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"STUDY, ANALYSIS, AND SUGGESTIONS FOR LABOR PRODUCTIVITY IMPROVEMENT IN CONSTRUCTION INDUSTRY"

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Abstract - *Productivity plays an important role in the construction industry. It helps construction industries to be competitive, to achieve goals, and to meet the stakeholder and value propositions. Pre-existing research studies have suggested different methods for measuring labor productivity at different levels, but none of them has been proved universally satisfying. It is very important to measure Labor Productivity qualitatively and quantitatively, as it affects the overall productivity of construction projects. As Construction project undergoes several problems and complex factors such as cost and time.*

This paper includes the Objective, Methodology, Study process adopted for calculation of labor productivity, Result, and conclusion with recommendations. To study labor Productivity chose the 15 factors, were classified into four groups. Analysis of that factors is done using the Relative Importance Index. And study the effect of that factors after that suggest the ways to improve the productivity for construction Industry.

Key Words*: *Keywords: Construction Industry, Labor Productivity, Relative Importance Index.

1.INTRODUCTION

The construction Industry is words largest industry. After agriculture, the 2nd largest employment is provided by the construction industry. The construction industry is mainly depending on 3M Resources. 3M resources include Manpower, Machine, and Materials. These are the basic need of the industry. The most important and precious resource in the construction industry is Manpower. If we consider only Manpower as an input in the construction productivity, then it will be called Construction Labor Productivity.

This is the most used topic for research because 30 to 50% of the total cost of the project is Labor cost. Labor Productivity is an important parameter that provides feedback to determine trends and improvement-level of the Construction Industry.

In this industry, the main problem is that the uneducated and unskilled labor. Because of them, we have to face productivity loss, which directly affects the cost and time overrun of the project and affects the quality of the work. As Construction project undergoes several problems and complex factors such as cost and time, an effective framework has to be designed, so that overall productivity of project is improved. To improve productivity labor should be familiar with machinery, material, and tools they use.

Pre-existing research studies have suggested different methods for measuring labor productivity at different levels, but none of them has been proved universally satisfying. It is very important to measure Labor Productivity qualitatively and quantitatively, as it affects the overall productivity of construction projects.

This research reflects the Critical study analysis on factors affecting labor productivity using the Preliminary Questionnaire Survey and the impact of each factor influencing the project was generated through the Relative Important Index. A total of fifteen factors were considered to measure labor productivity on Construction Sites using the Relative Important Index. With the Suggestions and recommendations provided, the upcoming activities showed drastic productivity improvement, thus improving the overall productivity of the site. This research helps the project managers to consider the Labor affecting factors, during the planning phase of a project and in the execution stage to measure productivity.

2. OBJECTIVE

- To assess the current situation and make a review for productivity improvement in the construction industry.
- To collect current data of Labor Productivity through industrial building sites.
- To identify factors that affect Labor Productivity.
- To give suggestive measures to improve Labor Productivity.

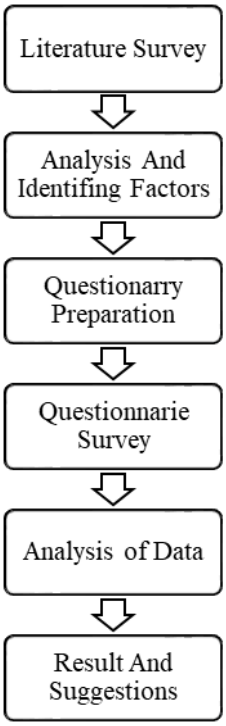

Chart No: - 1 Flow Chart describing various Stages of Project

3. METHODOLOGY

The following methodology was adopted for critical analysis of factors and suggestions for improvement of labor productivity. As shown in Chart No. 1.

The background and benchmarking of labor productivity completely depend on the method opted for measuring. The research first considers the factors affecting the most for productivity through various research studies.

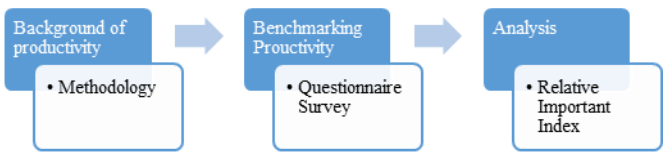

Chart -2: Projects Work Methodology Plan

From Chart 1, it is understood that a questionnaire survey is designed to find the rank of factors affecting the most through the Relative Important Index.

The selected factors are classified into four different groups as shown in Table. 1 To know the Severity of that factor we first calculate the Relative Importance Index then the rank of each factor helps the practitioner to assess the planning phase of the project. The higher the rank of factor, the greater impact on labor productivity and vice-versa.

