

Challenges in Integrating Sustainability into Affordable Housing Projects in India

Dr. Mayank Varshney^{1*}, Er. Krishan Murari², Ar. Meenu Varshney³,
Ar. Shweta Choudhary⁴

¹Professor, Civil Engineering Department, Vivekananda Institute of Technology, Jaipur

²Assistant Professor, Civil Engineering Department, Vivekananda Institute of Technology, Jaipur

³Associate Professor, Malviya National Institute of Technology, Jaipur

⁴Assoc. Professor, Architecture Department, Vivekananda Global University, Jaipur

ABSTRACT

The main aim of Affordable & Sustainable housing is to meet the growing housing needs of the people belonging to a larger community by providing them with better social, economic & physical conditions and also at the same time minimizing the lifecycle environmental impacts of the housing in the long run. Both Affordable & Sustainable housing are not compatible in general. This particular study will analyze the various challenges and opportunities in planning, designing & implementing such a composite housing system in an Indian scenario. It is learned that, the major obstructions or impediments in integrating affordability & sustainability in India's housing sector basically are; inadequacies in the existing regulatory framework, and the perceived notion that incorporating sustainability implies additional costs. This study finally concludes by providing key suggestions for implementing the concept of affordable & sustainable housing in India, such as framing favorable & clear cut policies and also strengthening the supply chains of sustainable materials.

Key words –Affordable housing, Sustainable Housing, Environmental sustainability, Life cycle Environmental Impacts, Low-cost Housing, Social Housing, Sustainable Materials

INTRODUCTION

In various countries & places where a majority of the population cannot afford to buy homes at the prevailing present market rates, the government has to bear the responsibility of providing decent shelter & ensuring adequate living conditions to all its citizens or people. In this context, projects that constitute low-cost housing, social housing or affordable housing have already been developed by various countries. In a country like India with the rapidly growing population, and burgeoning housing demand such schemes are extremely important.

However, facilitating and fulfilling the large scale demand for such affordable housing and also promoting it through favorable policies and schemes would concurrently create an exponential adverse impact on the environment in terms of depletion of natural resources, soil erosion, and climate change. Therefore, it is also important to consider and incorporate energy and sustainability related aspects into the affordable housing rules & regulations. In the recent times, the interests of governments' and corporate stakeholders in sustainable housing have increased manifold because globally, issues such as addressing the climate change and sustainable infrastructure development is getting increased attention.

On a global scale, buildings consume tremendous energy and resources in both construction and operation phases, and especially the construction sector in India accounts for about 24 percent of its total greenhouse gas emissions (GHG) [8]. This reinforces the need for integrating sustainability into affordable housing projects, to maintain the required balance between social needs of the present, and the needs of the future generations to sustain in the urban environments. Therefore, this study is aimed at investigating the current scenario of this sector on a global scale, followed by summarizing the challenges and opportunities existing in realizing sustainable and affordable housing projects in India.

METHODS

The concept of green and affordable housing’ had gained importance since the early 2000’s in the US with policies and regulations favoring it. Washington D.C. was the first state in US that framed a specific legislation for ‘Green Affordable housing’ with the Evergreen Sustainable Development Standard (ESDS) [2]. Similarly, sustainable development agenda is being promoted in the social housing sector in countries such as UK, New Zealand, and China [3,4] . In India, IGBC (Indian Green Building Council) has launched the green affordable housing rating system with an objective to ensure a high degree of sustainability with no or minimal additional cost to the building developer or the occupant. Though vast research is done in the area of environmental sustainable buildings, it is not so prevalent in the affordable housing segment owing to the perception that sustainability and affordability are incompatible in nature. Table 1 below summarizes the various challenges as identified through existing studies & reference material available in literature review in this domain.

