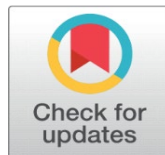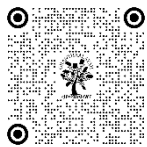# A REVIEW ON SUSTAINABLE AFFORDABLE HOUSING IN INDIA: ONE STEP TO BUILD A GOOD ECONOMY AND ENVIRONMENT

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ABSTRACT

Affordable housing, economic growth, and environmental protection are India's urban development priorities. The housing sector of India holds the third largest position among other industries. India needs inexpensive, sustainable housing for economic and environmental reasons. The definition of affordable housing has been discussed as given by the government schemes and authorities. Urbanisation, infrastructure, and housing shortages affect India's housing business. According to a government technical study from 2011, there was an 18.76-million-unit shortfall in metropolitan areas, with 96% of those units belonging to EWS and LIG. However, it doesn't consider nondurable and rental houses, which further increases the housing demand. To address such issues, the central government has launched various sustainable affordable housing policies to integrate sustainability, affordability, and inclusion into architecture and construction. 'Housing for all' is one of the government schemes launched in June 2015 which promotes affordable housing and technology in the sector. Housing and allied industries play a significant role to boost GDP, jobs, and communities. Energy-efficient technology, waste management, green spaces, and sustainable building reduce housing developments' environmental impact. These activities reduce carbon emissions and strengthen urban climate change resilience, saving the environment. The research stresses social inclusion to provide affordable housing to low-income, women, and vulnerable people. Housing inclusivity promotes equity in the society. India's sustainable, affordable housing schemes are analysed, and gaps are identified. Public-private partnerships, subsidies, and governments encourage sustainable housing. Finally, affordable housing benefits India's economy and environment. This study underlines the necessity to incorporate economic, environmental, and social factors into housing laws and practices to solve India's housing crisis. It further mentions Sustainable, affordable housing will boost India's economy, environment, and the quality of life holistically.

Keywords: Sustainable Affordable Housing, Housing Shortage, Urban Migration, Housing Policies, PMAY

1. INTRODUCTION

Affordable housing for all people is one of the huge challenges faced by developing countries. Housing is an essential necessity that provides families with access to shelter and basic amenities, hence creating demand for resources, physical infrastructure, labour, technology, capital, and land (Herda et al., 2017). Housing is important for family stability and the growth of the economy; it is an essential part of every nation. Housing necessity is a sign of an existing deficiency. The families that lack opportunity for housing and are homeless, without a shelter or habitation, is an indicator of housing need. Housing shortages encompass households living in outmoded dwellings, non-serviceable katcha dwellings, congested houses that need new houses, and homeless families. Housing shortage means the number of households in

need of accommodation or a liveable dwelling (Herda et al., 2017). Instead, it has been referred as a measure of development in growing cities since cities contribute a large share in the economy of a country. In India, migration has increased for better lifestyle and employment opportunities, which leads to housing shortage in many urbanized areas. Since independence, the government of India focused on the housing problem in the country, and they made some housing policies and programs in it all five years plans to provide housing to all citizens for a better life. Post-independence, the housing sector was at the forefront of the government, specifically to provide shelter for industrial workers. It was during the phase of 'industrialization' when the government was playing the role of 'provider' in the housing sector later transformed to the 'liberalisation' phase, the government became the 'facilitator' in the housing sector. The wave of industrialization led to a rise in migration rates from rural hinterlands to the cities. According to the 2001 census of India, 'there are 194 million households with 1028 people'. Despite the fact that adequate housing has been recognised as a necessity for social welfare, India has a total of 138 million households in rural areas and 56 million in urban areas, with 193 million being Normal Households (excluding Houseless and Institutional Households). These are further divided into 132 million households (70.8 percent) in rural regions and 55 million families (29.2 percent) in cities." (Indian census, 2001). Although appropriate housing is recognised as a necessary for social welfare, India did not have an official national housing strategy until 2007 (Tiwari & Rao, 2011). It is astonishing that despite 70 years of policy and planning design after independence, a total of 53% of families do not have access to potable water on their premises, 53% do not have bathrooms, and 33% do not have connectivity to electricity (Census 2011) (Tiwari & Rao, 2011).

