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A Review on Low Cost Housing Projects

Mr. Omkar G.Dinde [1], Mr. Omkar L.Narbat [2], Mr. Vaibhav Shinde.[3] Mr. Praduman P. Polawar [4]

(Student in Department of Civil Engineering, Raisoni College, Pune)

(Lecturer in Department of Civil Engineering, Raisoni College, Pune)

G.H. Raisoni College of Engineering and Management, Wagholi, Pune.

Abstract

In this present study low cost housing is the future requirement of globe. India is currently facing a shortage of about 17.6 million houses. The dream of owning a house particularly for low-income and middle-income families is becoming a difficult reality. Hence, it has become a necessity to adopt cost effective, innovative and environment-friendly housing technologies for the construction of houses and buildings for enabling the common people to construct houses at affordable cost.

This paper compares construction cost for the traditional and low cost housing technologies. Case studies in India are used for the investigation. Construction methods of foundation, walling, roofing and lintel are compared. Strength and durability of the structure, stability, safety and mental satisfaction are factors that assume top priority during cost reduction. It is found that about 26. 11% and 22.68% of the construction cost can be saved by using low cost housing technologies in comparison with the traditional construction methods in the case studies for walling and roofing respectively. This proves that using low cost housing technologies is a cost effective construction approach for the industry.

1.INTRODUCTION

Low cost housing can be considered affordable for low- and moderate- income earners if household can acquire a housing unit (owned or rented) for an amount up to 30 percent of its household income. In developing countries such as India, only 20% of the population are high-income earners, who are able to afford normal housing units. The low-income groups in developing countries are generally unable to access the housing market. Cost effective housing is a relative concept and has more to do with budgeting and seeks to reduce construction cost through better management, appropriate use of local materials, skills and technology but without sacrificing the performance and structure life. It should be noted that low cost housings are not houses which constructed by cheap building materials of substandard quality. A low cost house is designed and constructed as any other house with regard to foundation, structure and strength. The reduction in cost is achieved through effective utilization of locally available building materials and techniques that are durable, economical, accepted by users and not requiring costly maintenance. Economy is also achieved by postponing finishing and implementing low cost housing technologies in phases. High efficiency of workers, minimize waste in design and apply good management practices, can also be achieved.

I. *HOUSING SCENARIO IN INDIA*:

India is a populous country where approximately 70% of the people reside in rural areas. These people are migrating to urban settlements in search of jobs and better living standards. The exhibit 1 below shows the state-wise and category-wise housing shortage in India. It can be seen that 99% of the housing requirement is in the Economically Weaker Section (EWS) and the Low Income Housing (LIG) space.

1. ESTIMATION OF URBAN HOUSING SHORTAGE

About nineteen million (18.78 million) households grapple with housing shortage in Urban India (2012) as per the estimate of the Technical Group on Urban Housing Shortage. The estimate is based on Census & NSS 65th Round results on Housing conditions and Urban Slums with usual inputs like obsolescence factor, congestion factor & homeless households.

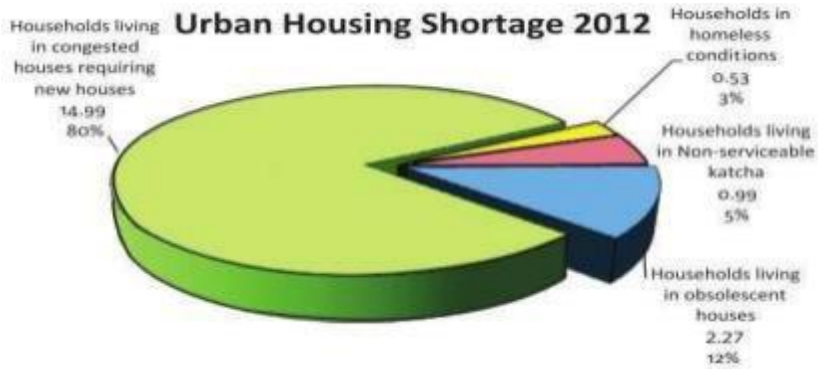
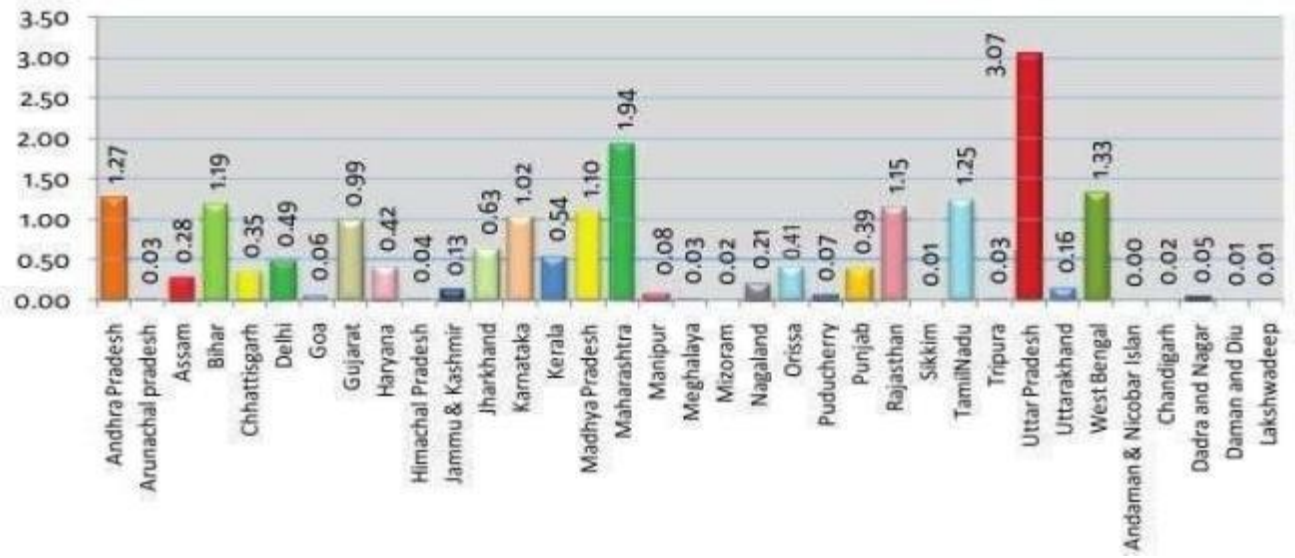


