

Performance of Factors Influencing on Labour Productivity for Construction Projects– A Review

Ms. Varsha R. Borole¹, Dr. Ghansaham Sarode²

¹PG Student, Department of Civil Engineering, Dr . D.Y. Patil Institute of Technology, Pimpri, Pune, India 411018

²Assistant Professor, Department of Civil Engineering Dr. D. Y. Patil Institute of Technology, Pimpri, Pune, India 411018

Abstract - In the construction industry, labour productivity is highly crucial. Productivity is important in the construction firm since the only valuable resource is labour power and the industry is primarily dependent on the work performance of human capital. Because the construction business is labor-intensive, this study focuses on labour productivity in the construction sector and identifies factors influencing labour productivity at building construction projects. The study's goal is to identify the key elements causing changes in labour productivity in building projects of high-rise building assessing the impact of the Welfare, Safety, and Output groups on labour productivity variations and making recommendations to reduce labour productivity fluctuations. The above-mentioned objectives are attained by examination of sets of questionnaires based on performance, health, and worker safety.

Index Terms - Labour, Construction, Productivity.

INTRODUCTION

The construction sector is concerned with challenges related to optimum productivity and worker management. Inadequate labor jobs management leads to low productivity. Effective productivity can be enhanced by proper labor protection. In today's intensely cutthroat construction market, construction efficiency has become such a buzz word and one of the most frequently researched area. As we know in overall project's cost worker cost almost consists 30 to 50 %. There are a lot of elements that have a direct impact on labour productivity; therefore, it is critical for any business to research and understand these aspects, as well as take necessary action to improve productivity. Better productivity and labour performance can be obtained if project labour management includes education and training skills, the

system, personal health, motivation level, the type of techniques, machineries, required equipment In India many factors are affecting on construction industry but one of the most important is low productivity which can affect the profitability of construction firms. Labour productivity is one of the greatest remarkable aspects which disturb the physical growth of any building or commercial construction projects.

A. WHAT IS LABOR PRODUCTIVITY?

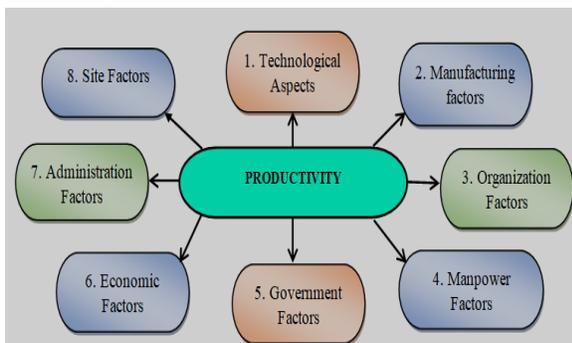
Productivity may be described in a variety of ways like out to input ratio. In the construction industry, productivity is commonly understood to refer to labour productivity, or the number of units of work put or produced per man-hour. Manhours every unit (unit rate), the reciprocal of labour productivity, is also often used. Productivity is defined as the ratio of output to all or portion of the resources needed to generate that output. The output might be either heterogeneous in nature. Labour, capital, energy, raw materials, and so on are examples of resources. Labour Productivity= Output/Work Hour

Most of the workers are being less productive because of their bad habits or attitudes towards their work such as not coming on working time and going back early to the home, this is happening because lack of supervision. Labors are one of the most important tools of any construction project in general and project organizations in particular as the quality of output of the organization depends largely on the caliber of the labor working there in. With both positive and negative labor contributions, the quality of an organization's output can provide a major competitive advantage over their competitors. In today's competitive environment, management will need to make some strategic decisions to improve the performance of its human assets in order to achieve

this. One of these decisions is to create a work system that will fit the job to the worker rather than the worker for the job. It includes the scientific use of human data to design a workstation, work process, or working environment to create a job-friendly environment for individual workers. This is done to improve workers' well-being, safety, and efficiency by fitting the environment to their needs. It also helps improve the flow of work within a company.

