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Financial Feasibility Study on a Redevelopment Residential High Rise Building

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Abstract - *: Redevelopment schemes have been presented by the state as humanitarian and innovative solutions to rescue Mumbai from disorder and degeneration and set it on a path of 'world class'-ness. As the number of buildings in need of repair started rising the debt-ridden state involved private builders to take over the responsibility of rehabilitation and redevelopment. In exchange it offered the developers a Floor Space Index of 2.5 that could be used for constructing profitable projects to the builder. But two major challenges are limiting the performance of the construction industry in India, which are poor cost and schedule performance of the construction projects. Therefore, the aim of this study is to fill an important knowledge gap by identifying the various attributes for construction project delay, using the residential building project at Vartak Nagar Bldg No 18 Thane. This thesis concentrates on investigation of centre components that are bringing about deferrals and breaking down the everyday records to limit delays. Depending on the sort of study , an extra collection of relevant evidence like information about resource plans, resource usage, budgets, and expenditures will aid within the effort.*

***Key Words*: Delay analysis, Redevelopment projects, Microsoft Project, Project Management**

INTRODUCTION

There has been a growing trend in easing of various regulations and utilization of private resources since the 1980s, when the central government's policy for urban renaissance was presented, which led to somewhat a boom of large-scale urban redevelopment projects, especially in the central Mumbai. And many of those started in the 1980s completed these days. Moreover, it can be expected that the central government's urban renaissance policy (again) since 2002 will accelerate this trend Mumbai, being one of the most valued real estate markets in a developing country like India, needs a thoughtful and robust development plan to sustain its growth potential. The work on Mumbai's development plan started a couple of years ago. The large-scale redevelopment projects aren't only mere targets of the urban renaissance policies. Because these large-scale redevelopment projects can provides a big impact on a reasonably large area, naturally, they will become arenas of interests. In the project process, the stakeholders, like government, private developers, communities, manage to coordinate their interests and to form cooperation among them through various organizations, both formal and informal, though the formation of cooperation sometimes delays the project. Then, how did those large-scale redevelopment projects complete? How were their processes? How did the stakeholders coordinate their interests and form cooperation among them? As there's no recipe applicable to each project, the important is to find out from various projects. Delays of a re-development venture is characterized as late fulfilment of the venture when contrasted with the arranged timetable. Clinched alongside construction, the expression —Delay alludes on something happening toward a after the very fact occasion when over planned, expected, specified. Delay will be those abating down from claiming worth of effort without ceasing development actually. Furthermore which may prompt run through overwhelm Possibly past the agreement date or past the date that the gatherings bring concurred to the conveyance of the project. Delays classified into non-excusable delays, excusable non compensable delays, excusable compensable delays and concurrent delays. Non-excusable delays are delays, which those foreman whichever reasons alternately accepts the hazard for. Sensible non-compensable delays might be delays initiated Eventually Compensable reasonable delays are reasonable delays, suspensions, or interruptions should every last bit or and only the worth of effort brought on Eventually an indication or disappointment to enactment by the manager happening due to owner 's break for an obligation, stated alternately implied, within the contract. Concurrent delays occur when both owner and therefore the contractor are liable for the delay.

There are three basic ways to categorize type of delays:

- Critical and noncritical
- Excusable and Non-excusable
- Compensable and non-compensable

REDEVELOPMENT

Redevelopment means demolishing the Old Structure and replacing an equivalent with New Structure with new Dimensions and Space. As per Bye-law no. 77, Structural Audit of the Building is to be conducted when the Building is quite 30 years old. The Report of such Structural Audit would reveal the condition of the Building and indicate whether the Society needs Redevelopment. The Structural Audit is conducted only by a Government approved

Architect. Conducting Structural Audit is mandatory since it's the primary and therefore the foremost step to be taken for deciding Redevelopment as Structural Survey is required to be administered for both the building and the adjacent structures.

The state government of Maharashtra first recognized the importance of redeveloping in 1971. The Slum Improvement Programme (SIP) of 1972 was intended to supply basic amenities to the slum like water, electricity, latrines and disposal , but couldn't implement these plans as there was no comprehensive census on the slums of Mumbai.

