

Rapid Slum Rehabilitation by Pradhan Mantri Awas Yojana and Public Private Partnership using Rapid Wall Technique

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Abstract— Slum could be a neighbourhood with vital population living in substandard housing that lacks basic and scientific discipline amenities. Urbanization, growing population and migration pressurizes cities leading to overflowing infrastructure, increase in urban status and haphazard development of cities. thus rehabilitation of slum is very important to produce truthful and cheap homes to slum dwellers.

GFRG is the truncation for glass fiber reinforce gypsum. It is the name of another building board item, made basically of gypsum plaster, strengthened with glass strands, and is likewise referred to in the business as rapid wall. This item, appropriate for fast mass-scale building development, was initially created and utilized since 1990 in Australia. GFRG is of specific importance to India, where there is a huge requirement for financially savvy mass-scale reasonable lodging, and where gypsum is inexhaustibly accessible as a mechanical result squander. The item is eco-accommodating or green, as well as impervious to water and fire.

During this thesis, slum rehabilitation by Public private Partnership is completed exploitation rapid wall technique. the knowledge in Pune city is collected. To a lower place Pradhan Mantri Awas Yojana housing for all theme the slum rehabilitation by Public private Partnership is completed. Techno-economic analysis of rehabilitation theme by typical/conventional manner and rapid wall is completed. Comparison of your time, value and resources is completed. And best various is chosen.

Keywords- Slum rehabilitation, Pradhan Mantri Awas Yojana, Public Private Partnership, Rapid wall technique, Glass Fiber Reinforced Gypsum(GFRG).

I. INTRODUCTION

Restoration of ghetto is basic to supply honest and shoddy homes to ghetto inhabitants. Urban industry changes face of geographic district, it's capacities as well. Due to urban industry city's past capacities are predominantly benefits, providers. City's antiquated work served to ideal limit, however these days it serve extra edge through blemished. It's offer higher monetary profit in analyze of topographical area. That the encompass provincial populace has pulled in toward closer town or geographic locale. This urban gave all season work. It lead the technique for relocation. Country limit has been relocated toward town or geographic district looking for occupations. These transients are low taught untalented and great work for urban industry. This sort of employments gave low monetary benefit work.

Ghetto restoration might be a welfare work with edges of TDR (Transferable development Rights) for builders who are included, if the time and estimation of development of ghetto recovery is lessen while not involving with it's quality so a great deal of and a considerable measure of individual builders will be enlivened. By this design the ghetto are unit expelled, ghetto occupants get a more grounded place to live, builders zone unit in benefit and consequently the town is created.

Glass Fiber Reinforced Gypsum (GFRG) Panel branded as Rapid wall is a building panel product, made of calcined gypsum, fiber reinforce fortified with glass filaments, for Mass-scale building development, was initially created and utilized since 1990 in Australia. The board, made to a thickness of 124mm under precisely controlled conditions to a length of 12 m and tallness of 3m, contains pits that might be unfilled, somewhat filled or completely loaded with strengthened concrete according to basic necessity. Trial studies and research in Australia, China and India have demonstrated that GFRG boards, reasonably loaded with plain fortified cement has generous quality to act as load bearing components as well as shear divider, fit for opposing horizontal loads because of seismic tremor and wind. GFRG board can likewise be utilized favorably as in-fills (non load bearing) in blend with RCC surrounded sections and bars (conventional framed construction of multi storey building) with no limitation on number of stories micro beams and RCC screed (acting on T-beam) can be utilized as floor/roof slab.

II. PRADHAN MANTRI AWAS YOJANA

The President of India, in his address to the Joint Session of Parliament on 9th June, 2014 had announced "By the time the Nation completes 75 years of its Independence, every family will have a pucca house with water connection, toilet facilities, 24x7 electricity supply and access." Prime Minister

envisioned Housing for All by 2022 when the Nation completes 75 years of its Independence. In order to achieve this objective, Central Government has launched a comprehensive mission "Housing for All by 2022" Housing for All (HFA) mission is since launched in compliance with the above objective of the Government and with the approval of competent authority.

Scope of scheme

- Housing for all missions for urban area will be implemented during 2015-2022 and this mission will provide central assistance to implementing agencies through states for providing houses to all eligible families or beneficiaries by 2022.
- Mission will be implemented as centrally sponsored scheme.
- A beneficiary family will comprise husband, wife, unmarried sons and/or unmarried daughters. The beneficiary family should not own a pucca house either in his/her name or in the name of his or her family in any part of India.
- States at their discretion, may decide a cut-off date on which beneficiaries need to be resident of that urban area for being eligible to take benefits under the scheme.
- Mission with all its component has become effective from the date 17.06.2015 and will be implemented up to 31.03.2022.

