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Sustainable Living Spaces in Residential Construction: Possibilities and Challenges- A Critical Study

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In the contemporary times, the world has witnessed a sudden degradation in the climatic conditions. Unsustainable and anthropocentric approaches deeply threaten humanity's future progress and development. Carbon emissions are a significant factor contributing to climate degradation. Real estate is a sector where sustainable development will lead to building specific sustainable communities that undertake environmentally friendly approaches to usher in new developments. Green initiatives have proved efficient in bringing about sustainable living climate upgrades. Green initiatives are an essential part of sustainable development. Sustainable development requires a comprehensive approach towards development, integrating environmental, social, and economic considerations into planning and policies across various sectors of an economy. Green buildings have emerged as a productive mechanism to bring about sustainable development. The concept of green buildings has also received a welcoming response in India. India has witnessed a rapid inclusion of sustainable infrastructure in the country's commercial sector. However, the rapid urbanization in the country has brought forth a pressing need for revamping the residential infrastructure. With the growth and evolution of skyline buildings in India, the necessity of adopting eco-friendly construction practices in residential living spaces has become increasingly noticeable. In this regard, the research delves into green living spaces as an effective mechanism for sustainable development in India's real estate sector while navigating its challenges. The article delves into the needs of green development and is divided into various chapters ranging from the impact of these structures to how the buyer's psyche is involved and the challenges green initiatives bring with them. The researchers have provided their suggestions and concluded that green spaces should become

the norm in residential complexes. The paper will also fill in the gaps in the existing literature to understand buyers' psyche while purchasing in the real estate sector in the hyper-sensitive 21st century.

Keywords: *real estate, sustainable development, green initiative, green buildings, & sustainable residential buildings.*

INTRODUCTION

The world has been experiencing a dangerous degradation of the environment in recent years. The world is going through a natural crisis, and humans have caused this natural crisis. Human actions have led to the alteration of 75 per cent of the Earth's land¹. Global greenhouse gas emissions are contributed to by land clearing to the extent of 25 per cent². Carbon emissions are a significant factor contributing to climate degradation. Such environmental degradation has far-reaching consequences. It undermines basic security and puts humans at risk. The real estate sector is one of the most critical contributors to carbon emissions. As per the World Council for Sustainable Development, 40 per cent of energy consumption is done by buildings in most countries worldwide³. The United Nations Environment Programme says buildings contribute to one-third of greenhouse gas emissions. Therefore, 'Green Buildings' are of paramount importance when addressing issues about environmental protection. In India, buildings consume nearly 20 per cent of total power and, thus, leave a significant impact on the environment⁴. With rapid urbanization in India and massive power consumption, investing in the initiatives concerning 'Green Buildings' is intelligent.

India has witnessed a rapid inclusion of sustainable infrastructure in the country's commercial sector. However, the rapid urbanization in the country has brought forth a pressing need for revamping the residential infrastructure. With the growth and evolution of skyline buildings in

¹ 'Facts about the Nature Crisis' (UN Environment Programme) <https://www.unep.org/facts-about-nature-crisis?gad_source=1&gclid=CjwKCAjw8diwBhAbEiwA7i_sjYXhLlrQoiO_Gs5yBUuhIY3MW77nDalkWAEuZkTQpoJ-VzhMgOOoRnhoCXzoQAvD_BwE> accessed 11 April 2024

² *Ibid*

³ S. Manasi et. al., 'Promoting Green Buildings towards Achieving Sustainable Development Goals: A Review' (2021) Institute For Social And Economic Change <<https://www.isec.ac.in/wp-content/uploads/2023/07/WP-516-Manasi-et-al-Final.pdf>> accessed 11 April 2024

⁴ *Ibid*

India, the necessity of adopting eco-friendly construction practices in residential living spaces has become increasingly noticeable. Green buildings in residential spaces thus come as an attempt to minimize the impact of the construction and maintenance of such structures on the environment's health. It includes minimizing disturbances caused to the land due to construction, using sustainable and environment-friendly building materials, and increasing the usage of recycled materials and renewable energy in the construction and maintenance of residential buildings. In this regard, the research delves into green living spaces as an effective mechanism for sustainable development in India's real estate sector while navigating its challenges. The paper will also fill in the gaps in the existing literature to understand the buyer's psyche while purchasing in the real estate sector in the hyper-sensitive 21st century.

RESEARCH OBJECTIVES

The research aims to achieve the following objectives:

- To investigate the impacts of sustainable green building practices on the real estate sector in India and identify their potential for adoption.
- To assess the economic viability of implementing sustainable housing spaces concerning initial investment cost, market demand, and profitability for all the stakeholders, including buyers.

