

CHANGING PARADIGMS OF AFFORDABLE HOUSING IN INDEPENDENT INDIA - RESEARCH REPORT



INTRODUCTION

Housing is a basic social aspiration and indicator of living quality. Affordable Housing (AH) is socio-political agenda in any democratic country which ensures every family has a shelter to reckon with. India intensified its search for alternate options to AH as around 1.77 million people live without a roof over their heads (Jha, 2013) and around 10 million of the houses are dilapidated state while around 7 million are living unliveable conditions (MHA, 2011).

To overcome this giant gap, the Government of India (GoI) has come up with an ambitious plan of providing permanent shelter through the mission 'Pradhan Mantri Awas Yojana' (PMAY 2015)- Housing for All by 2022, with significant deviations from previous schemes. Policies are instrumental to realize socio-economic development goals set by any government which they propose in their election manifesto. Housing policy includes agenda-setting and creating procedural tools for policy application and appraisal. Implementation tools are fundamental to policy design and they device modification in the way services are provided to public or the approach of implementation of processes. Land and Finance mechanisms have evolved further in PMAY in comparison to other previous programs launched after independence of the country in 1947.

Review on policy changes and its impact on house ownership by economically weaker section (EWS) and low income group (LIG) people will be first deliverable of the article. Deliberations on strength and opportunity created by the PMAY will follow next. Lastly, the Sustainable Total Living Environment for Affordable Housing (S_{US}TLE-AH) model, a policy implementation tool, will be discussed. The S_{US}TLE-AH accommodates the concept of sustainable integration of design and planning of housing with appropriate technologies and materials, Eco-services' system network and disaster risk reduction. The model is developed as a road map to sustainable alternative for AH.

TEMPORAL SHIFT IN HOUSING POLICIES IN INDIA

After six decades of housing policy design and implementation for EWS and LIG housing in India, significance and limitation of these policies are being critically reviewed (Hingorani, 2011). After Independence, the young nation was reeling with burden of migrated people. Policies evolved with time to address changing socio-economic context. Initially, housing policies considered house to be a provision to be made available by the government, and no participation was expected from the target beneficiaries. A comprehensive list of policy initiatives are presented in Table 1. The quality of the housing provided was not good. Readily available housing could not evoke any sentimental attachments. People from lower income group could not retained ownership of the same for long. Market economy played role in change of ownership from the beneficiaries to higher income group which was in contrary to original intention. Rent control act led poor maintenance of rental housing stock leading to worse living conditions for tenants and loss of capital and income for landlords.

TABLE 1: List of Housing Policy Initiatives in India since Independence

Period	Settings	Initiatives	Outcome
1950s and 1960s	<p>During this period government was the Primary policy driver. Housing was considered more a welfare job than economic growth contributor.</p> <p>Private sector intervention was limited to HIG housing section. There was lack of coordination among different programs due to absence of strong housing policy. Development funds were majorly coming from central government subsidies.</p> <p>In the latter part state governments shared responsibilities other than funding. Construction of institutional buildings and affordable housing for poor were considered as government's responsibility. Major emphasis was on cost reduction, whereas there were shortcoming in master planning and land assembly for the poor</p>	<p>1952: Subsidised Housing Scheme for Industrial Workers and Economically Weaker Sections</p> <p>1954: Low Income Housing Scheme</p> <p>1956: Subsidised Housing Scheme for Plantation Workers</p> <p>1956: Slum Clearance and Improvement Scheme</p> <p>1959: Middle Income Group (MIG) Housing Scheme</p> <p>1959: Rental Housing for State Government Employees</p> <p>1959: Village Housing Projects Scheme</p> <p>1959: Land Acquisition and development by State government</p> <p>1961: Rent control Act</p>	<p>Due to lack of funds, targets were not achieved, on the contrary existing housing stock was reduced in the process of dismantling of depleted units, meant to reconstruct/ relocate.</p> <p>Public housing was out of reach both in terms of economic affordability and physical location from workplace. This resulted in the growth of informal illegal private housing, which was affordable and well- connected, but of low quality built environment.</p> <p>State governments were failed to assemble land for housing for urban poor. Growth in HIG/MIG housing stock was appreciable in proportion to demand.</p>
1970s and 1980s	<p>Housing in this period was considered more than just a shelter. High subsidies were replaced by cross-subsidization and cost recovery.</p> <p>In-situ slum upgrading and site and services programs were introduced instead of shifting of slum- dwellers.</p> <p>Formal housing finance organizations like HUDCO, HDFC, NHB were formed.</p> <p>State governments started sharing more financial responsibility. Central Government's role was changed to facilitator to state government and private sector instead of direct actor.</p> <p>Importance of community participation was</p>	<p>1970: Housing and Urban Development Corporation (HUDCO) established</p> <p>1971: Provision of House Sites of Houseless Workers in Rural Areas 1972: Environmental Improvement of Urban Slums</p> <p>1977: Housing Development Finance Corporation (HDFC) established</p> <p>1980: Sites and Services Scheme 1981: Scheme of Urban Low-Cost Sanitation for Liberation of Scavengers</p> <p>1980: Sites and Services Scheme</p> <p>1981 & 89: Scheme of Urban Low-Cost Sanitation for Liberation of Scavengers</p>	<p>HIG/ MIG benefited most from housing finance organizations.</p> <p>Government employees were the main beneficiaries of public housing schemes.</p> <p>Despite efforts, there were lag in community participation and growth was slow in weaker sections' housing.</p> <p>Rapid changes to institutional frameworks of programs and their structure slowed the process further.</p>