Table 1: Housing Scarcity across India (Millions)

Year	Rural	Urban	Total
1951	6.5	2.5	9.0
1961	11.6	3.0	15.6
1971	11.6	3.0	14.6
1981	16.3	7.0	23.3
1991	14.6	8.2	22.8
2001	13.5	8.9	22.4
2011	17.4	9.1	26.5
2021	-	-	18.78

Source: Census 2011 in accordance with the 11th plan (2007-12) of the Planning Commission, the Government of India, the National Building Organisation, NITI Aayog, and the Ministry of Housing and Urban Affairs report

Some housing policies include the Indira Awaas Yojana (IAY) (1985-86), Rajiv Awaas Yojana (RAY) 2013, and Housing for All (2015); of which they focussed more on the rural and urban poor, infrastructural provision, and funding subsidies. These policies lack housing for many social groups of the society such as women, the elderly, and refugees among others. As a result, emerging countries such as India place a greater emphasis on housing development and construction. The housing crisis mostly affects the poor or slum dwellers, as well as the economically vulnerable low- and middle-income groups. The present government was also running one of its housing policies by the name of "Housing for all". The Prime Minister of India proposed this housing strategy in June 2015. It concerns the policy of credit link subsidies, which will be implemented through the central sector plan. The project intends to offer homes to the urban poor, including slum residents, with the key target categories being LIG, EWS, and MIG I and II. This scheme also introduced some new construction techniques and new materials, which give a sustainable friendly environment to the citizens. The husband, wife, and unmarried children must fulfil insurance policy conditions to receive benefits. They cannot own a pucca home in India in their name or in the name of a family member to receive central funding under the mission. First, women may register their homes in their names. The GOI gave the women the right to possess their properties. Policy criteria for a beneficiary family include husband, wife, unmarried boys, and girls. To get central support

under the mission, they cannot possess a pucca house in India on their own or in the name of any family member. Women can name their homes. Women were empowered by the Government of India (GOI) to own their homes by name. Housing is the place where families are living, and it is one of the basic needs that provides all amenities to the human population. Housing style and development are changed in every city; it has different locations, areas, and sizes, some because of family income or living standards. In this paper, we discussed affordable housing, which is known as low-income housing, and nowadays in India, it is a very emerging segment in the housing sector. There is no precise definition of the phrase 'affordable' since it is a relative notion that might have several suggested connotations in different settings.

Table 2: Definitions of Affordable Housing

Government Organisation Ministry of Housing and Urban Poverty Alleviation	• Size of dwelling unit (DU), Carpet area: - 21-27 sqm. Size of DU for EWS: - 28-60 sqm. (Super Built- up area), for LIG A: 28-40 sqm., for LIG B: 41-60 sqm • Monthly home loan repayments should not exceed 30-40% of the buyer's monthly income. • Annual Income, for EWS up to 2 lakh and LIG 1 lakh to 2 lakh
Research Institute Making Urban Housing Work in India (RICS, LEVVEL, CBRE)	Provision of 'Adequate Shelter' on a continuous basis, assuring tenure security within the reach of the average urban household. Affordable housing is supplied to people whose requirements cannot be satisfied on the free market.
Private Sector A vital growth engine in the real estate industry.	• Income level (Independent Variable) • The size of the dwelling unit (Independent Variable) • Affordability (Dependent Variable)

1.1. METHODOLOGY

Various books, documents, reports, and research papers related to the subject matter are studied. In the secondary data collection, we include annual reports and other publications by the Ministry of Housing and Urban Affairs. Housing is classified into three broad categories and accordingly, data is collected and analysed. Based on the observations of data thus collected, the shortfall in this sector is determined.

1.2. AIM

To identify gaps and provide suggestions, solutions, and recommendations for sustainable affordable housing.

1.3. OBJECTIVES

1) Literature study for affordable housing and government policies
   - To analyse the gaps of the policy on the ground.
   - To Study how sustainability helps to make housing affordable through its new techniques and system.
2) Strategies for Affordable housing to build a good economy and environment.
3) Proposals for futuristic affordable housing

1.4. PURPOSE OF THE STUDY

The purpose of this research is to analyse the present scenario of affordable and sustainable housing in India and to determine the shortfall in housing. Accordingly, some strategies are recommended to bridge the gap.

