

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 7, Issue 1, January 2018

Redevelopment of Slum and It's Challenges and Solution

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ABSTRACT: Developing countries are facing a challenges of slums and there appears to be no fool proof solution to eradicate them. For improving the quality of life there are three approaches of slum Development and In-situ up-gradation approach is found to be the best one. Urbanization has created a large housing demand of urban poor. Although different stakeholders are involved there's a challenge to meet the redevelopment of urban slum dwelling projects in an effective manner. The concept is discussed with a case study of a slum in Nagpur City. Physical data was collected from stakeholders (construction material choices & cost incurred) and site monitoring. The study revealed the possible issues and challenges related to project execution i.e. resource and time management and other challenges with construction. The outcome of the study is to suggest suitable strategy and solutions for improving the functionality of the project to increase the speed and conserve the resources that ultimately benefit government as well as end user.

I. INTRODUCTION

Housing is one of the basic human needs along with food, clothing and education. Mankind has been evolving different kinds of shelter with the changing civilizations and time. High rise buildings the skyline of the large cities all over the world. Notwithstanding the rapid stride in the field of building technology, providing shelter to the teeming millions at affordable cost remains a distant reality in most of the developing countries across the globe.

Like any other developing country, India too is presently passing through a phase of acute housing shortage. Housing in India varies greatly and reflects the socio-economic mix of its vast population. . In the last decade, there has been tremendous growth in the country's housing sector, along with demographic changes, rise in income, growth in the number of nuclear families, and urbanization.

There is a housing shortage of about 6 crore units. The level of annual investments in the housing sector is about USD 110 to 120 billion. There is an average growth of 5 to 6 per cent in the annual real estate sector investments between FY08 and FY14. Both the central and state governments are spending about USD 5 to 6 billion annually, which is about 3 % of the current investments in the real estate sector, or 1 % of its annual expenditure.

The housing finance system, as it exists now, consists of formal sector includes budgetary allocations of central and state governments, assistance from financial institutions like LIC, GIC, UTI, NHB, HDFC, commercial banks, PF, housing finance companies and cooperative housing finance societies. Also major public sector agency like HUDCO is channelizing investible funds to the State housing Boards, Development authorities, Improvement trusts and co-operative societies. The private sectors, including companies such as Tata, have started to enter the low-income residential projects.

In 2013, the Government of India and National Housing Bank borrowed US \$100 million to fund their Low Income Housing Finance project. The money will be loaned to low income residents who wish to purchase or renovate a home. By 2022, India needs to develop about 11 crore housing units. Investments of more than USD 2 trillion or about USD 250 to 260 billion annual investment until 2022. Urban housing is to account for about 85 to 90 % of the total investments; the focus should be on affordable urban houses, which is 70 % of the total urban housing requirement. About 1.7 to 2.0 lakh hectare of land is expected to be required to fulfil urban housing need by 2022. About 70 % of the housing needs till 2022 should be concentrated in ten states. These states are Uttar Pradesh, Bihar, Maharashtra, West Bengal, Madhya Pradesh, Andhra Pradesh, Telangana, Rajasthan, Tamil Nadu, and Karnataka.

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(Source: Report of the Technical Group on Urban Housing Shortage (2012-17), Ministry of Housing and Urban Poverty Alleviation, Rural Housing for XII Five Year Plan, Ministry of Rural Development 2011; Funding the Vision - Housing for all by 2022, KPMG in India, 2014; KPMG in India analysis)