	encouraged. Housing stock in urban sector had better growth in-comparison to rural section	1985: Indira Awas Yojana 1986: Urban Basic Services Scheme (UBS) 1987: National Housing Bank (NHB) established 1988: National Housing Policy (NHP)	
1990s and 2000s	<p>Urban Local Bodies came to the driving seat with more powers and responsibilities with 74th Constitutional Amendment Act.</p> <p>Central government's role was that of an enabler and participation from private sector was encouraged.</p> <p>Still it was the MIG and HIG group who took maximum advantage of housing finance institutes.</p> <p>Focus was given on research of building material and affordable construction technology. Housing was integrated with urban services and public transportation under JnNURM.</p>	<p>1990: Building Materials and Technology Promotion Council (BMTPC) replaces NBO</p> <p>1990: Night Shelter Scheme for Pavement Dwellers</p> <p>1990: Nehru Rozgar Yojana's Scheme of Housing and Shelter Upgradation (SHASHU)</p> <p>1990-01: Urban Basic Services for the Poor (UBSP)</p> <p>1996: National Slum Development Program (NSDP)</p> <p>1998: 2 Million Housing Program 2001: Valmiki Ambedkar Aawas Yojana</p> <p>2005: Jawaharlal Nehru National Urban Renewal Mission, JnNURM</p> <p>2007: National Urban Housing and Habitat Policy (NUHHP)</p>	<p>Shortage of housing continued in LIG/EWS sectors. Land assembling was still an issue. UBLs were seem to lack in capacity to cope up with the targets.</p> <p>Community participation and Policy approach under JNNURM had limitations and thus resulted in inappropriate usages of funds.</p>
2010 onwards	The shortage of housing units meant for LIG/EWS is the target to reduce; contribution from government, private sector and beneficiaries are identified.	2013: Rajiv Awas Yojana 2015: PMAY- Housing for all	<p>Private participation in affordable housing was encouraged under RAY</p> <p>Private sector Investment increased in AH, as is considered as Infrastructure projects.</p>

Based on Hingorani, 2011

In 1970s and 80s, systematic effort to integrate poverty alleviation agenda to housing was initiated. Attention shifted to public-private partnership. Government's role was shifting as enabler than provider of housing; emphasis on efficient land and finance mechanisms, building materials and appropriate technology was laid. Through schemes like 'sites and services' or 'slum upgradation', clear shift towards participatory development was visible; beneficiaries were expected to contribute partly. Despite significant shift in paradigm, it failed to address the housing need of weaker sections and well-off section of the society continued to consolidate housing as asset.

In 1990s, after 73rd and 74th amendment of the Indian Constitution, Local Bodies (LBs) were entrusted with resource management. Implementation relied profoundly on capability of individual LB; planning and implementation capacity building become a major challenge for success. Incentives for private real estate sector and loan availability from housing finance industry brought positive change to MIG and HIG housing significantly. Later on, it eventually led to speculative housing stocks lying vacant. In the year of 2005, the Jawaharlal Nehru National Urban Renewal Mission (JnNURM) (MoUD, 2005) was instituted. This was meant for 64 cities at initial stage and is one of the largest investment allocated by any government globally. This has a component of Basic Services for Urban Poor (BSUP) to improve quality of built environment and services for weaker sections. The Mission offered options of in-situ renewal, redevelopment or new housing in different location. Efficient LBs could take advantage. This entire mission could bring a new perspective into capacity building of LBs. But success was limited to only those LBs who are equipped with professional project management. The Sardar Patel Urban housing Mission was discussed widely in the year of 2014 which was laden with new ideas like Foreign Direct Investment, Infrastructure project, high rise dense neighborhood etc. The GoI introduced the PMAY-2015 which is being analyzed in following sections.

PMAY-2015

In the year of 2014, the GoI planned to provide roof to every urban homeless family with a dwelling unit under Sardar Patel Urban housing Mission. Later the mission was discussed further and the "Pradhan Mantri Awas Yojana – 2015: Housing for all" is launched. The Mission identified scope to address the housing requirements of the Urban Poor (including slums) in four verticals (MoHUPA, 2015):

- Slum rehabilitation of Slum Dwellers with participation of private developers using land as a resource
- Promotion of Affordable Housing for weaker section through credit linked subsidy
- Affordable Housing in Partnership with Public and Private sectors
- Subsidy for beneficiary-led individual house construction

This is meant to cover all statutory towns as per Census 2011 and priority will be 500 Class I cities. These 500 Class I cities will be covered in three phases: Initial phase will end by 2017 with focus on 100 cities and then 200 each for 2nd and 3rd phase planned to finish by 2019 and 2022 respectively.

Slum Dwellers, Urban poor living in non-slum area, Prospective Migrants and Homeless and Destitute are in focus of the Mission. The recognized policies are: In-situ development/ upgrading for slum dwellers; affordable housing in partnership for urban poor; Temporary rental housing/ affordable house with interest subvention for migrants and government sponsored rental housing/ night shelter for homeless.

