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A CASE STUDY OF PESTLE ANALYSIS ON CURRENT GREEN BUILDING SCENARIO IN PUNE CITY

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Abstract:

As the world grapples with the urgent need for sustainable development, India has emerged as a focal point for green building practices. Pune is witnessing a boom in eco- friendly construction, driven by increasing awareness of environmental issues and governmental support. This article presents a detailed case study employing PESTLE analysis—a tool that assesses Political, Economic, Social, Technological, Legal, and Environmental factors— in the context of India's current green building landscape. We will explore how each factor contributes to the growth and challenges of sustainable architecture in India.

Keywords: sustainable, PESTLE analysis, environmental.

1. INTRODUCTION

Sustainable construction refers to methods and practices that employ eco- friendly materials and less dependence on external factors which help function conventional structures. These structures also promote preserving and reusing conserved resources. Many problems such as land use, indoor and outdoor surroundings, electricity power and lifecycle impacts of construction materials are taken into consideration when it comes to sustainable construction practices. The Green Building Movement in response to sizable environmental effects resulting from typical buildings is on the rise in both metropolitian cities and rural villages encompassing holisitic development. Traditional structures consume a great quantity of conventional construction materials during construction phase and maintenance phase contributing to carbon dioxide emissions and indoor air pollution. Also, unbounded city improvements have augmented such environmentally derailing situations. The Green building movement aspires to deal with these issues by encouraging sustainable building practices that cut down resource allocation and consumption, reduce electricity usage, mitigate greenhouse gas emissions and improve indoor environment by exceptional levels. Sustainable construction practices comprehend numerous components including layout, production, operation and preservation of structures.

1.1. The key goals of the green-building movement are as follows:

a. **Electricity efficiency:** Green buildings include electricity-efficient technologies and layout strategies to reduce the impact of electricity intake for heating, cooling, lighting and home equipment.

b. **Useful Resource Conservation:** Green buildings comprise techniques to minimize material usage,

promote recycling and reuse reducing waste technology at some point of construction and demolition. This curtails the pressure on natural resources and the landfill capacity.

c. **Water Conservation:** Green buildings combine water-green furnishings, rainwater harvesting systems and water recycling mechanisms to reduce water consumption and maintain water demand.

d. **Indoor Environmental niche:** Sustainable homes prioritize occupant health and luxury by ensuring proper ventilation, natural lighting and use of low-emission substances in construction of structure.

e. **Sustainable site selection:** Green structures recall the environmental impact of building site selection, aiming to maintain ecosystems, guard biodiversity and reduce habitat disruption. Sustainable construction also reduces the overall load of the structure on the ground level.

f. **Lifestyles Cycle evaluation:** Green building practices do include the lifestyle-cycle impacts of a building and this holistic method helps to discover opportunities for decreasing environmental impacts at each stage of construction.

2. METHODOLOGY

This study was conducted by thorough study of International and National Reseach Papers in which there was a lot of information about a method of PESTLE analysis that is explained below.

The study was started by researching articles and research papers about the current sustainable construction practices and the ways in which such structures are analysed.For the case study we have a very famous public infrastructure that was the collector building situated in pune city and all the green features of that building were learned.

We then visited a site that was under construction but employing green practices during their construction which was carried out by an MNC.

Both the sites were compared byt their unique green features and also PESTLE(Political, Enviromental, Social, Technological, Legal, Economical) analysis was being conducted on both case study and the common features were identified.

These fashion shall help the construction diligence to extemporize their strategies and vulgarize green structures in India. It will also help experimenters find new ways to apply green structures to individual parcels.

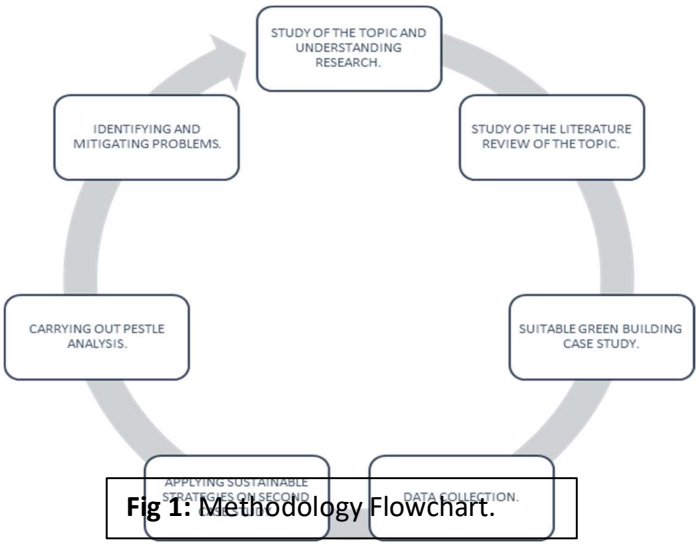

Fig 1: Methodology Flowchart.

