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To Study and Evaluate Economic Aspects of Green & Conventional Bungalow

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ABSTRACT: One of the sectors with the fastest global growth is the building industry. Development of the residential, commercial, industrial, and infrastructural sectors has exploded globally in the past four to five decades. Global warming has become a worry for the whole globe as a consequence of the massive amount of development activity worldwide. The global climate is changing, as has been seen. Green building is a solution for it in order to regulate the same and preserve acceptable environmental conditions worldwide. In comparison to a conventional structure, a green building uses less water, utilizes energy more effectively, protects natural resources, produces less waste, and offers healthier places for inhabitants.

Additionally, one of the global hot themes that has been proposed to lessen the significant influence of the construction industry on society, the economy, and the environment is green building technology. Strict steps have already been adopted in industrialized nations like the United States of America, Russia, Australia, and the United Kingdom to achieve a sustainable and eco-friendly development of their country. But emerging nations like India, China, Sri Lanka, Pakistan, and others are far behind in attaining sustainable development and environmentally friendly building. In these developing nations, there is also a dearth of public awareness of this problem on a worldwide scale.

This essay discusses the necessity for sustainable development everywhere, but particularly in emerging nations like India, which have sizable land masses, are growing quickly, and are on track to overtake the United States and the United Kingdom as the next great powers in the near future. Additionally, it contains economic and sustainability studies with connections to Indian settings and a supporting real-world case study of a freshly planned and built magnificent residential home in a small Indian village.

I. INTRODUCTION

In India, 68.84% of the population, or over 833.1 million people, reside in 6, 40,867 distinct villages, according to the 2011 census. One of the sectors in India's economy that is growing the fastest is construction.

Additionally, the building sector is growing the fastest overall in the global economy. The building business also has a large negative influence on the economy, the environment, and society. The majority of these effects are seen throughout the lifespan of the built buildings. Additionally, there are both beneficial and bad effects of building activity on society. The provision of structures and habitats as well as the amenities needed to meet human needs, the creation of jobs for citizens, and eventually the support of the national economy are some of the beneficial effects. The disposal of garbage during construction operations, dust, noise pollution, water pollution, traffic congestion, etc. are additional detrimental effects. Additionally, the detrimental effects last throughout their whole life cycle. The World Business Council for Sustainable Development estimates that 40% of all energy is used by building blocks.

In addition to using energy, buildings also emit greenhouse gases (GHGs), which are to blame for global warming. Researchers predict that the global carbon emissions from buildings will increase by 43% from 2007 levels to 42.4 billion tones in 2035. Additionally, these activities will include the use of natural resources and energy, noise pollution, and other sorts of pollution, as well as trash generation. All those nations with a land shortage face a new dilemma as a result of post-building destruction. According to various experts, a "Green building" may be defined in a variety of ways. It is also important to keep in mind that the phrase "green building" is now often used interchangeably with "high performance buildings" or "sustainable buildings or structures."

The four key tenets of the "green building" idea are as follows.

1. Reducing the negative environmental consequences or side effects of the construction.
2. Improving and strengthening the inhabitants of a structure's health conditions.
3. Savings and investment returns to the community and investors.



4. Life cycle factors are taken into account while planning and developing. In India, 68.84% of the population, or over 833.1 million people, reside in 6, 40,867 distinct villages, according to the 2011 census. One of the sectors in India's economy that is growing the fastest is construction.

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3. Savings and investment returns to the community and investors.

Life cycle factors are taken into account while planning and developing.

There have been several research projects on various elements of green construction, but none of them have included thorough evaluations of the body of information already in existence. To pinpoint the typical research issues and to highlight potential research methodologies, systematic study is crucial. This research will be crucial in highlighting the current status of the field and the future need in this area for India and other emerging nations interested in advancing green building. This study article will aid in the development of eco-friendly houses and green buildings in India since it outlines practical, doable steps that can be taken to create green homes as well as their significance and potential long-term benefits.

II. A REVIEW OF THE BOOK

A. GREEN BUILDING-REGULARLY USED THEMES IN RESEARCH

Since there have been an increasing number of articles and journals published online over the past five to ten years, many research on green buildings have been conducted. As can be seen from the fact that research have been done in both wealthy and developing nations, this is a worldwide concern. According to a study of the corpus of available information, these investigations often have three similar foci. The mapping of research relevant to green construction is shown in the image below.

