



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJIRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 11, Issue 6, June 2022

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.118



9940 572 462



6381 907 438



ijirset@gmail.com



www.ijirset.com

Cost-Benefit Analysis of High-Rise Structure Due to Pandemic Impact on Construction Industry

Shrunkhala Anil Shende¹, Dr. Pratibha M. Alandkar², Prof. Swati Kshirsagar³

Department of Civil Engineering, RMD Sinhgad School of Engineering, Warje, Pune, India¹

HOD, Department of Civil Engineering, RMD Sinhgad of Engineering, Warje, Pune, India²

Professor, Department of Civil Engineering, RMD Sinhgad of Engineering Warje, Pune, India³

3

ABSTRACT: To discover the key causes of construction project delays in India; the major causes of delays from this research study were studied following data collecting using a questionnaire survey with a wide range of construction professionals based in High-rise Projects. The findings of this study used an importance index to determine the major causes of delays, and the main conclusions drawn from the data could aid the construction industry in better assessing not only the major causes of delays on construction projects, but also how to minimize them through proper planning. The importance of safety leadership is sometimes disregarded in guidelines, despite its importance in ensuring the safe implementation of working procedures.

KEYWORDS: Low Rise & High Rise Buildings, Cost-benefit analysis

I. INTRODUCTION

Impacts of COVID-19 on High rise construction sector

COVID-19 victims are becoming more numerous by the day, which is having an influence on the building industry. Government lockdowns are disrupting the supply chain; labour shortages are emerging; companies are experiencing an economic downturn; and they are having difficulty keeping their contracts.

Management of the supply chain

In several places of the world, the supply chain has been interrupted in various ways. Various construction materials are necessary, but they are not reaching the construction site from outside due to lockdown, which is causing delays in the construction process. Various resources for construction work that come from various industries in the country or overseas via various vehicles, those items cannot come.

An issue with transportation

All modes of mobility in the country have been hampered as a result of the nationwide lockdown. As a result, no materials are being delivered to the construction industry, and no workers are able to work from home. As a result, the work has come to a halt.

Labor scarcity

To begin with, workers are unable to get to work since the transit system is entirely shut down. Second, because the sickness is caused by a viral infection, workers who come into touch with one another are more likely to spread it. As a result, many workers refuse to come to work. Furthermore, forcing workers to labour without any protection is impossible.

Financial difficulty

Companies are not making any profit as a result of the work stoppage; on the contrary, more losses are being incurred, and not only the company is losing money, but all of the suppliers who provide the required materials to various companies for use in the construction sector are also losing a lot of money.

Issues with contractual implication

It is primarily based on the 'force major' clause. This clause has a number of rules, one of which is 'Large Scale Epidemic.' This category includes the COVID-19 pandemic. Different contractors placed their various tools in various locations for usage in various machinery construction sectors, but because to the lockdown, all of these equipment have been laying around for a long period.

Unemployment

Because of the lockdown, businesses are losing a lot of money. As a result, businesses are unable to appropriately compensate their employees, and many people are laid off. Many people's jobs have been taken away as a result of this. Their families are also dealing with a lot of difficulties as a result of their job loss. Overall, a concerning scenario has developed.

II. LITRATURE REVIEW

1) Shelly Stiles, David Golightly, Brendan Ryan 5 December 2020. [1], Impact of COVID-19 on health and safety in the construction sector

It is a sector where safety has reached a plateau that still accounts for a significant number of injuries, lost working days, and a fatality injury rate in Great Britain 1.31 per 100,000 workers that is three times the all industry rate and where evidence of effective safety interventions is scarce.

Hari Bhakta Sharma et al. Peñaloza et al., 2020; Wilson et al., 2009 Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis of China's Prevention and Control Strategy for the COVID-19 Epidemic,

- This paper highlighted the pressing issues and global challenges of solid waste management in the context of the current COVID-19 crisis.
- To reduced economic activities due to COVID-19 have certainly made air and water cleaner as per many reports, change in the dynamics of plastic, food, and biomedical waste generation during the same time has however stirred the woes of solid waste management.

2) McClure et al., 2020, Downturns, Construction Delays, and the COVID-19 Pandemic,

Work with hazardous materials and exposure to potentially harmful conditions that impact the respiratory function may also mean greater risk of underlying health problems linked to COVID-19. Data are limited and direct causal pathways are still not well understood, these factors may explain why this sector has experienced higher incidence of COVID-19. Followings are the major findings from above paper:-

- The findings from this research determined the major causes of delays based on an importance index, and the main conclusions from output of the data could help the construction sector
- To better assess not only the major causes of delays on construction projects but also how to minimize them by proper planning.

