



## ECO-FRIENDLY HOUSING MATERIALS: A STUDY WITH REFERENCE TO KERALA

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### Introduction

In India affordable housing is fast gaining acceptance among housing loan customers as well as suppliers like builders and developers. Market is becoming increasingly price sensitive and customers find it unaffordable to go for residential units built on conventional technologies. This in turn is because of various factors, like (i) relatively high interest rates on housing loans (notwithstanding the fact that of late there have been some downward revision in interest rates on housing loans, eg. loans upto Rs.20 lacks would qualify for reduced rates ranging from 8.5 % to 9.25% as per a stimulus package announced by the Central Government in December 2008); (ii) declining earnings from employment in many industries, for example, IT / ITES sector – the most prominent sector that decides the prospects of housing and real estate market in India. Sensing the pinch of economic downturn as evidenced by slower sales growth (falling registrations for new houses) and also the growing tendency of customers to opt for low-cost or affordable houses (budget houses), builders and developers are seriously thinking of switching over to affordable housing models for survival and growth.

In the above context, this paper seeks to identify the major emerging technologies for affordable housing in India, their salient features and also strategies for proper implementation of such technologies, keeping in view the ground realities of the Indian housing market as well as relevant global experiences in the field of housing finance. The rest of the paper is organized into three major parts. First part deals with the growing significance of affordable housing in India. Second part the emerging technologies and materials for affordable housing along with major global and Indian experiences. Third part gives hurdles in affordable housing development. Furth part offers strategies for development of affordable housing in India. This is followed by author's concluding remarks.

### 1. Significance of Affordable Housing in India and Its National Priority

Housing development activities in India witnessed considerable growth momentum in the ongoing regime of economic and financial sector reforms, initiated in the early nineties. This trend was more prominent during the second phase of the reforms process (viz. since 1997) when commercial banks aggressively entered the housing finance arena consequent upon a major policy initiative of the Reserve Bank of India (RBI) that permitted banks to extend housing credit on a larger scale. As a result there was an unprecedented boom in institutional finance to housing activities in India, which in turn could effectively propel the housing activities in the country. The consistent policy support from the Government in the form of incentives and concessions to the beneficiaries and providers of housing finance, availability of funds at low rates, reasonably resilient macro economic environment, relatively low credit off-take to industrial and business sectors prompting banks to focus more on housing finance and other retail credits, constantly falling interest rates coupled with relaxed terms and conditions etc. were the main causes for this growth pattern which continued till 2005.

Since 2005, however, there has been a gradual fall in institutional housing finance particularly the one from commercial banks – the largest group among the institutional intermediaries (Table I). Firstly, retail credit (like housing finance) is no more as attractive to the banks as in the past because of the gradual picking up of credit to productive sectors like industry and business. Secondly, as already noted interest rates on housing loans are generally on the rise because of mounting cost pressures resulting in reduced demand for housing finance. Thirdly, in view of the growing delinquency rates in housing advances credit terms have been made stricter. In short, banks have become relatively more cautious while extending housing finance unlike in the past. Likewise, there has been severe strain in the earnings of builders and developers too. For instance, large builders like Parsvnath reported just a 17 percent growth in revenues in FY 2008 as against 135 percent in FY 2007. For Unitech this is 26 percent and 253 percent respectively. The falling growth rate in housing exposures of banks is shown in



**Table I: Break up of Credit Portfolio (Incremental) of Banks in India.**

Particulars	2004	2005	2006	2007	2008	2009	2010
Housing Loans	89449	134653 (50.54)	179060 (33.4)	224481 (25.4)	248435 (12.12)	284751 (13.14)	306307 (07.51)
Total of all Loans	864271	1105725 (27.94)	1473723 (31.0)	1893775 (28.5)	2417007 (21.6)	2847713 (17.82)	3345169 (17.47)
Share of Housing in Total Credit (Per cent)	10.35	12.18	12.15	11.85	10.72	10.0	9.7

Source: (i) Compiled from, *Report on Trend and Progress of Banking in India* for 2004 to 2007, Reserve Bank of India (RBI) (in respect of FY 2004 to FY 2007).

