

Labour Productivity on Construction Industry in Pandemic

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Abstract This paper describes the labour productivity in the construction industry through labour management. In India, construction is the second largest industry. In the construction industry, a more critical perspective is effective productivity and labour performance, which is driven by the three most crucial parameter, i.e. time, cost and quality. The main objective of this research during a pandemic situation is to investigate identification factors reducing and increasing productivity in construction through labour management—the principal tool used for the collection of data are questionnaire survey; questionnaires for field survey. Data from the study done, obtain through a structured questionnaire are administrated. The respondents involve labours and managerial peoples. Microsoft Power BI software's reliable statistical functions help to analyse the responses/opinions received from all the respondents. Graphical analysis of the result carved a path in concluding the view of all respondents on factors reducing or increasing productivity in construction through labour management. Various key factors used to provide appropriate conclusion and recommendations about this paper.

Keywords — construction, graphical analysis, labour management, labour productivity, pandemic, questionnaires

I. INTRODUCTION

A. General

During pandemic construction project profitability and productivity is an essential aspect. Labour productivity is the ratio of the number of workers who complete the work in a given time to the available resources consists of labour, cost, time, power, raw material, management, etc. One need to consider important factors like management and technologies that affect labour productivity in the construction industry during a pandemic. In pandemic situation construction industry, productivity is nothing but a mean of labour productivity; that is, it the ratio of the quantity of work done per person in an hour. India has more than 46.8% of the construction worker population. In already established and budding construction industry projects, there is a lack of employment opportunities for labours in critical situations like a pandemic. Construction is depending on labours. There is a lack of choices for labours in this situation, as their skills and educations are limited and specific. In the pandemic situation, the performance of labour in the construction industry is directly affecting the timeline of the project, cost of projects

due to delays and quality of work due to the unavailability of skilled labours. Therefore, it is essential to calculate these factors of labour productivity in the construction industry.

Various researches related to labour productivity has done for the construction industry in the near past. Various researches related to fulfilling productivity factor improved actual labour cost. Varieties of labours affected productivity in the construction industry. Labour productivity is one of the sensitive problems in construction industry, which used to calculate the efficiency of a construction project, especially during a pandemic. The expenditure on labours is 30 to 50% of the total project cost quite evident from the previous researches. So the profitability of construction company during such a difficult time and project cost is directly influenced by labour productivity which affects the completion of project in the pandemic. Labour productivity is defined as the work done by a certain number of workforces given period. In a pandemic, situation one need to consider many factors which affect productivity such as delay in payment, lack of leadership, labour supervision, frequently unscheduled labour breaks, storage location, communication between site management and labour.

B. Aims & Objectives

Labour productivity is a vital subject when it comes to construction projects and their management. This subject is critical in situations like pandemic when labours availability is an issue, and construction projects need to manage with limited resources. This report aims at identifying key parameters/aspects which impacts labour productivity, especially during a pandemic. After understanding various factors, questions surrounding these factors are put forward in front of people working at various projects, levels, roles in the construction industry. The objective of this activity is to understand and deduce how each factor affects labour productivity so that corrective majors can be taking to increase it in situations like a pandemic.

C. Scopes of Work

The current research has limited to find the most critical construction trades for both infrastructure and building projects during this pandemic situation, .and the most critical factors affecting the labour productivity of the overall construction trades found previously. the beginning of a search that could focus on more aspects, such as:

- 1) Analyze how each of the critical factors affecting the labour productivity effects one by one the critical construction industry.
- 2) The research focuses on a vast region, and it would be a good idea to focus state by state in order to satisfy their proper productivity needs.
- 3) To find more representative productivity data of the different critical construction industry.
- 4) Most of the previous analysis was limited to only the ten most critical construction industry for regions. Future papers can focus not just on them, but in the overall construction trades.

II. METHODOLOGY

A. Questionnaires planning

For the research study, we took feedback by asking questions to construction managerial people and construction labours via e-mail. The hard copy of the questionnaires in Word version to do it in writing.

B. Questionnaire design

The questionnaire was prepared after the reviewing various paper and understanding the factors of labour productivity. They are targeted to the factors identified.

C. Questionnaire survey

The Questionnaire is prepared on labour productivity in a pandemic situation in the Construction industry is distributed to people of various levels and roles in the

construction project. Their responses are extracted and analysed.

D. Data analysis using a statistical tool

The answered questionnaires were collected and using Microsoft Power BI software it is analysed. Microsoft Power BI Statistics is a software package used for statistical analysis. Microsoft Power BI is an excellent tool for building useful dashboards. Discover the key concepts you need to create data visualizations that communicate meaningful strategic information with your audience.

