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ANALYSIS OF CONSTRUCTION INDUSTRY PSYCHOLOGY AFTER PANDEMIC USING CONTEMPORANEOUS ACTIVITIES RECORD – CASE STUDY OF NASIK CITY

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Abstract – *Since the World Health Organization (WHO) declares the coronavirus 2019 (COVID-19) outbreak as a pandemic, many countries have declared a complete national lockdown after a remarkable spike in COVID 19 cases. These decisions have restricted the movement of people and closed down of many businesses across many sectors. With few expectations, the construction industry has been completely shut down as a key driver of economy's growth. All the developments and projects were scheduled until further notice. The purpose is to study the effects of COVID 19 on the existence of the construction industry. The impacts have been classified into various categories which include economic, human resources etc. This paper focuses on if a situation arises in future, we can handle the situation as per careful planning, optimistic approach and steps taken in that direction can save the construction sector. These included safety measures such as requiring workers to wear face coverings, implementing social distancing guidelines, adopting COVID-19- related safety training etc. The COVID-19 is all over the country and has affected our personal, family, social and social work. It should be good analysis that how it was made a mistake and how to reduce the recurrence of this error. This will help the contractor, consultants and clients to work on time, avoiding delays and also it will help to complete project on time*

Key Words: Construction industry, Covid 19, pandemic situations, labours psychology.

1. INTRODUCTION

The construction industry is the second largest industry in the country after agriculture, makes a significant contribution to the national economy and provides jobs to large number of people. Construction activity is an integral part of country's infrastructure and industrial development and has accounted for their growth and economic development of the industrialized, organization, and increased people's expectations for improved quality of living.

It plays an important role in development of infrastructure of a country. The most challenging issue in construction industry in the last decade is the labours productivity assesses the efficiency of the operation system in utilizing communication barriers like that had mainly creating psychological stress to the labours. A study on labours psychology in construction industry in Nasik city. These includes hospitals, schools, townships, for commercial and other buildings, urban infrastructure, highways, roads, ports, railways, airports, power systems.

1. Construction industry – 2nd largest industry after agriculture
2. Contributes 8% in GDP & gives almost 40 lac people job opportunities/year.
3. Construction industry consists of
    - Residential & Commercial
    - Infrastructural
    - Industrial
4. Construction industry – Unorganized Sector.

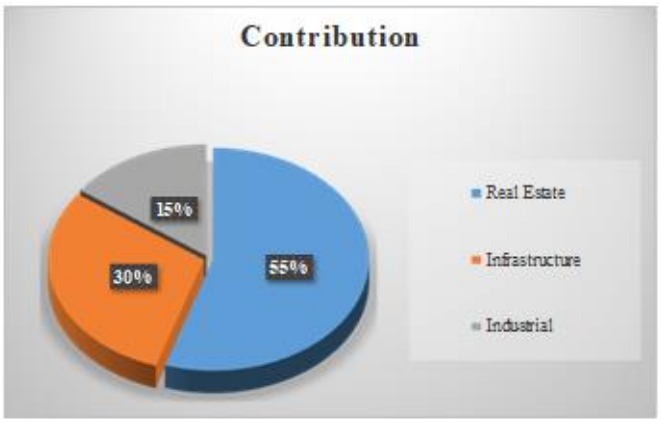

Fig.1. Contribution of construction industry

A. Problem Statement

After Covid 19 pandemic situation is getting worsen, as the industry is considered as unorganized.

Need to focus on the contemporaneous activities & minimal resource allocation for the same.

After Covid 19 pandemic situation is getting worsen, as the industry faced the problems of availability of resources.

Due to this pandemic many construction projects get stopped in midway & the result is all resources has stopped, therefore the whole industry has to face financial & labours psychological problems.

B. Research Gap

This kind of thought process is not coming and due to the Setback comes on construction industry after such pandemic situation.

Considering all components which are working in construction industry on such situations is not researched by anyone.

Considering all components which are working in construction industry on such labours Psychology is not researched by anyone.

C. S.M.A.R.T. Objectives

To studying the current condition after Covid 19 pandemic situation.

To analysis of effects after Covid 19 pandemic situation on construction industry

To comparing Covid 19 pandemic situations of a project before & after pandemic.

To analysis of labours psychology effects after Covid 19 pandemic situation on industry.