(ii) Compiled from, *Macroeconomic and Monetary Developments in 2007-'08*, BI, Half Yearly Publication dt. 28 April, 2008 (in respect of FY 2008).

Notes: Figures in brackets show the percentage variation over the previous year.

Another dimension of the change in the outlook of banks is the added significance given to financial inclusion in general and inclusive housing in particular, partly because of the growing regulatory compulsions, as the Central and State governments are increasingly promoting inclusive housing policies. This in turn is because of the fact that vast majority (nearly 95 percent or more) of the total housing shortage relates to people who are outside the reach of formal system of institutional housing finance (typically banks and housing finance companies, and to a very less extent the co-operative sector institutions). Equitable development of the nation, thus calls for bringing the above vast majority of the shelter-less population who are traditionally excluded from the formal housing finance system, within its reach. Hence there is utmost significance of inclusiveness in housing finance through affordable housing. Accordingly, the National Urban Housing and Habitat policy 2007 (NHHP 2007) seeks to achieve as its major goal, 'Housing for All'. As a continuation of the above policy, the Union Cabinet has already constituted a high level task force on affordable housing in January 2008, which is expected to recommend measures to enhance the accessibility of Economically Weaker Sections (EWS) and Low Income Groups (LIG) to housing, with Government support.

As already noted, vast majority of the customers can afford only low cost housing units and so also housing loans at cheaper rates. As such, they are growingly in search of affordable (low cost) housing units. Besides, Governments at the Centre and States as well as regulatory authorities like the RBI and NHB are also promoting affordable housing in a big way. For instance, as per the latest directives of the RBI (December 2008) relating to the promotion of low income housing as a stimulus package to revive the economy, public sector banks (PSBs) have to provide housing loans upto Rs.5 lakhs at 8.5 percent rate and those above Rs. 5 lakhs upto 20 lakhs at 9.25 percent rate. These special rates are quite lower than the earlier rates of 11 percent or more, and as such these rates may impose considerable strain on the profitability of PSBs, unless they receive refinance support from the RBI or other government agencies like National Housing Bank (NHB). These special rates are applicable for a limited period till June 30, 2009. The largest PSB, State Bank of India (SBI) has gone one step further by announcing housing loans at 08 percent for the first year, and then at the applicable rates as above. Banks like Union Bank of India (UBI), Punjab National Bank (PNB) etc. followed the suit by cutting housing loan rates in February 2009.

Apart from the demand side factors (customer preferences) and regulatory level compulsions and budgetary supports (RBI, Central and State Governments), there are many supply side factors (builders, developers, housing agencies etc.) too in favour of affordable housing. For instance, because of lesser demand for luxury homes as a consequence of economic slowdown (like, reduced income levels, job losses etc.) of the high-income customers the housing suppliers are increasingly promoting more affordable housing products across all segments of customers. In many cases, such agencies have even gone for new business models too, including floating separate subsidiary companies to exclusively deal in affordable housing units. For example, Omaxe Ltd. – a Delhi-based developer who wants to construct one million affordable houses across India (spread over 140 locations). Besides, Omaxe has floated a new company named, National Affordable Housing and Infrastructure Ltd. for the above purpose. In short, affordable housing has gained unprecedented significance among customers, regulators and suppliers. Strategies toward affordable housing adopted by a few popular realty firms are shown in