The Mission is expected to support construction of houses upto 30 m² carpet area with basic civic infrastructure. The States/UTs have the flexibility to determine the size of the house and other facilities at state level with consultation with the GoI but the central financial assistance not to be enhanced. Target of developing ten million dwelling units has been set under this scheme. It is the state government who will select the cities, deal with private investors, and decide upon building norms / guidelines like allowable built area, density etc. as per regional requirements, framed in consultation with experts from regional technical institutes.

“In-situ” Slum Redevelopment using land as Resource. This is an important tool for providing houses to eligible slum dwellers. This approach aims to leverage the locked potential of land under slums to provide houses to the eligible slum dwellers bringing them into the formal urban settlement (MoHUPA, 2015). Private Partner would be selected through Open Bidding System.

The government has a provision of doing the resettlement by self or by the help of private partners. The land of the slum would be under Central Government. Table 2 tabulates the process flow and role of stakeholders involved under this vertical. The larger portion of the land will be used for redevelopment of slum. But a small proportion of the land can be used for generating revenue by cross-subsidization and other tools.

Credit Linked Subsidy Scheme. (MoHUPA, 2015) This scheme is meant for the beneficiaries of EWS and LIG sector, seeking loans from Financial Institutions. The eligible beneficiaries will get the loans for an interest subsidy at the rate of 6.5 % for a tenure of 15 years or during tenure of loan whichever is lower. The subsidized rate would be applicable for loan amount of Rs. 6 lakhs only, for the Dwelling Unit with Carpet Area 30 m² and 60 m² for EWS and LIG sections respectively.

Affordable Housing in Partnership (AHP). AHP is the only scheme in the policy with a supply side intervention. For any AH project (as defined by PMAY), the Central Government will provide an assistance of Rs. 1.5 Lakhs per EWS dwelling unit to the developer. Benefits and credentials, definition of EWS etc. can be changed by State Governments with consultation of Ministry of GoI.

Beneficiary led individual house construction or enhancement. The beneficiary, living in or outside the slum, will get central assistance of Rs. 1.5 lakh for construction of new houses under the mission. The 4th vertical recommends that the beneficiary of this scheme should not be taking advantage over any other schemes of the policy (MoHUPA, 2015).

TABLE 2: Process Flow, Role and Responsibility of stakeholders under “In-situ” Slum Redevelopment

Serial no	Strategy	Responsible Authority
1.	Beneficiary de-notification	Central government
2.	Additional FAR/FSI	State government
3.	Grant (Rs. 1 Lakh/house)	Central government
4.	Upper Ceiling Cost	MoHUPA
5.	Privately owned land	Incentivised by state government
6.	Eligibility of slum dweller	State Government
7.	Beneficiary contribution	State Government
8.	Ownership rights or renewable /mortgage & inheritable leasehold rights	State Government
9.	2 components: <ul style="list-style-type: none">- “slum rehabilitation component”- “free sale component”	
10.	Area of slum under private developers	Implementing authorities
11.	Slum dwellers can participate by association or other suitable means	
12.	Developers - open transparent bidding Eligibility under State Government	

Based on MoHUPA, 2015

CHANGING DIMENSIONS OF LAND MARKETS FOR MASS HOUSING

In India, land use has been identified as a state (provincial) subject matter. Whereas any public authority can acquire land for ‘public purpose’ as defined in Land Acquisition Act, 1894. Traditionally compulsory acquisition of land has been a major source of land assembly by the public agency for all categories of housing and infrastructure development. In 70’s, almost all the state governments came up with Town and Country Planning Acts in order to control over use of land for a sustainable development and significant numbers of such planning authorities were framed accordingly. However in 90s, control over use of urban land was further percolated to the urban local bodies (ULBs or municipalities). On the other hand, in order to maintain an equitable distribution, the land ownership under any individual has been restricted for decades. As a result until 2000, bigger land parcels were scarce, especially in urban areas for large housing and other projects. Realizing these, governments started exploring various models (see Table 3 below) for mobilizing large land for mass housing.

Therefore the land management in India has been flown into two directions. Firstly the control over use of land has been decentralized up to the ULB level and secondly the extent of ownership of land has faced multiple restrictions with single ownership, causing scarcity of large land parcels in urban areas. Through various reforms and interventions as discussed above which government attempted to deregulate the land and to make it more market friendly to enable developers to develop large housing

projects. In the recently launched PMAY, government is encouraging similar approach in JV models through the sub-scheme called Affordable Housing in Partnership (AHP). However through the state level housing policies, other approaches like reforms and indirect interventions are applicable for housing.

TABLE 3: Land assembly models related to housing in India (after 2000)

<i>Sl no.</i>	<i>Model</i>	<i>Description of Model</i>	<i>Result</i>
1	Joint Venture (JV) Model	Cross subsidy based approach started in the state of West Bengal in the year 2000 and later adopted in the scheme named Affordable Housing in Partnership under JNNURM and PMAY. This model encourages private companies to form JV with public agencies like municipal authorities, housing boards and development authorities. Land is acquired by government partner and development right is given to private partner for developing housing with 50:50 sharing of profit.	Many housing projects came up through these model in spite of limitation of land laws.
2	Land Reform Model	Various legal and policy initiatives taken by government of India towards making land available from the market avoiding any legal and institutional barriers by doing <ul style="list-style-type: none"> • Repeal of Urban Land Ceiling and Regulation Act (making large land parcels available) • Amendment of Land Acquisition Act (making the process simple, shorter, inclusive and effective) 	Following these there are many housing projects coming up in the country which are market based and servicing the affordable groups
3	Indirect intervention Model	Various tools like Transferable of Development Right (TDR), Variable Floor Area Ratio, and Reservation for affordable housing and rental housing has been attempted to increase the total supply of homes in piece of land. Rental housing has been indentified in PMAY as a preventive mechanism for the slum formation.	Due to these indirect influences of land market, the proportional share of affordable housing in mainstream housing market has increased manifold.