D. Psychology of Current Construction Industry

1. Main 3 components of industry
    - Client
    - Consultant
    - Contractor
2. Effect of Corona pandemic on industry based on McKinsey Report
3. Project Budget
    - Material cost
    - Labour cost
    - Machinery cost
    - Overhead cost

E. Main three components:

- Clients:

The client is a person for whom the project is carried out. In case of modifiable projects, clients must appoint a principal designer and a principal contractor.

- Consultants:

Consultants are appointed by the clients in order to perform expert tasks on the project. Consultations can be given for various areas of construction such as structural design and project management, contracts, surveys etc.

- Contractor:

The contractor is responsible to find and hire right subcontractor and individuals to complete the job. The content of main contract request must be managed with the corporation of the sub-contract and the service is as smooth as the flow of the project.

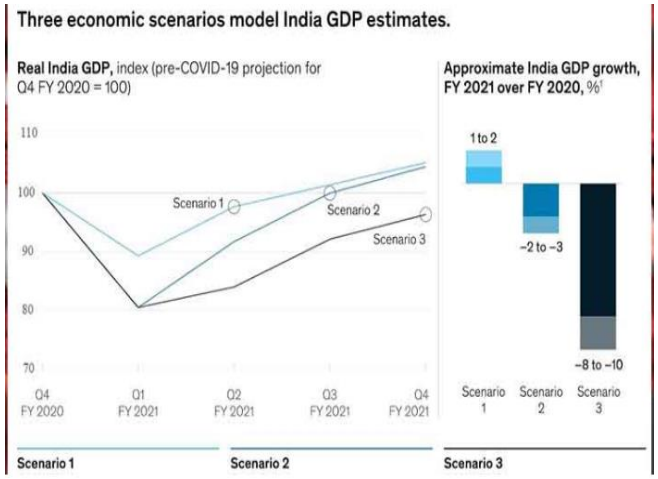

Fig.2. Model of Economic Scenarios In India

F. Mackinsey & company reports as per

Upto march:

Construction industry was already starting to experience an unprecedented rate of disruption before the COVID-19 pandemic. Over the next few years, fundamental change is likely to be catalyzed by a shortage of skilled labours, constant cost pressure on infrastructure, and changes in market characteristics such as affordability, stricter regulations on work-site sustainability and safety, and evolving sophistication and needs of customers and owners.

March to July:

The annual GDP growth after Covid 19 post will be 8 to 8.5 percent which will require me to have stronger productivity growth and faster employment growth than before fiscal year 2013 to 2018. India's economy faced structural challenges ahead of pandemic process, and GDP growth slows to 4.2 percent.

The corona virus pandemic has had a serious effect on the lives and livelihoods of people in India. Although the lockdown measures introduced in late March have helped to reduce the spread of the disease, the number of deaths in Covid 19 cases and Covid 19 deaths is increasing daily. Like other countries, the lockdown has recently slowed down economic activity and led to rising unemployment.

July – October:

The pandemic has entirely suspended the construction industry and only a few projects are still running which are considered essential for medical facilities expansion to cope with the high demand for spaces. Project participants working on site must be prepared with a complete list of tasks. Continuous interactions with all sub-contractors established through daily video meetings, manages all orders, constantly reviewing shop drawings, coordinate with all the stakeholders for updates, and maintain proper communication with people onsite. The way the construction industry was managed has to be modified to suit contingency time where it should accommodate all the needs to deal with the entire sudden crisis.

Looking at a current situation, the overall picture is clear that in this time of uncertainty, our plans and efforts in that direction may be short-lived. About 60-65% of the damage is expected and it is estimated that it will take at least 6-7 months for the situation to normal.

2. RESEARCH METHODOLOGY

A. Literature Review

A literature review has been done from previously published research papers on this topic from various international journals as well as relevant books and researched topics to understand the previous work done on such kind of project. Based on the purpose of the thesis and research questions, related literature was selected. Main sources of literature were books and journal articles. It helps to determine the relative importance of the various factors affecting on labour productivity. Proper implementation of both planning and execution is required to complete the project.

Many factors negatively affecting labour productivity in building construction of the projects have been identified and ranked according to their relative importance. It helps to determine the relative importance of the various factors affecting on labour productivity. The COVID-19 is all over the country and has affected our personal, family, social and social work. The project manager must accept the project is failure and close it in case of outside some limits.

For labours psychology Analysis of variance (ANOVA) is calculated, it is a statistical procedure concerned with comparing means of several samples. It can be thought of as

an extension of the t-test for two independent samples to more than two groups. The purpose is to test for significant differences between class means, and this is done through the form of analysis the variances.

