

Assessment of factors influencing Labour Productivity in Construction- A Review

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Abstract--Assessment and prevention of failures of construction projects focused on time, cost and quality is a crucial factor that is always troubling the construction industry. Even those factors are increasing every year. In this circumstance it is important to analysis identify and solve the factors. In this article the factors influencing labour productivity are identified from different articles to rank them using the RII method and also by using SPSS software in order to suggest some effective recommendations to solve this issue and thus to improve productivity

Keywords- Labour productivity, critical factors, assessment, improvement.

I. INTRODUCTION

In the field of construction, Construction labor productivity is a critical factor to the success of the industry. It is thus, important for the estimation and scheduling of construction project. A major portion of our India's GDP constitutes by the construction industry. Thus factors improving productivity of this sector is really important. 30% to 40% of the total project cost is consumed by the labours. Hence factors affecting labour productivity are much important and should give more attention. In this circumstance factors affecting labour productivity is more valid.

II. LITERATURE REVIEW

According to the authors *Nasiru Zakari Muhammad, Ashiru Sani, Ahmad Muhammad, Saeed Balubaid, Egba Ernest Ituma, Jibrin Hassan Suleiman* ; most of the traditional construction firms fails to have accurate data on labour productivity. In this paper the author was trying to identify the factors that affect the labour productivity rate and their effects on the construction industry. A survey was made by using 44 returned questionnaires from different contractors. By using SPSS software these factors were ranked in a descending order with greater mean scores. The result of analysis shown that the management and labour level factors such as motivation, incentives, disruption of needs, lack of experienced or trained workers, lack of communication between the supervisors and labours etc are the major factors that affect the labour productivity.

Prachi R. Ghate, Pravin R. Minde they explained that the efficient supply chain management of construction resources can save cost and time of the construction. Construction industry is highly labour oriented and hence depends on its work force. It is possible to enlarging the productivity by maximizing the skill of workforce. Objective of this project is to study the importance of measure of labour productivity followed by their affecting factors around Mumbai. Factors were ranked subsequently by using RII method. As a result it can be concluded that skilled workforce can reduce cost and time without damaging the quality of work.

According to *Khaled Mahmoud El-Gohary and Remon Fayek Aziz* in their journal describes that construction industry is embedded by the workforce. Therefore it plays a vital role in the profitability of most of the projects. Many constructions are still suffering with habitual issues such as poor management, inferior working conditions and insufficient quality. Many researchers found that these issues are still continuing from the past decades and still are affecting the firm's productivity and economy. This paper aims to identify, investigate and rank the factors affecting labour productivity. In order to procure this objective; questionnaire surveys regarding 30 productivity factors under (1) labour (2) industrials (3) management were done. The results were ranked in the descending order as (1) labour experience and skills (2) incentive programs (3) availability of materials and ease of handling (4) leaderships and competitions between the construction management (5) competitions between labour supervisors.

The author *N.T.Satheish Kumar, S.Loganathan* said that when considering the profitability and economy in the construction industry, labour productivity is always the prime concern. This study induced human ergonomics disciplines, evaluate the role they accommodate in labour productivity which suits in their working habitat to enlarge the total productivity. From the factors that are affecting the labour productivity a questionnaire was prepared and conducted a survey from labours working in various construction projects. The factors were ranked by using RII method and suitable

suggestions were provided to different companies for ameliorating their economic techniques in worksite.

According to *Conor O'Neill and Kriengsak Panuwatwanich* explained that the aim of their paper is to analyze the fatigue impact on the productivity of a construction crew in a dam construction at Queensland and to give the suggestions for fatigue prevention. In order to procure this goal, the Palm Psychomotor Vigilance task (PVT) and Labour Utilization Factor (LUF) reaction test were done on site at different times during the day for one week duration to evaluate the fatigue with labour productivity. As a result, high fatigue was found during physical exhaustion and also at high temperatures. The result shows that the productivity of the labours was decreased due to fatigue and as a result productivity get reduced significantly. It can be prevented to an extend by combining of the simple and complex works for the workforce; scheduling to combine and providing short breaks during high temperature and high humidity. Usage of salt tablets and increase of shaded area for workers are some other remedies.

