

## FACTORS AFFECTING LABOUR PRODUCTIVITY IN CONSTRUCTION SITE

*Mr.S.KAVEEN*

Assistant Professor, Cheran College of Engineering, [kaveencivil@gmail.com](mailto:kaveencivil@gmail.com).

*BHUVANESHWARI.T, KALAISELVAN.P, NAVIN.M, SATHYA.R*

IV Civil, Cheran College of Engineering, Karur

### ABSTRACT:

Labour productivity is one of the least studied areas within the construction site. The improvement of productivity achieve higher cost saving (reduce high cost) with minimal investment. And the main aim of this study is to find critical factors affecting labour productivity. A survey was carried out in (place) on civil contractors. The number of feedbacks were analysed through the Relative Importance Index (RII) techniques. From that a five most critical factors order by descending from RII techniques are (1)Lack of materials (2) Lack of skill and experience of the workers (3) No supervision method (4) Clarity of technical specification (5) Delay of payment & poor management. Using this case study the necessary steps are provided to improve the labour productivity.

### INTRODUCTION:

Productivity can be defined in many ways. One of the most important factor which upset the overall performance of labours productivity in construction may be either maximum or minimum. The construction sector has deliberate role in developed and developing countries. The main aim of productivity constitutes major part of productivity input in construction project to overcome the delay factors labour productivity at microlevel is important. Since the cost of the construction project can be reduced. There are number of activities involved in the construction project where the labour productivity is very important in construction operations. In this paper we review & identify the top ranked labour productivity factor from the various paper investigation.

### DEFINITIONS:

The origin of the term Productivity defined in many ways. Labour Productivity is the ratio of output to all or some of the resources used to produce that output. (B.PrakashRao et.al)

In 1950 the organization for European Economic co-operation (OECE) announced a proper definition of productivity as factors. (Sumanth 1984).

The United States department of commerce defines productivity as “cash of output of work per person- per hour of labour input” (Adrian 1987).

Handa and Adballa(1989) defined productivity as the ratio of outputs of work goods or services to input of basic resources materials.

Arditi and Machtar (2000) referred productivity as the ratio between total outputs of work expressed in Dollars and total inputs of resource materials expressed in Dollars as well.

Labour Productivity is also a foremost concept of construction planning efforts and has a direct interrelationship with the triple constraint mentioned above (SerdarUlubeyli, Agnurkazaz, Bayram Er.2014).

The Productivity as a “relative measure of labour efficiency, either good or bad, when

compared to a stabilized base or norm” (Salmon et.al.2000).

The Productivity is defined as relation between the output and the input of a production process. The Labour Productivity as a partial productivity index typically describes the relation of the output of a process to the used capacity given in time units or the number of persons involved (T.Czumanski,H.Lodding 2012).

### **FACTORS AFFECTING LABOUR PRODUCTIVITY:**

C.Thiyagu(student)&M.Dheenadhayalan classified various factors affecting the construction productivity and shortlisted the following as most significant top five factors.(1) Lack of material,(2) Labour strikes,(3)Delay in arrival of materials,(4) Financial difficulties of the owners,(5)Unclear instruction to labour and high absentees of labours.

MistrySoham&Bhaft Rajiv researched &identified 27 factors on the productivity in construction industry and shortlisted the top five factors (1) Payment delay (2) Skill of labours (3) clarity (4) Specification (5) Shortage of materials.

Shree Raja Gopal TG &Murali K more over graphed 54 factors affecting labour productivity in the construction industry and shortlisted the top factors (1) Lack of skill and experience of the workers,(2) Lack of empowerment ( training and resourcing),(3) High worforce absenteeism (4) Low labour morale / commitments (5) Increase of labour age.

Mr.A.Atlar et.al identified 30 factors affecting the labour productivity in construction and shortlisted the top ranked factors affecting labour productivity (1) Lack of material,(2) Delay in arrival of material,(3) Unclear instruction to

labour,(4)Labour strikes,(5)Financial difficulties of the owners.

Mr.AbdulKadri et.al surveyed the influence of factors affecting labour productivity and identified 50 factors ,the shortlisted top factors those factors are (1) Material shortage at project site,(2) Non-Payment to supplies,(3) Late issue of construction drawing,(4) Incapability of contractor’s site management,(5) Late issue of progress payment.

Abduloziz.M.Jarkas et.al categorized various factors impacting the construction productivity and shortlisted the following most significant top factors they are (1) Clarity of technical specification (2) Extent of variation (3) Daring execution,(4) Co-ordination level among various design specification,(5) Proporation of work subcontracted.