**Table II: Affordable Housing: a Top Priority among Builders and Developers**

Sl. No.	Builders/ Developers	Future Plans / Affordable Housing scheme proposed	Technology / Materials
01.	Golden Gate Properties—the first company to set up affordable housing in India.	Affordable houses at Rs.19 lakh ('Commune' project in Bangalore, first one) to be launched in various South Indian cities. Golden Gate has tie-up with world renowned architects'. Andy Fischer for the use of modern construction technology for cost savings. This technology will ensure safest buildings, having used 100% concrete solutions.	Smart and innovative use of modern construction technology
02.	Omaxe Ltd., Delhi.	One million affordable houses (300 to 1000 sq. ft) in 140 locations throughout India, priced at 2.99 to 9.99 lakhs. Started a new company also for promotion of affordable housing units. (ie. National Affordable Housing and Infrastructure Ltd.)	Pre-cast or pre-pre-fabrication
03.	Matheran Realty Ltd. Mumbai.	Focus on Low income group (LIG) housing. It uses post offices to vend its applications for low cost housing units. It constructs flats of 300 to 500 sq. ft, priced at Rs. 3 to 5 lakh per unit. Plans to construct 2 lakhs such houses in the vicinity of Mumbai. The company has got tie-up with Sterling Construction Systems for cost-effective building system, that saves considerable time and manpower costs. Cost savings is over 30 percent for this technology.	Uses pre-fabricated fibre (perforated) boards for plaster-free finish; in-built ducts for power and water supply. Avoids brick and plaster.
04.	Mir Realtors (Mir group)	Budget and service apartments in various tier II and III cities in Kerala / other South Indian states, to tap huge demand for budget houses.	Cost-effective building technologies.
05.	Ansal Properties and Infra-structure Ltd.	Plans to develop 10,000 affordable housing units in 2009-'10 in North India (Meerut, Agra, Jaipur etc.). These units fall under two categories:(i) Rs.2.5 lakhs, for 200 sq. ft units, and (ii) Rs.9.5 lakhs, for Rs.850 sq. ft units.	Construction at Rs.500 to 550, and selling at Rs.1,120 to 1,250 per sq. ft.
06.	Unitech Ltd.	Plans to invest Rs.25,000 crore in Affordable housing project, for constructing 10,000 residential houses priced at Rs.30-50 lakhs in FY 2009-'10. The proposed locations are Gurgaon, Noida, Greater Noida, Kolkata, Chennai etc.	Shift of focus from luxury to affordable units (30% earlier to 7-8% now)
07.	Ozonegroup- 'Affordable Housing Project'	'India's first affordable city housing project', "Evergreen" in Bangalore with 2BHK, 3BHK apartments (900 to 1200 sq. ft) for Rs. 29 to 35 lakhs. Proper planning enables keeping sizes optimum. Aims to expand affordable housing to other cities.	Cost management solutions developed in house minimize wastage
08.	Purvankara Projects, Bangalore – based Builders	Plans to construct 64,500 affordable homes in the price band of Rs.10 to 20 lakhs across five cities in the next five years (since FY 2009). Housing units of one, two and three bedrooms will be price at Rs.10, Rs.15 and Rs.20 lakhs respectively. Purvankara has floated a company, 'Provident Housing and Infra-structure' to build affordable homes across India.	Cost savings through advanced technology and suitable design (smaller size and value-adding features alone)
09.	DLF, Chennai-based real estate firm.	DLF has re-oriented its construction strategy by entering the budget housing sector. DLF has revised its own earlier offer prices downward, by creating efficiencies. The price-cuts typically range from Rs.300 to 600 per sq. ft, resulting in a savings of Rs. 6 to 12.6 lakhs per flat for the buyer.	Price-cuts are effected by cost savings, to meet opting out of clients who have already booked.



10.	Other major players (like, Sharpoorji Pallonji, Marathon Developers)	All these companies have aggressive plans for affordable housing, and are going by (i) the “Low margin but large volume” rationale underlying affordable housing, (ii) technology advancements that could scale down the costs	Cost savings through advanced technology, selection of plots in semi-urban areas etc.
11.	Promoters and Builders’ Association of Pune (PBAP)	Plans to launch 10,000 affordable units (1-BHK) of 500 – 700 sq. feet, priced at Rs.15 to 25 lakhs. These projects are mostly in the outer areas of Pune city and are mostly targeted at ‘self-financing’ (not availing bank loan) customers who need ‘value for money’. The target customers are typically middle-income group with annual income starting from Rs.5 lakhs. This group accounts for 45 to 55 percent of the potential home buyers.	Thrust on value-added features and hence lower cost of construction. Focus on middle-income group customers who cannot afford luxuries.