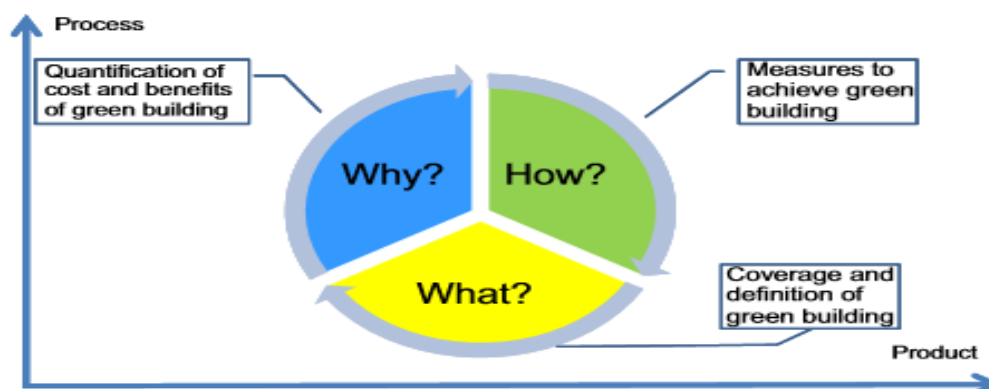


Fig. 1. Mapping of green building related studies.

Additionally, the green building may be addressed from a process or viewpoint, i.e., from "how to execute the process" or from "how to assess the process". Different development and management strategies may be used depending on the priorities set in order to attain sustainability.

B. IDENTIFICATION OF A GREEN BUILDING

As the global warming problem continues to trouble the whole globe by demonstrating its impact on the climate, there is an increasing degree of public awareness of green construction technologies. As a result, both experienced academics and younger researchers have conducted a significant quantity of study on green building technologies. Various scholars have given various definitions of "green building." However, based on my study, my definition of a green construction idea primarily rests on five primary principles, which are listed below and can be readily comprehended by both novice and seasoned researchers:

Ecologically sound

Energy effectiveness

3. conserving natural resources (conservation)

Saving money

5. Independence

By meeting the five criteria listed above that characterise a green building or a sustainable construction, a green building may be built with ease.

C. AIDING TOOLS FOR GREEN BUILDING EVALUATION

There are many evaluation techniques that have been created globally to aid in the advancement of the green building. LEED, short for Leadership in energy and Environmental Design, is one of the most popular green building evaluation techniques. Others include BREEAM, short for Building Research Establishment Environmental Assessment Method, and GBCA, short for Green Building Council of Australia. The Green Building Index (Malaysia), the GRIHA or the Green Rating for Integrated Habitat Assessment by IGBC or the Indian Green Building Council, the German Sustainable Building Council (DGNB), the Comprehensive Assessment System for Building Environmental Efficiency (CASBEE) or the Comprehensive Assessment System for Building Environmental Efficiency (Japan), the Hong Kong Building Environmental Assessment Method or the HK BEAM, the Green Mark Scheme (Singapore), and the German Sustainable Building Council (India). These optional rather than mandated green building evaluation tools were created by the green building council in each nation or area, and they are all used by qualified specialists who were hired by the green building council. A global green building council has also been created to coordinate the actions of the green building councils throughout the globe.

All of the aforementioned technologies have a fundamental structure that is relatively similar to one another, and their primary goal is to advance the development of green buildings. They address a variety of sustainability-related topics, including the various grading methods according to the project's utilities, the amount of credits available in each category, etc. For instance, the Green Building Council of Australia (GBCA) has published eight grading systems for various types of buildings, including multi-family housing, office interiors, industrial structures, healthcare facilities, and office buildings. There are nine areas in the GBCA green star grading instruments, including management, indoor environmental quality, energy, transport, water, material, land use and ecology, emissions, and innovations. There are a

certain number of credit scores that may be applied for under each category. There are 105 total points weighted, with 5 points going to the innovation category. A similar rating structure may be found in the GRIHA rating system developed by the Indian Green Building Council (IGBC). The 34 criteria that make up the GRIHA grading system are divided into divisions such as site selection and planning, resource conservation and efficient use, building operation and maintenance, and innovation points.

The GRIHA weights and criteria are as follows:

All structures larger than 2,500 square metres that are still in the design phase, with the exception of industrial complexes, are eligible for certification under GRIHA. Offices, hospitals, healthcare facilities, residences, and multi-family high rise structures are all examples of buildings. As previously indicated, the 34 factors that make up the GRIHA grading system are divided into eight obligatory and eight optional categories. Each criteria is given a certain amount of points. It indicates that the project would be eligible for points if it intended to satisfy the requirement.