Apart from the above model based on partnership, the PMAY mentioned in-situ development of slum in central government land, by using it as a resource for providing houses to slum dwellers. In case of relocation, a land should either be provided by the agency or the agency may collaborate with the States/UTs for obtaining land from

State/UT/City. Central Government agencies should not charge land costs for the land used for the purpose of housing the eligible slum dwellers. Central govt. agencies undertaking slum development in partnership with private developers would be eligible for slum rehabilitation grant of Rs. 100,000/- per house on an average for all slums on their land being taken up for redevelopment with private partners.

Mandatory Conditions for State/UTs were given under PMAY like

- Make suitable changes in the procedure and rules for obviating the need for separate Non Agricultural (NA) Permission if land already falls in the residential zone earmarked in Master Plan of city or area.
- Prepare/amend their Master Plans earmarking land for Affordable Housing.
- A System should be put in place to ensure single-window, time bound clearance for layout approval and building permissions at ULB level.
- Adopt the approach of deemed building permission and layout approval on the basis of pre-approved lay outs and building plans for EWS/LIG housing or exempt approval for houses below certain built up area or plot area.
- Legislate or amend existing rental laws on the lines of model Tenancy Act being prepared by Ministry.
- Provide additional FAR/FSI/TDR and relaxed density norms.

FINANCE MECHANISM FOR AH

Housing finance is relatively recent phenomenon. It became more popular in developed economies after 1993. Recently developing economies are also experiencing growth of different magnitude in housing finance. Traditional two major financial mechanisms for housing are, debt and residential mortgage¹. In developed economies housing loan is very significant, whereas developing economies like India, housing loan constituents for 5% of GDP. Financial liberalization after 1991 and access to capital market have significantly changed housing and real estate scenario in India. Control of state run housing finance institution shrank significantly, at least in open market. But housing for economically weaker section still remains a challenge in housing finance. Even for open market housing finance has become critical after global financial meltdown and Eurozone crisis. Now states are cautious to reduce risk of its banks and limiting bad loans. Following the financial crisis bad loans and non-performing assets (NPAs) in Indian banks stood very high. NPA for Indian banks varies from 3% to 4.25%, with state run banks perform poorer than private banks. Private Banks focus more on retail lending, unlike state run banks which have more exposure in housing and infrastructure. Even for state controlled banks, it is difficult to lend for mass housing or housing for economically weaker section, fearing loan recovery woes. In this increasingly complicated financial environment state run banks also need to compete with privately

¹ There is recognition of other relevant forms of housing finance, such as developer finance, rental finance, or microfinance applied to housing. Developer finance is often in the form of unregulated advance payments by buyers, and developers sometimes provide long-term finance to buyers through installment sales when mortgage markets are not accessible. Microfinance for housing is typically used for home improvement or progressive housing purposes. Loans are typically granted without pledging properties. Although the overall impact of microfinance in housing remains limited, this activity can represent an important source of funding for those in the informal sector (Chiquier, et al., 2009).

operated bank for profit and efficient services. Otherwise capital market with some control of the state might collapse. Sustainable housing finance system is built over a certain period with effective regulations and innovative financial policy. But financing affordable housing needs a different financial strategy than in free market. This paper will explore some emerging means to facilitate access to housing finance for affordable housing and its relevance in PMAY-2015.

Mortgage has been very common tool utilize in housing finance but is less explored in affordable housing. EWS and LIG households are unable to access mortgage loan due to their below par credit worthiness. They do not have any asset or ability to contribute for initial down payment or repayment in installments. States are constrained in extending credit due to the fear of market collapse. And lenders are not very keen for financing due to credit credibility of borrowers, liquidity and high interest rates. In this context, government security can be beneficial for lenders to gain confidence in aggressive promoting of housing finance. Mortgage bonds were first introduced in Europe in the late 18th century and are a major component of housing finance today (EMF, 2001). Mortgage Pass-Through securities were introduced in the United States in the early 1970s and along with more complex structured finance instruments now fund more than 50 percent of outstanding debt in that country. Today, mortgage-related securities have been issued in almost all European and many Asian and Latin American countries (Chiquier, et al., 2009). Once security is confirmed, many lenders feel confident in financing through mortgage. It attracts investment within the country or from foreign investors, increase competition among lenders, increase efficiency in fund flow in housing market. Institutional investors like pension and insurance authorities are effective buyers of mortgage securities. These institutions have enough liquidity and long term liability which is advantageous than short term lenders. Mortgage insurance is another instrument which protects investors and buyers from default in repayment by the borrower. Borrower's credibility and asset are calculated through loan to value (LTV) ratio, which divulges information like loan default probability. But it depends on individual state and its risk-taking ability to support with insurance.