3. RESULTS AND DISCUSSION

3.1. RESULTS

1. Political Factors- The political landscape in India significantly influences the green construction industry. This together with policy frameworks and initiatives by the authorithies are pivotal elements in promoting sustainability practices through green construction.

- Policy Instruments: Regulation in the form of GRIHA and other state-level laws stimulate building energy efficiency.
- Economic motives: Indian authorities offers tax benefits in addition to subsidies for green infrastructure supporting developers.
- National Mission for Sustainable Habitat(NMSH): Flagship programme launched in 2010 which promotes reduction in GHG emissions intensity and achieving nationally determined goals.

2. Economic Factors- India's booming economy presents both openings as well as dilemmas for current green industry scenario.

- Sustainable Market: On going green building market in India is expected to flourish at a compound annual growth rate (CAGR) of 20% from 2021 to 2026.
- Budgetary Impact: While initial building costs for green structures may be higher, long-term savings through efficiency and energy conservation present a credible case.

3. Social Factors- Social change is the foundation for Green Architecture. The recognition and awareness of green architercute in Bharat are gaining momentum.

- Sociological sphere: Public Campaigns along with informative measures are essential for promoting the benefits of living in sustainable environments.
- Cultural Perspective: Contemporary Indian architecture often aligns with sustainable practices, making it conformtable for new green buildings to be accepted socially.
- Consumers Opinion: Buyers are constantly looking for eco- friendly features furher inspire developers to adapt and innovate.

4. Technological Factors- Integration of advanced technology in the Civil engineering is revolutionizing green practices and sustainabilty.

- Smart Sensor System: smart equipments and devices are being installed on the site to ensure the green building normsare being followed by weekly or monthly auditing of such systems by authorities.
- Building Information Modeling (BIM): BIM helps in maximizing performance without exhausting assets during pre-construction and helps in sustainable designs.

5. Legal Factors- Legal framework in India helps in a holistic manner to promote green framework in current scenario of development.

- Eco-compilance standards: Stricter regulations and rules are being implemented by the authorities for scrutinizing emissions on weekly or monthly basis on construction sites.
- Sustainable Architecture Regulations: Programs like Leadership in Energy and Environmental Design(LEED) and Indian Green Building Council(IGBC) have lead to recognition in reference to green construction startegies.
- Environmental Measures: Obedience with environmental protection laws is crucial for attaining permits for new green constructions.

6. Environmental Factors- India's environmental objectives are being aligned with International goals for better sustaiblity development.

- Climate Change Isuue: Climate change has been a major issue for modern construction trends in India and it is being given a critical priority while developing net zero buildings.
- Resource Optimization Strategies: Designing along with Structure associated with buildings are being done in such a manner to reduce overall dependence on external factors for proper resource allocation.
- Biodiversity Enviroment: Structural designs often assimiliate climate respomsive buildings to enhance biodiversity making urban areas more livable also taking health of occupants in mind.

3.2. DISCUSSIONS

The PESTLE study that was conducted highlights that eco-sustainable construction scenario in Bharat is significantly influenced by a mix of political, economic, social, technical, legal together with ecological factors. Whilst overall situation towards carbon neutral approaches seem to be a step in the right direction, various barriers remain including the need for further public awareness and greater congruency in guideline formulation across regions.

3.2.1. Politcal interference in green building sector cause a major hindrance in applying such sustainable strategies.

3.2.2. Cost of preliminary stage construction is very high which makes the properties more expensive.Government should provide subsidies in the field of construction of Green Infrastructure.

3.2.3. Social factor that we experienced was unfamiliarity in the field of Eco-concious materials in the society made it very hard to change their perspective in the initial phase of Green Architecture scenario within India.

3.2.4. Energy saving structures provide a lot of contenment to residents living inside such enviroments which encourage them to invest in more properties now-a-days.

4. CONCLUSION

As India steps into a climate conscious future, role of green structures become crucial for both urban and rural real estate. PESTLE survey reveals insight that there are promising trends and supportive policies, continuous effort is needed to address these obstacles that lay forward. The way forward for green building methods and infrastructure lies within a collaborative approach where government, industrial sector as well as society work together to foster an environment that values eco-sustainability also aligning with the sustainable development goals and well as nationally determined goals. The key takeaway for industrial stakeholders comprises adaptation, investment in technology and also to imbibe community engagement which will be critical in driving the green building agenda forward. Society is now-a-days accepting the Green Building practices and also extend their support when they see that their resources are being retained and the cost of maintenance of green buildings is less than convention buildings. The residents of green buildings also sense comfort and behavioural changes in their day to day activities which makes them very calm. As we can see residents have had experienced psychological and social changes when residing in green structures. The green building scenario in India is flourishing and the future looks promising.

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