The state of Maharashtra seems to be witnessing rapid urbanization. As per National Census 2011, Maharashtra has the highest urban population of more than 5 crore the highest among any state. By the year 2022 the housing need in Maharashtra is expected to grow to 1 crore housing units (50 lakh each in urban and rural), with more of the, housing requirements in the Urban regions. The State Government has resolved to provide 19 lakh houses by the year 2022, with main thrust for Economically Weaker Section (EWS), Lower Income Group (LIG) and Middle Income Group (MIG) housing. This time bound objective has given a dimension of urgency to revise the earlier government housing policy. Thus a new housing policy needs to be in place in view of the new dynamic scenario by defining the role of the State as a Facilitator, Catalyst, Builder and Regulator. As per the census of 2011, out of 3.36 crore census houses 2.98 crore houses were occupied in the State. The population of the rural houses in the total census houses was 52.2% and 47.8% in urban areas. A Survey by the National Housing Bank (NHB), reveals a national housing shortage of 18.78 million in 2012-13, with Maharashtra's shortage estimated at 1.94 million houses. Urbanisation in Maharashtra has increased from 42.43% to 45.23% in 2001-2010. All indicators project an ever increasing trend of urbanisation. All indicators indicate the gravity of the housing deficit in the State particularly in the affordable housing following fig No. 1.1 shows the percentage of population of slum in various cities of housing segment and hence affordable housing needs a big push in India.

II. LITERATURE REVIEW

Sk. Nagaraju, B. Sivakonda Reddy, Prof. A. Ray Chaudhuri

Presented that resource management in construction projects a case study, they focussed on the study has been carried out in two phases. In the first phase, with the aid of primavera software project schedule for various activities for the construction of a commercial building was prepared. Subsequently, requirements of resources were attributed to the activities based on standard schedule rates (CPWD). The requisite data has been collected from the detailed drawings and prevailing site conditions. In the second phase, a resource constrained analysis was carried out by resource levelling for various activities by decreasing resources with increased duration to study the time-cost implications.

T.Subramani1, P.T.Lishitha2, M.Kavitha3

Time Overrun and Cost Effectiveness in the Construction Industry. The project management technique of planning and scheduling using tools and devices are helpful in comparing the project with stipulated cost, time and quality. Resource tracking, Minimize the uncertainty and Cost Effectiveness is focused in this project. The software tool used for planning and scheduling is Primavera project planner enterprise for construction. The study covers three case studies of the process of planning, scheduling the activities and monitoring. A general re sequencing model had been proposed to overcome the delay factor from the critical area, to minimize the delay of the construction and to reduce the time, cost and it also helpful to concentrate on the major areas in the project. Re sequencing model leads the management to cost savings and make entire project success. Resource planning is one aspect, which decides the systematic execution of the project at worksite. This study is to have hands- on experience in an ongoing project, and evaluation of schedule of equipment, staff, Labour and Materials. It helps to plan and evaluate the resources for the Construction of the building project. This study also compares the cost variation due to the delay of the project and re scheduling the project by crashing process.

Andrew Fernans Tom1, Sachin Paul2

Project Monitoring and Control using Primavera. Project monitoring and control is the process of collecting, recording, and reporting information concerning project performance. Project controlling uses the data from monitor activity to bring actual performance to planned performance. The present study deals with the project monitoring process of "Standard Design Factory", a four storeyed (G+3) factory building whose construction is in progress at Cochin, Kerala. A comparison between the planned progress of construction work and actual progress is performed in this study using project management software Primavera P6. Despite well-established principles and policies of project monitoring the

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process itself may not be efficiently accomplished in a project, because of those practical problems existing or arising in the project. Such an attempt in realizing the practical problems in implementation of project monitoring and control will contribute to proper recognition of the problem areas and putting in place the control process to rectify the deviations.

Rhuta Joshi¹, Prof. V. Z. Patil

The paper presents a resource constrained project schedule as per the site conditions. For resource constrained analysis resource levelling is done. The resource type for this project is considered manpower (labour) only. The project schedule increases day by day cost due to sudden requirement of labour or any unavoidable circumstances thus, it has an impact on the overall cost of the project. Duration is increased for decrease in resource constraints. The resources are masons, Male coolie and Electricians etc. Increase in duration (% increase) is 10.38% which causes increase in project cost by 0.94%. Thus the resource scheduling reduces the unexpected loss of the project which may be caused due to the huge variations in the usage of the resources.

III. RESEARCH METHODOLOGY

In order to achieve the stipulated aim, the study presented in this study, traces the following steps:

- General Brief for slum areas in Nagpur then identifies the selected cases for study.
- Find out Challenges in slum redevelopment project through site visit and face to face interview of stakeholder were done.
- Present the case study evolution to achieve the major findings of the study as per management perspective.
- Throughout the case study evolution, we can determine the number of recommendations to deal with the slums, which will create a balanced and sustainable management plan for sensitive redevelopment.