III. RESULT

Feedback received as a part of response received for google form questionnaire from various people are collated using google excel shit. This sheet is used as an input to Microsoft Power Bi software which helps us to understand the response received in a more effective way by using a pie chart as shown below:



Figure 1

- 1) Social distancing maintained (left side top) - Report suggests if social distancing is maintained at the workplace.
- 2) Monitoring on labour health (right side top) - Report suggests if the health of labour is monitored.
- 3) Timely payment (left side bottom) - Report suggest if timely payments are maintained to labours.
- 4) Alternate financial arrangements (right side bottom) - Report suggest if alternate financial arrangements are provided by management.



Figure 2

- 1) Impact to psychology (left side top) - Report suggests if the psychology of labourer is impacted.
- 2) Evaluate psychology (right side top) - Report suggests if the psychology of labourer is evaluated periodically.
- 3) Impact to quality of work (left side bottom) - Report suggests if the quality of work is impacted.
- 4) Enough labours maintained (right side bottom) - Report suggests if enough labour maintained at the site.



Figure 3

- 1) Cleanliness at the site (left side top) - Report suggest if cleanliness at the site is maintained correctly.
- 2) HVAC problem resolution (right side top) - Report suggests if the HVAC problem is resolved at the workplace periodically.
- 3) Availability of labours (left side bottom) - Report suggests if the availability of labourers is appropriately at the site.
- 4) Innovative Design Techniques (right side bottom) - Report suggest if the innovative design is well maintained by using techniques.



Figure 4

- 1) Review Methods Implemented (left side top) - Report suggests if the implementation of construction methods is adequately done.
- 2) Quality of Material (right side top) - Report suggests if the quality of work is maintaining a site.

- 3) Cleanliness of Equipment (left side bottom) - Report suggests if the equipment cleanliness is doing correctly.
- 4) Skill Training (right side bottom) - Report suggests if skill training is given to labour.



Figure 5

- 1) Transport Facilities (left side top) - Report suggests if the transport facility is available for labours.
- 2) Regular Breaks (right side top) - Report suggests if the routine break is getting to labour from work.
- 3) Government Restriction Impact (left side bottom) - Report suggest if government restriction is impacting to labour for an extended period of time.
- 4) Additional Support Provided (right side bottom) - Report suggest if additional support is giving labour in the pandemic.

Additional comments/suggestions received as part of feedback responses are outlined below:

- 1) Most Indian companies fail to do so in order to cut profits, which in turn affects their reputation. The simple solution to any construction-related problem is to follow guidelines, and if the problem still persists, further investigation would help develop a model to help the productivity of the company. Secondly, risk management has to be done to identify the risks involved with the labours due to the pandemic, and best mitigation strategies could be prepared based on that. Thirdly, based on the company's scope, the labours involvement and essential can be judged in the supply chain during the pandemic, and this would help in understanding the further investment involved to extract the optimum production from the labours. Finally, hire a consulting firm to manage the operations.
- 2) Labour cost is very less for construction work, and their necessary expenses are very less they need some financial help at this time. Helping labours is always a win situation for project work, so just need to help them and keep them safe there is

nothing without labour in the construction industry.

- 3) Try to normalise things at site, keeping in mind the precautions and safety measures. Spray bottles of isopropyl sanitizer, mask, gloves should be provided to all of them. Children and others who are with them must be kept safely.

IV. CONCLUSION

The conclusions drawn from the pie chart plot for the responses from the feedback are as follows:

- 1) In critical situations, government interference plays a significant role in productivity. There are times when government shutdowns principal government offices, transportation (impacting labours and material), limited food and medical supply, temporarily closing the construction projects etc.
- 2) Huge psychological impact on labours during pandemic has been observed, which results in inferior construction quality, design violations etc. which are deciding factors for a successful construction project.
- 3) Timely psychological evaluation is a must at the workplace, especially in a situation like a pandemic, along with other medical facilities. Additionally, special measures should be taken to monitor the health of labours during the pandemic.
- 4) A clean and healthy environment is not provided to labours at the workplace, which lacks necessary sanitation arrangements to counter pandemic in small or medium companies.
- 5) There is a lack of technology exploration or technology transfer which can boost up labour productivity due to pandemic.
- 6) Regular breaks during work are also a critical factor for labour productivity as labours are undergoing through added mental stress like fear, worry about family member etc. along with physical stress.
- 7) Furthermore, during the pandemic, there is a lack of skilled labour which in turn puts pressure on other labours affecting their productivity.
- 8) Management is also under pressure to complete the project on time and with limited funds which in turn puts labours productivity under a microscope.

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