Dagmara Nikulin said that the ultimate aim of this study is to determine the relative labour productivity, unemployment rates and relative wage changes. They used mean annual macro-data from the period of 2002 to 2013 for Poland and other 5 new EU members. As a process, first they examined the correlation between the wages, productivity and unemployment rate changes in countries on the topic. Then they evaluated the flexibility of the relative wage changes with regard to relative productivity and unemployment changes by using Panel Data Model. And found these data were different from each other and shows only minor significance within those countries.

Aims of the study done by *Odysseus Manoliadis* to demonstrate and implement the conceptual bench marking principles in some Greece projects for construction labour productivity by using indices and measure of bench marking in labour productivity. Indices such as the disruption index (DI), performance ratio (PR), project management index (PMI), and project waste index (PWI) are calculated. And this study was concluded that the bench marking in the labour productivity is important delineator in the project performance.

The authors *Aparna. B, Linu.T Kuriakose* collected the information from different worksites and analyzed by using multivariate linear regression analysis. Study shows that the skilled labours, over manning, daily payment complicity of design and age group between 30 to 50 increases the productivity on machine mixing man transfer concreting technique of column. Likewise labour efficiency was developed to be influenced by female workers, higher floors number, native speaker, communication problem and afternoon work hours.

The authors *Michael Gerges, Ograbe Ahiakwo, Remon Aziz, Georgios Kapogiannis, Messaoud Saidani and Danah Saraireh* adopted a quantitative research methodology and it entails structured survey questionnaires. Data was analysed using Relative Importance Index and found top 10

major factors affecting construction labour productivity in Egypt as tools and equipment shortages; delay in material delivery on site; payment delay; undisciplined labor, material shortage; rework; labor expensive and skills; low quality of raw material; waiting for equipment to arrive; and on-site accident. And it serves as to make recommendations to government and construction personnel regarding the productivity of labour in the Egyptian construction industry.

Ahsan Ali Khan and Sadia Ajmal describes that labor productivity plays an important role in giving success to construction industry. However Labor productivity has decreased every year because of increasing complexity in construction projects. Many researchers hypothesized suitable motivation of labor as a key contributor to maximizing labor productivity. The desire of this analysis paper is to assess management role in maintaining motivation in labor to improve their productivity. To achieve this objective survey study was carried out at different construction sites of Pakistan and data were collected using a questionnaire. Data analysis was accomplished by using graphical and statistical techniques. The results indicate that management is not interested in motivation of their workers. Management claims that their company policies include motivational plans and that they provide supervision, better working environment and facilities etc. for motivation. Besides it was not found to be true when cross check with labor response. This study gives clear picture of role of management. The research conclusion and suggested recommendation will help management in judging themselves and diverting attention of management towards motivational factors to improve labor productivity.

The authors *Shabir Hussain Khahro, Tauha Hussain Ali, Nafees Ahmed Memon and Zubair Ahmed Memon* described that productivity remains an interesting subject and a leading theme to efficient use of resources in construction sector. It has been observed that low productivity of construction workers is one of the major causes of time & cost overrun in construction projects. Labour productivity is chiefly necessary for all but especially for developing countries like Pakistan, where most of the building activities are executed manually. Thus, remedial actions to low labour production are not possible until the factors with particular reference to building construction sector will not be identified. Hence, this paper culminate the elements influencing labour productivity in construction sector of Pakistan. Questionnaire survey has been carried out from the stakeholders in private building sector projects. The data has been analyzed using Relative Importance Index (RII) method. In the eventual phase, major significant components effecting labour efficiency are located as the remedial measures can be taken accordingly to improve labour productivity.