3) Fennelly, Domingo, Setti et al., Kenyon 2020; COVID-19 Could Leverage a Sustainable Built Environment,

It is important to consider the mechanisms of transmission of COVID-19. Transmission is primarily airborne as droplets from person to person through face to face contact, though recent evidence also indicates that the virus may be suspended in the air as aerosols for appreciable periods of time Carriers may be symptomatic or asymptomatic and transmission is significantly greater in enclosed spaces.

Followings are the major findings from above paper:-

Author enlightened that a green field hospital can have a minimum of 30 beds. The number of beds to be constructed in a green field hospital will be dependent on feasibility study which would take into account the technical and commercials aspects of a project facility.

4) COVID-19 in Wuhan: Sociodemographic characteristics and hospital support measures associated with the immediate psychological impact on healthcare workers, Woolley et al., 2020

An implication of the PDO is that it can make more complex the communication and management of safety. Safety is managed down the hierarchy, but feedback up the hierarchy is often restricted.

Followings are the major findings from above paper:-

- In this research work, a case study in the state of Tamil Nadu was considered to find a suitable a HCW disposal alternative in Indian context.

5) **How is COVID-19 Experience Transforming Sustainability Requirements of Residential Building? A Review,** Stiles et al., 2018a, 2018;

The principal contractor has the primary responsibility for co-ordination of site safety; the employer also has statutory duties for their employees. To study differences in safety culture and safety practice across the PDO may inhibit how safety leadership from the principal contractor influences the supply chain.

Followings are the major findings from above paper:-

- Author highlighted how by working together collaboratively, leads towards SMART documentation process with eliminated waste. This improvement, in conjunction with an entire team working together in the best interests of the project along many different fronts, allowed the team to deliver the project ahead of schedule and under budget.
- Study contributes the best value in renovations or expansion versus green field construction.

III. RESEARCH METHODOLOGY

Research Methodology will be designing a questionnaire survey by which we can find out the factor affecting the construction cost which directly related with material use in construction projects in pandemic situation.

By operating advance technology at construction project reduce delay in transporting of material and increase efficiency of work that ultimately reflect of time and cost.

From literature found that because of frequent change of project managers, Appointment of staffs in the site who are not experienced and also Non sequential progress of works and that Work was not followed as per procedure instead it was followed as per availability of resources caused delays in construction project on pandemic situation

Unavailability of adequately trained health workers and lack of experience in managing an unprecedented emergency; the pandemic and the confinement measures created a psychosocial burden for the population and, especially, the wellbeing of the health workforce.

The construction industry is the vehicle through which physical development is achieved, and this is truly the locomotive of the national economy. The more resources, engineering know-how, labor, materials, equipment, capital, and market exchange provided from within the national economy, the higher the extent of self-reliance. The increasing complexity of infrastructure projects and the environment, within which they are constructed, place greater demands on construction managers to deliver projects on time, within the planned budget and with high quality.

Therefore, improving construction efficiency by means of cost-effectiveness and timeliness would certainly contribute to cost savings for the country as a whole. Efforts directed to cost and time effectiveness were associated with managing time and cost.

It also aims to identify the main factors that lead to project delays and to suggest recommendations on how to overcome or mitigate effects of the problem. Data is gathered from responses from questionnaire survey and interviews with those involved in construction project

The surveys and research findings indicate that delay incidents occur mainly during the construction phase of a project and one or more parties usually contribute to delay. This paper highlights the importance of having more experienced and capable construction managers as well as skilled labourers to enable the industry to develop at a faster rate either nationally or internationally.

A questionnaire and personal interviews have formed the basis of this research. Factor analysis and regression modelling were used to examine the significance of the delay factors. From the factor analysis, most critical factors of construction delay were identified as

- Lack of commitment;
- Inefficient site management;

- Poor site coordination;
- Improper planning;
- lack of clarity in project scope;
- lack of communication; and
- Sub-standard contract.

1. Questionnaire construction

A questionnaire survey approach was used for this project to determine the impact of various factors affecting the project's cost. The questionnaire's design philosophy was based on the fact that it needed to be simple, clear, and understandable for the respondents while also being easily interpreted by the researcher.