Source: (i) Compiled by the Author from *The Hindu Business Line* dt. on *Trend and Progress of Banking in India* for 2004 to 2007, Reserve Bank of India (RBI) (in respect of FY 2004 to FY 2007)

## Part II

### 2.Materials for Affordable Housing in India: an Overview

In view of the foregoing, it is clear that innovative approaches are imminent in order to make housing affordable to the masses. In fact, the most important reason behind construction of fewer number of dwelling units much lesser than the actual requirement is the mounting cost of construction, primarily the spiralling cost of land and various building materials. This in turn results in widening gap between the demand and production (supply) of houses in the face of fast growth in population. This underlines the significance of cost-effective housing technologies. Adoption of low cost housing technologies is essential for bridging the ever growing gap between housing demand and supply. Besides, choice of the appropriate technology for low cost housing has got many ramifications on economic, social and environmental planning for development. A cost-effective technology refers to a collection of strategies using innovative materials and / or techniques without compromising the structural and functional requirements and produce a holistic design to construct a building at a cost far less than what it would take normally. Some general guidelines which are relevant while selecting the appropriate technology for housing are given in Exhibit I.

- Making use of local resources to the maximum extent, both material and human.
- Expanding the use of local skills and improving the existing methods.
- Capability for expansion and growth within the formal and informal sectors.
- Encouraging the incorporation of the informal sector into the formal sector and thus having a base on skills that are initially easy to acquire.
- Avoiding dependence on complex infrastructure for implementation.
- Capability of accepting production fluctuations without disastrous economic results.
- Relying on foreign skills and imported technologies to the minimum extent.
- Flexibility to encompass as wide a sector of the population as possible.
- Minimizing wastage of resources of any type.

#### Exhibit I: General Guidelines for Selecting Appropriate Housing Technology.

It has been observed that buildings based on cost-effective technologies could be constructed at costs much below the projections and that too without compromising strength, durability, safety or aesthetics. Or, in other words, while these technologies seek to achieve savings in costs it is not at all at the cost of quality. A few of the affordable housing technologies that are relevant in the case of developing countries as tools for meeting the growing shortage in housing stock, particularly in the Indian context, have been pointed out by Mathur (1993). These technologies in turn have been identified based on the broad agreements reached in different international seminars and conferences [like, (i) International Conference on Low-Cost Housing for Developing Countries, March 9-14, 1985 organized by Central Building Research Institute (CBRI), Roorkee; (ii) CIB-IYSH International Seminar on Low-Cost Housing and Alternative Building Materials organized by CBRI at New Delhi during February 10-11, 1988 etc.] as well as personal observations of the above expert. The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) fielded a mission to identify innovative and appropriate



technologies for low-cost housing based on indigenous building materials. The improved indigenous materials and construction technologies that are recommended by ESCAP are given in Exhibit II.

**Exhibit II: Materials and Technologies Recommended by ESCAP**

❖ SOIL TECHNOLOGIES
1) Rammed Soil Construction
2) Compressed Earth Blocks
❖ LIME AND POZZOLANA TECHNOLOGIES
3) Improved Lime Production
4) Some Artificial Pozzolana
❖ BRICK CONSTRUCTIONS
5) Pre-cast Brick Elements for Roofing
6) Improvements in Bricklaying
❖ CONCRETE TECHNOLOGIES
7) Pre-cast Concrete Elements
8) Fibre-reinforced Concrete Roofing
❖ TIMBER AND FOREST PRODUCTS
9) Non-poisonous Timber Protection
10) Improved Pole Timber Construction
11) Curved Bamboo Roof Structure
❖ UTILIZATION OF WASTES
12) Use of organic Wastes

**2.1. Alternative Materials for Low Cost Housing:**

It has been estimated that about 70-75% of the total cost of construction of a house goes to building materials. This points to the utmost importance of saving the cost of materials while constructing house. By making use of low-cost building materials having the requisite features to ensure adequate strength, durability, comfort, elegance etc., the cost of building construction can be significantly brought down. Table III shows the breakup of the average cost of house construction.