Table 1 Challenges in Implementing Sustainable and Affordable Housing

| Challenges identified from literature in implementing sustainable and affordable housing | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Inadequacies in regulatory frameworks that frame policies and schemes with respect to housing and sustainability | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Lack of awareness about low-cost ‘green’ technologies among stakeholders of affordable housing projects | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Poor supply chain of sustainable materials | | | | | ✓ | ✓ | | | |
| Lack of access to information from documented sources about successful measures of achieving sustainability | ✓ | ✓ | | ✓ | ✓ | | ✓ | | ✓ |
| Improper construction practices | | | ✓ | | ✓ | ✓ | | ✓ | |
| Perceived high cost for sustainable practices | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| Incompetence of the project implementation bodies | | | | | ✓ | ✓ | | | |

RESULTS AND CONCLUSIONS

The preliminary investigations and literature review conducted across the globe reveal that ‘Inadequacies in the regulatory framework’ and "perceived notion that incorporating sustainability might lead to increased project costs" are the major & prime impediments in the implementation of sustainable and affordable housing. In India, therefore the government policies and schemes should include additional grants or incentives for ensuring sustainable practices in the affordable housing projects. Innovative & dynamic business models which facilitate in promoting sustainable techniques in the social & affordable housing that involve higher initial investments should be promoted, by involving third party investors who would lease these facilities in return for annual long term payments or subsidies and tax benefits from the government. Similarly, the focus should also be shifted towards strengthening the supply-chain of sustainable materials thus making them easily accessible at lower costs. Above all, better construction practices to be adopted with core focus on environmental sustainability should be encouraged in affordable housing projects with minimal impact on the project budgets.

In short, even though there is a grave necessity for the large scale housing projects in India to meet the social requirements, the environmental impacts of such mass construction should also be given due contemplation. This is an ongoing study on the related subject and shortly a simulation based computational framework shall be developed that will facilitate analyzing the impacts of various challenges and opportunities associated in realizing sustainable and affordable housing goals in India.

REFERENCES

- [1]. Bradshaw, W., Connelly, E.F., Cook, M.F., Goldstein, J. and Pauly, J., 2005. The costs and benefits of green affordable housing. *Cambridge (MA): New Ecology*.
- [2]. Bruen, J., Hadjri, K. and von Meding, J., 2013. Design drivers for affordable and sustainable housing in developing countries., *Journal of Civil Engineering and Architecture*, 7(10), pp.1220-1228
- [3]. Deepa Gopalakrishnan, N., 2006. *Sustainable-Affordable Housing for the Poor in Kerala* (Doctoral dissertation, Birla Institute of Technology and Science)
- [4]. Development alternatives research, 2014. Sustainable Social Housing Initiative-Stakeholder assessment report, Sustainable Social Housing Initiative, Development alternatives, New Delhi. (<https://smartnet.niua.org/sites/default/files/resources/Sustainable%20Social%20Housing%20Initiative.pdf>)
- [5]. Henry, M., Ross, J., & Harold, J. 2013, Barriers to Developing Sustainable Housing in Palmerston North. : Massey University. <http://www.massey.ac.nz> .
- [6]. Kathy Moore Cowan, "Green, Affordable" Housing: A Contradiction in Terms?' Federal Reserve Bank of St. Louis-Central to America's economy, Bridges, summer 2008, <https://www.stlouisfed.org/publications/bridges/summer-2008/green-affordable-housing-a-contradiction-in-terms>.
- [7]. Oyebanji, A.O., Liyanage, C. and Akintoye, A., 2017. Critical Success Factors (CSFs) for achieving sustainable social housing (SSH). *International Journal of Sustainable Built Environment*, 6(1), pp.216-227.
- [8]. Parikh, J., Panda, M., Ganesh-Kumar, A. and Singh, V., 2009. CO2 emissions structure of Indian economy. *Energy*, 34(8), pp.1024-1031.
- [9]. Ugochukwu, I.B. and Chioma, M.I.B., 2015. Local building materials: affordable strategy for housing the urban poor in Nigeria. *Procedia engineering*, 118, pp.42-49
- [10]. Zhang, X., Shen, L. and Wu, Y., 2011. Green strategy for gaining competitive advantage in housing development: a China study. *Journal of Cleaner Production*, 19(2-3), pp.157-167.