3. DATA COLLECTION

Data collection has been carried out by questionnaire survey from various construction sites that have faced problems after Covid 19 pandemic situation.

- Name Of Project: PMAY Kharadi Pune
- Types Of Project : Residential
- Total Area Of Project: 15125 Sqm
- No. Of Structures: 6
- Start Date : 31-05-2019
- Duration Of Project: 44 Months
- Tentative Finish Date:31-07-2022
- Lockdown Period:15-03-2020 To 01-08-2020
- Extended Finish Date:31-01-2023

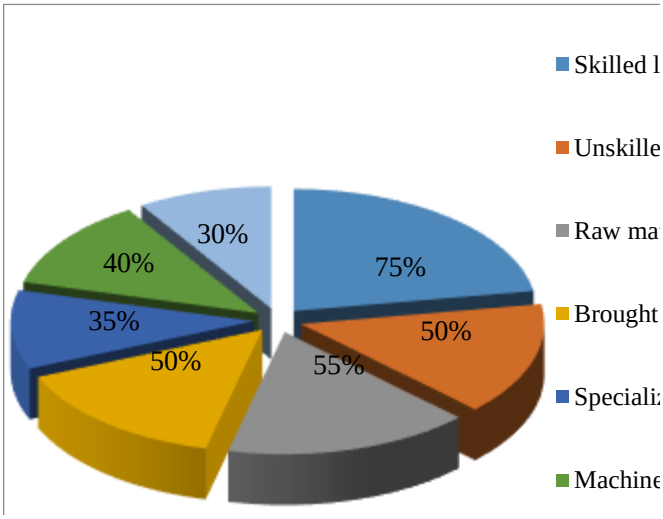

Fig.3. Loss of resources availability after lockdown

DATA ANALYSIS

Data analysis has been done from collected data survey by analysing the data so that proper importance index to factor can be achieved.

The COVID 19 pandemic has had far-reaching very severe consequences since it has spread all over. The construction sector is far different from all other industries which require the on-site involvement of all the project members. Hence, it is crucial to know How the construction industry addresses this unpredicted situation. The survey mainly had four sections labours psychology in Construction Industry, Impact of Covid 19 on Supply of labours, Impact of Covid 19 after pandemic situation, Labours Survey. After the response given by the participant and all the data collected results are shown in graphical representation.

List of Questions for Questionnaire survey.

Part A-

Information Participating Candidate Email

Part B

Does COVID-19 affect your construction site?

Does COVID-19 affect your Labours psychology on construction site?

The construction sites & labours psychology affected by...?

What was the overall effect of labours psychology?

Does the pandemic situation disturb your labours lifecycle?

Part C-

Were the labours being mentally disturbed due to Covid 19 pandemic situation?

Has Covid 19 Affected the attendances of labours?

Does the labour available on site after Covid 19 pandemic situation?

Were labours demanding high wages after Covid 19 pandemic situation?

Part D-

Were labours comfortable using Safety Precautions during working after Covid 19 pandemic situation?

After Covid 19 pandemic situation many labours loss their job?

They put extra efforts in their work after after Covid 19 pandemic situation?

Part E-

Happy Labours Survey – Interested, Disturbed, Excited, Upset, Nervous & Irritable, Alert, Afraid.

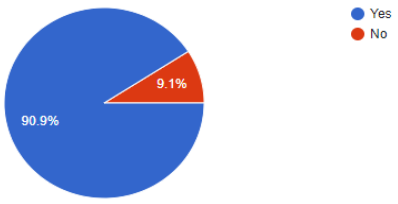

Figure 01: Percentage of Firms indicating the COVID-19 affect construction site.

A. Impact of Pandemic on the Labours psychology of the Construction Projects Covid 19 affected the availability of labours as the lockdown was imposed and there were restrictions to the movement of people. Many of the labours migrated to their hometown. About 93% of the contractors in Nashik faced a scarcity of labours. And the many firms were having the issues of attendance of labours on site. And about 82% of contractor experienced the labours demanding high wages after covid 19 pandemic situation.

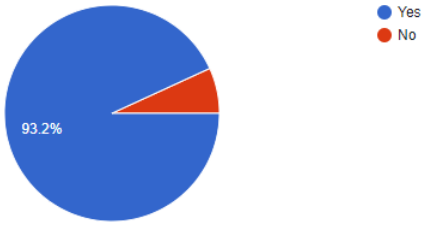

Figure 02: Percentage of Firms indicating the overall effect of labours psychology.

