

A Study on Factors Affecting Labor Productivity In Indian Building Construction

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Abstract- *The objective of the study is to overview the productivity measurement practices in the Indian construction industry. It mainly aims to investigate and rank the critical factors affecting labor productivity in building construction projects according to the rate given by respondents and to compare the investigated critical factors affecting labor productivity in India to that of other studies in different countries. Furthermore, it describes approaches suggested by construction practitioners to improve labor productivity on building projects. The study result indicates that the performances of building construction projects are influenced by the effect of poor labor productivity; however, most of the contractors do not have experience of measuring labor productivity on their projects due to negligence, lack of awareness and believing that measuring productivity is difficult to implement. Hence, contractors are recommended to participate in trainings and workshops to increase their knowledge and level of awareness.*

Keywords- Labor Productivity. Building, Construction, Projects. Factors Affecting Labor Productivity.

I. INTRODUCTION

Range of construction projects is wide and divided into various segments usually residential buildings, commercial buildings, industrial buildings, road construction, utility construction etc. Construction involves various people, skills, organizations, technologies, contracting methods, financing arrangements and regulatory mechanisms and has different phases such as planning, designing and building, then they are used, maintained, repaired, renovated and eventually demolished or replaced in their life cycle. This diversity of construction projects makes it difficult to manage. In line with this adopt a common productivity measurement system. Now a big question is that how can we measure construction productivity considering all these segments, aspects and phases.

The construction industry is one of the few most labor intensive industries in the developing countries. Therefore it is very important to understand the concept of

construction labor productivity. In different researches it was found that productivity measurement techniques could be perceived as theoretical, difficult and expensive for construction companies to adopt. Good project management in construction must strongly measure and monitor productivity on construction site. Construction productivity has got increased attention from different construction researchers. Researchers and practitioners around the world have provided several contributions on areas related to construction work productivity. In addition, the result of different researches indicated that productivity is a complex issue as many factors influence productivity such as labor, capital, material, equipment, tools and equipments, poor communication or relationship between workers and management, disorganized projects, poor supervision, lack of cooperation and communication between different workers, and unfair workloads are the some of the factors that affect productivity. Technical problems like inadequate designs or incomplete engineering work can also lead to a decrease in construction productivity. The main findings of previous studies indicate that the critical areas affecting construction productivity were related to materials, tools, equipment availability, and the workers' performance.

Increasing the construction work productivity benefits a contractor in several ways: projects can be completed more quickly, project cost will be lowered, the contractor can submit more competitive bids, the project becomes more profitable and in addition it makes the firm to be capable and also helps to have good will among different stakeholders. Therefore measuring productivity, identifying factors affecting productivity and use productivity improving approaches should be a major and continual concern for construction contractors to increase the probability of projects to be completed as per the budgeted cost and specified time..

II. OBJECTIVES

The objectives of this study are as follows;

1. To Study Productivity in the Indian Construction Industry.

2. To Study Factors Affecting Labor Productivity.

III. LITERATURE REVIEW

A project means doing something new. In the business world this usually means creating something that someone else wants and is prepared to pay for. According to Namho Kim et al (2007), the construction industry's core business is undertaking projects in generating new buildings or renovating existing ones for a variety of clients.

Since the construction industry is mostly project-oriented, the performance of the construction company is dependent on the performance of projects. Projects have targets, which mean they have to be built right, within a cost budget, and finished by a certain date. Project management is implying making sure that all these targets are met.

According to the Project Management Institute, the discipline of project management can be defined as follows: Project management is the art of directing and coordinating human and material resources throughout the life of a project by using modern management techniques to achieve predetermined objectives of scope, cost, time, and quality and participation satisfaction.

Therefore project management aims to plan, organize and control to make a project successful. The simplest way of defining a project as successful is to show that three primary objectives have been met. These might possibly be called the three graces of project management and they are;

- Time: Delivery or completion on or before the date agreed with the customer.
- Cost: Completion within the budgeted cost.
- Quality: A building that meets the set standards of quality.

Productivity is a multidimensional term, the meaning of which can vary, depending on the context within which it is used. However, there are common characteristics that tend to be embraced by the term. In industrial engineering, productivity is generally defined as the relation of output (i.e. produced goods) to input (i.e. consumed resources) in the manufacturing transformation process. However, there are several variations on this basic ratio, which is often too wide a definition to be useful in practice.

IV. RESEARCH METHODOLOGY

A comprehensive literature review to understand the definitions and terminology related to productivity. Personal

interviews were taken with engineers, labors, contractors to study the factors affecting labor productivity.

4.1 List of Factors Affecting on Productivity

Table No.1 Factors Affecting on Productivity

No	Major Factor	Sub Factor
1	DESIGN	Design Changes
2		Inaccurate Drawings
3		Incomplete Drawings
4	Work Plan	Absence of working schedule
5		Lack of updating schedule.
6	Material	Poor Material Management.
7		Inappropriate Material Storage.
8		Use of Poor Quality Material
9		Presence of Shopkeeper & Security Personnel
10	Equipment and Technology	Inappropriate type and size of construction equipment
11		Lack of equipment and frequent damage of equipments
12	LABOR	Lack of Experienced & Skilled Labor
13		Misunderstandings in between labors
14		Overcrowded labor force
15		Use of alcohol & drugs
16		Management of Surplus Material
17	HEALTH AND SAFETY	Inadequate Safety Equipment
18		Lack of First Aid on site
19		Major Accidents on Site.
20	Supervision	Unclear instruction given by supervisors
21		Change of supervisors
22		Incompetence of supervisors and supervisors absenteeism
23	Project Characteristics	Poor Site Layout
24		uniqueness, complexity, size, site congestion, contract type

25		Unclear and in adequate details in material specification
26	Quality of Work	Ambiguous Specification
27		Correction/Rectification of works
28		Rework
29	Leadership, coordination and Organization	Poor Management
30		Lack of Training
31	Stakeholders	Financial difficulties of the owner/Payment delay
32		Lack of General support to the contractor
33		Misunderstanding between the Owner, Consultant and Contractor
34	EXTERNAL	Bad Weather
35		Holidays

V. DATA ANALYSIS

The data was collected through a comprehensive literature review to understand the definitions and terminology related to productivity and interviews were taken of Contractors, Engineers, Labors and other experienced people in the building construction industry. According to the literature review and the data collected through interviews the factors affecting the labor productivity were found out.

VI. CONCLUSIONS

1. Most of the contractors do not have experience of measuring labor productivity on their projects due to negligence, lack of awareness and believing that measuring productivity is difficult to implement.
2. The top ten labor productivity influencing factors rated by their level of effect and frequency of occurrence are: 1)Shortage of material, 2)Delays in decisions making, 3)Incomplete and Inaccurate drawings, 4) Lack of follow up the work progress, 5) Financial difficulties of the owner/Payment delay , 6)Incomplete facilities (water & power supply, and sanitary facilities), 7)Inspection and Instruction delay, 8)Lack of Motivation, 9)Frequent

damage of equipments and 10)Change of work order/Variation.

3. The study result shows that 1) Contract type of the project, 2) Increased labor Age, 3) Overcrowded labor force, 4) Indiscipline labor, 5) Congestion of Site, 6) Change of supervisor, 7) Design changes, 8) Bad health of labors, 9) Unforeseen Conditions (Ex. Ground Condition) and 10) Lack of Safety tools factors were ranked in the lowest position with their lowest impact on productivity of labor.

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