1) Housing scenario in India:

In India, migration to cities is on the rise as people seek better living conditions and employment possibilities. Since post-independence, the government of India has focused on the housing problem in the country, and they made some policies and programs related to housing. PMAY is one of the schemes, which started in June 2015 intending to provide housing to all in the urban and rural areas of India. According to the 2011 Census, there were 13.65 million slum households in 4041 statutory towns, up from 10.2 million in 2001, representing a 34% increase over the previous

decade. At the same decadal rate, slum families are expected to increase to 18 million by 2021. Of India's 1.21 billion inhabitants, 377 million live in cities, and with more than 10 million people moving to cities each year, the country's urban population is predicted to reach 600 million by 2031. The increasing speed of urbanisation caused by rural-urban migration is putting a pressure on the urban infrastructure of these cities. As urbanisation continues, India's urban planners are increasingly concerned about the country's significant urban housing deficit. A focus on increasing private sector engagement in affordable housing, which has traditionally been a government area, might help India's urban housing situation. These housing initiatives are of the utmost significance in a nation like India with a population that is expanding at a rapid rate. However, simultaneously facilitating the widespread demand for affordable housing and promoting it through favourable policies and programs may have an exponential impact on the environment in terms of climate change, soil erosion, and resource depletion. As a result, affordable housing regulations must also consider energy and sustainability issues. Because global issues like addressing climate change and sustainable infrastructure development are receiving increased attention, the interests of governments and corporate stakeholders in sustainable housing have increased recently. Buildings use a lot of energy and resources both during construction and operation, and in India specifically, the construction industry is responsible for around 24% of the country's total greenhouse gas emissions (GHG). This only emphasizes how important it is to incorporate sustainability into schemes for inexpensive housing to preserve the necessary equilibrium between the social requirements of the present and the needs of the next generation to survive in urban areas. To summarize the opportunities and constraints involved in implementing sustainable and affordable housing developments in India, this study will first investigate the global state of this industry. The number of census dwellings in India (excluding Assam, Jammu and Kashmir, Goa, and Daman & Diu) increased from 104.44 million in 1961 to 190.33 million in 1991, an increase of 85.89 million or 82%. The number of census dwellings increased by around 62 percent in rural regions, but by 178 percent in urban areas between 1961 and 1991. The MHUPA's Task Force on Affordable Housing, established in 2012, defines affordable housing as shown in Table 3. Affordable housing is characterised by three primary parameters: income level, dwelling unit size, and affordability, which determine the income criterion for affordable housing.

2) Affordable housing policies:

India is a developing country and takes second place in the world for population growth. Many Indians live in rural areas but for a better life, people come to urban areas which promotes urbanization. The Indian government has failed to provide housing in the city since independence. For housing issues, the Indian government is always focused on providing houses and shelters for slums. In all five-year plans, the government always made some policies, schemes, and programs on housing.

Table 3: Criteria for affordable housing beneficiary

Income groups	Size	Income criteria	Affordability
EWS	• 21-27 sqm of carpet area • Subsidies may limit EWS to a maximum area of 25.2-30.8 square meters.	The maximum monthly household income for the EWS and LIG groups is advised to be INR 8000 and INR 16000, respectively; however, because many homes in this category do not have a consistent monthly income, an annual income of INR 10,000 for EWS and INR 200,000 for LIG households might also be utilised.	The task committee advises that the ideal house price-to-income multiple for affordable housing developments be 5.
LIG	• 28-40 sqm of carpet area • LIG subsidies may limit the maximum area to 36.9-45.1 sqm.		
MIG	• 41-60 sqm of carpet area		
Source MHUPA, (Government, 2013)			