Implementation Methodology

The Mission will be implemented through four verticals giving option to beneficiaries, ULBs and State Governments. These four verticals are as below:

1) In-situ Slum Redevelopment using land as Resource

"In-situ" slum rehabilitation using land as a resource with private participation for providing houses to eligible slum dwellers is an important component of the "Housing for All" mission. This approach aims to leverage the locked potential of land under slums to provide houses "In situ" Slum Redevelopment - Using land as a resource - With private participation - Extra FSI/TDR/FAR if required to make projects financially viable.

2) Affordable Housing through Credit Linked - Interest subvention subsidy for EWS and LIG for new house or incremental housing - EWS: Annual Household Income Up to Rs.3 lakhs and house sizes upto 30 sq.m - LIG: Annual Household Income between Rs.3-6 lakhs and house sizes upto 60 sq.m.

3) Affordable Housing in Partnership-With private sector or public sector including Parastatal agencies - Central Assistance per EWS house in affordable housing projects where 35% of constructed houses are for EWS category.

4) Subsidy for beneficiary-led individual house construction-For individuals of EWS category requiring individual house. State to prepare a separate project for such beneficiaries.No isolated/ splintered beneficiary to be covered.

III. GLASS FIBER GYPSUM BUILDING PANEL SYSTEM

Glass Fiber Reinforced Gypsum (GFRG) Panel branded as Rapid wall is a building panel product, made of calcined gypsum, plaster, reinforced with glass fibers, for Mass-scale building construction, was originally developed and used since 1990 in Australia. The panel, manufactured to a thickness of 124mm under carefully controlled conditions to a length of 12 m and height of 3m, contains cavities that may be unfilled, partially filled or fully filled with reinforced concrete as per structural requirement. Experimental studies and research in Australia, China and India have shown that GFRG panels, suitably filled with plain reinforced concrete possesses substantial strength to act not only as load bearing elements but also as shear wall, capable of resisting lateral loads due to earthquake and wind. GFRG panel can also be used advantageously as in-fills (nonload bearing) in combination with RCC framed columns and beams (conventional framed construction of multi-storey building) without any restriction on number of stories micro-beams and RCC screed (acting on T-beam) can be used as floor/ roof slab.

Uses

- As lightweight load bearing walling in building (single or double storey construction) up to two storey construction: the panel may be used with or without non-structural core filling such as insulation, sand polyurethane or lightweight concrete.
- As high capacity vertical and shear load bearing structural walling in multi-storey construction: the panel core shall be filled with reinforced concrete suitably designed to resist the combined effect of lateral and gravity loading.
- As partition infill wall in multi-storey framed building: Panel may also be filled suitably.
- As Horizontal floor/roof slabs with reinforced concrete micro beams and screed (T-beam action).
- As pitched (sloped) roofing.
- As cladding for industrial building.
- As compound wall.

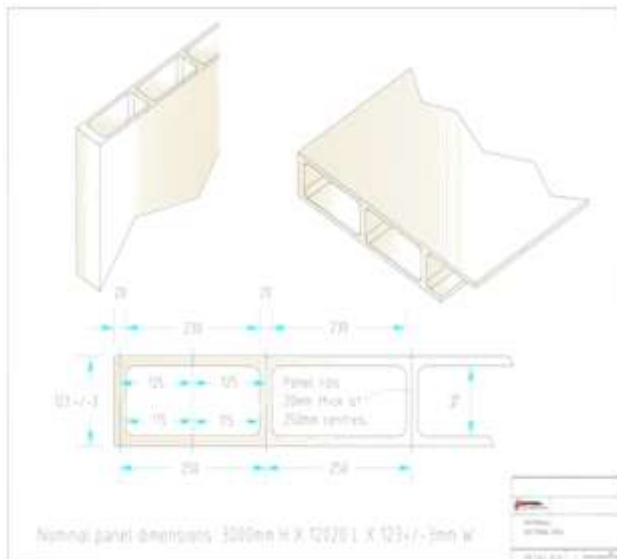


Figure 1. Typical Rapid wall sectional view

IV. OBJECTIVES

- To understand the technology of Rapid Wall construction thoroughly.
- To make the economical comparison between construction of building using rapid wall technique and conventional method.
- To study Pradhan Mantri Awas Yojana Scheme
- To prepare and analyze slum rehabilitation housing project for a particular slum area by public private partnership and Pradhan Mantri Awas Yojana.

