Affordable housing for tomorrow – leading to a sustainable future

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Abstract : The future of affordable housing is probably the most critical issue we come across when the society at large is hit by three major forces. Firstly, demographic changes with an elder generation, smaller houses, and a younger generation with vastly differing values – a complete mismatch between the built and the needed in future. Secondly, energy costs going high, the need to reduce our carbon footprints - again a mismatch between the supply and the demand. Finally, income inequality going higher, lower relative incomes for a majority of the population – mismatch again between what is available and exactly what is required in the future.

IndexTerms **- Alternative Livelihood; Sustainable Development; Eco-friendly Architecture; Smart City; Urban Planning; Affordable Housing.**

I. INTRODUCTION

In India, it is estimated that in 2009–10, approximately 32% of the population used to live below the poverty line and since then there has been an increasing demand for affordable housing. The deficit in urban housing is estimated at 18 million units most of which are amongst the economically weaker sections of the society. Some developers are developing low cost and affordable housing for this population. The Government of India has taken up various initiatives for developing properties in low cost and affordable segment. They have also looked at the PPP model for development of these properties. 'Government of Haryana' launched its affordable housing policy in 2013 [1]. This policy is intended to encourage the planning and completion of "Group Housing Projects" wherein apartments of "pre-defined size" were made available at "pre-defined rates" within a "Targeted time-frame" as prescribed under the present policy to ensure an increased supply of "Affordable Housing" in the urban areas of Haryana. This picture synchronizes with all India basis trend (Fig. 1).

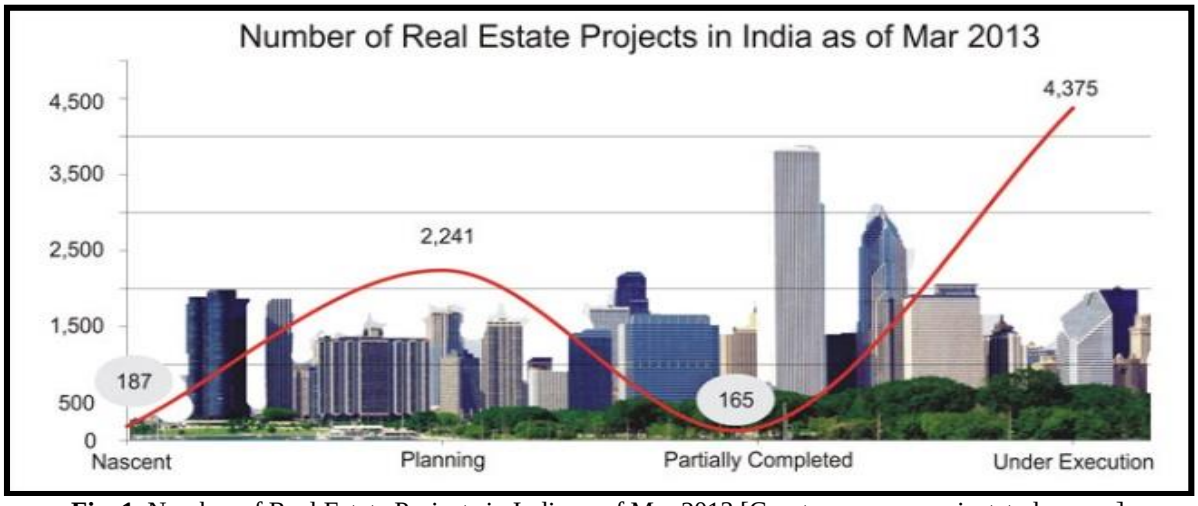

Fig. 1. Number of Real Estate Projects in India as of Mar 2013 [Courtesy: www.projectstoday.com]

Economic growth leads to rise in income, but this leads to even faster rise in property prices, leaving it un-affordable for the majority of the population. Affordable housing would have a positive impact on the society by improving the basic quality of life.

The concept of affordable housing seems to be a simple solution to current housing woes, but to make affordable housing work, it would require "will" from all the stakeholders by slightly adjusting their interests towards a wider social cause (Fig. 2).

What is an affordable house?