Microfinance is also getting popularity to fund small housing and housing repair. Microfinance can be useful for low income household which often finds it hard to approach capital market due to collateral shortages. Often government policies in developing country revolve around direct subsidization or cross subsidization. But cross subsidization has other social equity issues which hinders its novelty as a financial mechanism.

Developing economies have basic structural problem. It has unusual high percentage of informal economy, maximum cash transaction and high levels of inflation. Combination of all three implies underpayment and decrease in their savings. A large percentage of population is outside the purview of government benefits like provident fund, medical insurance and pension schemes. But countries with more structured economies adopt housing provident funds (HPFs) as a measure to tackle housing finance. HPFs function as long term saving schemes that operate through mandatory equal contributions from the government and the employee. Beneficiary can withdraw funds from their accrued

savings or take long term loan only for housing. HPFs have been created in many emerging economies, including Mexico, Nigeria, Brazil, Jamaica, Philippines, and China (Chiquier, et al., 2009).

INSTITUTIONAL FRAMEWORK FOR HOUSING FINANCE FOR AH

Housing finance is coordinated by the central bank or a bank under direct supervision of the country's central bank. State run housing banks are very common in developing countries to finance mass housing projects. But these banks have limitations in inhibiting deep impact in housing. India has set up National Housing Bank (NHB) in 1987. This is wholly owned by Reserve Bank of India, which contributes the entire paid-up capital for its functioning. Thus nature of functioning of the NHB is different from direct banking.

TABLE 4: NHBs policy activities from 2000-01

2000-01	First Residential Mortgaged Backed Securitization (RMBS) issue in the country; Refinance scheme for reconstruction of dwelling units in Gujarat earthquake affected areas
2001-02	Credit enhancement of bonds floated by HFCs
2002-03	Liberalized refinance scheme for housing loans
2004-05	Corporate Guarantee for RMBS is provided New window of lending to Micro Finance Institutions
2005-06	Fraud management cell set up to disseminate information on frauds on housing loans
2006-07	NHB RESIDEX was launched (first official residential housing price index) Reverse mortgage loan for Senior Citizens Productive Housing in Rural Areas (PHIRA) Refinance for top-up loan for Indira Awas Yojana beneficiaries Equity participation in New Rural Housing Finance Companies
2007-08	Rural housing fund was created with INR 10 Billion (USD 155 million) allocation Rural housing microfinance was launched Home loan counselling: Diploma programme put in place(IIBF)

The NHB regulates the activities of housing finance companies based on regulatory and supervisory authority derived under the National Housing Bank Act, 1987. It also create corpus fund facilitating liquidity in financial market for housing finance companies (HFCs) or micro finance companies to borrow capital and disburse retail loan to the customers. In the past decade and half NHB has introduced many policies and ideas to make housing finance more affordable (Table 4).

The NHB has taken three pronged initiatives: firstly, to oversee capital infusion in housing finance through HFCs; secondly, to enable retail borrower regulative back up to enhance their borrowing capacity; and thirdly, to safeguard borrower from fraudulent risks. The NHB is particularly focused on financing rural housing and housing for low and moderate income households through various schemes. Acceleration of funding in rural housing is supported through policies like USD 155 million pool fund, equity participation, and top up loan for Indira Awas Yojana (IAY) and micro financing. Enabling borrower with borrowing capacity is envisaged through residential mortgage, reverse mortgage, reverse mortgage of senior citizens, and corporate guarantee for reverse mortgage. The NHB is also focusing in popularizing home loan schemes with human resource development program and safeguard borrower from risks by setting up official residential housing price index to validate real house price and avoid fraud transaction by setting up fraud management cells.

RECENT POLICY TRENDS IN HOUSING FINANCE FOR AH

After identifying the emerging financial mechanism to fund affordable housing, the following sections will analyze PMAY 2015 to comprehend the scope and opportunity of financing affordable housing in India. The policy underlined four financial strategies to implement affordable housing. These are;

- i. In situ slum redevelopment through private participation. In exchange incentive for private participation would be TDR and extra FSI/FAR.
- ii. Affordable housing through credit linked subsidy, by interest subvention subsidy for EWS and LIG for new housing or to build incremental housing.
- iii. Affordable housing in partnership with private sector or public sector including parastatal agencies.
- iv. Subsidy for beneficiary led individual house construction.

Housing finance and alternative strategies that facilitates deprived people to acquire shelter has almost remained the same in India over the past many decades. The policy rightfully seeks private participation to solve an estimated 18.78 million housing shortages in India. But TDR and FSI/FAR is yet to prove very strong intensive for private participation in venturing into affordable housing. Financing slum redevelopment is a major challenge than to provide affordable housing to EWS or LIG. There needs to be a comprehensive financial strategy to enhance capability of slum dwellers to access housing finance. It may be a strategy implementation proven elsewhere in the globe or a completely new strategy. It's not only an economic but social issue. Economic participation from slum dwellers enables belongingness to their shelter and more attention to transform it into habitat from housing only.

Second strategy targeted towards EWS and LIG is to only subsidize the interest payable by the borrower. The strategy is very effective for the borrower as they have to pay less for their loan. But with limited government resource the number of beneficiary is restricted every year. With an estimated housing shortage of 18.78 million, this strategy will not affect significantly in reducing the number rapidly. The major concern is that subsidy in interest will reduce profit of state run financial institutions and its ability to fund any such project independently in future.