The Society should consider Redevelopment of the building as long as an adverse Structural Audit Report is received from an approved Structural Auditor appointed by the Society to try to to Structural Survey /Audit of the Building as per Bye-Law no. 77 and his report should clearly mention the small print of defects / remedies / cost of repairs etc.

A written consent is required from each and each member of the Society for completing Redevelopment. Unlike the S R A Project, during a Registered Co-operative Housing Society, 100% consent of all the members is required before the Society can plow ahead with Redevelopment

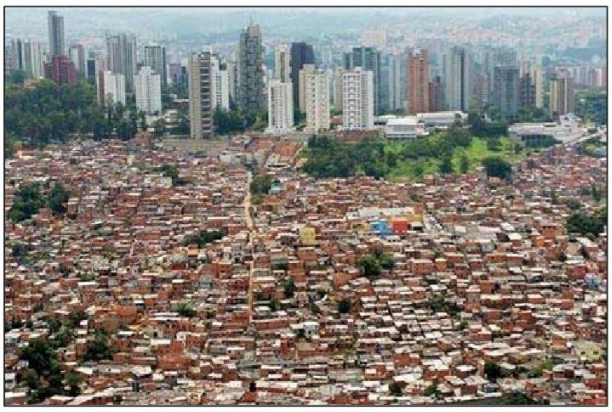


Figure: Mumbai's slum Region prompted for Redevelopment.

ADVANTAGES OF REDEVELOPMENT

• Better planned and designed flats with earthquake structure with attached bathrooms in bedrooms are going to be available.

• Corpus fund received by each individual member will lookout of increase within the maintenance cost of the Premises or might be utilized for other purposes.

• Additional area of 25-30% are going to be received as compensation from the Developer. Also, additional space, if available, might be purchased from the Developer at the best available price.

• Modern facilities / amenities / gadgets like lifts, intercom system, smoke detectors, firefighting alarm system, concealed plumbing, concealed wiring for electricity, telephone, cable TV etc. will be available.

• Stilt or underground parking will be available which will ease space on the ground.

• Clubhouse, Swimming Pool, Gymnasium, Community Hall etc. will be available.

DELAY ANALYSIS IN PROJECTS

Delay is one among the foremost usual, significant and high problems which impact the time think about the engineering construction projects. Even with technological advances and recuperating understanding of project management by project managers, time overrun may be a critical factor. There are different reasons for delay in the projects. Causes like "postponement of fabric delivery to the location of the project" which experienced at "Airport Development project" in Philippines (The ADB, 2005), breakdown which experienced at "Xieng Khouang road improvement project" in Lao people's democratic (The ADB, 2006), political issues which experienced at "Third road rehabilitation and maintenance project" in Republic of Nicaragua (The International Bank for Reconstruction and Development , 2007 B), and Sever weather that happened in "Gujarat earthquake rehabilitation and reconstruction project" in India (The International Bank for Reconstruction and Development , 2009 A) also are reasons and instanses for delays. In some cases, delays make the condition even more complex. It is required for an in depth appraisal to acknowledge the delay factors and choose accurate and right actions to scale back the adverse impact of delays on the duration of the projects.

RESEARCH SCOPE AND OBJECTIVES

This research aims at performing the analysis for the factors and effects of delays occurring at redevelopment sites in Mumbai on residential projects

Therefore, objectives of this research to fulfil the above aim are:

• To investigate the existence of time deviation from the original time factors in redevelopment construction projects;

• To understand various methodologies that will help in identifying the factors that lead to time deviation through extensive literature survey

• To undertake a case study to investigate the existence and the reasons of time overrun redevelopment sites in Mumbai;

• To Prepare and schedule the baseline program and update using MS project

• To develop a satisfaction factor for the projects based on data provided in the feasibility reports and completion reports.

