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Lowcost Housing Using Different Material & Its Comparison

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ABSTRACT: Now-a-days due to excessive population growth, people require more number of houses to stay within but they generally build normal building in which energy consumption is more which inefficient. But the energy source is decreasing very fast now-a-days, so by implementing green buildings throughout the world, we can reduce the conventional energy consumption and so by reducing pollution. India is facing shortage of about 17.6 million houses. It has become a necessity to adopt cost effective, innovative and environmental-friendly technologies. It is found that 26.11% to 22.68% of the construction cost can be saved using low cost technologies as compared with conventional traditional construction methods, in this paper an analysis has given to compare between Normal buildings and Green buildings and its economic analysis. Housing is a basic need of human being. But this is out of the means of low income householder who constitute majority of the population in the country. Low cost housing become must in civil engineering. In this report some methods of low cost housing given. First of all in this report present situation present trends and future tends about low costing hosting in India is given. This report is mainly concentrated on chapter construction materials. A few low cost materials are developed and discussed in this report..For example, use of solid blocks RFP Panels or low cost housing and bricks for common housing.In this report some case studies are being taken to compare it with conventional type of buildings. Finally we can Compare the Cost of the with Conventional and Affordable Materials for Construction.

I. INTRODUCTION

In Censes of 2011, the country had a blasting population of 1,211.96 million, among that 378.11 million (Approx. 31.15 %) stayed in Urban Areas. In last decade 2001-2011, the urban Indian population exploded at a compound annual rate-growth of 2.9%, resulted within the compounded enhanced level of urbanization from 27.81% to 31.15% and still increasing until date. This speedily growing population of individuals in Urban-Areas has led to the difficult downside in housing deficit, land scarcity, and engorged roads & has additionally many issues of the present basic amenities like electricity, water and green areas of the cities and city. The projected demand is given below.



Fig. 1 Year-wise demand-supply gap projected

According to the 2011 censuses, urbanization within the metro city has created individuals more and more staying in “squatter settlements” and conjointly decreased-housing condition of every income groups in India. This can be essentially reasoned by the sky-moving value of land and major real-estate players in Urban-Areas of the town which have forcibly made affordability to occupy marginal land-typified by degeneration and housing stock shortage.



II. NEED

Affordability, especially in the Indian real estate sector, can mean a wide range of things. Specifically, the term holds different meaning for different categories of demographics. Further, there are also several socio-economic variables governing a city or location to consider. Generally, 'affordable housing' refers to residences that have been especially designed for the economically weaker section (EWS) and Lower Income Group (LIG) who are looking for the same comfort and security of a self-owned property/home that the more fortunate middle class enjoys. In the earlier years of real estate development in India, the EWS and LIG categories did not get much attention to their needs. However, with changes in administration and especially with the current government coming to power, a significant amount of changes has taken place in this respect.

2.1 IMPORTANCE

- Creating affordable housing is not just about helping a certain demographic to achieve their dream of home ownership.
- True, from a political viewpoint it is obviously important to cater to the demands of a massive vote bank.

2.2. LOGICAL APPROACH FOR OPTIMIZING HOUSING SOLUTIONS

- i) There should be a logical approach for providing appropriate technology based on the availability of options, considering its technical and economic analysis.
- ii) There should be optimal space in the design considering efficiency of space, minimum circulation space.
- iii) Economy should be considered in design of individual buildings, layouts, clusters etc.
- iv) While preparing the specifications it should be kept in mind that, cost effective construction systems are adopted.

III. OBJECTIVE

- i) To study methodology used in low cost housing scheme and different materials used for low cost housing.
- ii) To Overview development cost of low cost housing and conventional housing for given case study (Laxmi township)
- iii) To study accountability of low cost housing scheme for developer as well as for client.
- iv) To study impact on environment assessment of material used for low cost housing.

IV. LITERATURE REVIEW

4.1 Vidya Devi, Rinki Taur (Oct 2009)

This paper aims at varied aspects of prefabricated building methodologies for low value housing by lightness the various manufacture techniques to scale back the price of construction. Since there's continuous and recurrent production of same varieties of parts in formed construction, therefore, it ends up in quicker execution, a lot of productivity and economy. In prefabricated construction, the work on web site is reduced to minimum, thereby, enhancing the standard of labor, irresponsibility and cleanliness.