Affordable housing in partnership seeks partnership with public and private enterprises. In case of 35% of total constructed houses are of EWS category, the GoI would finance part of the project. The ratio of finance is not mentioned and hence might be decided on case basis. Here the strategy depends on direct financial assistance and cross subsidy from the project sell. This strategy is limited to government's fiscal capacity and the non-subsidized housing market. The final strategy is to extend subsidy to individual house owner in building her/his own house. The government appointed to nodal agencies to disburse fund through state to individual beneficiary.

SUSTAINABLE INTERVENTION

Affordable Housing under PMAY has the opportune moment to go beyond regular concept of low-cost housing. Central theme shall evolve around sustainability concept of quality living through socially responsive community interaction, livelihood options and optimum resource utilization. Elderly and children friendly, hazard resistant, comfortable and functional built and open spaces can be designed and planned in such a way so that beneficiaries can associate themselves with their shelter from conceptual stages. It shall meet their future aspirations and don't feel to sell their property. The Sustainable Total Living Environment for Affordable Housing (S_{US}TLE-AH) model is proposed as a viable intervention for this.

S_{US}TLE-AH MODEL

The S_{US}TLE-AH model (Mukherjee, 2015) recognizes 4 stages of a built-environment's lifecycle: pre-design, design, construction and post-construction; and the Design stage builds its premise for discussion in this article. Implementability review i.e. the Pre-design exercise which takes care of land and finance considerations, Construction and Post-construction operation and maintenance (O&M) are outside the scope for discussion at present. Design stage allows innovative exploration of sustainable options in the S_{US}TLE-AH model and includes principles of Design and Planning, Technology and Materials, Eco-services' System Network and Risk Reduction.

DESIGN AND PLANNING

Climate and local context play vital role in any housing design. These prime motives often wither away in the process of delving balance between maximum constructed floor space and profit. Social sustainability through designed built- and open spaces, natural light and air for comfort, introduction of green infrastructure as resource conservation measures, and provision of livelihood opportunities are contextual challenges for building design and site planning. Good connectivity to public transportation and selection of brown site over green site are appreciable generator of the S_{US}TLE-AH.

Space Design Layout at Site and Block Level. Underlying sustainable strategy for site planning is minimum intervention in the natural setup. Housing in warm-humid climate may have well-spaced staggered arrangement so as prevailing air may pass through and

provide thermal comfort. Cold and hot-dry zones should have compact planning so they may provide mutual shading and protection from freezing/ hot winds. In Composite climate, blocks may be placed near to each other for mutual shading and reducing solar gains but should also be well ventilated. Preferably the longer axis of a block in such climatic zone should be along east- west axis. A tilt upto 15° towards south will allow south-east rising sun inside but will obstruct south- west harsh sun. Retention of site feature like water bodies can be used as green infrastructure, as natural reservoir for rainwater and be a source of water in case of fire breakout. It can act as part of waste water treatment and for pisciculture.

Box I. Belapur Housing case study

Belapur housing is one of the early planned settlement in Navi Mumbai by Charles Correa and his team to ease pressure on Mumbai. The project was commissioned by CIDCO in 1983, and it took three years to get ready. Its prime aim was to achieve high density with low rise housing. Each dwelling unit was planned on its own plot with an idea of incremental growth. To maintain social-economic integration, different plot sizes (with 5 types range from 45m to 75m) were worked out to facilitate different economic sections of society. Incremental construction accommodated the growing aspect of family size and economic potential.

Hierarchy of open, semi-open and covered spaces was maintained from whole to part i.e. from site to an individual house. Housing cluster were grouped around an court of size varying from 8X8m to 12X12m, which further are accommodated around a community space of 20X20m. Construction material and techniques were both local, which has resulted in self-help during construction, alteration and maintenance. Facilities like toilets are provided adjacent to each other for saving on plumbing, and sanitation. So the project not only focused for providing high-density low rise housing but also considered on other key factors like economic status, social interaction, neighbourhood watch, self-help, cost cutting and future incremental option determined as per once growing capacity and need. Project-learning is relevant till date.

Source: The Architectural Review, 2015.

Clustering of the low rise buildings is a proven efficient way of facilitating affordable LIG and EWS housing sustainability. As the urban land is very scarce resource, medium to high rise building blocks become natural option in Metro and tier I to III cities to take care of higher density requirements. Hierarchy of open spaces play a significant role in public interaction and need attention while designing high-rise housing. Mix of income groups can be facilitated in different stages of design to do away with social segregation. Possibility of being seen by the neighbors while entering into any flat increases safety of vulnerable residents. Creation of the experience of a miniature street in various levels of high rise buildings can enhance 'Knowing Your Neighbor' thus improving safety and security of residents.

In a densely packed city, there is very less open space for social interaction, playing and other community activities. Instead of providing water-intensive sprawling lawns, community orchards and kitchen gardens will be preferred alternatives for residents, as growing their own vegetables can fetch them some economic comfort. Playgrounds will facilitate physical activity among the youngsters and will help to keep modern-day lifestyle diseases away. The design shall advocate for healthy resident population by facilitating walking, jogging, sports etc. A runners' track around the field will help all

residents. Strategic placement of children's play lot alongside with Elderly Park can maintain visual control on both. Basic safety and security and utmost care for vulnerable groups like kids and elderly are key ingredients of this design proposal.