LIMITATIONS OF THE STUDY

The work for analyzing factors that affect delay overruns in construction projects is carried out only in the redevelopment project at Mumbai. The work is limited to the residential real estate sector only and the results of the analysis will be based on the acquired statistics and data from the site and interviewing the officials at the site.

RESEARCH PROBLEM

Time Overrun is one among the foremost significant issues being faced by the development industry today. There are various factors liable for the time overrun which require serious attention to know and address so as to realize successful completion of projects on time. This is because time overrun has great impact to construction cost which may never be recovered. In housing industry timely completion of project may be a major criterion of project success (Rwelamilla and Hall1995). Time overrun is any delay beyond the baseline construction schedule. Minimizing time and price is that the main goal in managing a construction project. However, time delay frequently occurs altogether phases of a construction project and consequently increases project total duration (Yang and Ou 2008). The overall objective of the study is to identify the factors responsible for the over-runs of time in a Redevelopment project. Furthermore impacting few puts which can't an opportunity to be excavated Toward hardware. This study attempts to generalize.

LITERATURE REVIEW

Miroslavas Pavlovskis, Jurgita Antucheviciene, Darius Migilinskas (2017) Assessment of buildings redevelopment possibilities using MCDM and BIM techniques – Procedia Engineering 172 (2017) 846 – 850
The paper deals with abandoned former industrial buildings problem and buildings' redevelopment possibilities with emphasis on sustainable development. A complex decision-making model for redevelopment of abandoned buildings, combining Building Information Modelling (BIM) and Multiple Criteria Decision Making (MCDM) techniques, is proposed. A case study of a former measurement equipment factory is presented. Ranking of possible redevelopment alternatives of the building using Weighted Aggregated Sum Product Assessment method with grey attributes scores (WASPAS-G) is proposed and the most rational projects are selected. While BIM techniques supports an effective selection process and allows implementation of full lifetime management strategy of a project and then of a real object.

Rashmi. M. Bijwar, Prof. Dr. A. B. More (2017) Delay analysis in construction of redevelopment residential project - International Research Journal of Engineering and Technology Volume: 04 Issue: 07 | July - The study is being conducted on various factors that were causing the delays in project. The causes, resources and therefore the discrete methods on nonetheless to derogate the delays within the ordering locality are noted down regularly. The day-to-day data is regularly collected from site. Beginning time, completing time, Also span is recorded over misundertaking differentiating undertaking Furthermore basic movement alongside the delays caused What's more purposes behind those delays. A questionnaire could also be arranged posting crazy Different variables helping to delay under diverse classifications In light of perceptions In development webpage Furthermore from a couple of diary papers as reference. Those sees on an equivalent starting with Different gatherings included On an undertaking almost like those builder/developer, foreman What's more consultants are moaning within the questionnaire. Each component are going to be provided for An weight-age landed at utilizing filled-up questionnaires, using, which those mossy cup oak persuasive elements would recognized.

Vinod Vanvari, Dr. Sumedh Mhaske (2018) Redevelopment of buildings in Mumbai city: risks and challenges - International Journal of Engineering & Technology, 7 (3.29) (2018) 91-94

The study has also revealed various pitfalls and uncertainties related to these projects. This will enable concerned stakeholders to prepare to address these. In most cities of developing countries, old buildings always tend to undergo redevelopment. There are one or more than one reasons for this. Such as buildings which are in dilapidated condition or uneconomic to repair or tenants are in a need of more usable floor area. This activity of building redevelopment is far visible in Mumbai city for past decade and half. Because of various constraints and considerations, this process of projects of building redevelopment is quite complex. It takes considerable efforts and time to accomplish the projects. If a proper and time bound process is not followed, or if the risks, uncertainties and challenges are not handled properly, even a seemingly simple project can fail, thereby causing great anguish and hardship to the stakeholders. Sometimes this may lead to prolonged litigation. There is a need to identify risks and challenges involved in the process of building redevelopment projects.