**Table III. Average Cost Break-up of Building Construction**

Materials (73%)		Labour (27%)		Component-wise (100)	
Cement	18%	Mason's wages	10%	Foundation	10%
Iron & Steel	10%	Carpenter's wages	5%	Walls	30%
Bricks	17%	Unskilled labour	12%	Roofs	25%
Timber	13%			Doors & Windows	15%
Sand	07%			Flooring	10%
Aggregate	08%			Finishing	10%

[Source: Lal, A.K., Hand Book of Low Cost Housing, New Age International (P) Ltd., 1995]

Findings of research studies done at various research institutes like CBRI, NCB, and CFRI etc. have shown that there are a number of alternative building materials that can considerably reduce the materials cost. Such promising low-cost building materials include, inter alia, hydrated lime, lime pozzolana mix, ferrocement, gypsum boards, timber substitution, asphaltic corrugated sheet, cellular concrete, plastics, sand-lime bricks, industrial wastes (like, flyash, blast furnace slag, red mud, red mud plastic, lime sludge, phosphogypsum etc.), agricultural wastes (like, rice husk, coir waste, bagasse etc.). It is observed that many of the agricultural and industrial wastes as mentioned hold great promise as building materials. Several initiatives have been taken at the governmental level to popularize the use of low-cost building materials as above. Researches are going on in order to develop more such materials, the basic objective in all cases being to reduce costs but not at the expense of quality or utility.





### **2.1.1. Governmental Initiative to Provide Building Materials at Affordable Prices: a replicable model initiated by the Government of Kerala ('Kalavara')**

Apart from going for suitable types of building materials of lower costs, there is the question of maintaining an infrastructure that ensures that the cost incurred by the end-user is less. A Kerala government initiative for providing building materials to the poor at affordable prices seeks to create a supply chain across the state. This programme which is named as 'Kalavara' is launched by KESNEK<sup>1</sup> (Kerala State Nirmithi Kendra). It has opened outlets initially at three locations in Kerala (viz. Ernakulam, Kozhikode and Thiruvananthapuram). Through these three centers (and more so in the future) it is sought to provide quality building materials at affordable prices by establishing a supply chain across the state. In fact, it is planned to open such 'Kalavaras' in every district headquarters at the earliest, i.e. at fourteen places corresponding to fourteen districts. The materials supplied through these items include steel rods with ISI mark, cement and sand, products like hollow concrete blocks, concrete doors, ferro-cement items and concrete window frames etc. Most of these items are procured from various State or Central public sector units. It is planned to give these materials without profit margin to families below the poverty line (BPL).

### **2.2. Cost-Effective Technologies for Low Cost Housing: an Overview:**

A cost-effective technology is a collection of strategies that make use of innovative materials and / or techniques without compromising on the structural and functional requirements. Such technologies seek to produce a holistic design to construct building at costs that are significantly lower than those involved while using traditional technologies.

Some of the most important cost-effective technologies suitable for affordable housing in India are discussed in the following paragraphs.

#### **2.2.1. Gypsum Load Bearing Panels**

Unlike the conventional building materials like cement, sand, concrete, bricks etc. the extensive use of which harms the environment including increasing the susceptibility for natural disasters like earth quakes, cyclones, high tides etc., there are some affordable, safer and environment-friendly building materials that are fast emerging the world over. Apart from the affordability aspect of such materials, they are strong enough to withstand natural disasters as noted above and hence are more relevant than ever before because of the growing instances of tsunami and such other natural disasters. One such promising technology named 'Rapidwall panel' is fast gaining momentum in India too as in many other parts of the world, its origin being in Australia in the 1990s. This technology has got many advantages like cost-effectiveness (affordability), eco-friendliness, efficiency in usage etc. It provides for manufacture of large load bearing wall panels that can be used for walling and roofing. One load bearing building panel (of size about 34 sq. mtrs) is estimated to have the capacity to replace one lorry load of conventional bricks. Using this modern technology, many buildings including large multistoried apartments have been built in Australia. Since the late 1990s, this technology has been fast picking up in countries like China, Malaysia etc. Houses and buildings built with these panels can resist natural disasters like earth quakes, cyclones, tidal waves, etc. It is resistant to fire, water and corrosion, and is also free from rot and termite. It has got high compressive strength, tensile strength, flexural strength and ductility. One of the greatest advantage is the modular cavities of the large panel which enables to use it in combination with concrete and RCC. It forms composite material by which the strength of the material can be increased many folds. By filling the cavities of the roofing panel with RCC tying down to the foundation through the wall panel, the structure can resist cyclones and disasters. It is most ideal for coastal regions as the panel can resist corrosion as well. In India, two major public sector companies FACT (Fertilizers and Chemicals Travancore Ltd.) and RCF (Rashtriya Chemicals and Fertilizers) have started a joint venture for producing fibre-glass reinforced gypsum load bearing wall panels made from phosphogypsum. Accordingly, the above two companies have signed a memorandum of understanding with RBS (Rapid Building Systems), Australia in early 2008 for supplying technology, license and critical equipments for manufacturing gypsum panels.