4.2 Jones Lang LaSalle (2011)

The paper offers the concept concerning Urbanization and Housing shortage in Bharat as per EWS, LIG, MIG and HIG as per the technical cluster report on Estimation of Urban Housing. In this paper below the Policy Framework and rules for Low price Housing the Central level Schemes likewise as State sponsored initiatives area unit mentioned. Central level schemes like. statesman National renewal Mission (JNNURM) and Maharashtra Housing and space Development Authority (MHADA)

4.3 Swaptik Chowdhury, Sangeeta Roy (Jan 21, 2013)

This paper aims to mean the varied aspects of prefabricated building ways for low price housing by light the various fabrication techniques, and therefore the efficient blessings achieved by its adoption which might be studied one by one supported the requirements so, rising the speed of construction and reducing the development price. the foremost gift ways of construction systems thought of here square measure particularly, structural, precast.

4.4 Krishnamachari (1980) as stated impermissible of the National Housing Policy

According to Krishnamachari (1980) as stated impermissible of the National Housing Policy, "shelter is a basic human



need and as an intrinsic part of human settlement, is closely linked with the process of overall socioeconomic development. Though a house is essentially a place of dwelling, it also fulfils many important social needs of the household. Besides providing shelter, it creates employment, generates voluntary saving and creates a conducive condition needed for achieving crucial goals

V. DATA COLLECTION

The data is being collected regarding the suitability of the materials for the environment and is analyzed. The detailed estimate is carried out with the proper plans of conventional building. The final cost of the conventional building is compared with low cost housing materials.

VI. METHODOLOGY

Housing for All” scheme and suggest feasible design and also to increase private partnership investment in the affordable housing policy. The focus lies on potentials found in construction technique, public-private partnerships model 4 for upgrading existing housing, as well as provide the housing shortage and providing basic facilities, and on beneficiary’s empowerment and creates a win-win situation for all with the model feasibility. These elements are based on an inclusive and people-cantered approach to development to speed up the scheme for the private builders towards affordable housing.

Some Common Methods which Can be Adopted are:

1.Designing and building of units:

The private developer will be responsible for designing and building of affordable housing units across all models.

2.Maintenance of units:

In the first two models, the beneficiaries would do the maintenance whereas in the remaining models he private developer is responsible for maintenance of the affordable housing units.

3.Distribution of units:

In the first four models, the private developer would be responsible for transfer of housing stock to the public authority, which in turn would hand over the units to the beneficiaries. In the remaining models i.e. direct relationship housing models, the private developer would be responsible for handover or allocation to beneficiaries.

4.Development mix:

The development mix would primarily include development of affordable housing across all the models, except in the case of mixed development cross subsidized model where the development mix would include development of high end housing or commercial development along with affordable housing.

Following are the steps which can be implemented:

1.IDENTIFYINGTHE LOCATION FOR LOWCOST HOUSING:

i.Identification the location and why does it require the Low Cost Housing concept will be carried out.

2.PREPERATION OF SITE LAYOUT:

i.Preparing the Layout of Site and how will the consrtruction going to take place.

3. PREPARATION OF SCHEDULE AND COSTING:

i.The schedule means how will the process going to take place and which process will take how much time and cost.

4.COMPARISON WITH CONVENTIONAL AREA:

i.Then there will be doing the comparison with the conventional type construction and how will it benefit.
ii.Comparison willlbe in terms cost,time,



environmental impact.

VII. RESULTS AND DISCUSSION

i. The results will be taken which will tell us which method is the best.

7.1. CONCLUSION

i. After all the study of the township we might conclude which method will be cost effective and best.

7.2. STUDYING AND FINDING

Data will be collected from case studies one study will be done on the site where construction is done by the conventional method and another study will be considered of the site where prefabrication is used. The difference between both the approaches will be made.

After the data collection and we will analyse the amount of material required for the construction we analyze what sustainable materials will be required and what it will cost.

After analyzing the use of various sustainable materials which are environment friendly, cheaper and easily available following conclusions are made with conventional type materials:

1. Filler slab is much more economical than traditional slab as it saves 16%, 44%, 17% of cement, steel and cost in two way slabs and 33%, 46%, 25% in one way slab respectively.
2. Brick panel saves 19% per m³ and Rs 418 in cement, 19% per m³ and Rs 21 in sand, 19% per m³ and Rs 127 in aggregate, and 38% per m³ and Rs 536 in steel.
3. For walling it saves around 26.11%
4. For Roofing it saves around 22.68%

Expected Outcome Would be:

1. After the data collection and analyzing it we will get to know about the cost of overall project.
2. Will review which method will be best possible and suitable for the area .