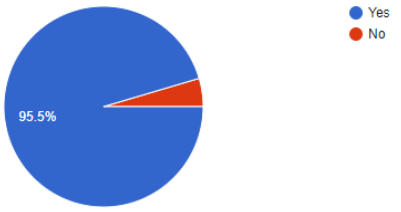

Figure 03: Percentage of Firms indicating the pandemic disturbed labours lifecycle

B. Below firms indicate the Covid 19 affected the 55% labours interest in work, 50% nervous & irritable labours, 46% disturbed labours, 52% upset labours on site after covid 19 pandemic situation.

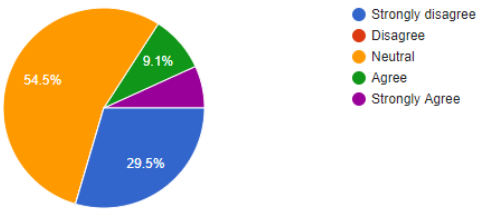

Figure 4: Percentage of Firms indicating the interest of labours.

Results and Analysis

The data is collected in tabular form by solving one-way ANOVA technique. One-way analysis of variance (abbreviated one-way ANOVA) is a technique that can be used to compare whether two samples mean are significantly different or not.

Variance source	Sum of squares SS	Degree of freedom df	Mean square MS	F-statistic	Tail area above F
Between	SSC	k − 1	MSC	MSC/MSE	p-value
Within	SSE	N − k	MSE	—	—
Total	SST	N − 1	—	—	—

Table 1. Basic one-way ANOVA table

To calculate the *F*-ratio Following steps:

Step 1: Calculate the mean within each group:

Step 2: Calculate the overall mean:

Step 3: Calculate the "between-group" sum of squared differences:

The between-group degrees of freedom are one less than the number of groups

Step 4: Calculate the "within-group" sum of squares. Begin by centering the data in each group

Step 5: The *F*-ratio is **F = MSC/MSE**

The critical value is the number that the test statistic must exceed to reject the test. In this case, Fcrit (2, 15) = 3.68 at $\alpha = 0.05$. Since F=7.54 > 3.68, the results are significant at the 5% significance level. One would reject the null hypothesis, concluding that there is strong evidence that the expected values in the three groups differ. The **p-value** for this test is 0.0054.

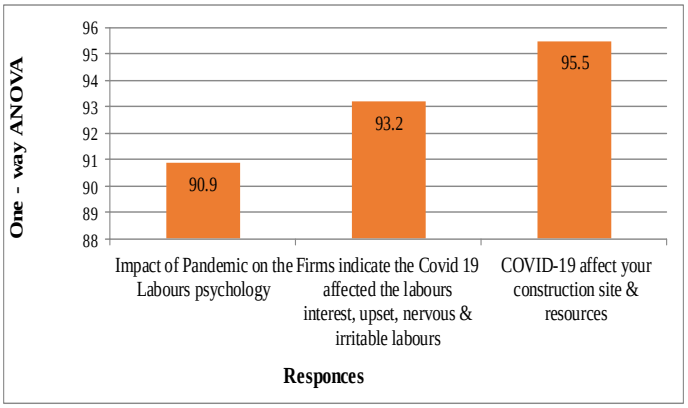

Fig no. 1. Impact of Covid 19 on Construction industry

4. CONCLUSIONS

The questionnaires survey will be conducted for the study of labours psychology. We will study labours psychology for next phase by taking the views of contractors, Engineers, sub-contractors etc. for

that ongoing project will be considered. In that Data like status of the labours will be collected. In collection of data, analysis will be done in major 3 steps like, Before Lockdown, In Lockdown & after Lockdown.

The respondents were all industry practitioners, including the residential project contractors, clients, subcontractors, engineers, for practical analysis of the labours psychology in construction industry. By online questionnaires, the analysis of these questionnaires helped for the study of labours psychology due to Covid 19 pandemic situation.

The COVID 19 has heavily impacted on the construction industry in a different way, including loss of labours, lack of supplies, increased cost of construction material, and the Change in demand. Due to pandemics, it is hard to complete most of the construction projects on scheduled time as per the set contracts. And due to pandemic, the labours were disturbed by all ways shown in above questionnaire analysis.

The impact caused on labours psychology in construction industry of Nasik city:

- Labours were mentally and financially disturbed
- The displacement of workers due to the closure of borders between States.

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