2. Using a literature review

In terms of structure, it can be seen that a significant amount of research has already been done. In India, there is a scarcity of data on the use and the factors that influence the construction industry. As a result, preliminary research into various literatures around the world resulted in the creation of a preliminary list of factors affecting project cost and timeliness.

3. A preliminary survey of the sites was conducted.

Following the identification of the fundamental factors through literature review, a preliminary survey of various sites was conducted to determine the nature and relative importance of those factors in Indian working conditions. The survey linked the effectiveness of global factors to the effectiveness of Indian sites, as well as providing practical insight into a few additional factors, though they are area specific.

IV. CONCLUSION

The experience of COVID-19 in the construction industry is not yet over as the learning curve has not completed the circle

Where such can work, and workspace management, additional design considerations and Services to the Situation
A limitation encountered during this research is the minimal number of the data collection when compared with arrays of construction professionals all over the world. It would be expected that such data could have a larger number of survey participants than the number evaluated.

Likewise, planning with unforeseen circumstances including other contingency covering that, and the reduction of on-site work through the use of prefabricated elements

Further study could expand to involve more participants so as to explore further updates on the impact of COVID-19 in the construction industry from mid-2020 onward. Another limitation is the shortage of literature to revert to in-depth for this particular study.

This is an unprecedented event which caught the entire world unaware and including the ardent risk takers in the construction industry.

In the end, if these experiences are harmonized, a comprehensive turnaround strategy for contingency plan would be produced

REFERENCES

1. Hale Thomas, Anna Petherick, Toby Phillips and Samuel Webster, "Variation in government responses to COVID-19", Blavatnik school of government working paper, Vol.31, 2020.
2. Aleksander Srdić, Assoc. Prof. Jana Šelih, "Delays in Construction Projects: Causes and Mitigation",
3. Madhavi Ashok Khandar, Aparna Panganti, "Immediate Impact of RERA on Construction Industry" International Journal of Engineering Research, Volume No.7, Issue Special 1, pp : 71-74, ISSN:2319-6890 (online),2347-5013(print) 11-12 Jan. 2018.
4. Ali Osman Kuşakcı, Berk Ayvaz, Emir Bejtagic, "An Analysis of Causes and Effects of Delays in Construction Projects in Libyan Oil Industry",Karaelmas Fen ve Mühendislik Dergisi Journal home page: <http://fbd.beun.edu.tr>.



5. Shaikh Asif Abdus Saeed, “delay to projects – cause, effect and measures to reduce / eliminate delay by mitigation / acceleration”.
6. P.M.Pethkar, B.V.Birajdar, “literature review on causes of delay in building construction projects”, journal of information, knowledge and research in civil engineering, ISSN: 0975 – 6744| NOV 14 TO OCT 15 | Volume 3, Issue 2.
7. Pawanhari ,Mukesh Panday ,Rakesh Gupta, “Effect of Time Delay in Construction Projects”, IJEDR1602196 International Journal of Engineering Development and Research (www.ijedr.org).
8. Murali, Sambasivan and Yau Wen, Soon. (2007) “Causes and effects of delays in Malaysian construction industry”. International Journal of Project Management, Vol, 25, No. 4, pp. 517-526.
9. Leena Mali, A. A. Warudkar, “Causes of Delay in the Construction Industry in Pune region of India”, nternational Journal of Application or Innovation in Engineering & Management (IIAIEM) Volume 5, Issue 5, May 2016 ISSN 2319 – 4847
10. Conceptual Cost Estimation Model for Engineering Services in Public Construction Projects Khaled Hesham Hyari; Ahmad Al-Daraiseh; and Mohammad El-Mashaleh, ASCE2015
11. An Artificial Neural Network Approach to Structural Cost Estimation of Building Projects in the Philippines Roxas, Chery Lyne C, Ongpeng, Jason Maximino C, Research Article 2017
12. Cost Estimation Model (CEM) of Buildings by ANN (Artificial Neural Networks) – A Review Bipin Pal, Ashtaveer Mhashilkar, Anjali Pandey, Bhavesh Nagphase, Viren Chandanshive, International Advanced Research Journal in Science, Engineering and Technology February 2018
13. Machine learning for estimation of building energy consumption and performance: a review Saleh Seyedzadeh, Farzad Pour Rahimian, Ivan Glesk and Marc Roper, Springer 2018



INNO SPACE
SJIF Scientific Journal Impact Factor
Impact Factor: 8.118



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 **9940 572 462**  **6381 907 438**  **ijirset@gmail.com**



www.ijirset.com

Scan to save the contact details