#### **2.2.2. Cost-Effective Technologies Suitable for Multi-Storey Flats in Urban Areas:**

##### **2.2.2.1. Rattrap Bond Wall (RTB):**

Under RTB technology, bricks are placed on edge in cement mortar (1:6 mix) after leaving gaps within the walls. This technology offers the following advantages, (i) reduction in cost of wall by 25 percent (eg. while a conventional English bond (9" thick wall) may require 350 bricks, an RTB wall requires only 280 bricks); (ii) there is reduction in number of joints and

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<sup>1</sup> KESNEK was formed in 1989 at the initiative of Government of Kerala for the purpose of promoting housing and habitat development through cost-effective and environment friendly technology.



hence reduction in mortar consumption; (iii) 25 percent less dead weight, 18 percent savings in bricks and 54 percent savings in cement mortar; (iv) thermally comfortable and aesthetically pleasing; and (v) these walls can easily be reinforced for seismic safety through the hollows if required, and further these can be elegantly used for filler walls also.

#### **2.2.2.2. Filler Slab Roofing**

In normal practice, in a typical concrete slab concrete below the neutral axis does not carry loads and only adds to the weight of the slab. Hence, if the bottom part of the concrete slab is replaced by filler materials (like, old Mangalore tiles, old bottles etc.) instead of concrete bottles, there would be substantial savings. Because of the substitution with a cheaper substitute, in fact the strength of the slab is not at all reduced. On the other hand, full scale tests have shown that indeed such slabs are stronger due to lower dead weight. Moreover, in cases where Mangalore tiles are used as substitute material, there is another advantage that insulation against direct radiation due to air trapped between the two tiles, so that such filler slab roof buildings are more comfortable to live in. Yet another advantage of filler slab roofing is the savings in foundation costs.

#### **2.2.2.3. Ferro-Cement Tanks**

Ferro-cement refers to cement-rich mortar reinforced with layers of wire mesh. Sometimes, for added strength there may be reinforcement with additional plain wire. Often, tanks made of ferro-cement are used in many countries for collection and storage of water for various uses (like, domestic use, use in farms etc.). Tanks made of ferro-cement have got several advantages over those made of concrete or brick. These include, inter alia, the following: (i) often cheaper to build and require less skilled labour, (ii) they are able to withstand shock better because of the characteristic flexibility associated with ferro-cement, (iii) small-sized ferro-cement tanks are portable.

#### **2.2.3. Laurie Baker Technology: a Low-Cost, Eco-Friendly and Sustainable Model**

Laurie Baker model is fast getting acceptance as sustainable and eco-friendly technology for low cost housing. In fact, the range of offerings available with this model is also on the rise and so also the various advantages associated in savings achieved – in terms of money, resources, material and even energy. A few of the elements that make up the Laurie baker model are rainwater harvesting, rainwater recharging, biogas and other means of conserving energy, particularly relevant in the context of high fuel prices.

#### **2.2.4. Portable Bamboo Dwellings and Bamboo Floor Tiles: Economical, Eco-Friendly and Elegant**

Bamboo has proven its worth as a key raw material in building houses, unveiling the concept of portable houses. Bamboo has potential for affordable, portable shelters for disaster-affected areas, ecologically sensitive forest areas etc. Researches have revealed that bamboo mats and boards can be used as the principal structural component for various purposes like flooring, walling and roofing. Structures for the supporting components can be developed in other suitable materials such as steel, wood and glass. Another dimension of utilization of bamboo as a structural component in buildings is that it opens up the prospect of providing a sustainable livelihood to thousands of people who depend on its exploitation for livelihood. In this connection, it may be stated that the durability of bamboo can be enhanced or maintained through appropriate treatments. Thus, by using bamboo, usage of structural materials that need lot of energy for production could be replaced. Further researches in this regard for enhancing the desirable features and to mitigate the limitations are still going on.