Minsun KIM (2012) Peri-urbanization and its impacts on rural livelihoods in Mumbai's urban fringe - Peri-urbanization and its impacts on rural livelihoods in Mumbai's urban fringe 48th ISOCARP Congress 2012

This research aims to analyze long-term trends in land-use change, to clarify various factors which have influenced spatial pattern of urban expansion in Mumbai metropolitan

region, and to discuss on the relationship with the land use management system operated within the context of preservation of prime agricultural land. A detailed case study on accessibility of physical assets and rural livelihood transformation of urban-rural fringe villages in Panvel block, Raigad district revealed urbanization trends on the local society and their implications for urban-rural relationships within the region. At present, the land problem has become compounded thanks to urbanization and industrialization. The rise in land prices have attracted brokers and agents, still is insufficient to maneuver to populated area for the tiny plot holders.

Ramakrishna Nallathiga , Prajakta Girkar and Samdisha Sapra (2019) Planning Slum Rehabilitation/ Redevelopment Projects: Evaluation and Learning from Mumbai - 'Real Estate Development', Research & Publications Department, National Institute of Construction Management Research, Pune, pp 11 – 30

This paper attempts to makes an evaluation of such SRS projects in Mumbai through a survey of the beneficiary slum dwellers to assess their effectiveness. The results indicate that social infrastructure at community level isn't well integrated into the SRS project planning, thereby affecting the general development and living environment of slum dwellers. Therefore, other Indian cities need to keep it in mind within the planning and style stage of SRS projects. Slum rehabilitation/ redevelopment is essential for improving housing in a large metropolitan city like Mumbai, which has more than 50% of the population living in slums. It is required for uplifting the living conditions and improving the living environment of slum dwellers. The SRA has taken leadership role while also serving as a planning authority. Most of the SRS projects are undertaken in Mumbai under the SRA schemes.

Ashwini Arun Salunkhe, Rahul S. Patil (2014) Effect of construction delays on project time overrun:indian scenario - International Journal of Research in Engineering and Technology Volume: 03 Issue: 01 | Jan-2014, This paper highlights the kinds of construction delays thanks to which project suffer time and price overrun. Construction delay is taken into account to be one among the recurring problems within the housing industry and it's an adverse effect on project success in terms of your time , cost and quality. The construction industry is that the tool through which a society achieves its goal of urban and rural development. It is one among the sectors that gives important ingredient for the event of an economy. This paper studies external and internal factors that influence the development process and descriptions the effect of delay in large construction projects. Various media reports shows incidents of extended delays and extensive cost overruns in infrastructure projects. These delayed projects are further can conclude additional delays and this affects an ongoing projects and also new projects which couldn't be started thanks to pending projects whose completion date already elongated. Realizing the density of matter this paper studies the performance of previous year 2012 ongoing and also completed projects.

Muhammad Akram Akhund , Ali Raza Khoso , Uroosa Memon , Shabeer Hussain Khahro (2017) Time Overrun in Construction Projects of Developing Countries - Imperial Journal of Interdisciplinary Research Vol-3, Issue-4, 2017

This paper provides a conceptual framework to beat this issue. Two important sorts of time overrun are considered during this study for developing the frame-work: one is excusable delay and second is non-excusable delay. Based on the frame-work it identifies the critical factors causing time overrun. This study is aimed to assist the industry practitioners in taking necessary measures for avoiding delay publicly Sector construction projects. The issue of your time overrun in construction projects has been unavoidable for several years. Its impacts are so numerous that it results in hamper the completion of plans of any country. The improvement of your time overruns causes both technical and project management related factors. This improvement can also improve the influence of human attitudes, behavior, skills and mentality. The purpose of this study is to supply positive and negative factors which cause time overrun during a construction projects by the theoretical frame work for the longer term study. To validate the significant of the frame work it is required the reliability and criticality of the framework.