Common spaces and services. Shared spaces and services directly impact on cost saving, shared O&M expenditure and social bonding. It can be a playground or a lobby or drainage system. During design process, wet areas like toilets and kitchen may be planned adjutant to each other for sharing service pipes. Common wall not only contribute in reducing material consumption but also protect from harsher weather. Elevators for this economic group will require some unique strategy like stop on alternate floors to reduce energy consumption and maintenance cost.

Educational space for kindergarten, crèche, vocational and continuing education center, digital literacy, must be given utmost importance. Hierarchy of vertical open spaces can augment interaction among the neighboring families sharing the same lobby. The common space helps the dwellers to know their neighbors better and the same space can be used as a small court for various purposes like toddlers play area, afternoon "Adda" space for the adults and the elderly.

Provision of urban farming induces the residents into physical activities with healthy produce. Scope of income generation from rentable commercial spaces, urban agriculture and produce selling etc. shall be integrated from the very inception stage of design. Access to formal loan can help to grow these initiatives.

TECHNOLOGY AND MATERIALS

Building envelope shall response to local climate optimally. Where thermal mass is preferred in cold areas to transfer daytime-absorbed solar heat inside, surface shading is required in hot-dry zone. Brick or stone lattice may provide visual and thermal comfort in composite, hot-dry and even warm-humid zone.

Prefabrication and industrial construction is the only logical means to solve the huge task within targeted time. Modular coordination, compatibility between elements and systems are the only choice left and more intense attention shall be placed in this sector. Locally available material be preferred except for special requirements. Such materials are generally responsive to local climate and consume less embodied energy. Selection of material shall be based on its properties like conductance, colour, texture, mass, modularity, acceptability etc. Material either with good insulation properties or construction technique like cavity wall/ rat-trap bond may be preferred where there is recognizable difference between inside and outside temperature. Sometimes affordability is misunderstood as low cost construction and materials which are cheap but not long lasting. This should be avoided at any cost; the material and construction shall require minimum maintenance to keep the monthly maintenance expenditure low.

Daylight harvesting is another integral strategy of the S_{US}TLE-AH as it provides visual comfort and reduces energy consumption for most of the seasons. Window to wall ratio

shall be provided in accordance to available daylight, surrounding built mass and illumination level required in different parts of building interiors. Otherwise, habitable spaces may lack in desired illumination quality or will have excess of thermal gain.

Energy consumption and utilization. One of the major aspect of affordability is the reduction in energy bill amount and utilization of renewable energy resources. The above mentioned strategies contribute in energy saving largely. On an average energy consumption load for EWS and LIG households are expected to be 1.5 kW and 3 kW. Energy for public facilities like street lighting, should preferably come from renewable energy source like solar photovoltaic cell. Hot water supply for laundry, kitchen, bathing etc. may come from solar water heater. India being rich in solar radiation resource, it shall be utilized to their best.

ECO-SERVICES' SYSTEM NETWORK

Systems and services play a vital role in community's life to flourish. The S_{US}TLE-AH takes cognizance to this fact and emphasizes the role of nature in introducing eco-services' system as integral part of design proposal. Waste becomes resource in nature and that's the principal optimization principle in this model. This reduces resource consumption, waste generation and O&M cost. So both for construction manager and facility manager of EWS and LIG housing, integrated Service system design becomes immensely important for success. Some design insights are listed below.

Road and pavements. Layout of roads shall not cut through any large open space with designated usage, as much as possible. Pedestrian walkways and jogging tracks' cover be permeable pavers as this ensures better groundwater percolation and reduces the storm-water drainage flow. Effort shall be made to keep hard-surface minimum. Waters collected after due purification shall be made accountable for future use.

Managing open spaces through provision of playground (separate for grown-ups and kids), community orchards, landscaped permeable surfaces and walkways, rainwater harvesting through rooftop collection, waste water treatment and recycling, introducing water body as resource management sink etc. are examples of various interlinking subsystems to create stronger Eco-services' system network.

Solid waste and sewage disposal. Landfill being hailed as worst form of solid waste management, community level decentralized bio-degradable waste management systems are good options. Door to door collection of solid waste may help in generating employment too. Segregation of biodegradable waste such as kitchen waste, paper, grass, cow-dung and dry leaves and feeding them into Biogas plants will deliver nutrient-rich manures and fuel gases used for domestic purposes or in vehicles. Bhabha Atomic Research Centre's (BARC) NISARG-RUNA plant for solid waste management is a good example for Zero garbage- Zero effluent waste management.

Sewage disposal system like Decentralized Wastewater Treatment (DEWATS) may be used. After primary treatment which may also generate biogas, the disposals may be

used for irrigating urban vegetables/flora farming. If the housing has access to city-sewerage and storm water drainage system, it eliminates necessity of on-site treatment of sewer and solid waste, and thus saves the space and cost of installation.