B. FACTORS AFFECTING LABOR PRODUCTIVITY:

The variables influencing construction labour productivity in various nations are currently being investigated. This may be accomplished by focusing on the elements that have been identified as favorably affecting productivity and regulating or removing the ones that have been recognized as negatively affecting productivity. It is definitely beneficial to boost construction productivity, and if all impacted aspects can be recognized, future productivity may be forecasted.



i. Technological Aspects: Technology has a huge impact on productivity. The most essential factors are technical ones. These include suitable plant and machinery location, layout, and size, appropriate machine and equipment design, research and development, automation, and computerization, and so on. When a firm employs trying to cut technology, its productivity keeps rising.

ii. Manufacturing factors: Productivity is proportional to the elements of production. All organizations' output should be adequately planned, coordinated, and regulated. Raw materials of the highest grade should be utilized in manufacture. The manufacturing process should be simplified and regulated. If everything goes smoothly, productivity will rise.

iii. Organization factors: The organizational elements have a direct relationship with productivity. A

fundamental organizational structure should be employed. Every individual's and department's authority and responsibility should be clearly stated. Line and staff connections should be clearly specified as well. As a result, conflicts between management and employees should be avoided. As much as feasible, there should be a division of work and specialization. This will improve the productivity of the organization.

iv. Manpower Factors: There are many elements that impact labour productivity in the manpower group, and identifying significant factors to assure the improvement of labour productivity. Absenteeism of labour, Skill of labour, Rest time(break time), Physically fitness of labour, Availability of labour, changing worker from one place to other etc.

v. Government factors: They must be adequately motivated, both financially and non-financially, with good incentives. Wage incentive programmes should be implemented. Job security should be provided as well. Workers' opinions and recommendations should be valued.

Transfer, promotion, and other personnel policies should be in place. All of these will boost the organization's productivity.

vi. Economic factors: Economic variables have an impact on productivity. The backbone of modern company is economics. Both fixed capital and operating capital should be carefully controlled. Financial planning should be done properly. Capital expenditures must be carefully monitored. Both excessive and insufficient capital consumption should be avoided. The management should ensure that the cash invested in the company generates enough returns. The organization's productivity will rise if its finances are appropriately handled.

vii. Administration factors: Organizational productivity is determined by managerial variables. Organizational management should be scientific, professional, future-oriented, truthful, and capable. Managers should be creative, have good judgement, and be prepared to take chances. They should make the best use of existing resources in order to acquire the most output for the least amount of money. They should make use of the most up-to-date manufacturing procedures. They should improve their working relationships with employees and labour unions. Employees should be encouraged to make recommendations. They must create a pleasant

working atmosphere and encourage people to boost their performance. The most important component in boosting productivity and lowering costs is effective management.

viii. Site Factors : There are different site factors such as delay in delivery resource, site access, and congested work area, Poor access to building sites, violations of safety rules, quality of needed work, insufficient transit facilities for employees, insufficient construction materials, and an increase in the cost of materials this overall affects in labour productivity.

C. OBJECTIVES OF STUDY

1. To Study Factors affecting improving Labor Productivity.
2. To identify influencing elements on performance evaluation of labor productivity.

D. PROBLEM STATEMENT

It is vital to enhance production efficiency through increasing labour efficiency in the construction industry in order to contribute to the advancement of life, the advancement of the national economy, and the improvement of global competitiveness. The significance of labour efficiency is defined in this study. The economy of country is becoming more complex and dynamic. Because of the growing importance of the service sector in the national economy. There has been an increase in the measurement of labor hours. The majority of workers are unaware that their workplace's ergonomic influence is harming their mental and physical abilities to accomplish their responsible jobs. The primary goal of this research is to investigate factors in order to improve labour efficiency and to devise a strategy for increasing production in the construction industry

II. LITERATURE REVIEW

Attar A.A., Gupta A.K., Desai D.B. (2012), studied & carried out a survey of building projects in the districts of Sangli, Kolhapur, and Pune, where an increase in productivity is desired. He identified the 10 most important factors that influence labour productivity in small, medium, and big businesses. Monitoring, resource, operational plan, and structure are examples of highly effectual groups of factors. He stated that for large corporations, device factors are also very

effective. While in small and medium enterprises, investor factors require special attention.

Vekaria S. G. (2012), this paper focus on project managerial skills were regarded as the most significant element influencing labour productivity, among other aspects including technological discovery, skill and training, labour organisation, project uniqueness, and salary trends. He was convinced that technological research would boost output.

AmehOko John, Osegbo Emeka Emmanuel (2011), they suggested that, on construction sites in Lagos, Nigeria, the association between time overrun and labour productivity was discovered. He determined that the variables that cause time overruns are insufficient project funding, insufficient project planning before to take-off, insufficient tools and equipment, delays in material supply, subcontractors' inefficiency, and design modifications through execution of the project. The most major variables affecting productivity on construction sites are the employment of incorrect construction methods, insufficient building supplies, and incorrect project specifications. Based on the findings of the study, he made some suggestions to increase productivity in the construction sector and decrease time and cost overrun on projects in Nigeria.

