

Impact of pandemic crisis of COVID-19 on construction industry in India.

Impacto de la crisis pandémica de COVID-19 en la industria de la construcción en India.

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ABSTRACT

The outbreak of COVID-19 has impacted whole world in a huge way which forever buzzed with activities has fallen silent and all the resources are diverted to meeting the never-experienced-before crisis. Today the construction sector is predicted to face simultaneous reduction in both supply and demand on account of this pandemic. This study aims to research the effect of COVID 19 on the construction industry's survival. This study adopted two methods to collect the data. The first method is quantitative data by associating construction practitioners to assess the level of impact using a five Likert scale and Descriptive Analysis was adapted to conduct analysis with MS Excel to find the quantity of impact certain factors display. A total of 30 respondents participated in answering the questionnaire survey. The second method is by conducting an exploratory interview with some experts from the construction industry sectors to share and express experiences and problems they faced and opinion on the condition of the construction industry during and after pandemic. The study found the most prominent impacts of COVID 19 are the suspension of projects, labour impact and job loss, time overrun, cost overrun, and financial implications. The findings also help project stakeholders to realize the sequences of the sudden epidemic and prepare for the worst-case scenario during the planning stage of the construction projects.

RESUMEN

El brote de COVID-19 ha impactado a todo el mundo de una manera enorme, que siempre ha sido un hervidero de actividades, se ha quedado en silencio y todos los recursos se han desviado para hacer frente a la crisis nunca antes experimentada. En la actualidad, se prevé que el sector de la construcción se enfrente a una reducción simultánea tanto de la oferta como de la demanda debido a esta pandemia. Este estudio tiene como objetivo

investigar el efecto de COVID 19 en la supervivencia de la industria de la construcción. Este estudio adoptó dos métodos para recopilar los datos. El primer método consiste en datos cuantitativos mediante la asociación de profesionales de la construcción para evaluar el nivel de impacto utilizando una escala de cinco Likert y el análisis descriptivo se adaptó para realizar análisis con MS Excel para encontrar la cantidad de impacto que muestran ciertos factores. Un total de 30 encuestados participaron en responder el cuestionario. El segundo método consiste en realizar una entrevista exploratoria con algunos expertos de los sectores de la industria de la construcción para compartir y expresar experiencias y problemas que enfrentaron y opinar sobre la condición de la industria de la construcción durante y después de la pandemia. El estudio encontró que los impactos más destacados de COVID 19 son la suspensión de proyectos, el impacto laboral y la pérdida de puestos de trabajo, el sobrecoste, el sobrecoste y las implicaciones financieras. Los hallazgos también ayudan a las partes interesadas del proyecto a darse cuenta de las secuencias de la epidemia repentina y prepararse para el peor de los casos durante la etapa de planificación de los proyectos de construcción.

INTRODUCTION

The outbreak of COVID-19 has impacted almost all nations in a huge way, especially the nationwide lockdowns which have brought social and economic life to a standstill. A world which forever buzzed with activities has fallen silent, and every other resources are diverted to meeting the never-experienced-before crisis. There is a multi-sectoral impact of this virus as the economic activities of countries have slowed down⁽⁷⁾. The construction industry in India is the second-largest employer next to agricultural industry and it's critical to the country's economic stability with an industry size of around Trillion INR, it accounts for around 8% of nation's GDP and employs around 57 million people, also being a core sector there are numerous industry that are dependent on the construction activity in the country. The construction sector is predicted to face simultaneous reduction in both supply and demand on account of this pandemic. Because the sector is driven by infrastructure projects to a large extent it's expected to be hit severely by the present levels of uncertainty, dismal business and consumer sentiment, loss of income also as the diversion of state funds towards COVID-19 management⁽⁸⁾.

This study aims to research the effect of COVID-19 on the construction industry's survival. The impacts and fallout are determined and evaluated through the interview of construction experts and practitioners. The study includes exploratory questionnaire surveys. The study found the most prominent impacts of COVID-19 are the suspension of projects, labor impact and job loss, time overrun, cost overrun, and financial implications. The findings also help project stakeholders to realize the sequences of the sudden epidemic and prepare for the worst-case scenario during the planning stage of the construction

projects. The method is quantitative data by associating construction practitioners to assess the level of impact using a five Likert type scale. The process adopted to conduct the research. The introductory part focused on the literature to define and identify the scope, problem, and objectives of the study. The second part involves evaluating the impacts by involving experts to determine the impacts of the pandemic on the survival of the construction industry and construction practitioners using a questionnaire survey. The respondents were asked to rank the level of effect using 5 Likert type scales.