The amount of points obtained determines the certification levels that are given (one star to five star). 50 points are the bare minimum needed for certification.

Points are gained for adhering to the design and performance purpose of the criteria in the GRIHA, which is a guiding and performance-oriented system. Each criteria is given a certain amount of points. It implies that a project with the intention of meeting the requirement would be eligible for the points. GRIHA is a 100 point system with certain basic points that are required and the other points being optional. Depending on the total amount of points obtained, several certification levels (ranging from one star to five star) are given. 50 points are the bare minimum needed for certification.

GRIHA star ratings for green buildings are shown in Table No. 1.

ACHIEVED POINTS FOR GRIHA RATINGS

50-60* 61-70 ** 71-80 *** 81-90 **** 91-100 *****

According to the local climatic circumstances and the needs of the evaluation criteria for these green buildings, various nations' green buildings are planned and constructed differently. It has also been noted that several research have been devoted to creating new green building grading methods or modifying the ones that already exist to take into account certain local settings, such as meteorological variables, economic development levels, and geographic circumstances.

D. TECHNICAL AND ENVIRONMENTAL ASPECTS

The environmental elements of sustainability have historically been the focus of research on green buildings. When using Green Star Healthcare VI as an example from the GBCE tool, environmental sustainability relativities have around 87% of the weighted points. It also includes technical studies on the environmental sustainability of the structures, such as those on reducing greenhouse gas emissions and improving resource efficiency and water efficiency. For instance, fly ash, which is commonly accessible from industrial sources as a residual waste, may be utilised for the structural elements of green buildings, helping to conserve energy and reducing the amount of garbage sent to landfills. Similar to how we can greatly minimise demolition waste by using precast and prefabricated approaches. Precast and prefabricated buildings can offer other benefits, such as cost efficiency. Prefabrication is also acknowledged by both design and construction experts as a way to reduce accidents when working at heights and in restricted places, in addition to its advantages.

E. SOCIAL ASPECTS:

Over the last several decades, social sustainability in buildings has been a growing source of concern. At the same time, a significant and varied quantity of research activity is being seen. The industrialised nations have a widespread understanding of sustainable development, while developing nations still lag behind in promoting the knowledge and significance of green and sustainable construction. For attaining and promoting sustainable development, laws and regulations already exist in industrialised nations. However, the industrialised nations are far behind in the development of sustainable structures.

Social sustainability in the context of construction primarily refers to living standards, workplace safety, occupational health, and chances for future professional growth. These days, social sustainability is taken into account in building projects from the planning stages forward in both developed and developing nations. According to the chartered institute of construction, the sectors' performance in terms of corporate social responsibility sometimes serves as a major impetus for them to give social sustainability more attention. Activities involved in building. Social sustainability was mentioned as another crucial component of green construction and its evaluation. As a result of better energy efficiency, the social and cultural advantages are recognised as major consequences of sustainable building envelopes.

Last but not least, the social sustainability performance of a green building evaluation should take into account the users' comfort and well-being, accessibility to public services, and their degree of sustainability knowledge. As the subject of sustainability is carefully considered and made a regular and obligatory practise, the degree of awareness should significantly rise.

F. Financial aspects

According to the study, green buildings need to meet a number of social and economic criteria, including accessibility, education, inclusiveness, cohesiveness, affordability, economic value, influence on the local economy, indoor health, cultural perception, and inspiration. The advantages of sustainable house renovations or energy retrofits include long-term cost savings as well as the potential to increase the property's value. This thereby contributes to a shorter payback time for energy saving solutions.

Therefore, the concept of a "green building" might be wide or limited, emphasising social, environmental, and economical factors. A restricted definition would focus just on environmental sustainability. The importance of the triple bottom line idea of sustainability in the creation of green buildings is, however, seldom acknowledged. The majority of research on sustainable buildings concentrate on environmental elements of sustainability.

RESEARCH METHODS:-

WHY GREEN BUILDINGS, FIRST?

