building is reduced by drastically reducing its operational energy.
through the use of active and passive technologies. According to the experts, using too many active and passive technology can be harmful. The researchers concluded that the life cycle energy use of buildings is determined by the operating (80-90 percent) and embodied (10-20 percent) energy of the buildings based on the analysis of cases reported in the literature. The normalized life cycle energy use of standard residential buildings is between 150 and 400 kwh/m² per year, and that of office buildings is between 250 and 550 kwh/m² per year. In addition, according to their research, practically all of the case studies discovered in the literature are from cold areas where oil or gas is used for a large portion of the operational phase, namely space heating. According to researchers in non-cold developing countries such as India, Thailand, and others, electricity derived primarily from fossil fuels is used in the operational period for space cooling, lightning, and other uses.

5) In a work on cost premium prediction of certified buildings, Omer Tatari and Murat Kucukvar claimed that the built environment has a significant impact on the economy, society, and hence the environment. The environmental assessment of buildings has grown in relevance as the industry has become more conscious of the influence of structures on the environment. A synthetic approach model is built in their study to anticipate the cost premium of LEED certified green buildings that support LEED categories. The researchers stated that future work will include utilizing the larger data sets and, as a result, a more in-depth examination of the interdependence of LEED points and its impact on prediction.

III. METHODOLOGY

This research focuses on the investigation, analysis, and development of green building construction approaches in order to protect our planet from pollution and global warming. It also intends to raise awareness among people all around the world about the benefits of green buildings, as well as future cost savings.

In addition, the structural technique is organized as follows:

1. Provide an overview
2. Review of the literature
3. Thorough research of the research topic
4. to read study papers, articles, and publications linked to the topic of study.
5. Data collecting from the projected research fields, which include big, medium, and small scale research projects in construction
6. Data collection through the use of web surveys.
7. Investigating new methods and strategies for the advancement of green construction.

| METHODOLOGY |
| --- |
| Case Lessons & Site Choice |
| Extent estimation |
| Choice of Variations |
| Market Educations |
| Cost examination |
| Assessment |
| Conclusion |

**Figure 1:** Flowchart of Policy
IV. CONCLUSION

This research investigated all of the practical and financial aspects of eco-friendly buildings around the world. Also, this live case study of a small inhabited cottage in a densely populated area of India is expected to appeal a minimum of researchers from all over the world, particularly from India, as well as any or all readers interested in planning new homelands or retrofitting old ones with simple alterations and converting them into a green or workable building for the future (environmental aspects). The studies' conclusions are frequently divided into three categories: descriptions and room for green building, rewards and costs of green building, and techniques to comprehend green building. 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. In addition, the life cycle evaluation method, which is broadly used in the ecofriendly elements of green architecture, is a good 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 assist investors and developers in making decisions. Also, public knowledge of green construction concepts and their future benefits should be spread. People in nations like India are now uninform of this concept, and there is a general lack of awareness. The government's initiative will go a long way toward raising awareness. Also, teaching and training individuals or tenants will aid in managing their behavior when utilizing the green building, which can have a substantial impact on the building's performance. Also notable is the issue of the price and paybacks of green-building. It's also worth noting that all of the top green building valuation systems are tailored to the climate and geography of their respective regions. Thus, when assessing the effectiveness of those green building assessment methods, it is now necessary to align standards for the planet with orientations to green building. The case study included in this research paper was specifically chosen, developed, and built with green building concepts in mind, as well as their importance to the environment and our wallets in the long run. This circumstance study will also aid in raising awareness of green building concepts among the people of India's cities and townships, as well as supporting them in developing their own green home and promoting it after completion.

In a country like India, where the bulk of the population lives in villages and towns rather than cities, it’s critical to raise awareness among the inhabitants of the countryside and towns. Special populations, such as the elderly, children, and teachers, may also receive additional attention. Overheating and, as a result, poor indoor environmental quality is more common among the elderly. In the long run, students will become practitioners and leaders in a variety of fields. Teachers, similar to the issue of building use, have a crucial role in shaping students' attitudes and behaviors toward sustainability-related concerns. As a result, the aforementioned challenges serve as future agenda items for green building research as well as raising the quantity of environment-friendly and sustainable development.

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