AS DEFINED BY KPMG

	Income level	Size of dwelling unit	Affordablity
EWS	Rs 1.5 lakh a year	up to 300 sq ft	EMI to monthly income 30-40%
LIG	Rs 1.5-3 lakh a year	300-600 sq ft	House price to annual income Less than 5:1
MIG	Rs 3-10 lakh a year	600-1,200 sq ft	

AS DEFINED BY MINISTRY OF URBAN POVERTY ALLEVIATION (2011)

	Size	EMI or rent
EWS	• Minimum of 300 sq ft super built-up area • Minimum of 269 sq ft carpet area	Not exceeding 30-40% of a buyer's gross monthly household income
LIG	• Minimum of 500 sq ft super built-up area • Maximum of 517 sq ft carpet area	
MIG	• 600-1,200 sq ft super built-up area • Maximum of 861 sq ft carpet area	

EWS: Economically weaker section, LIG: Low income group, MIG: Middle income group

Fig. 2. What is an affordable house? [Courtesy: www.indiatoday.intoday.in]

II. THE LIVELIHOOD CONCERN

Lack of affordable housing poses a burden on local economies. Because of this, the consumers mostly face mortgage arrears and excessive debt and therefore cut back on consumption. A combination of high housing costs and high debt levels contributes to a reduction in savings. These factors can lead to decreased investment in sectors that are essential to the long-term growth of the economy.

In some countries, the market has been unable to meet the growing demand to supply housing stock at affordable prices. Although demand for affordable housing, particularly rental housing that is affordable for low and middle-income earners, has increased, the supply has not. Potential home buyers are forced to turn to the rental market, which is also under pressure. Inadequate supply of housing stock has accelerated the demand on the private and social rented sectors, and in the worst case the scenario is homelessness [2].

Some of the factors that affect the supply and demand of housing stock are as follows:

- Demographic and behavioural factors
- Migration (to cities and potential employment)
- Increased life expectancy
- Building codes
- A greater propensity for people to live alone
- Young adults delaying forming their own household (in advanced economies).
- Exclusionary zoning

When we look at the bigger picture, we see overpopulation almost everywhere and witness unplanned urbanization, which is mostly universal in nature.In this context there is an utmost need for ecofriendly space of dwelling. The concept of sustainable Affordable Housing with modular, compact, affordable and high-volume housing apparently is the answer.

III. ARCHITECTURAL INTERPRETATION

Affordable housing should include provisions to remain at an affordable price for future eligible households or for the subsidy to be recycled for alternative affordable housing provision. However, there must be an assurance for congenial environment also. Affordable housing is an option/ provision which is deemed affordable to those with a median household income as rated by the National Government or a local Government by a recognized housing affordability index. Most of the literature on affordable housing refers to mortgages and the number of forms that exist along a continuum – from emergency shelters, to transitional housing, to non-market rental (also known as social or subsidized housing), to formal and informal rental, indigenous housing, and ending with affordable home ownership. The affordability of housing is one of the main elements in the social, economic and environmental health of a region. It is a key indicator of smart growth and implicates the local government, transportation, economic development, environment, and shelter sectors in the need to improve quality of life. Ensuring a range of housing options and prices is a key smart growth strategy. By using our land more efficiently, building homes closer to employment, shops and learning institutions, we are creating more complete communities that reduce the need for driving, expanding costly infrastructure, and using up valuable green space [3].

The Affordable housing should have a design development process that addresses several core values like being community focused, designed to serve working families, incorporated green building strategies and demonstrates a comprehensive sustainable model. This would assist while meeting the need for sustainable affordable housing, focusing on the needs of the mass, fitting the immediate neighborhood and its environment.

The notion of housing affordability became widespread in the 1980s in Europe and North America. In the words of Alain Bertaud, of New York University and former principal planner at the World Bank, "It is time for planners to abandon abstract objectives and to focus their efforts on two measurable outcomes that have always mattered since the growth of large cities during the 19th century industrial revolution: workers' spatial mobility and house [4].

Housing choice is a response to an extremely complex set of economic, social, and psychological impulses. For example, some households may choose to spend more on housing because they feel they can afford to, while others may not have a choice. Housing is a definitely a positive right. Everyone, regardless of their economic status, should have access to affordable housing that is clean, healthy, safe, economical and environmentally sustainable.

Despite the current surge in the construction of lowcost housing environments worldwide, the quest for affordable housing remains elusive for a large segment of local societies. Descent, affordable housing is emerging as a critical issue toward the social and economic well being of local populations. Demands for such housing continue to far outstrip supply and those projects that are currently built suffer from severe cost constraints while lacking important qualities that relate to people needs and cultural aspirations [5].

To many architects, engineers, and developers, the terms "affordable housing", "design", and "the preferences and lifestyles of the targeted populations" are exclusive and are looked at in isolation. Once the goal of providing quality design and once the goal of understanding people preferences and their lifestyles enter the discussion, it is generally assumed that the cost will automatically increase. When production techniques are developed to provide genuinely affordable housing, effort is often focused on cost reduction only while preferences and lifestyle aspects are overlooked. Theorists argue that it has proven difficult to strike a harmonious balance [5].