Several studies have attempted to investigate the impact of COVID-19 on the economy and industrial sectors. Of these studies, A study of the impact of pandemic crisis on the survival of construction industry: a case of covid-19 by Dr. Yaser gamil and abdulsalam alhagar, Fernandes, N⁽⁹⁾. (2020) which addressed the economic impact of the pandemic outbreak on the economy of 30 countries and the study found that the gross domestic product (GDP) is likely to be hit by 3-6% or might fall to 15% in some countries⁽⁵⁾. The study also outlined the service-oriented economy are negatively impacted and jobs are at risk and the countries that depend on the foreign trade are likely to be affected the most in their GDP. Harari (2020) also expressed that COVID-19 pandemic is the biggest crisis of the generation and it may take years to recover and action must be taken decisively to subsidize and plan new strategies to avoid the travail of humankind. Another study by Helm, D. (2020)⁽¹²⁾ also pointed out that the total lockdown caused by COVID-19 has severely curtailed economic activities. A study by Dr. Yaser Gamil Abdulsalam Alhagar on The Impact of Pandemic Crisis on the Survival of Construction Industry was carried out reporting to effects in April 2020. Bangash (2016) analyzed the causes of delays in construction projects in Pakistan and found that efficient communication between parties and management skills are critical items in contractor related factors. Anees and Sabarinathan (2016) studied delay factors in the Indian building construction and concluded that the most important factors were delay in payments, shortage of equipment and ineffective planning and scheduling. Zewdu (2016) examined construction projects delays and their antidotes for the Ethiopian construction sector and revealed low level application of techniques and software packages for project planning and time control.⁽¹²⁾ The study carried out by Thabani Nyoni and Wellington G. Bonga (2017) to find the causes of delay in construction projects in Zimbabwe. A questionnaire survey was used to collect data from the selected population of research. The study fills a gap in knowledge of factors affecting delay in construction projects in Zimbabwe.

MATERIAL AND METHODS

The Study was conducted in part to collect the data. The first part was by collecting quantitative data by communicating with a questionnaire to construction practitioners of all levels to assess the level of impact using a Five Likert scale and analysing the responses

with statistical tools. A total of 30 respondents participated in answering the questionnaire survey. The second part is by conducting an exploratory interview with some selected 4-5 experts from the Construction Industry sectors to share and express experiences and problems they faced and opinion on the condition of the construction industry during and after pandemic and the experts were asked to share the impact of the pandemic on the construction industry and their views about improving the state of industry, Precautions to taken and tackling these kinds of problems if occurred in future⁽¹⁾.

In the first method the Respondents were asked to rate the impact to a set of questions which comprised of the difficulties and set back that they may have faced. Likert scale is applied as one of the most fundamental and frequently used psychometric tools in educational and social sciences research. The most important consideration is to include at least five response categories, having 5 categories will be convenient for responders and the response scale in which responders specify their level of agreement to a statement typically in five points: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree. Numeric data collected in research project can be analysed quantitatively using statistical tools in different ways and Descriptive analysis was utilized for the project⁽¹³⁾. Descriptive analysis is the transformation of raw data into a form that will make them easy to understand and interpret rearranging, ordering and manipulating data to generate descriptive information. Likert scale data are analysed at the interval measurement scale. Descriptive statistics recommended for interval scale items include the mean for central tendency and standard deviations for variability. Microsoft Excel was used to conduct the Data Analysis because it easily available and easy to use for everyone and Excel has the ability to perform a large array of mathematical and statistical functions, this resource addresses data entry, and calculating means (averages) for either one time or pre/post survey instruments.

In the second part of the survey consisted of interviews of construction experts and practitioners about the challenges faced in the industry during the COVID lockdown situation and the measures taken to avoid or minimize the effect with some of Open-Ended Questions with means of communication options such as Zoom call. The Explanation gathered from the exploratory interviews were informative and are mentioned in the conclusion part.