Researchers have conducted a significant amount of research on the advantages and disadvantages of developing green buildings. The major goal of this research is to increase public understanding of the benefits of turning green, which will help individuals make better decisions. For a nation like India, where there is a dearth of knowledge about sustainable structures and sensitivity to investing more for sustainability of the structure, this research plays a significant role. It is even more beneficial in cases when customers have relatively limited financial resources and are more cautious when making credit choices due to the global financial problems. These studies mostly concentrate on the advantages and disadvantages of developing green buildings as opposed to conventional structures. Comparing the attributes of green buildings against those of conventional structures, such as water efficiency, energy efficiency, interior environmental quality, thermal comfort, health and productivity, is another common thread used in ongoing research investigations.

ECOLOGICAL BENEFITS

The research that has been done up to this point provides solid proof of the multiple advantages of green buildings. Considering the environment, a sustainable construction aids in increasing urban biodiversity and safeguards the eco system via sustainable land usage. Another crucial element of sustainable building design is the minimization of waste from construction and dismantling. In order to lessen the effects on the environment and use recycled materials from construction wastes in the construction of new structures, the recycling rate should be more than 90%.

In terms of energy efficiency, water efficiency, and lowering carbon emissions, green buildings often perform better than conventional structures. Studies have also shown that if LEED grading systems were used in all new building projects worldwide, a significant proportion of carbon dioxide emissions might be saved. In terms of reducing carbon dioxide, it has also been shown that commercial buildings benefit from LEED certification the most, followed by residential and public buildings. Additionally, LEED-certified buildings save more than 25% more energy than the average national level. The statement above is supported by the figure below. Among other structures, a library building structure gains the most from the LEED certification in terms of energy efficiency.

III. FINANCIAL

When considering the life cycle viewpoint, the cost reductions are also linked to better building performance, which leads to the final optimization of operating costs. The cost of energy usage may be reduced in a green building by up to 25–30% when compared to a conventional one, according to economists and academics. The study found that achieving a GBCA green star (5 and 6 stars) certified building requires an additional expenditure of 4% to 10%. However, given the skyrocketing energy prices and the high expenses of the carbon market, there are also enormous costs associated with not turning green. Additionally, a researcher's financial model estimates that up to 10% more money would be needed to attain LEED certification for a building.

Additionally, its cash flow study projected savings from a green building design vs a conventional building of between US\$1.28 and \$1.32/sq.ft. per year. Additionally, from a maintenance perspective, a green building outperforms a conventional one significantly in terms of energy efficiency, water efficiency, and cost efficiency. Additionally, a

researcher who has focused repeatedly on energy efficiency claims that his tests show low energy office buildings with green features may save more than 55% of energy expenditures when compared to conventional structures.

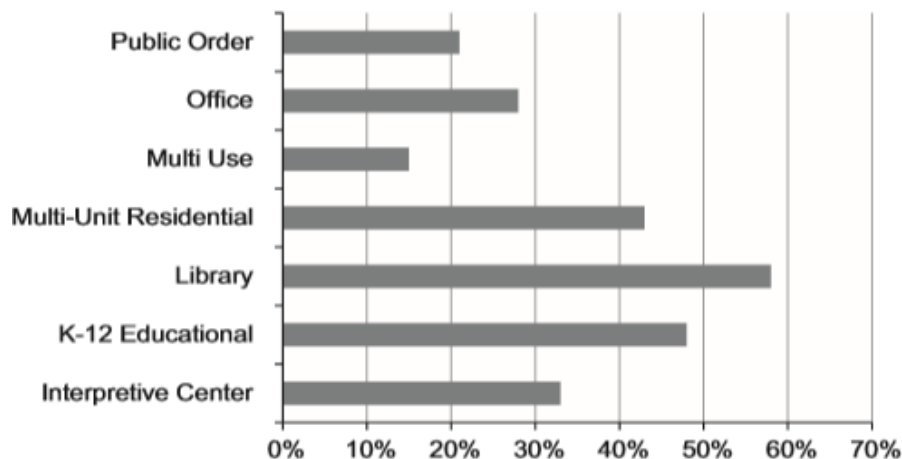


Fig1. EnergysavingsfromLEEDcertifiedbuildings

Interior ENVIRONMENTAL QUALITY:

The IEQ, or indoor environmental quality, is one of the most important factors in the positive effects that green buildings have on people. emissions of volatile organic compounds and comparable harmful substances.