B.Vijay Antony Raj, P.S. Kothai studied that Productivity endure an intriguing subject and a ruling difficulty in the construction area, promising cost savings and efficient usage of resources. Productivity is one of the most important issues in both developed and developing countries. Human Resource Management or HRM is the process of managing people in a company/firm as well as managing the existing inter-personal relationships. These two processes are key in the success and growth of a business. Human resource

management is the management process of an organization's workforce, or human resources. It is accountable for the attraction, assortment, grounding, judgment, and satisfying of employees, while also overseeing organizational leadership and culture and ensuring compliance with employment and labour laws. HR now focuses on strategic initiatives like mergers and acquisitions, talent management, succession planning, industrial and labour relations, and diversity and inclusion. Triumphant implementation safeguard that all employees know their part, vocation path and also feel part of an organization which is able to manage and reconcile their expectations as well as those of the organization and its objectives. Based on those factors a questionnaire has been prepared in labours point of view. In this proposal, questionnaire contemplate have been regulated with diverse companies among 100 labours and using SPSS software their response have been extracted for studying the impact of human resource management practices on productivity and financial performance in construction industry and appropriate solution was given for all impacts.

In the study done by *Zahra Ehsanbakhsh Mostahsan-Seyedeh Somaiye Mirzaee* explained that the fact of our society is that if people have good feeling about a special work, they will definitely succeed in it. Organizations are also not exempted from this. Because if organizations have higher self confidence, they will get more energy for working and the chance of their success will be greater. Members of the work force are the virtuous benefit of each organization. Reaching the objectives of any organization depends on intelligent management of these worthy resources. In this article, definitions, significance of productivity and also affective factors in enhancement of required condition for improvement of labor productivity and affective factors in decrease of labor productivity are briefly expressed.

A study by *Essam Lotffy* says that Abu Dhabi is one of the cities in GCC where Construction field is booming very fast, this technical paper is intended to show the effects of labor productivity on construction projects profits. The factors which result in productivity loss and how to improve the productivity using WBS & OBS framework. The author seeks to illustrate how loss productivity will affect *direct labor cost* which may results in reducing project profits by using Earned Value management (*Accomplished man-hours*). Upon applying earned value calculations the negative deviation from planned man-hours will be analyzed and root cause of productivity loss and how it may affect the direct labor cost. Hence establish WBS & OBS integration matrix to recover this losses. Examples and figures used in this report are adopted from On-going construction project within Abu Dhabi city and estimated productivity rates are limited to this project only. The consequence of this analyze will unveil the outcome of organize WBS & OBS integration matrix to monitor the project performance and improve the labor productivity by assigning works to appropriate organizational units using right combination between Responsibility assignments' matrix and organizational breakdown structure by identifying the individual responsibility for performing the work.

In the study of *Brent G. Hicksona and Leighton A. Ellis*, Labour productivity is at the forefront of concerns facing professionals in the construction industry worldwide. Despite the breakthroughs made in technology and an ever-expanding labour market much of the advances in construction are being eroded by inherently poor practices on the job site. This study highlights the factors affecting labour productivity of the Construction industry in Trinidad and Tobago (T&T). A questionnaire was used to gather the relevant data from members of the Trinidad and Tobago Contractors Association. It intricate grading 42 predefined components split into 4 class: Management; Technological; Human/Labour and External. The relative importance of indices (RII) was determined and the factors were ranked. The top ten factors affecting construction labour productivity in T&T are: the lack of labour supervision, unrealistic scheduling and expectation of labour performance, shortage of experienced labour, construction manager's lack of leadership skills, skillset of labourers, delay in responding to requests for information (RFI), payment delay, communication problems between site management and labour, rain and late arrival, early quitting, and frequent unscheduled breaks. Recommendations have been made in the study to address these factors. The research has direct benefits to key stakeholders in the construction industry.

III.CONCLUSION

Several studies and discussions are done on assessment of factors influencing labour productivity in construction. Labour productivity is a challenging task in construction industry because it severely affects the total cost of the project. Different factors affecting labour productivity in construction are identified and the conceptual remedial measures are suggested according to the problem are given in this paper as solved in the literatures. There are various risk factors affecting the labour productivity in construction and the details regarding the topic will be collected by questionnaire survey from the experienced personalities involved in this field. Different methods are suggested by the authors for the ranking of the factors in the management system like RII technique, SPSS software will be use. Most effective questionnaire was the Likert scale method in which each and every one can respond according to his/her will. Finally I may able to gain more knowledge regarding the labour productivity in construction and the relative factors affecting it. And it is also planning to suggest the remedial measures for all the possible issues.

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