Rainwater Management: Regular withdrawal and increase in impermeable surfaces expediting storm water runoff would lead to shortage of ground water. The solution should be planned in response to local requirements. Terrace runoff may be collected in underground tanks after early flush off and after screening and treatment, may be used for fire protection tanks, landscaping, urban farming, washing etc. Areas with low water table may plan for rain water harvesting and strategies must be integrated in site development proposal. Cost of filtration treatment required for rainwater to convert into potable water needs consideration. Excess rainwater from the roads, pathways and open spaces may be directed to the existing natural water body in and around the site; this helps to reduce the peak flow rate in the city sewer immediately after the rain. Locations having naturally occurring ponds with high water table may go for business like fish culture.


RISK REDUCTION

Safety and security provided through strong social bonding within neighborhood has incomparable strength. From the inception of the design, interaction between people and spaces should be the design target as this brings resiliency to neighborhood. Coherence and connection between different spaces can be created by physical or visual connections depending on appropriateness and characteristics of the spaces. Considering the present day context, where the interaction between neighbors is on a diminishing note, the design should have the capability within itself to facilitate more interaction.

Though there are lot of controversies regarding the wider social aspects of gated communities, it is widely practiced in India and successful too. The complex should be secured by external compound wall, preferably tall vegetated wall with punctures at required intervals for visual connectivity. This can ensure a sense of security and protection automatically prevailing in the residents' psychology. This helps to cut down the SPM (suspended particles) of air and noise (appx. by 10dB) pollution significantly. Thoroughfare of vehicular traffic must be restricted.

Fire safety guidelines as per the National Building Code (SP7) (NBC, 2005) shall be followed during designing. Maximum travel distance from any corner of the building to the staircase does not exceed 22.5m. The staircase should be separated by a fire rated door of 1800 mm width which opens on a direction of the flight of the staircase. Hose reel should be connected with the down-comer in each floor. Sprinkler system should be avoided due to its high installation and maintenance cost. Refuge decks should be provided as per the existing building norms.

Natural hazards like Earthquake, Urban flood, heat-waves etc. are quite frequent incidents happening to Indian cities. Resiliency through adaptation and mitigation



measures are now necessary to consider integrally. Many of the Eco-services will help to non-structurally control the problem both at site level and also with larger impact footprint. Elderly, women and children-centric design shall be a norm than an exception. The design development through its form, structure, use of good materials and proper workmanship can bring better resiliency to communities.

CONCLUSION


Review of Indian housing policy brings out broad attitudinal changes in Government's role from direct provider with social welfare approach, to facilitator of housing through land and finance mechanisms. These mechanisms helped Middle and Higher Income group to consolidate their asset; but failed to cater lower income groups due to lack of access to land and finance.

The strategies outlined in PMAY 2015 are hugely dependent on the government and its fiscal capacity to finance projects. Although the vision statement of the policy emphasizes on private participation but the strategies to uphold this vision is insufficient. Attaining 18.78 million housing shortage is extremely difficult with direct assistance from the government. Alternative land and financing mechanism discussed prior might hold the key for remedy towards India's housing woes if applied innovatively.

Enhancement of financial capability of borrower will significantly improve the status of housing market in India. But it is also difficult for housing policy makers to address all these issues alone. Many relevant policies need significant restructuring of India's economic and financial configuration. Large part of India's legal, economic and financial structure is still undeveloped. Unless the improvement envisaged in sectors like taxation, financial laws, recent housing finance strategies; it is difficult to improve housing finance and housing tenureship in India.

One another major challenge to accomplish this challenge of 'housing for all', is to devise affordable construction techniques, availability of building materials, phase of construction, quality workmanship through skilled labor and many more in cohesive to established and migrated socio-cultural lifestyle through a sustainable environmental approach.

The central idea of sustainable affordable urban housing like the $S_{US}TLE-AH$ is to develop a habitat which fulfils basic human needs in coherence with nature and society, is economically viable and creates opportunity to accomplish future generations' aspirations. This results both in economic as well as social learning. Social Cross-subsidy concept i.e. interaction between children and elders living in the same compound shall be objectives to achieve to keep the *parampara* alive.



References.

- Chiquier, L. & Lea, M., [ed].(2009) *Housing Finance Policy in Emerging Markets*. Washington, DC : The World Bank, 2009.
- EMF.(2001). *Mortgage Banks and Mortgage Bonds*. 3rd.Consultative Paper, European Mortgage Federation, Brussels
- Hingorani, P. (2011). Revisiting Low Income Housing: A Review of Policies and Perspectives. In *Indian Institute for Human Settlements* (p. 35). Mysore: Indian Institute for Human Settlements. Retrieved from <http://www.idfc.com/pdf/publications/Paper1-Housing-Policy-Review-Final.pdf>
- Jha, S. (2013). Business Standard. http://www.business-standard.com/article/economy-policy/1-77-million-people-live-without-shelter-albeit-the-number-decline-over-a-decade-113120600835_1.html. [Cited: 4 November 2015.]
- Ministry of Home Affairs., (2011). *Census of India 2011*. New Delhi : Government of India
- Ministry of Housing and Urban Poverty Alleviation.(2015) *Pradhan Mantri Awas Yojana Housing for All (Urban) Scheme Guidelines*. New Delhi : Government of India.
- Ministry of Urban Development, (2005) .JnNURM Mission, New Delhi : Government of India,
- Mukherjee, M. (2015). Draft Report on *Standards & Specifications for Design and Planning of Affordable Innovative Green Housing*, sponsored by BMTPC.
- National Building Code (2005). Bureau of Indian Standards.

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