Table 4: Post-independence housing policies and programmes

Year	Housing policies and program
1952	**Subsidized Housing Programme** – It is the first housing initiative in which the central government offers financing for land and house building.
1954	**Low-Income Group Housing Scheme-** In this arrangement, the government grants an 80% loan to homeowners with an annual income of less than 6,000.
1956	**Slum Clearance and Improvement Scheme-** to eliminate sprawl by offering dwellings at reasonable rents.
1959	**Middle Income Group Housing Scheme** –encourages the development of rural homes and infrastructure.
1959	Other schemes **–Rental housing for state government employees, village housing project schemes, land acquisitions, and development schemes.**
1970	**Creation of HUDCO (Housing and Urban Development Corporation)-** promoting sustainable habitat development and lending to LIG for long-term payback durations.
1977	**Formation of HDFC-** It is a private cooperative that provides individuals with financing options for homes.
1985	**Indira Awas Yojana-** Providing housing for BPL households in a remote region.
1987	**Establishment of NHB (National Housing Bank)-** The RBI established this financial entity to supply home financing.
1990	**Nehru Rozgar Yojna's Scheme of Housing and Shelter Up gradation-**dedicated for the urban poor.
1998	**Formation of NHHP (National Housing and Habitat Policy)-** This program disrupted the housing market for both ownership and renting models for EWS and LIG groups.
2001	**Valmiki Ambedkar Aawas Yojana –** offers and improves slum dwellings.
2009	**Rajiv Awas Yojana-** This strategy aims to give slum residents with property rights and achieve a slum-free India.
2015	**Pradhan Mantri Awas Yojana Scheme in June 2015-** The Prime Minister of India launched the housing for all initiative. This strategy is based on Credit Linked Subsidies and Partnerships for Affordable Housing.
2017	**Status of Infrastructure for affordable housing-** government has established infrastructure status for affordable housing projects in order to enable access to institutional funding and lower borrowing costs. **Public-Private Partnership for Affordable Housing** - On September 21st, the government implemented a PPP strategy that incorporates a variety of models and levels of assistance. One of them is to grant federal support of Rs. 2.50 lakh to every dwelling, even those on private grounds. **Govt. hikes carpet area for affordable housing** - In November, the carpet area for the MIG-I and MIG-II groups under the PMAY plan was increased from 90 to 120 square meters and 110 to 150 square meters, respectively.

Source: Affordable housing climate in Mumbai report (2018)

2. CHALLENGES IN POLICIES

The Pradhan Mantri Awas Yojana, also known as PMAY, is a program run by the Indian central government with the goal of making affordable housing available to everyone by the year 2022. Some of the shortcomings are PMAY has been delayed in implementation which is why it is extended to 2024 from 2022. Long waiting times have been a source of frustration for a significant number of beneficiaries who are entitled to their homes. The plan concentrates its efforts exclusively on metropolitan areas, ignoring the fact that those living in rural areas also require inexpensive housing. Income Criteria is another gap in the policy to provide housing. Some people believe that the income criteria for eligibility are set too high, which causes many qualified people to be disqualified from applying.

Table 5: Housing policy criteria for different income groups

Income Segment	Delivery Channel	Housing Segment	Gov. Defined Annual HH Income	Urban Housing Shortage (DUs)	Gov. Defined Size of DU
HIG	Private Sector – led Government-led (small-scale)	Market Housing	>6 Lakh	0.82	600 - 1,200 sq. ft
MIG				(4.38%)	(55-110 m²)
LIG	Government-led Gov-subsidised	Social Housing	3-6 Lakh	7.41 million (39.44%)	300 - 600 sq. ft (28-55 m²)
EWS	Gov-mandated Cooperatives -Private-sector-led targeting EWS/LIG		< 3 Lakh	10.55 million (56.18%)	< 300 sq. ft (< 28 m²)

The quality of the construction was questionable. Many projects raised questions regarding the longevity and safety of the residences that have been erected as a result. Obstacles presented by bureaucracy such as the application procedure and approval methods have been criticized for being so difficult and time-consuming that they discourage people who are qualified to apply for the position. Obstacles in the way of funding, concerns have been raised over the allotment of budgetary resources since adequate funding for the scheme is necessary for its success. Obstacles Presented by Rapid Urbanization and Population Growth Keeping up with the demand for affordable housing can be a difficult task due to rapid urbanization and population growth. Some people believe that the program ought to be subjected to more stringent monitoring and evaluation to guarantee its efficiency and forestall the inappropriate distribution of resources. It is essential to emphasize the fact that the government has been striving to resolve these problems and enhance the PMAY program over time. When examining the inadequacies of PMAY, it is vital to consider the local environment, as the unique issues and complaints may vary from one location to another.

3. RESULT AND DISCUSSIONS

The Government of India (GOI) has taken several initiatives to strengthen the housing facilities in the nation. Some of the documents on the housing scenarios were prepared by the government departments. So many peer-reviewed articles and government-published documents were included in the research of the current and past housing analysis. The paper presents the study of affordable housing in terms which is easy to understand. In this paper, we present suggestions, solutions, and recommendations for affordable housing. As per our study on this research we find that many schemes and policies are speaking about sustainable and affordable housing but many housing projects are not founded on sustainability and affordable for the citizens. The GOI should do some awareness programs and involve NGOs to spread detailed information about the government schemes related to affordable housing it can help citizens to understand the government schemes and programs deeply. As a result, some suggestions are provided for policymakers, researchers, and bureaucrats in India's housing market, based on a review of sustainable, inexpensive housing in India. These recommendations are intended to further encourage and strengthen the development of sustainable, affordable housing.