For more understanding, we decided to do field visits and collect the data regarding labor productivity, a survey form generated through the Questionnaire. Our target was Industrial buildings. started from the Industrial buildings from Kolhapur and sangali region to collect the data. We have visited ongoing construction sites of Industrial buildings. As per the questionary survey prepared we have collected data for industrial building construction based upon selected factors.

Sr. No.	Factors	Group
1	Lack of Construction Material	Management
2	Poor Access within Construction site	
3	Shortage of water and power supply	
4	Poor Management	
5	Storage Location	
6	Lack of skills (Unskilled labor)	Labor
7	Improper construction method	
8	Working overtime	
9	Variation in drawing	Client / Technical
10	Unclear Instruction	
11	Misunderstanding between owner and Contractor	
12	Weather Conditions	External
13	Accidents during Construction	
14	Violation of safety law	
15	Health and safety	

Table 1- Group-wise Labor Productivity Factors

The questionnaire survey format of labor productivity consists of 15 response factors, including initial information, defining Likert scale for the collection of data from Industrial buildings of Kolhapur and Sangli region. After collecting responses from the construction sites, collected data is analyzed with the Relative Importance Index.

4. RELATIVE IMPORTANCE INDEX

The results of the analysis on factors affecting labor productivity were obtained using the Relative Important Index. The factors discussed in the earlier point were drawn into a questionnaire survey with a metric scale. The range lies from 1-4 dissipating its importance shown in table 2 The questionnaire survey was sent to the construction industry, to get responses and feedback from the professionals.

Sr. No.	Index	Range
1	Not Applicable	1
2	Does not Affect	2
3	Somewhat affect	3
4	Directly Affect	4

Fig - 2: Scale used for Data Measurement

5. RESULT

it is seen that when surveyed the Industrial building site, the building sites are bigger as compared to the Residential site also commercial building site. Therefore, the factors that affect the productivity of labor are different than the small site factors. The topmost factors are poor management, Unskilled labor, Accidents during construction, and violation of safety law. All the factors have the RII above the 80.00%. as the sites and projects are bigger required laborers are more in numbers and skilled labor is required.