7.2 MATERIALS SELECTION FOR LOW COST HOUSING:

The first step to low cost housing material selection is to select ecofriendly building materials. This also enhances the sustainable design principle. The life cycle of building is Pre-building, building and post-building stages. Each stage of building should be such that they help conserve the energy. These three stages indicate flow of building materials through different stages of a building. Pre-building stage mainly consists of manufacture which is subdivided into Processing, packing and transport. The building phase mainly consists of construction, operation and maintenance whilst as the last stage would be disposal where the material can be recycled or reused. In Manufacturing of low cost building materials.

Non erodible Mud Plaster:

The plaster over mud walls gets eroded during rains, which necessitates costly annual repairs. This can be made non-erodible by the use of bitumen cutback emulsion containing mixture of hot bitumen and kerosene oil. The mixture is pugged along with mud mortar and wheat/ rice straw. This mortar is then applied on mud wall surface in thickness of 12 mm. One or two coats of mud cow dung slurry with cutback are applied after the plaster has dried as shown in figure 1. The maintenance cost gets lowered due to enhanced durability of mud walls. (R.K.Garg, 2008).



Fig 4.1. Mud Plastered House

Flat Slab

Slab is one such component of house that is directly supported on columns without any intermediate beams as shown in figure 3. It was constructed in 1906 by Turner in USA by using some of the basic theoretical designs. Testing of different slabs was done during 1910- 1920. But Nicholas in 1914 gave a basic design method for its construction, but Jacob S Grossman's method of equivalent frame method with equivalent beam had been preferred by many engineers.



Fig 4.2 Flat Slab

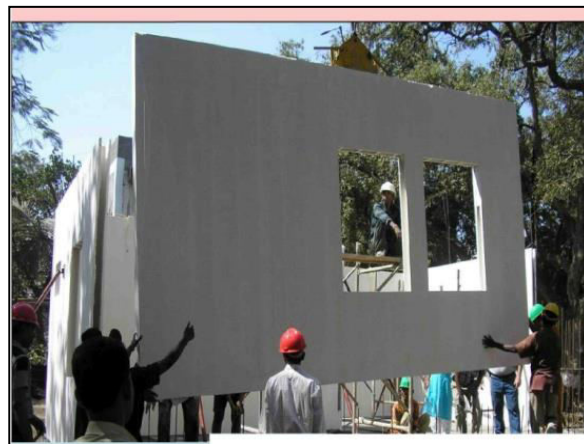


Fig 4.3. Rapid Wall Panel

Construction of the building is same up to the plinth level with RCC plinth beams provided with MS rods as start up rods for erection of panels as superstructure of building. Panels cut into various sizes as per building plan are brought to construction sites by truck or lorry. While panel is placed over plinth beam over a thin layer of cement mortar slurry, start up rod will go into cavities, including corner joints. Cavities up to required height will be in-filled with concrete



Materials used in Low Cost Housing Solutions

Low cost Housing materials can be broadly classified into natural materials and manmade materials according to the source of their availability. Materials like bagasse, rice husk, banana leaves, coconut husk, are naturally available from the remains of agriculture industry. Natural materials such as fibres, earth and fly ash are some of the materials which are easily available and have excellent prospects of being used in the construction industry. Materials like fly ash and Ferro cement are an example of man-made materials which can be recycled to make new product that helps in lowering the cost of construction.

7.5 SUITABILITY

The primary step for land conversion is getting the approval from the competent revenue authority i.e. Collector/ SDO/ Tehsildar. An application has to be sent to the competent authority for 'change of land use' explaining the purpose of such conversion.

The application shall comprise of:

- ✓ Certified copies of land records :
- ✓ Record of Rights and Tenancy Certificate (RTC)
- ✓ Mutation letter
- ✓ Original sale deed (or gift partition deed)
- ✓ Latest paid tax receipt
- ✓ Certified copies of Land map (from Tehsil/Taluk Office)
- ✓ Certified measurement plan of Land Survey (from District Inspector of Land records)
- ✓ Copies of Layout, Site plan and Building Plan duly signed by an architect
- ✓ Appointment letter of Architect and Registration Certificate of Architect

VIII. EXPECTATIONS IN LOW COST HOUSING:

- House building while also dealing with a significant environmental concern Specifically, it permitted the burning of rice chaff straw, which is generating major air pollution and a slew of health issues.
- Instead of burning the straw, recycling it with a cement mixture not only creates a sustainable low-cost construction material, but it may help cut air pollution.
- This research will describes a technique for creating a novel composite recycled material out of straw and cement.
- The material will be investigated from both economic and structural standpoint.
- A further research will look into and report on the thermal insulation capabilities of this material.
- The major anticipated consequence is to assist in the introduction of a unique sustainable construction material for low-cost housing as a supplement to the most recent government-funded housing projects.

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