RESEARCH QUESTIONS

The following questions form the basis of the research:

1. What are the impacts of sustainable residential green building on the real estate sector in India?
2. What are the challenges to implementing the 'Green Buildings' concept in residential living spaces while considering the buyer's psyche regarding such housing areas?

IMPACT OF RESIDENTIAL GREEN BUILDINGS ON THE REAL ESTATE IN INDIA

In the last several decades, India's real estate market has grown and changed dramatically for many reasons, such as economic development, population expansion, urbanization, and government initiatives. This rapidly growing sector now plays a significant role in wealth creation, infrastructure development, and employment creation for the nation's economy. The need for industrial, commercial, and residential space is rising unprecedentedly in India's cities. Estimates indicate that by 2031, there will be 600 million people living in India's cities, which will result in an increased demand for real estate development⁵. Due to this change in the population, there are more urban clusters, megacities, and satellite towns than ever before, which has boosted national spending on housing, infrastructure, and commercial enterprises. Retail stores, office buildings, industrial parks, and logistics centres are in high demand due to rapid industrialization, globalization, and services sector growth. Real estate development, affordable housing, and urban infrastructure have all benefited from government-led projects, including the Smart Cities Mission, Housing for All, and Made in India⁶. The Indian real estate industry has drawn local and foreign investors due to its emphasis on boosting urban amenities, facilitating better connectivity, and establishing business-friendly settings. With such a rapid growth of the real estate sector in India, the concept of 'Green Buildings', which helps reduce environmental impact, optimize energy efficiency, and improve occupant comfort in residential construction, has become increasingly significant. As per the GRIHA (Green Rating for Integrated Habitat Assessment)⁷, in India's green infrastructure rating system, green buildings have multiple advantages for building owners, users, and society. It allows decreased energy use without compromising comfort levels. It helps in less loss of soil due to erosion, reduction of levels of pollutants, less degradation of ecosystems, natural spaces, and biodiversity, decreased use of water, and reduced pollution of the air and water, which gives immediate health advantages to the occupants. At the same time, little waste is created due to reuse and

⁵ P.D. Aher and S.S.Pimplikar, 'Green Building Construction Techniques' (2012) 1(8) International Journal of Engineering Research & Technology <<https://www.ijert.org/research/green-building-construction-techniques-IJERTV1IS8108.pdf>> accessed 11 April 2024

⁶ Craig Nielson et. al., *Green Building Guide: Design Techniques, Construction Practices & Materials for Affordable Housing* (Rural Community Assistance Corporation 2009)

⁷ 'About us' (*Green Rating for Integrated Habitat Assessment*) <<https://www.grihaindia.org/about-griha>> accessed 11 April 2024

recycling, which enhances the productivity of occupants and improves the marketability and image of the real estate property⁸.

The stakeholders in India's booming real estate sector would consider a few primary criteria based on which they would accept or reject the implementation of 'Residential Green Buildings' on a wide scale. The primary concern is the financial impact of building residential green housing. The financial implications of green buildings have been the subject of extensive research and study. The initial construction cost is slightly higher than that of an ordinary building. However, the cost of maintenance and operation of green buildings is lower by 22 per cent and 28 per cent, respectively⁹. This results in an overall profitability benefit for the builders in the long run. Additionally, one must view the financial impacts through a distinct lens. One must assess the financial impact based on the design's 'baseline' and cost. The additional expense depends on how much eco-friendly design has been considered. The extra cost would seem minor if the baseline design already meets a particular standard of excellent eco-design. In contrast, the cost would look enormous if the base design does not consider green principles. The second and rather critical paradigm is to look at the incremental cost, the initial cost concerning the life cycle cost. This approach is based on the understanding that although the incremental cost is a little higher for green buildings than that of conventional buildings, the life cycle cost, that is, the cost of maintenance and operation, is much lower in the case of green buildings as compared to that of conventional buildings¹⁰. Given the proposal for widespread implementation of green residential buildings, the days are not far from when the cost of green residential buildings would be nearly equal to or less than the existing conventional building in terms of construction.