Mulenga Mukuka, Clinton Aigbavboa, Wellington Thwala (2015) Effects of construction projects schedule overruns: A case of the Gauteng Province, South Africa - Procedia Manufacturing 3 (2015) 1690 – 1695

This paper assesses the consequences of construction projects schedule overruns within the Gauteng – South African housing industry. The data utilized in this paper were derived from both primary and secondary sources. The secondary data was collected via an in depth review of related literature. The primary data was collected through a well-structured questionnaire which was distributed to construction professionals, who include: Architects, quantity surveyors, civil engineers, construction mangers and project managers. Out of the 200 questionnaires sent out, 146 were received back representing a 73% response rate. Data received from the questionnaires was analysed using descriptive statistics procedures. Findings from the study revealed that extension of some time , cost overruns, loss of profit, disputes, poor quality of labor because of hurrying the project, creates stress to the client, acceleration losses, bad reputation with contraction team, claims and delay in getting profit by the client were the most effects of construction projects schedule overruns in Gauteng, South Africa.

Tsegay Gebrehiwet, Hanbin Luo (2017) Analysis of Delay Impact on Construction Project Based on RII and Correlation Coefficient: Empirical Study - Procedia Engineering 196 (2017) 366 – 374

This study investigates the typical causes of delay at different stages of construction and its effect in the Ethiopian construction projects. Using a questionnaire with 52 causes and 5 effects of delay, data were collected from 77 participants' selected based on purposive sampling from the different contracting organizations. The methodologies utilized in this research are relative important index (RII) and coefficient of correlation. Based on the comparison, the impact of delay is found as, construction stage, pre-construction stage, and post-construction stage sequentially. The analysis of the relation in construction process shows; the average/overall is highly related, construction stage is the second related, post-construction stage is the third related and pre-construction stage is far part of all stages. As far as, overall/average causes of delay are like all stages. So from the overall, the influential causes of delay investigated are corruption, unavailability of utilities at site, inflation/price increases in materials, lack of quality materials, late design and style documents, slow delivery of materials, late in approving and receiving of complete project work, poor site management and performance, late release budget/funds, and ineffective project planning and scheduling successively as unique to the Ethiopian construction project.

Daniel W M Chan and Mohan M Kumaraswamy (1996) A comparative study of causes of time overruns in Hong Kong construction projects - International Journal of Project Management Vol. 15, No. 1, pp. 55-63, 1997

This paper presents the results of a survey undertaken to figure out and evaluate the relative importance of the various factors causing delays in Hong Kong construction projects. The survey covered 83 previously identified delay factors, which were grouped into eight major categories. The main reasons for delays were analyzed and ranked consistent with different groups classified on the idea of (a) the role of the parties within the local housing industry (i.e. whether clients, consultants or contractors) and (b) the sort of projects. Results indicate that the five principal and customary causes of delays are: 'poor site management and supervision', 'unforeseen ground conditions', 'low speed of deciding involving all project teams', 'client-initiated variations' and 'necessary variations of works'. Differing perceptions on the principal causes delaying projects are observed between Hong Kong, Saudi Arabia and Nigeria, the two latter countries being chosen for purposes of comparison with other countries. It is hoped that the many delay factors identified during this survey will provide a basis for strategies to attenuate delays and can even be incorporated into a 'construction time' forecasting model for Hong Kong construction projects within the future research programme. Copyright © 1996 Elsevier Science Ltd and IPMA. This paper presents the results of a questionnaire survey conducted in early 1995 in Hong Kong as part of a PhD research programme into the significant factors affecting the construction durations of projects. Two previous papers (Chan and Kumaraswamy t7'18) discussed and highlighted some of the significant factors incorporated in the present survey. The main thrust of this survey was to investigate the current views of construction industry participants as to the causes of time overruns of local projects.

METHODOLOGY

The data has been collected by interviewing the officials of the construction industry. The study has been broadly undertaken as follows:

• Identified the projects, which are undergoing Redevelopment.

• Studied all the available plans, estimates, schedules and work procedures intimately and picked up all the relevant data about the project.