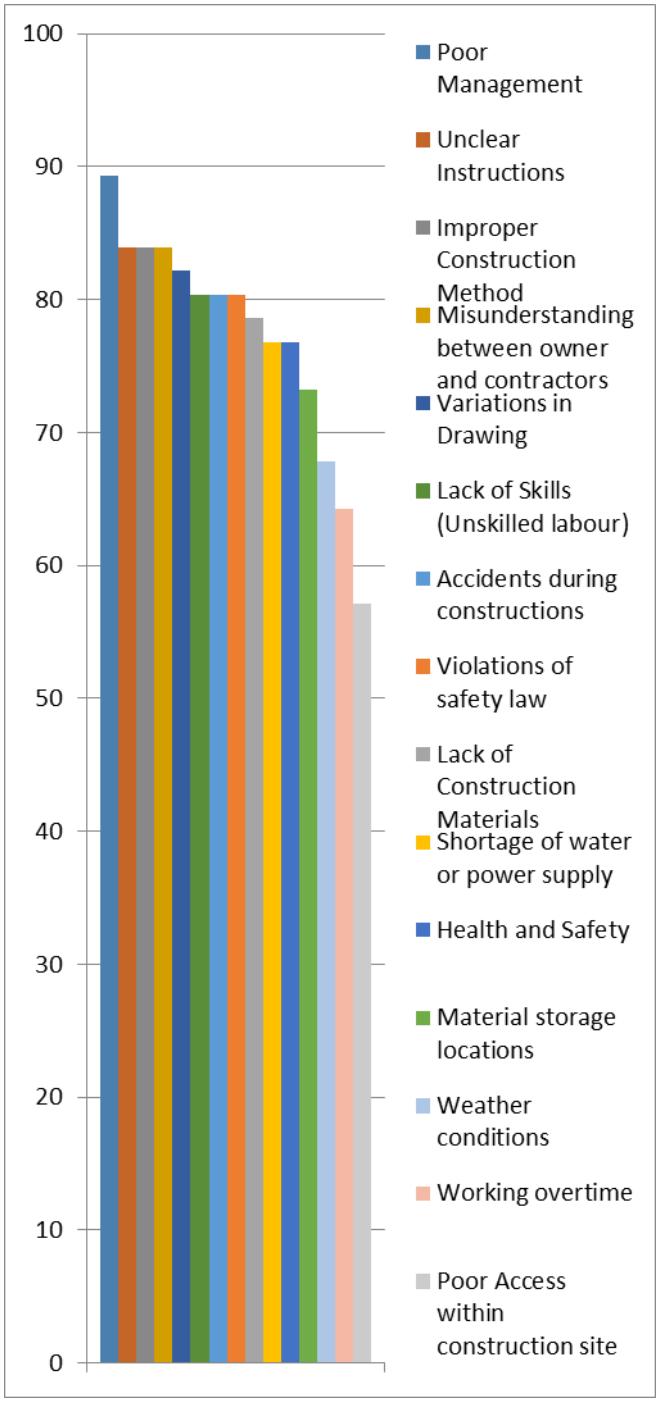

Chart -3: Rank wise factors affecting Labor productivity for Industrial Building

6. CONCLUSIONS

The following factors affect most Industrial buildings because their range of RII is very high, it is between 80 to 100.

i. Poor Management (89.28)
ii. Unclear Instructions (83.92)
iii. Improper Construction Method (83.92)

iv. Misunderstanding between owner and contractor (83.92)
v. Variation in Drawing (82.14)
vi. Lack of skills (unskilled labor) (80.35)
vii. Accidents during Construction (80.35)
viii. Violation of safety law (80.35)

Based on the outcome of the study, the following recommendations are made towards improved productivity in the construction industry and to reduce time overrun on projects in the Kolhapur and Sangli Region.

I. Analyze the entire construction process in detail.
II. Proper planning
III. Communication
IV. Training for supervisors and labors
V. Adopting new technologies
VI. Health and safety
VII. Housekeeping.

7. REFERENCES

1. Ameh Oko John, Osegbo Emeka Emmanuel, (2011) "Study of Relationship Between Time Overrun and Productivity on Construction Sites" International Journal of Construction Supply Chain Management Volume 1
2. Gupta Vaishant, R. Kansal (Oct 2014) "Improvement of Construction Labor Productivity in Chambal Region" International Journal of Research in Engineering and Technology,
3. Ibbs, W., & Nguyen, L. D. (2012). Using the Classical Measured Mile Approach and Variants to Quantify Cumulative Impact Claims. Constr. Law., 32, 18.
4. Jamadagni Sneha, Birajdar B. V. (2015) "Productivity Improvement in Construction Industry" International Research Journal of Engineering and Technology Volume: 02 Issue: 08
5. Mohammed Salleh Hammad, Abdelnaser Omran, Abdul Hamid Kadir pakir (2011) "Identifying Ways to Improve Productivity at the Construction Industry"
6. Nazarkoa Joanicjusz, Chodakowska Ewa, (2015) "Measuring productivity of construction industry in Europe with Data Envelopment Analysis" Procedia Engineering 122 204 – 212
7. Paul Riya, Prof. Mrs. Adavi P. R. (Aug. 2013) "Effect of Labor Productivity on Project Performance" International Journal of Engineering Research & Technology (IJERT) Vol. 2 Issue 8,
8. Shashank K, Dr. Sutapa Hazra, Kabindra Nath Pal (May 2014) "Analysis of Key Factors Affecting the Variation of Labor Productivity in Construction Projects" International Journal of Emerging Technology and Advanced Engineering, Volume 4, Issue 5
9. Shehata M. E., El-Gohary K. M. (3 March 2012) "Towards improving construction labor productivity and projects' performance", Alexandria Engineering Journal 50 321-330.
10. Shinde V. J. and Dr. Hedaoo M. N. (November 2017) "A Review On Productivity Improvement In Construction Industry" International Research Journal of Engineering and Technology (IRJET) Volume: 04 Issue: 11
11. Soekiman, A., K. S. Pribadi, B. W. Soemardi, and R. D. Wirahadikusumah. "Factors relating to labor productivity affecting the project schedule performance in Indonesia." *Procedia engineering* 14 (2011): 865-873.
12. Subramani T., P. T. Lishitha, M. Kavitha (June 2014) "Time Overrun and Cost-Affectiveness in the Construction Industry" Int. Journal of Engineering Research and Applications Vol. 4, Issue 6(Version 5)
13. Thomas, H. R., & Sakarcan, A. S. (1994). "Forecasting labor productivity using factor model". Journal of Construction Engineering and Management, 120(1), 228-239.
14. Venkatesh M.P and Saravana Natarajan P.S (November 2019) "Improvement of Manpower and Equipment Productivity in Indian Construction Projects" International Journal of Applied Engineering Research Volume 14