Contaminants are another important problem in the building that is covered by the IEQ scopes. IEQ therefore plays a significant part in all the top green building evaluation tools. Numerous studies have previously shown that green buildings may reach greater IEQ levels than conventional structures, which directly affects the inhabitants' productivity and health. This contributes to raising building users' satisfaction levels. A researcher's online poll of 180 buildings for assessments on indoor environmental quality came to the conclusion that green buildings fared better than conventional ones, with the exception of acoustics, lighting, and office layout. The follow-up survey also revealed that the most common lighting-related concerns are: insufficient daylight, reflections on computer displays, and too-dark or too-bright rooms. People overhearing private talks and phone calls were the two main acoustic-related concerns. The research found that residents of green buildings were content with their thermal comforts, but those of conventional structures displayed greater discontent. Additionally, it was shown that rather than affecting building occupants' pleasure, indoor air quality had a significant impact on how well they performed. Other occupant-impact criteria, such as office design, acoustic comfort, and thermal comfort, were not statistically significant in green buildings.

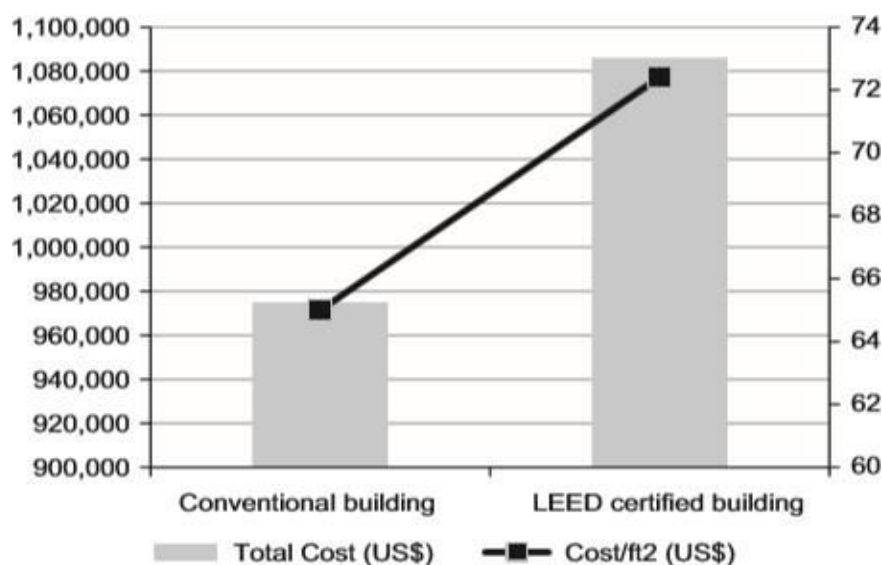


Fig.3.Totalcost andcost perunitof floorarea,ConventionalbuildingVs.LEEDcertifiedbuilding.

IV. THERMAL COZINESS

It was found that thermal comfort, a complex dynamic of temperature and humidity, was directly connected to the happiness of building occupants. This drew a lot of academics to test and gauge the difference between thermal comfort levels in green buildings and conventional buildings. The indoor room temperature ranges were subsequently suggested. When it comes to adopting thermal comfort, aspects including psychological, physiological, cultural, and behavioural factors are quite important.

Health and productivity are six.

The fundamental idea underlying green building technology is that the sustainability of the building and energy savings should not come at the expense of the users' productivity, happiness, or well-being.

So, in any certified green building constructions, the interior environmental quality of a sustainable structure and the happiness of the occupants play a key role. Maintaining a delicate balance between the quality of the interior atmosphere and the energy and financial efficiency of the heating, ventilation, and air conditioning (HVAC) plants does seem to be a tough challenge for a designer. Considering the conditions in India, heating is only required in a few of the country's northern areas, but ventilation and air conditioning systems are required almost everywhere.

Getting a strong output from employees and authorities in office buildings depends critically on their health and productivity. Excellent outputs and work outcomes may be readily attained with good health and productivity since the workplace environment also has an impact on the employees' capacity for work and efficacy. Additionally, studies have shown that when people shift from a conventional building to a green one, their health and level of productivity both increase. According to a research, when tenants switch from a traditional structure to a green building, productivity increases by 25% and absenteeism is dramatically decreased. Additionally, a study of 31 GBCA-certified office buildings revealed that employers rather than workers were aware of the advantages of green workplaces for their employees' productivity and health. This research also discovered that the occupants' psychological well-being and productivity are impacted by the amount of visual comfort, which is related to the interior lighting environment, such as ll luminance distribution. These health-related advantages of green buildings are expanding their conventional emphasis on the environment to include social and economic sustainability as well.