Furthermore, in terms of selling such properties, since the initial costs are higher than those of traditional buildings, it provides a better opportunity for profitability for the builders. In both

⁸ Padma Priyadarshini Parija, 'Challenges in Implementing Green Retrofitting in Pre-Existing Residential Buildings: A Review' (2022) 5 International Conference On Construction, Real Estate, Infrastructure and Project Management
<https://www.researchgate.net/publication/358233548_Challenges_in_Implementing_Green_Retrofitting_in_Pre-Existing_Residential_Buildings_A_Review> accessed 11 April 2024

⁹ Centre for Advanced Maintenance Technology, *Green Building* (Ministry of Railways 2009)

¹⁰ *Ibid*

ways, that is, construction and sale, the real estate sector in the country seems to turn profitable given the consideration of long-term benefits and considering the nature of the industry, which is based on the long-term sustainability of a particular infrastructure or housing society, the concept of introduction of widespread residential living spaces comes as a welcoming prospect for enhancing both real estate business and environment protection. In the Indian real estate market, using green building techniques has also impacted financial concerns and property worth. Research has indicated that green buildings are more valuable than conventional ones regarding property worth¹¹. Green homes are more beneficial because of reduced maintenance expenses, better marketability, and energy savings. Green buildings frequently qualify for incentives and certifications to further increase their financial appeal, including the Leadership in Energy and Environmental Design (LEED)¹² accreditation. However, LEED India accreditation is currently only available for commercial buildings. Consequently, there has been an increase in investment in sustainable real estate developments throughout India as developers and investors have come to understand the long-term financial benefits of green building projects. Through encouraging legislative frameworks and regulations, the Indian government has also been instrumental in advancing green buildings. There have been multiple initiatives by the government of India about projects and programs concerning energy efficient construction industry.

The housing industry has experienced a significant improvement in energy efficiency and environmental sustainability because of initiatives like the Energy Conservation Building Code (ECBC)¹³ and the Green Rating for Integrated Habitat Assessment (GRIHA)¹⁴. Incentives for builders and households involved in green construction initiatives include tax reductions and subsidies. In addition to providing incentives for implementing sustainable techniques, these legislative measures are accelerators that advance the appeal for green buildings in the Indian real estate sector. Additionally, many foreign investors have shown interest in funding green

¹¹ *Ibid*

¹² 'Overview' (*Green Building Information Gateway*) <<https://www.gbig.org/collections/14555>> accessed 11 April 2024

¹³ 'Objective' (*Bureau of Energy Efficiency*) <<https://beeindia.gov.in/en/energy-conservation-building-code-ecbc>> accessed 11 April 2024

¹⁴ About us (n 7)

construction projects in India as 'Foreign Direct Investment' because of its position as a promising market¹⁵. One of the major concerns concerning the introduction of green buildings in housing construction is that it may not be cost-efficient for the government to take big initiatives in this arena. However, the promising funding from the 'foreign direct investments' ensured an increased inflow of money into the Indian real estate industry. Thus, this has also acted as a propelling factor as well as a supportive measure for the government of the country about making investments in the emerging concepts of green buildings in housing societies.

Along with financial support, it has also brought knowledge and advanced technology. Moreover, International developers and investors contribute to innovation and quality improvement in construction techniques by bringing global best practices and standards to green building projects in India. Thus, the implications of residential green building on the real estate industry in India, at both micro and macro levels, seem to promise a flourishing real estate market.

BUYER'S PSYCHE

The buyer's psyche must be looked at as a whole. The buyer ought to make informed decisions when buying anything, let alone real estate. The buyer delves into many things while purchasing a property, such as the costs involved, ease of registration, location of the property, etc. In the hyper-sensitive age of the 21st century, millennials and Generation Z also look into a property's sustainability aspect. It is imperative that the seller understands the buyer's psyche and offers specially curated choices to each potential buyer.¹⁶ Awareness is crucial before making any purchase, and the buyers also need to be aware of the kind of building or property they'd be investing in.

Psychology is crucial in the real estate sector since the sector involves a lot of money and thinking. India is far from achieving net zero emissions, and the only concentrated effort by the

¹⁵ Hina Zia, 'Green Growth and Buildings Sector in India' (*The Energy and Resources Institute*, 28 January 2016) <<https://www.teriin.org/projects/green/pdf/National-Buildings.pdf>> accessed 11 April 2024

¹⁶ 'Concentration of Real Estate Development in The Vicinity of Metropolitan Cities: Reasons, Benefits, Challenges, Impact on Future Generations & Sustainable Development The recent global pandemic, though challenging, had a positive effect of reducing carb' (*Institute of Company Secretaries of India*, 10 October 2022) <<https://www.icsi.edu/media/webmodules/CSI/October/19.pdf>> accessed 11 April 2024

government in the said regard has been to build smart cities.¹⁷ Potential buyers must be given such deals that it becomes hard to reject. Buildings that support sustainable greenery must become a regular choice for buyers, not just for luxury but also for buyers from lower-income groups. Whilst making earthquake-resistant buildings is still an expensive proposition, strategies to make it cheaper must be devised so that all income groups can purchase sustainable living spaces, and the phrase which lays down the necessities - roti(bread), kapda(cloth), makan(house), becomes roti, kapda, aur sustainable makan(house). Modern buyers often consider real estate purchases lifelong investments and are thus more conscious about their choices.