1) **Strengthen Policy Frameworks:** reinforce of building considerations, zoning regulations, and financial incentives to support environmentally friendly and economical home construction.

2) **Encourage Innovation:** execution of integrated approach of architecture, urban planning and technology for new innovations. This involves providing financial incentives for the adoption of energy-efficient designs, affordable housing prototypes, and environmentally friendly building materials such as light house technology used in PMAY.

3) Investigate the possibility of public-private partnerships, microfinance, and government subsidies as means of making house ownership more accessible to low-income families and individuals.

4) Provide financial incentives for green building certifications. Provide financial incentives to developers who obtain green building certifications such as LEED or GRIHA certification. Provide financial incentives or tax breaks to projects that reach certain quality thresholds.

5) **Address Land Use Challenges:** Implement urban planning tools and techniques that optimize land use, decrease sprawl, and develop communities with a mix of different types of uses.

6) Involve local communities in the process of planning and making decisions on sustainable, affordable housing developments i.e. "community engagement.

7) Establish systems for continual monitoring and assessment of sustainable affordable housing initiatives to guarantee that these projects accomplish their intended economic, environmental, and social goals. The outcomes of regular assessments will help to make reforms and amendments.

8) **Invest in capacity building:** To guarantee that builders, architects, and construction workers have the skills and knowledge necessary to effectively adopt sustainable construction methods, it is important to invest in training and capacity-building programs for these groups.

9) **Public Awareness and Education:** Initiate public awareness campaigns to educate individuals on the merits of environmentally responsible and cost-effective housing.

10) **Support for Vulnerable Populations:** Tailor housing policy to suit the special needs of vulnerable populations, such as women, elder people, persons with diverse abilities, and marginalized groups, ensuring that they have fair access to housing that is both affordable and sustainable.

11) **Cross-Sector Collaboration:** Encourage collaboration between housing, transportation, and environmental authorities to develop integrated solutions that simultaneously address affordability, accessibility, and environmental sustainability in housing.

By putting these suggestions into action, India would be able to make significant headway in resolving the housing issues that plague the country while also enhancing its economy and minimizing its impact on the environment. Affordable and sustainable housing has the potential to be a driving force behind constructive social change, elevating the standard of living for millions of the nation's inhabitants.

4. CONCLUSIONS

Although the Pradhan Mantri Awas Yojana (PMAY) program in India has made admirable attempts to provide affordable housing, the program might benefit from numerous crucial recommendations, including simplifying and streamlining the application processes as beneficiaries' time spent navigating bureaucracy and waiting for decisions should be cut down by streamlining and speeding up the application and approval processes; increase the program's reach to cover rural areas. The program's scope should be expanded to cover rural areas that have major housing needs as well. Also evaluating the criteria for income, the criteria for income should be reevaluated and, if necessary, revised to make more people eligible for help. Ensure that rigorous quality control methods are implemented to guarantee that newly built homes fulfil all applicable safety and durability standards. Increase the Amount of Funding Allocated; to satisfy the ever-increasing demand for low-cost housing, you need to increase the amount of funding that is allocated to the program. Improving monitoring and assessment to properly track progress, prevent the misallocation of resources, and maintain accountability, you need to improve the monitoring and assessment systems. Promotion of awareness increases public awareness of the scheme so that beneficiaries who are eligible for the program are aware of the benefits it offers. In conclusion, the Pradhan Mantri Awas Yojana (PMAY) scheme is an important government project in India that aims to provide housing that is affordable for all. Although it has made some headway in meeting housing requirements, there are still many obstacles and critiques connected to it. These include lags in implementation, restricted coverage, rigorous income criteria, worries about the quality of buildings, bureaucratic impediments, financial constraints, and the continued difficulties caused by growing urbanization. Continued efforts to fix these deficiencies, expedite processes, and guarantee that affordable housing reaches those who use it the most are essential to the success of the PMAY scheme, which is dependent on these efforts.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

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