Fig No. 1 Showing Urban Housing Shortage

2. Distribution of Housing shortage state wise

Taking into account the fact that the shortage in housing is significant in lower income group, for 2012, TG- 12 distributed the shortage on the basis of State's contribution to the total, on the basis of average of total number of households below poverty line in urban areas & households with katcha houses in urban areas. In the past national level housing shortage was distributed among the states in proportion to number of urban households



*3. **Housing shortage across Economic categories**.*

Three fourths of the shortage is in the EWS (Economically Weaker Section- income up to Rs 5000 per month) category a n d another quarter of the shortage is in LIG (Lower Income Group- Income between Rs 5001- 10,000 per month) category. In the latter, a significant proportion of shortage is on account of congestion in living conditions.

TABLE I DISTRIBUTION OF HOUSING SHORTAGE

Category	**Distribution Of Housing Shortage among different Economic categories as on 2012**	
	No. (in Millions)	**In Percentage**
EWS	10.55	56.18
LIG	7.41	39.44
MIG and above	0.82	4.38
Total	**18.78**	**100.00**

III. *LOW COST CONSTRUCTION TECHNO- LOGIES*

It is found that cost-effective and alternative construction technologies, which apart from reducing construction cost by the reduction of quantity of building materials through improved and innovative techniques, can play a great role in providing better housing methods and

protecting the environment. It should be noted that cost-effective construction technologies do not compromise with safety and security of the buildings. Mostly follow the prevailing building codes. The detail procedures of each step used for the case study are as follow:

Foundation:

Arch foundation is used in which walls are supported on the brick or stone masonry. For the construction

of the foundation, the use of available materials such as brick or concrete blocks can be made to resist lateral forces buttresses at the corner.

Walling:

Rat trap bond technology is used in the case study. It is an alternative brick bonding

system for English and

Flemish Bond. The reduced number of joints can reduce mortar consumption. No plastering of the outside face is required and the wall usually is quite aesthetically pleasing and air

gaps created within the wall help making the house

thermally comfortable. In summer, the temperature inside the house is usually at least 5

degrees lower that the outside

ambient temperature and vice versa in winter.

Roofing:

A filler slab roofing system is used which based on the principle that for roofs which are simply supported, the upper part of the slab is subjected to compressive forces and the lower part of the slab experience tensile forces. Concrete is very good in withstanding compressive forces and steel bears the load due to tensile forces. Thus the low tensile region of the slab does not need any concrete except for holding steel reinforcements together.

Flooring:

Flooring is generally made of terracotta tiles or color oxides. Bedding is made out of broken brick bats. Various patterns and designs are used, depending on shape, size of tiles, span of flooring, and client's personal preference.

Plastering:

Plastering can be avoided on the walls, frequent expenditure on finishes and its maintenance is avoided. Properly protected brick wall will never lose its color or finish.

Doors and windows:

As door and window frames are responsible for almost half the cost of timber used, avoiding frames can considerably reduce timber cost. Door planks are screwed together with strap iron hinges to form doors, and this can be carried by 'holdfast' carried into the wall. The

simplest and cost effective door can be made of vertical planks held together with horizontal or diagonal battens.

A simplest frameless window consists of a vertical plank of about 9" wide set into two holes, one at the top and one at the bottom. This forms a simple pivotal window. Wide span windows can be partially framed and fixed to walls or can have rows of pivotal planks.

IV. *MATERIALS:*

1. Energy Efficient
2. Environment Friendly
3. Employment Generating

V. *LIST OF CONSTRUCTION MATERIALS*

Hollow bricks

Load bearing wall

Precast beams

Precast slabs

Precast stairs

VI. *COST EFFECTIVENESS*

The construction methods of walling and roofing are selected for the detail cost analysis based on available resources from the interviews. Table 1 and Table 2 summarise the cost analysis of the traditional construction methods and the low cost housing technologies in the case studies for walling and roofing respectively.

It is found that about 26.11% and 22.68% of the construction cost, including material and labour cost, can be saved by using the low cost housing technologies in comparison with the traditional construction methods for walling and roofing respectively.

However, it is necessary that good planning and design methods shall be adopted by utilizing the services of an experienced engineer or an architect for supervising the work, thereby achieving overall cost effectiveness.

VIII. *CONCLUSION*:

The dream of owning a house particularly for low- income and middle- income families is becoming a difficult reality. It is necessary to adopt cost effective, innovative and environment-friendly housing technologies for the construction. This paper examined the cost effectiveness of using low cost housing technologies in comparison with the

traditional construction methods. Two case studies in India were conducted. It was found that about 26. 11% and 22.68% of the construction cost, including material and labour cost, can be saved by using the low cost housing technologies in comparison with the traditional construction methods for walling and roofing respectively. This proves the benefits and the trends for implementing low cost housing technologies in the industry.

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