To Find Out Challenges in Slum Redevelopment Project

In order to study the challenges, a physical survey was carried out for a specific slum located at Pandharabodi, an on-going SRA project site at Nagpur. Out of considered 360 dwelling units of planned size around 30 sq. m. 150 dwellings were completed however 55 houses were observed under construction during the study. Different plans were prepared by local Municipal Corporation for in situ housing, according to plot size available.

- 1) The major challenges point out in a survey which details attached in Appendix 1.
- 2) Data collection from stakeholders like material supplier, Engg. in charge to enlist problems, material rates with the price break.
- 3) Planning on primavera software for time management and compared with existing planning.
- 4) Study of the practical solution to challenges for SRA project through analysis of data with literature review and comparing with the same finding.

Profile of Slums in Nagpur

In early 19th century, the people from western part of Vidarbha & Chhattisgarh migrated in search of job and started settling in old city area of Nagpur i.e. near Empress Mill (Cotton Industry). The squatting in Nagpur has taken place in proximity to the place of work and open land or low lying unused areas. The development plan of Nagpur in 1971 for the first time identified 45 slum pockets. Now, there are a total of 446 slums in city, out of which 421 are recognized in NMC official data. Out of the 446 slums, there are 279 notified (Slum has legal status) and 137 slums do not have any legal or administrative status and 18 newly identified slums. The number of households in slums is 2, 09,001 and the average size is about 6 per family. The land ownership of slum is 18% slums on the private land, 34% slums on mix which includes government, industrial and private ownership and remaining 48% slums on government land. The securities of tenure or tenure right are not allocated to any of the slums situated in Government land. Three main types of Settlements are identified in Nagpur in terms of settlement development processes, land tenure and settlement characteristics.

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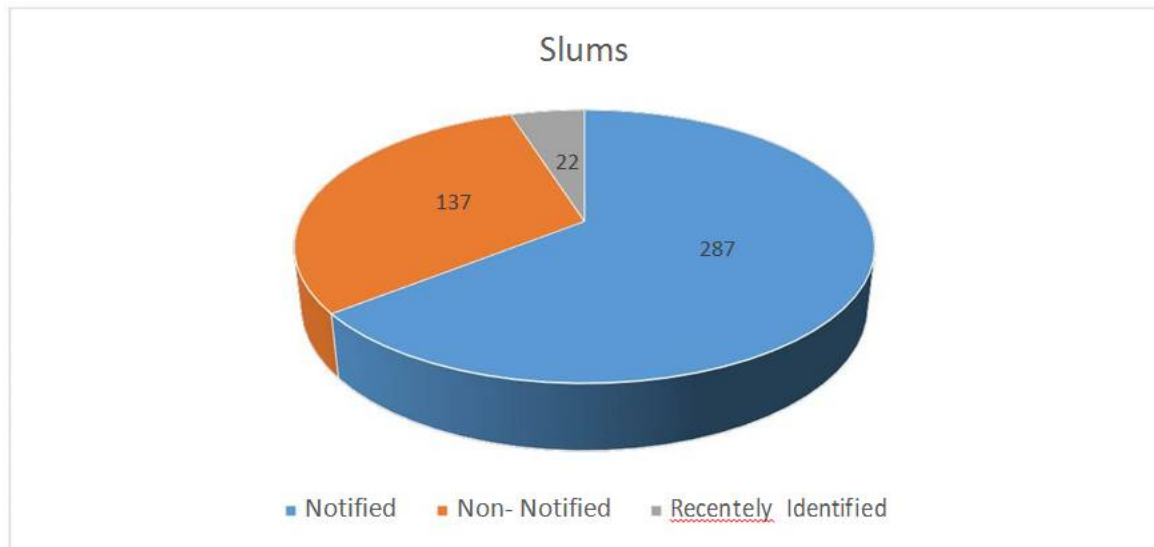


Fig No. 1: No of slum in Nagpur city

Housing Condition

The appropriate total no of housing structures in the slum is 1, 47,716 out of which 40% are permanent structure, 38% is semi-permanent (semi-pucca) structure and the remaining structures are temporary.