### **Part – III**

#### **3. Hurdles in Affordable Housing Development in India: an Overview**

In this section, an attempt is made to examine the major hurdles faced in promotion of affordable housing development in India. These are briefly discussed below:

##### **3.1. Availability of Land at Reasonable Prices**

Often builders and developers find it extremely difficult to find land at reasonable prices while going for development of affordable housing units. As the land cost is too high, making available affordable housing units becomes very difficult. Unless, the government takes the role as a facilitator to provide land at cheap rates (say, in particular notified areas) or some other agency does that job, affordable housing development becomes quite difficult.

##### **3.2. Too thin Margins for the Builders and Developers**

Another problem with the builders and developers is the fact that the profit margin on affordable housing market is too thin to be attractive for them. For instance, housing units for the high income demographic (HID) segments would fetch a margin of 40 percent for the developers while the same in respect of low income demographic (LID) segments is not even half of the former.



### 3.3. Availability of Infrastructure (like Sewage, Power, Water, Transport etc.)

For affordable housing development, the only land available to developers is outside the city limits. This in turn involves added costs of sewage, power, water, transport facilities like road lines and such other amenities. While in respect of HID customers all the above monumental costs could be added and then recouped from the customers, this is not possible in respect of LID segments. Thus, affordable houses may often lack many of the requisite amenities which in turn makes them less attractive to the target groups, especially because most LIDs need to live near to their workplaces for their livelihood.

## Part – IV

### 4. Using Technologies and Materials for Affordable Housing: Some Suggestions

In view of the foregoing discussions, in this section an attempt is made to offer a few pragmatic suggestions which could be meaningfully applied for policy decisions both at the macro level (industry, government, association of builders, etc.) and at the micro level (individual builders, developers etc.). These strategies seek to provide usable housing infrastructure to the low-income population through the use of affordable housing technologies (including affordable building materials).

#### 4.1 Suggestions relating to the Affordable Building Materials and Technologies

- Greater emphasis on the promotion of scarce building materials as well as the use of cost-effective and environmentally appropriate technology and indigenous resources. Besides, added thrust has to be given for promotion of building materials based on industrial and agricultural wastes among the construction agencies– under both public and private sectors.
- Public construction agencies be brought under mandatory compulsion to set aside minimum one-fourth of their total construction, to be made using cost effective technologies and materials. [In fact, National Housing Policy (NHP), 1992 had advocated 10% to be earmarked for cost-effective technologies and materials.]
- The governmental policy of offering fiscal incentives to entrepreneurs willing to take manufacture of building products based on industrial wastes like fly ash and phosphogypsum needs to be continued further. This includes exemption of excise duty on materials and components that are made making use of such low cost materials as inputs. Further concessions in the form of customs duty reduction be offered for import of plant and machinery required for the manufacture of the above kind. Likewise, excise duty waiver be offered for production of bricks or tiles with 25% or more of red mud (a waste product of the aluminum industry) and light concrete blocks / components. The excise duty on pre-fabricated building components also needs to be reduced further (say, 10 to 20%) for encouraging further use of flyash, phosphogypsum etc.
- Flyash be accorded the status of national resource material. Besides, in order to encourage its use to the maximum extent, new licenses to burnt clay kilns be given only if such units start replacing natural soil with flyash as the former is fast depleting.
- Research studies have shown that the costs of housing construction can be considerably reduced by the intelligent use of three ways of practice; viz. (i) standardization, (ii) mass production, and (iii) reduction of all designs; to the utmost functional simplicity compatible with modern, civilized standard of living.
- Financing in the form of equity participation as well as low-cost debts and term loans be offered by national regulatory agencies and apex financial institutions in the field of housing finance (like, HUDCO, NHB etc.) to new units engaged in production of building materials based on industrial and agricultural wastes.
- Permanent mechanism should be there under the union government to encourage research in the field of development of alternative housing technologies, low cost building materials, effective utilization of industrial and agricultural wastes etc. Besides, incentives are to be given for research in the area of innovative methods and models for financing the low income group, like, housing microfinance, SHG financing etc.
- Lastly, but not the least in importance, an integrated approach is very much essential for strong transfer of technology mechanism.