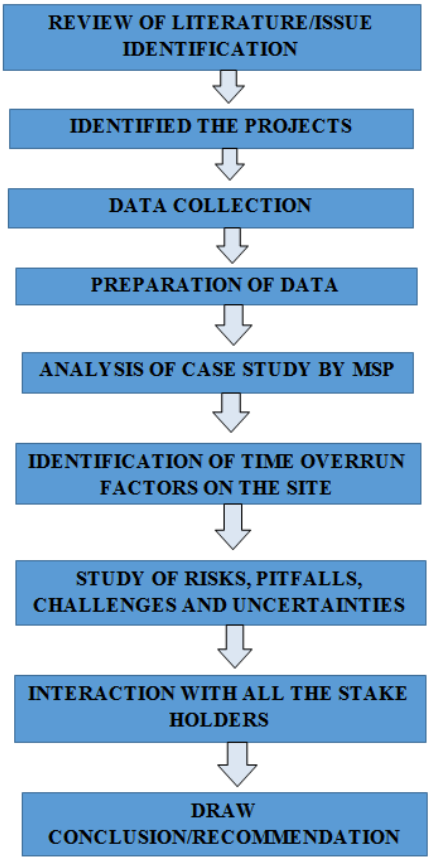
• Analyse the data obtained and compare the estimated and actual schedules and budget to understand the causes and implications of overruns.

• Examined the explanations for the over-runs through either personal interviews or questionnaires.

• Listed out all the shortcomings.

• Identified the reasons of Time overruns through a general survey of opinion from Architects, Consultants and Contractors and suggest the possible remedial solutions.

• The project study involved two stages. The primary data was gathered through a Literature survey targeted by web searches and review of e books, manuals, codes and journal papers. After review the problem statement is defined and the selected Project Sites of Mumbai region are taken up for detail study and analysis purposes. This project execution follows the flow chart given below:



Flow Chart

PROBLEM STATEMENT

In most cities of developing countries, old buildings always tend to undergo redevelopment. There are one or more than one reasons for this. Such as buildings which are in dilapidated condition or uneconomic to repair or tenants are in a need of more usable floor area. This activity of building redevelopment is much visible in Mumbai city for past decade and half. Because of various constraints and considerations, this process of projects of building redevelopment is quite complex. It takes considerable efforts and time to accomplish the projects. If a proper and time bound process is not followed, or if the risks, uncertainties and challenges are not handled properly, even a seemingly simple project can fail, thereby causing great anguish and hardship to the stakeholders. Sometimes this may lead to prolonged litigation. There is a need to identify risks and challenges involved in the process of building redevelopment projects. The aim of research is to interact with all the stakeholders of building development projects of housing societies and identify various risks and challenges visa-a-vis gains. However, some of them ignored the existing temporary populations during redevelopment process and many factors developed leading to the time and cost overruns in such type of projects.

RESEARCH GAP

From the available literature review it is noted that there is no significant research done to analyse the factors that affect time overruns in construction industry for redevelopment projects in Mumbai region. Mumbai is a developing city where there are multimillion projects going on simultaneously and contribute to the major share of employment for the human resource. With this consideration, work is undertaken to analyse the factors affecting construction productivity due to time and cost overruns in Mumbai area by using Microsoft Project and propose recommendations to improve the productivity on the redevelopment sites.

CHOICE OF STUDY AREA

The study was carried out within the city of Mumbai, Maharashtra. The choice of the location was based on three main factors:

- Mumbai is the largest city in India and largest city in Maharashtra.
- In Mumbai the current urban renewal projects that have either been completed or are under construction have a complete team of various stakeholders that are responsible for analytical causes that was useful to the study and
- Most of these projects are being financed by banks and other development partners coupled with the high level of investments in them; the developers are under pressure to complete on time, within budget and to the desired quality so as to put them to use immediately to get quick returns to service the loans and therefore time is of great concern to the developers

SUMMARY

To realize the objective of developing a framework to establish and assess the redevelopment strategies, the research method and procedure are identified and generated in the first part of this chapter. The development history of case study in Mumbai is reviewed. The factors that affect time and schedule delays on the site are investigated by interviewing the officials. According to the literature review in chapter 2, the needed data which associated with potential indicators to assess perspective are collected. the interview and findings are expected explained in the concluding part. The delays that affect the project schedule will be explained in the further chapters.

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