1. CASE STUDY

1. Photo1: Actual photograph of the case study



This is a real-world case study of a green bungalow for a home. It is specifically referred to as a "live case study" since I was actively engaged in the project as an assistant planner, designer, and contractor for the bungalow's construction. This well designed green house may be used as a case study and for purposes of green home evaluation.

Between the two major cities of Mumbai and Pune lies a hill station by the name of Lonavala where this home is located. The home was primarily planned by Mumbai-based architect Mr. S. Shirsat, and I created the green ideas since it is a major area of study for my post-graduate work. The bungalow was created with the goal of incorporating green building principles into it while still achieving a smart and contemporary style. And in this project, we are successful in attaining both of them: a green house and a smart, elegant design.

This cottage was built on an about 1100 square metre plot that is part of a town planning plotting programme. The bungalow area is about 450 square metres, and it is a ground-plus-one-floored building with a bedroom, a kitchen, a living room, and a dining area on the ground floor. A lift leads to the first level, where there are two bedrooms and a lounge space that opens to a partially covered balcony. The first-floor children's bedroom has an elevated garden that is open to the sky. Three distinct portions, one entirely curved, one straight, and one half curved toward both sides, split the roof into these three pieces. All have gutters built into the building itself to catch rainwater. The bungalow's construction began in January 2015, and ownership was handed over in May 2016.

The bungalow has the following features, which make it a green house:

1. Use of OPC with a 50% fly ash component in place of PPC (cement).

PPC with fly ash, which produces less heat and carbon dioxide during hydration than regular Portland cement and decreases the heat of hydration, was used for the bungalow's overall construction.

Additionally, fly ash-based porous "Syporex" light weight blocks were used in place of the standard conventional bricks. Gypsum plaster was used to cover the inside walls, which again results in relatively lower heat and carbon dioxide emissions.

Ingenious architecture: The bungalow's interiors were planned and constructed to get the most natural light and the best ventilation possible. That entails using the least amount of electricity possible to light and ventilate the house.

(Observation: It was noted that the bungalow's natural light levels were so high that there was never a need for artificial lighting between the hours of 6.30 a.m. and 6.30 p.m. Additionally, the cottage is well ventilated throughout thanks to several sliding doors and huge windows, so fans and air conditioners are not required at any time of year, not even in the heat.

3. Installed double-glazed glass (for doors and windows), which functions as an insulator to prevent direct sunlight from entering the house, keeping it cool during the day and also assisting in controlling room temperature in cold weather conditions.

4. Solar water heaters: Solar water heaters are set up to provide the bungalow with hot water. It is a racold dual heating system that includes an inside electric coil heater as a backup in the event of insufficient sunshine or when sunlight is scarce.

5. A particularly designed STP for treating wastewater is built on the bungalow property. This STP processes the sewage water from the bungalow before it is dumped into a soak pit or increased ground water levels.

6. Compost pit: In the garden, a compost pit is also created to process kitchen wastes and provide nutrient-rich manure for the gardens.

Rainwater harvesting system: The bungalow's design ensures that all of the rainwater from its roof is gathered in gutters that are built right on the roof top, and then it is released into pits that charge the ground with water.

8. Garden solar lighting system: The garden is completely illuminated by solar lights that are left on auto mode and provide light backup for up to SIX hours.

9. Auto pumping system: Auto level sensors that are built into the water tanks itself are used to control the above water tank. These conserve both water as well as power.

10. Special cladding: The bungalow's design calls for at least one wall in every room to be covered with terracotta tiles. This serves two purposes: (1) to create an attractive interior (2) to keep the space cold

11. Backup solar inverter charging

In case of a power outage, a hybrid vehicle may be charged using solar power thanks to the installation of a solar charging inverter. With typical use, a backup lasting up to four hours is obtained.

12. The bungalow's general appliances are energy-efficient 5 star models.

LED lighting: LED fixtures, which use up to % less energy than traditional CFLs and tungsten lights, are used to illuminate the whole cottage.

14. Fly ash pavement blocks are employed in the bungalow's automobile parking pathway area.

15. This cottage also uses the exterior vertical garden design. According to the research, the vertical garden aids in reducing the quantity of carbon dioxide released into the atmosphere by cement-plastered walls and RCC buildings.

16. All of the paints used in the bungalow are water-based paints, which took the place of oil-based paints that contain VOCs and are harmful to people when breathed.