Shehata Mostafa E., El-Gohary Khaled M. (2012), this study briefly explained that good resource management in building projects may result in significant time and cost savings. Furthermore, it was established that the key to increasing productivity is not to finish as many activities as possible or to increase workload, but to focus on keeping a consistent workflow and therefore being able to compare the present volume of work with capacity (work hours).

Vishal Sherekar , Mahesh Tatikonda (2016), this study is mostly concerned with Thirty-five significant elements affecting labour productivity have been identified. The selected factors are evaluated using the multi-criteria decision analysis Analytic Hierarchy Process (AHP) approach. According to the findings, the three most important factors influencing labour productivity in minor construction projects in Pune are remuneration, drug usage, and disregard for safety precautions. and the three leading elements in major construction projects are job satisfaction, degree of training, and work planning and scheduling.

Mr. Ghanasham C. Sarode, Dr. Pankaj P. Bhangale (2020), this study showed that the most essential element is effective planning, selection, and control of equipment, which is largely dependent on the site condition and kind of project. As a result, it is the construction manager's responsibility to comprehend and effectively use such aspects for improved equipment performance. This research highlights the importance of construction equipment in the construction industry in order to maximise profit by decreasing labour hours.

Er. Shriyank Sen, Er. Sandeep verma (2018), the purpose of this study is to find the link between the variables and to compare the elements of worker productivity in constructions and their relevance. The research explores all conceivable parameters using standardised questionnaires distributed throughout Madhya Pradesh. The primary aim behind the research is to look at the numerous elements that influence labour productivity in construction.

Thiyagu C., Dheenadhayalan M. (2015), studied & identified fifteen distinct groups with an impact on labour productivity in building projects. The most important factors influencing labour productivity are listed below. Construction site sanitation and hygiene, as well as the emergency shelter; On-the-job accidents; alcoholism; working overtime; a lack of building supplies; funding delays; changing orders from designers; inadequate equipment; poor material construction ; worker miscommunication.

Dayakar P., Jothi Krishnan P. (2012), this study proposed Quality of construction site, material scarcity, regular payment of salaries, worker experience, and disagreement between workers and supervisor are all essential elements influencing labour productivity. Work was focused on labour productivity ratios that were decreasing day by day, which harmed the company's productivity. For analysis, MS Excel and SPSS software were utilised. Fifty-one elements were studied and classified into four categories: job content concerns, workplace environment issues, labour issues, and legislation.

Varma Santosh, Apte M. R. (2014), this paper gives an idea related to schedule planning and actual planning data consumption may be used to determine productivity. In this case, projected concrete is the input value, while actual consumption of concrete is the productivity output. They calculated the productivity for shell and core types of contracts using

a single element kind of productivity, namely concrete.

Loeraa I., Espinosab G., Enríquezc C., Rodriguezb J. (2013), studied established a framework for evaluating the labour productivity of economic maintenance projects. They recommended the use of a work sample tool to identify the primary elements impacting labour productivity, as well as using lean thinking to increase labour productivity, in this technique.

Revianty Nurmey liandari Nurhendi, Muhamad Azry Khoiry, Noraini Hamzah (2019), reviewed a Factors Influencing Labor Productivity in Construction Projects' proposed. The purpose of this study is to critically investigate the elements that impact labour productivity and organize these factors into categories based on past research in various nations. Based on a critical analysis of prior research and the use of Drewin's Open Conversion System (DOCS), there are three main components in achieving goals: input factors, internal environment factors, and external factors.

Mr. Ghanasham C. Sarode, Dr. P. P. Bhangale , Dr. Ajay Swaroop(2021), the goal of this research is to look through the most effective manner to utilize heavy machinery for the National Road Project. It also includes an equipment cost estimation in terms of production, duration, and budget. When implementing these improvements, production capacity, effective working hours, and equipment cost are all taken into account.

Sandeep K. Jadhav , Shruti Wadalkar (2017) Proposed The author of this work gives a research of parameters for developing labour efficiency. Entire construction completion time is determined by the formwork plan and its successful use, and we may save project money to a certain level by conducting analysis. The upcoming task will be a productivity analysis of reinforcing and concreting activities.

Raj B.Vijay Antony, Kothai P.S. (2014), this research paper focus on Proposed that, Human resource management in the construction business was the emphasis. They perform a questionnaire study with 100 workers from various companies. In addition, the influence of human resource management strategies on productivity and financial performance in the construction business was investigated. They came to the conclusion that 75 percent of participants believe that site congestion is causing them to work in an uncomfortable manner.