The Architectural designing process can also use the good practice of a mass participatory and interactive planning model, to encourage and appreciate inputs from various interested individuals, social groups, communities and all other such stakeholders. This process would help the designer to envisage and zero down to some specific design criteria which can then be incorporated in the project, making the Shelter suitable for all.

IV. MEASURING THE AFFORDABILITY OF HOUSING

Median Multiple:

The Median Multiple indicator, recommended by the World Bank and the United Nations, rates affordability of housing, by dividing the median house price by the gross (before tax) annual median household income. This index is, however, region-specific.

"A common measure of community-wide affordability is the number of homes that a household with a certain percentage of median income can afford. For example, in a perfectly balanced housing market, the median household (the wealthier half of households) could officially afford the median housing option, while those poorer than the median income could not afford the median home. 50% affordability for the median home indicates a balanced market."[6].

Determining housing affordability is complex and the commonly used housing-expenditure-to-income-ratio tool has been challenged. In the United States and Canada, a commonly accepted guideline for housing affordability is a housing cost that does not exceed 30% of a household's gross income. Canada, for example, switched to a 25% rule from a 20% rule in the 1950s. In the 1980s, this was replaced by a 30% rule [7]. India uses a 40% rule.

Housing Affordability Index (HAI):

One of the greatest strengths of the HAI developed by MIT is its ability to capture the Total Cost of Ownership of individuals' housing choices. In computing the index, the obvious cost of rents and mortgage payments are modified by the hidden costs of those choices.

The term "housing affordability" has come into popular usage in the last two decades, replacing 'housing need' at the centre of debate about the provision of adequate housing for all (Whitehead, 1991; Swartz and Miller, 2002). According to Fallis (1993), this move could be attributed to the increasing adoption of more market-oriented reforms within the housing sector in many countries [8].

Affordability has become the key term in housing policy in both developed countries and those in transition. In the latter, the puzzle is that high price/income ratio is accompanied by low levels of housing cost/income ratio, which means that most of the transactions are based on cash transfers, both inter-generation (inheritance) and intra-generation (family help). Housing affordability focuses on the relationship between housing expenditure and household income, and defines a relative or absolute standard in terms of that income above which housing is regarded as unaffordable. Affordability considers not just housing, but also what quality of housing is obtained and whether the household has enough income remaining for other necessities of life after offsetting the cost of housing [8].

V. CONCLUSION

Intermediate housing must be available to households across these income ranges to achieve affordability and meet the full objectively assessed needs. There is no point only providing housing at the top end of the ranges as this will not meet the needs of households with middle-low incomes. Therefore, sub-market rent alongside low cost home-ownership options need to be provided. Developers are required to meet more of the cost of providing affordable housing following the government's revised funding framework. This makes it even more difficult to break the connection with market value of homes, which skews provision toward the top end of the affordability spectrum [9].

That there is a shortage of housing in India is not in contention. Clearly, despite a considerable increase in the housing stock, it is the supply of affordable housing that is the biggest challenge in India's urbanisation. The type of housing is broadly classified into economically weaker sections (EWS), low-income group (LIG), middle income group (MIG) and high income group (HIG). As land and housing are state subjects, the classification of income groups varies from state to state [9].

We do have all the resources and the required technology, now we need the right will, to create a sustainable Affordable Housing environment, aiming towards providing dwelling units that are economically designed and built, that have minimum energy bills, that are free from any toxic building materials and interwoven with greenery and are then, truly sustainable for our future generations to come.

The housing sector is an important contributor to the economy. It is the second-largest source of livelihood after agriculture, contributing a 5 per cent to 6 per cent share of India's GDP and capital formation. It is perceived as the third most impactful industry in terms of its effects on other industries, as it directly affects over 250 ancillary industries such as cement, steel, transport, construction, paint, brick, building materials, and consumer durables. It is expected to soon overtake other industrial sectors in terms of GDP contribution [9].

As an assurance to the quality of Affordable Housing, the entire system can be linked with cryptography, which is a mechanism of securely encoding the picture of a system, i.e. whether the housing is following the building rules, ecological principles in terms of greenery, waste disposal and various other parameters. Also the construction protocol would be encrypted in this technology, which enables quality control of the data. The data generated would basically be a blockchain based supply chain management system which means that the planning, BOQ and cost estimation, construction, would be scanned as a QR code (like a bar code) through smartphone and every step can be monitored. In such a case the generated data quality would be of the highest degree, which would eventually serve as a road map for Affordable Housing in a sustainable Smart City/ village of the future.

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