A quick economic examination of this case study:

The entire cost of this green building would have been around Rs. 1,12,50,000 if it had been built conventionally without any green building requirements. And the whole project's ultimate cost, which took into account all the aforementioned green construction components, was Rs. 1,19,15,000/-. This indicates that an additional Rs. 6,65,000 was paid for the house to become green. i.e., an additional 5.9% of the cost was spent to create a green home. Additionally, studies have shown that achieving a green bungalow would add between 5 and 10% to the overall cost. Therefore, an additional cost of around 5.9% for this project is extremely advantageous and will continue to result in 30–40% savings throughout the course of its life.

V. TRADICTORY CASE STUDY:



Photo2: Actual photograph of the conventional casestudy



The three row homes chosen for the conventional case study were constructed conventionally without using any green construction techniques.

Basic information

Friends Villas is how the property is known.

Owners' names: Mr. Bavsar.

Case study context

Our construction firm began building three row homes in May 2015. This turnkey project had already been determined upon the requirements. We made an effort to persuade the customers to build green houses with certain green applications, but the clients, being traditional thinking, wanted everything built traditionally.

The major reason for choosing this case study is to demonstrate how to include green features into traditionally built residences while also persuading the owners of the long-term cost benefits on building operations and maintenance.

The green implementations listed below may be applied to the case study that was built traditionally:

1. Switch to LED lights

Solar-powered water heaters

3. Solar garden lighting

The solar inverter.

The idea of a vertical garden

6. Glasses with two glazes

7. A technique for collecting rainwater

sensors for automatic pumping and levelling

9. Plumbing fixtures with low discharge

10. Electric pumping system fueled by solar energy

Green star energy-efficient appliances

12. Making use of local resources for residential needs on a daily basis.

Thus, by putting these 12 ideas into practise, the typical house may save up to 30% to 40% of its energy and water usage and become a better place to live than it was before.

FINAL COMMENTS

This research paper covered all the technical and financial aspects of green construction across the globe.

Additionally, it is anticipated that this live case study of a small residential bungalow in a small Indian town will inspire readers to plan for their new homes or retrofit their existing ones by making small changes and converting it into a green or sustainable building for future long-term savings (from both an economic and sustainability perspective) (environmental aspects).

Additionally, the typical case study will assist researchers in learning more about the green features that may be added to a traditional house. The research' findings may be divided into three groups, including definitions and the range of green construction, its advantages and disadvantages, and methods for achieving it. It has been noted that the majority of literature evaluations place a strong emphasis on technological solutions for environmental sustainability issues such energy usage, water efficiency, and greenhouse gas emissions. A helpful tool for social sustainability is the life cycle assessment methodology, which is widely used in the environmental elements of green architecture. Around the globe, new grading tools are emerging quickly. However, further research in these areas is needed to support these new grading systems and also aid in the decision-making for investors and developers. Additionally, the benefits of green construction should be made known to the public, as well as its long-term advantages.

VI. PERIODICAL SCOPE

The current situation is that there is a dearth of knowledge and understanding of this notion among individuals in nations like India. The dissemination of knowledge will be greatly aided by government action. Additionally, tenants' use of the green building will be controlled by systems for education and training, which might have a substantial impact on the building's performance. It is clear that there has been debate of the costs and advantages of green construction. It is also important to note that the design of the top green building evaluation tools takes into account the regional climate and geography. Therefore, while evaluating the efficacy of different green building grading methods, this issue has to be taken into account in order to create standards for the globe with regards to green construction. The



case study taken into account for this research paper was specifically chosen, developed, and built with respect for green building ideas and their importance to the environment as well as to our wallets over the long run. Additionally, this case study will assist in determining the level of familiarity that Indian townspeople and villagers have with the principles of green construction. It will also assist them in creating their own green homes and in promoting them after they have been constructed. In a nation like India, where the bulk of the population resides in villages and towns rather than cities, it is crucial to raise awareness among those who live there. Additionally, particular populations like the elderly, kids, and instructors should get greater attention.

People who are older are often more sensitive to indoor air quality and hyperthermia. Future graduates will work as practitioners and leaders in a variety of industries. Teachers are essential in helping students develop their attitudes and behaviours regarding sustainability-related concerns, such as the use of buildings.

Therefore, the aforementioned concerns serve as topics on the future agenda for research connected to green construction while also encouraging quantity of green and sustainable growth.

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