Shashank K, SutapaHazra, KabindraNath Pal (2014), studied & categorized elements influencing labour productivity into six categories: inspiration, workforce, material/equipment, safeness, leadership, and quality. According to them, the motivation component has the greatest influence on labour productivity. As a result, they recommended that the construction business boost labour satisfaction by providing a suitable wage, implementing a financial incentive or acknowledgment programme, and changing the living environment on site.

Shah Meet P., Pitroda Jayeshkumar R., Bhavsar Jaydev J. (2014), proved productivity may have a significant role in reducing project losses or increasing revenues. Productivity may help an organization obtain a competitive edge while maintaining small profitability. According to a survey done in the central Gujarat area, the top issues affecting productivity include low remuneration, inadequate building techniques, usage of technology/level of automation, delays in material supply, and so on.

Mahesh K.S & Reshma Kassim (2017), this authors intended this research to determine the relationship between variables and to compare the elements of labour productivity in construction with their relevance . A comprehensive questionnaire is used in this study to evaluate all conceivable components. The primary aim behind the research is to look at the numerous elements that influence labour productivity in the construction industry.

Kazaz Aynur, Ackara Turgut (2015), this study described a Comparison of Labor Productivity Perspectives of Project Managers and Craft Workers in Turkish Construction Industry” claimed that of all the inputs, managing workforce is the most problematic. The goal of their research was to compare the opinions of managers and craft workers on labour productivity. They came to the conclusion that the most relevant elements affecting worker productivity may be classified as organizational characteristics.

Khaled, Mahmoud El-Gohary, Remon, Fayek Aziz (2013), this study focus on Factors Influencing Construction Labor Productivity in Egypt. 30 productivity determinants were identified and grouped into three basic categories: human/labor, economic, and administration. Their analysis showed five aspects that are most important in Egypt's construction labour productivity: (1) Labor experience and capabilities, (2) Incentive schemes, (3) Material availability and

simplicity of handling, (4) Construction management leadership and competency, and (5) Labor supervision competency.

III. SUMMARY OF OBSERVATION

As per the data analyze & studied by authors in the various papers, performance of labour productivity in construction industry is depends on various factors affecting on planning, selection & management of labour or manpower as per their position of work in a construction projects. Toward productivity, construction labour is one of the main contributions of construction process of any structure, together with equipment and materials. In most cases, data were collected using a questionnaire prepared, personal interviews and case studies. Construction is a professional region that trusts primarily on use of manpower & equipment. Labour is thus one of the key factors for improving experiences in performing work more effectively and efficiently. Many other factors influence labour productivity, and they all interact in intricate ways.

After the above study of more than 30 papers from various countries, conclude that more focus on identifying & evaluating major problems in labours planning, selection, management & its performance and their effect on labour productivity on civil engineering projects, also studied parameters of respondents classification. Literature has been investigated in order to identify the factors that mostly influencing the productivity of construction labour in building projects. Some Key factors which govern Construction of building projects are;

1. Resource factors
2. Communication factors
3. Miscellaneous factors
4. External factors
5. Human factors
6. Safety factors

IV. CONCLUSION

After review of literature from various research papers it is concluded that;

1. Many other factors influence labour productivity, and their interplay is complex.
2. More focus should be on identifying factors influencing on productivity are always study before starting construction work, so better productivity can be obtained in future project work by precise planning and site management.

3. Understanding of labour productivity can ultimately save overall cost and duration period of project work.
4. In order to achieve better productivity the construction team should have to increase teamwork and collaboration.
5. This study concluded that the most critical factor is proper labour planning, selection, and management, which is mostly dependent on the site conditions and project type. As a result, it is critical for a construction manager to comprehend and effectively apply such aspects in order to improve labour productivity.

ACKNOWLEDGMENT

I am extremely thankful to Dr. Ghansham Sarode , Assistant professor of Civil Engineering Department, Dr. D. Y. Patil Institute of Technology ,Pimpri for guiding and supporting me throughout this research. I am also thankful to Principal Dr. Pramod D. Patil, Dr. Deepa Joshi Head of Civil Engineering Department & Dr. Shruti Wadalkar PG Coordinator of D.Y. Patil Institute of Technology for providing all facilities to me in the form of good environment of the college. I would like to thankful to all staff members of civil department for time-to-time help and confidence of fulfillment of project work.

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