CHALLENGES IN IMPLEMENTING GREEN CONSTRUCTION

The green construction revolution has been in the news for quite some time, but the challenges in building green spaces persist as an issue to date. India is committed to the UN's Sustainable Development Goals (SDGs), of which sustainable cities play a crucial part.¹⁸ Real Estate groups need to work with the administration to ensure that green housing is not just a dream but a reality. India has come a long way in building green residential spaces, but the implementation challenges still plague the country.

The issues that have been highlighted are as follows¹⁹:

The lack of Urban Land - that supports sustainable living is a significant concern since urban spaces are already overcrowded.

Initial Costs - The initial costs of building a green residential complex are manifoldly increasing compared to other residential complexes. The initial costs include installing solar panels and sustainable waste dumping, which take a considerable share of the overall costs.

¹⁷ Nelson (n 6)

¹⁸ Rohan Sharma, 'Sustainable real estate: India's response to a greener future' (*JLL*, 18 April 2022) <<https://www.jll.co.in/en/trends-and-insights/research/sustainable-real-estate-indias-response-to-a-greener-future>> accessed 17 April 2024

¹⁹ Concentration of Real Estate Development in The Vicinity of Metropolitan Cities: Reasons, Benefits, Challenges, Impact on Future Generations & Sustainable Development The recent global pandemic, though challenging, had a positive effect of reducing carb (n 16)

Semi-urban and tier II & III cities - In India, the tier II & III cities and semi-urban areas are some areas with less focus on sustainability. Instead, the focus in such cities is on proper waste management and reduction in the usage of plastic. Even in metropolitan cities like Mumbai and Delhi, the issue of overcrowding and unsustainable living is still prevalent due to overcrowding and population explosion.

Water scarcity is an issue that has started plaguing India in recent times. With very little water available, it ought to be used judiciously for construction and living.

Awareness - There is very little amongst the buyers about sustainable living and the need for green buildings. With little to no understanding, people tend to be dissuaded from buying such a property, for it'll also cost more because of sustainable practices being used.

Lack of sustainable building materials: Lack of awareness is a chronic problem since the constructors and engineers also don't know what material is sustainable for building these complexes.

SUGGESTIONS AND CONCLUSION

SUGGESTIONS

The authors feel that India's booming sector of real estate must now focus on sustainability and sustained development. The authors, through this research, present the following suggestions:

- Awareness through public-private partnerships must be increased about the need to develop and reside in sustainable complexes.
- The government must offer rebates and other attractive offers to buyers who purchase sustainable living spaces, as is the case for commercial buildings.
- Lawmakers must frame laws to ensure that buyers and sellers have enough incentives to build and reside in green spaces.
- Decongestion of overly crowded urban areas and a keen lookout for sustainable practices in the village system should be encouraged.

- Plantation of trees along with separate animal zones must be developed so humans can live in harmony with other organisms.
- While the researchers are against misusing air conditioners, conscious and judicious use of such appliances can bring about a lot of positive change that will make Earth a better place to live.
- There should be plans and strategies to make sustainable living spaces cheaper and a reality even in tier II and III cities.

CONCLUSION

Green construction technology is evolving from an exotic wonder to a societal need under environmental stress. Buildings are responsible for 25% of the world's wood harvest, 25% of its freshwater withdrawals, and 25% of its material and energy fluxes, making them possibly the single most significant environmental stressor²⁰. Sustainable living spaces are better suited both at the micro and macroeconomic levels. At the micro level, it increases the productivity of each individual, and at the macro level, it boosts the entire economy. It is safe to conclude that the cost of operating and managing green buildings is minimal, as with other residential buildings. The challenges are aplenty, but these challenges can be overcome only when concentrated efforts are made in the right direction. Over the years, the real estate sector has become a better sector, with corporate social responsibility playing a significant role. CSR initiatives require environment-friendly approaches with sustainable development in mind. The real estate sector has welcomed green spaces in the commercial world, and it is now time to make our homes greener and more sustainable.

²⁰ Facts about the Nature Crisis (n 1)