V. METHODOLOGY

Sr no.	Item	Conventional Building	Rapid wall Building	Remark
1	Concrete (per flat)	30 m ³	12 m ³	GFRG requires 60% less
2	Steel	0.33 Tonnes	0.20 Tonnes	GFRG requires 40% less
3	Brick	112000	Nil	
4	Wall Panels	Nil	1056 m ²	
5	Formwork	Requires	Do not require	
6	Props	More	less	
7	Labour	Requires high	Requires less	
8	Natural resources	Requires high	Requires less	
9	Necessity of cranes	Optional	Must	

10	Time	300-315 Days	180-200 Days	GFRG requires 35% less
11	Cost	Rs 438774	Rs 399663	GFRG requires 10% less
12	Availability	Easily	Panels are available in Cochin.	

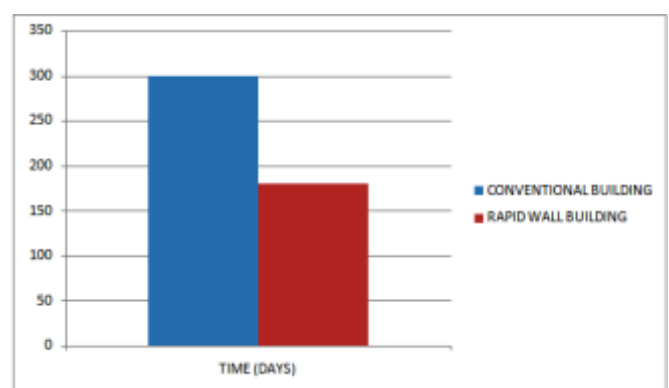
Table 1. Comparison of Rapid wall construction technique and conventional building technique.

In above table the comparison of Rapid wall construction technique and conventional building technique is done.

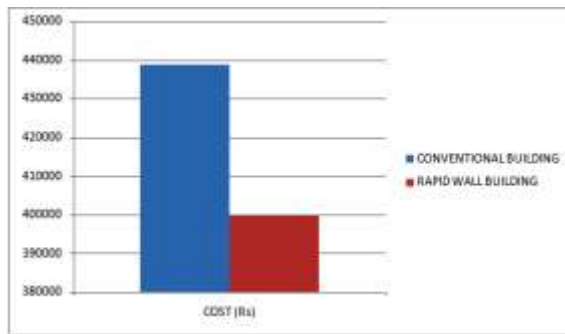
Result and discussions

Slum rehabilitation by public private partnership is carried out by conventional technique and rapid wall technique. The rehabilitation is done on the existing slum land .the slum dwellers paid Rs 100000 each for their flat. The contractor will get TDR from Pune Municipal Corporation. The supplier of Rapid wall panels FACT RCF Building Products Ltd. (FRBL) in Cochin and Mumbai. The erection of Rapid wall is done by Bounteous contractor Kerala. Techno-economic analysis of conventional technique and Rapid wall is carried out.

- GFRG building requires 60% less concrete, 40% less steel, 35% less time, 10% less cost, as compared to conventional building.
- GFRG building requires fewer natural resources as compared to conventional building.
- GFRG building does not require formwork for construction.
- The panels are available in Cochin and Mumbai. Hence the manufacturing company should expand their plants where ever possible.



Graph 1. Comparison Of Convention Building And Rapid Wall Building (Required Days)



Graph 2. Comparison Of Convention Building And Rapid Wall Building (Required Cost)

VI. CONCLUSION

Due to rapid urbanization the slums are growing fast in India. Increasing population is another major reason behind it. Slums are growing mostly on government land. Government should maintain record of their lands and unauthorized slums on it year wise. An officer must be appointed for maintaining the record of unauthorized slums. Government must undertake a well defined action plan for the unauthorized slums. The following are conclusion from this project.

- 1) The review of slum rehabilitation should be made because the funds allocated are money of tax payer.
- 2) Proper steps should be taken by government for identifying new slum areas.
- 3) Rapid wall is a low cost and fast track technique which leads to saving of resources, time and money.
- 4) In today's world of environmental degradation, where resources are exploited, Rapid wall technology is a boon as it is manufactured from the waste gypsum.
- 5) Rapid wall doesn't require formwork and is an easy erection process that leads to light weight structure.
- 6) Rapid wall technique is an ideal for construction of slum rehabilitation projects where low rise buildings are to be constructed.
- 7) In Rapid wall technique we can achieve 10% cost saving as compare to conventional building system.
- 8) In Rapid wall technique we can achieve 35% time saving as compare to conventional building system.

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