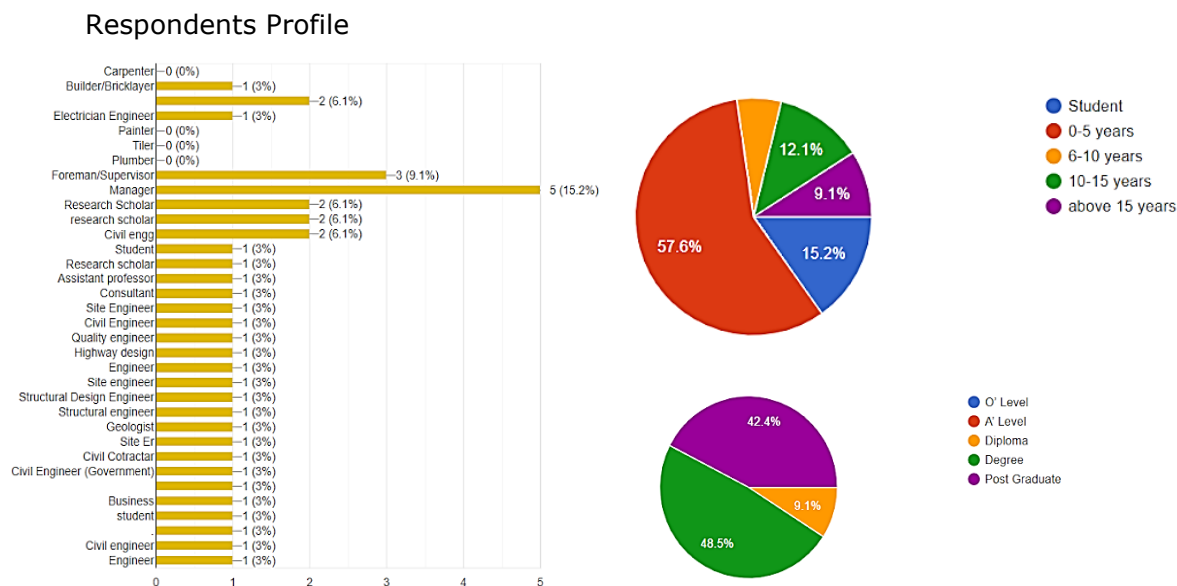


Fig 1 : Respondents profile

RESULTS AND DISCUSSION

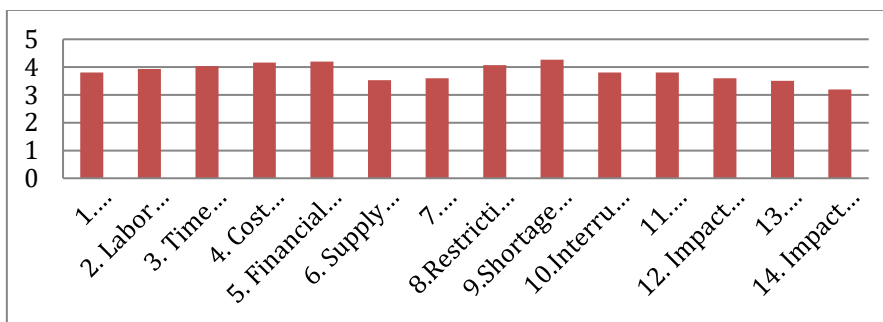


Fig 2: Identified Impacts from exploratory survey

The three majorly affecting factors during pandemic situation⁽¹³⁾ from fig.2 are shortage of materials to support running projects and sudden fluctuation of material price, restriction of movement on the work and travel bans, cost overrun. Moderately affected factors are interruption of contractual terms (legal issues), suspension of projects, socio-economic impact. The least affected factors are impact on Research and technology, uncertainty of survival, impact on the existing accomplished activities.

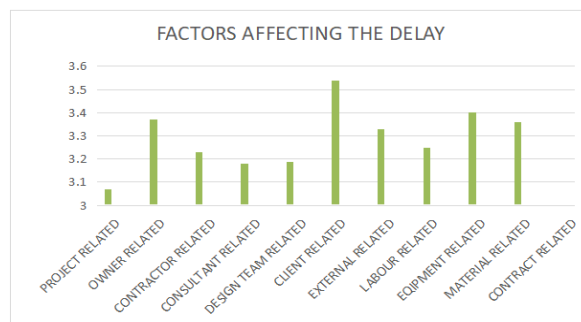


Fig 3: Factors affecting the delay

The first factor affecting the delay is client related, due to finance and payment of completed work and unrealistically imposed contract duration. The second factor affecting delay is equipment and material related during the COVID situation due to lack adequate equipment, lack of technologically advanced equipment, Shortage of materials, delay in materials delivery. The least affecting factor is contract related due to well maintenance of contract and sufficient communication between parties, avoiding discrepancies. The table below shows the clear results of the recorded data of the factors affecting delay.

Collective responses from the Exploratory Interviews:

Timely unavailability of raw materials, Not enough man power, Curing process, Insufficient planning skills lead to the delay in project. Construction delay can be minimized by identifying the source of material and confirming it before hiring man power or start the project. The most important curing can be completed fast by using the rapid hardening/setting cement.

As conclusions, this study has investigated and assessed the consequences of the COVID-19 pandemic on the construction industry either in private or public sectors. It is statically proven that the most impacting factors are the suspension of projects, labour impact and job loss, time overrun, cost overrun, and financial impact. From the interviews, it was highlighted that the economic impact is significant to all the project stakeholders and the workforce. The project developers are working on mitigating the impact by reducing the number of workers on-site and encouraging offsite work to avoid and slow the spread of the contagious virus. Projects are still running for the urgent need to expand the medical facilities. The findings of this study help to understand the impact of the unforeseen and uncontrolled pandemic on the construction. This will help to improve the plans to cope with any encountered circumstances. Overall, technology plays an enormous role in surviving these problems so firms should start embracing innovation. Using construction project management software, for instance, can help resolve labour shortage issues (through proper scheduling), low productivity rates, safety issues, and so on. So, consider the digital solutions to assist your firm recover from construction challenges. Following this, the landscape of the construction industry will very likely change and demand will flourish again. Governments and investors will look towards new infrastructure projects. The competition will also evolve, with some businesses not surviving and others being acquired by larger groups. While we can all agree that this is a challenging situation for the construction sector, emerging from this crisis will allow you to bid on future projects from a position of strength.

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Received: 03th November 2020; Accepted: 06th January 2022; First distribution: 06th November 2022.