#### **4.2. Suggestions relating to the Broad Strategies that may adopted by the Providers of Housing (like, Builders and Developers)**

- The primary reasons for the builders and developers to shift their focus to affordable housing are mainly, (i) declining sales, (ii) low interest rates, (iii) paucity of funds, and (iv) global economic slow down. In fact, real estate sector is witnessing two grave problems, viz. (i) slump in demand, and (ii) poor performance of their stocks in the capital market. In the current scenario, the best strategy appears to be that of adopting affordable (budget) housing and hence seek to achieve profits through (i) higher volumes, though low profit margins, (ii) focusing on Tier II and Tier III cities (where there is greater demand for affordable housing units. Besides, in Tier II and Tier III cities, land and other amenities are available at relatively cheaper rates). Often, costly land is the biggest problem for builders for providing housing units at lower rates.
- As there is growing demand for small houses, (like. hall and kitchen) and also for low-priced versions of 2-BHK (two-bed-room, hall and kitchen) etc., it is always preferable to go for focus on such small-sized houses.
- Research studies have shown that success of affordable housing initiatives depends on two main factors (i) market conditions, (ii) location of the project. These two factors determine how much to invest in luxury housing and how much in affordable housing. Needless to mention, in the present scenario affordable housing has got a much higher demand than luxury segment. Here, it may be stated that selection of appropriate sites (like, those in the vicinity of work places, those with easy access to various amenities like water supply, electricity etc.) has got added significance in respect of affordable housing. Improper site selection may often result in situations where there may not be takers for houses so offered.
- While shifting focus to affordable housing from luxury housing, the strategies that could often be adopted are (i) reduction of the size of the housing units, (ii) focus on value engineering – only those features that really add value are incorporated and not the non-value added items, (iii) expecting lesser margins.
- Finding cheap sources of financing as well as reducing operational expenses are quite important because of the constant thinning of profit margins. For instance, in the present scenario banks have to pay on an average 9.5 percent on term deposits, but their housing loan rates (floating) are only in the range of 10 to 10.25 percent. In view of the very thin margins of 0.5 to 0.75 percent as above, it may be very difficult for banks to reduce the home loan interest rates further unless they get suitable refinance facility at rates lower than their lending rates. Thus, competitiveness and operational efficiency depend on cheap sources of funds and level of operational expenses.
- Last, but not the least in significance, is the role of advanced technology as the prime driver of affordable housing. For instance, as already discussed earlier cost-effective building systems based on pre-fabricated and perforated fibre boards ensure (i) plaster-free finish, (ii) in-built ducts for power and water supply, and (iii) considerable saving in time and manpower costs. Other advantages include, (i) about 10 percent extra carpet area, because the walls are of 4 inches width as against the conventional 7.5 to 9 inches. It is observed that, there would be cost savings to the tune of about 30 percent. In fact, only those players who keep abreast of the latest developments in the field alone can survive and prosper in the days to come in view of cut-throat competition. Investment in research and development on an ongoing basis is of utmost significance in this regard, as business innovation is increasingly becoming the hallmark of excellence in performance.

#### **Concluding Observations**

From the foregoing discussions it may be observed that as housing shortage is assuming gigantic proportions in India, the significance of affordable housing technologies increase day by day. So does the responsibility of the government to put up a permanent mechanism for promotion of low cost housing technologies including housing materials as well as innovative methods of financing the low-income group. Apart from maintaining and increasing the fiscal and budgetary support to all the agencies connected the promotion affordable housing, it appears that promotion of ongoing research in the relevant fields has to be given added thrust by providing requisite financial support and physical infrastructure. In view of the reasonable resilience of the Indian financial system in general and housing finance system in particular and favourable macroeconomic environment, it appears that through promotion of affordable housing in a big way, apart from a quantum jump in the standard of living of the masses, a very high level of economic development can be ensured. Thus, the prospects are quite good for the nation.



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