Adnan Enshassi et.al discovered various factors affecting labour productivity in Gaza strip and identified the top factors were(1) Material shortages,(2) Lack of labour experience (3) Lack of labour surveillance (4) Misunderstanding between labour& superintendents (5) Drawing & specification alteration during execution.

Edom Atomengraphed 18 factors affecting labour productivity in Nigeria and identified the following factors as most important labour efficient `factors (1) Involvement nonprofessional (2) Material shortage (3)Variation in cost of material (4) Recuirement of supervisors (5) Inclement weather.

Prachi.R.Ghate and Pravin.R.Minde surveyed the influence of 24 factors affecting labour productivity and the top high ranked factors (1) Availability of material,(2) Availability of tools,(3) Project Manager’s Leadership,(4) Miscommunication

between Site Management,(5) Construction method.

E.C.Lim&Jahidul Alum to learn 17 factors and selected 5 factors (1) Recruitment of supervisors,(2) Recruitment of workers,(3) Labour turnover,(4) Absenteeism,(5) Communication problem.

A.Soekiman et.al based on past researches 113 factors affecting labour productivity in construction site have been identified and were grouped into 15 groups according to their characteristics, namely (1) Design,(2) Execution plan,(3) Material,(4) Equipment,(5) Labour. Some of the top ranked factors are (1) Material shortage,(2) ) Unclear instruction to labour,(3) Payment delay,(4) Daring execution,(5) Skill of labours.

B.PrakashRao et.al factors analysis for the client's factors divided the factors into 5 components & 13 factors are (1) Unclear questions,(2) Lack of experience of the respondents,(3) factors which were irrelevant to their projects,(4) Economic slowdown/ Recession,(4) Government regulations.

#### **METHOD OF ANALYSIS USED FOR LABOUR PRODUCTIVITY:**

Mr.A.Soekiman et.al made a research through questions survey and the relative important index (RII) method used for analysis the respondent data;

A Labour Productivity suggested by “PravinMirde research was carryout by Questionnaire survey for required data”.

Relative Importance Index (RII) was used for analysis of data. It is used to determine the relative importance of various factors.

Other methods are used by this analysis,

Work study Activities

Time study Activities

Mr.C.Thiyagu (student), Mr.M.Dheenadhayalan(Guide) suggested the statistical software package SPSSV21 for analyzing the data by questionnaires survey.

Edom Atomen suggested the Important Index Method to determine the relative Importance attached to the factors by the construction workers. It is also in the form of questionnaires survey to collect the data.

MistrySoham, Bhatt Rajiv suggested RII method is used to determine the relative importance of the various factor affecting on labour productivity.

The RII analysis is used to rank the different factors affecting labour productivity.

D.Nguyen and William Ibbs et.al suggested earned value analysis, measured mile analysis and earned value & measured mile combined are used for quantifying the loss of productivity.

The difference between actual hours and the earned hours to calculate the inefficiency experience. Measured miles analyze compares the productivity in impacted period and productivity in un impacted period.

Earned value and measured mile combined analysis used to establish loss productivity.

$$\text{EVA: Loss of efficiency} = \sum_{k=1}^n (\text{Actual cost} - \text{Earned value})$$

$$\text{MMA-Loss productivity} = \text{Expected productivity} - \text{Actual productivity}$$

B.Prakash Rau et.al researched that the data's are collected by SPSS software analysis by different tests.

(1) Reliability (2)Factor Analysis (3) Correlation

Test (4) Regression Analysis (5) Descriptive Statistics.

E C Lim and Jahidul Alum conducted a qualitative survey of overall construction productivity by Important Index Analyse.

Shree Raja Gopal TG and Murali.G suggested RII method to collect the data's by online survey and it is carried out by three parts.

1<sup>st</sup> part consists of General Information of the company. 2<sup>nd</sup> part consist of questions targeting, which the factors affecting labour productivity and the final stage response information

### CONCLUSION:

From this study, total factors were identified which affect the labour productivity of construction site. The following factors are most common factors in labour productivity in construction. They are (1) Payment delay (2) Skill of labour (3) Clarity of technical specification (4) Shortage of materials (5) Improper (or) Bad supervision and the related factors are analysed by using Relative Important Index and using Earn Value Analysis method. The ranking of factors was calculated based on Relative Importance Index. From the review paper and analysis the top most factors of labour productivity are to be identified.

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