Out of 446 slums, 44 slum have more than are equal to 70 % of temporary kaccha structure and this constitute about 14% total temporary structure in city.

Nagpur Municipal Corporation had appointed *German Technical Committee (GTZ)* as a consultant for detailed study of slums in Nagpur City. Committee has suggested the following

Recommendations

1. Slums on lands earmarked for non-residential use may need relocation.
2. Settlement with poor soil conditioned and drainage should be considered for relocation.
3. Relocation proposal should be formulated with the consent and cooperation of community and concerned corporates (Elected representatives)
4. Slums for relocation to be prioritized on the basis of extent to which communities face hazards of flooding, willingness of community to shift and availability of relocation of site.
5. Proposal to be formulated in close cooperation with authority.
6. Availability of serviced sites for relocation to be examined in terms of available area, distance from existing settlement and cost of development.

Slum Rehabilitation Authority (SRA): SRA has identified slums in Nagpur city for relocation due to the reservation of land uses, ownership of land (security of tenure) and un-notified status of slums.

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IV. RESULT AND DISCUSSION

- Construction material constitutes a major cost component in any construction project. The total cost of material may be 50% of total cost; so that it is important for contractor to consider that timely availability of material is potential cause of successful completion of project.
- Make sure that all the resources and Material are available at site just in time and make funds available to reorder at reorder quantity level.
- After EOQ analysis for cement it is concluded that economic order quantity which is 2700 Bags & frequency of ordering 30days which has overcome the problems of Stock out successfully over the actual Site stock records.
- For B class material such as sand and aggregate on site material are ordered as per requirement because of space availability they could not maintain stock as per EOQ.
- After performance of EOQ on sand & Aggregate it can be concluded that those material does not gives satisfactory results because ordering frequency after EOQ was 30 days & 25 days but actually on site demand is as per daily requirement .
- The Total cost of inventory after adoption of EOQ analysis is less than without adopting EOQ.
- Material Manager should maintain reports such as material to order between two dates, material assignments, waste control, when to purchase construction material, when material must be on site, and purchase order between two dates.
- Approve a concrete mixer for desired quality and quantity of concrete.
- Accessibility in slums greatly effects on material management which tends to delay in supply of material.
- Provide more supervisory staff to control the production and quality of construction.
- An important characteristic of the EOQ model is is robustness which draws from the that the total cost curve relatively flat at the bottom *Which implies that the cost would go up by 2.5% if order quantity increase by 25%*

Table 1: Reorder level of material according to lead time given by material contractors.

Name of Material	EOQ	No. Of orders	Frequency Of ordering	Daily average demand	Lead Time in Days	Demand during lead time OR Reorder level
Cement	2700 bags	5	30 days	90 bags	4-6 days	360-540 Bags
Sand	250	5	30 days	8.33 Cum	2-4 days	16.66-33.33 Cum
Aggregate	200 Cum	6	25 days	8 Cum	2-3 days	16- 24 Cum
Steel	25 MT	6	25 days	1 MT	4-6 days	4-6MT
Bricks	150000 Nos	5	30days	5000 Nos	2-3 days	10000-15000Nos
Tiles	1020 Sq m	3	40 days	25.5 Sqm	1-3 days	25.5-76.5 Sq.m

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V. CONCLUSION

Slum redevelopment projects deals with major allocation of money and resource. Many studies have been done to maximize the efficiency of resource usage, but there exist gaps and limitations on ground, this study has brought up the issues, problems faced on site and try to give better solution to rectify the same . Following are the major identified challenges.

- Time overrun
- Seepage in newly constructed building due to bad construction and lack of water proofing treatment.
- Material quality used in construction becomes inferior due to improper storage, handling and poor mixing of concrete.
- According to plot size, preparation of plan with minimum requirement of sizes of rooms as per slandered could not followed.

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