

A CASE STUDY ON LABOR PRODUCTIVITY

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Abstract- Most of the construction activity is costly and the material cost are increase time to time, which is directly affect to the total project cost. So that analysis the weakness of particular activity in construction field. In this review paper we represent the labor productivity in introduction part and also give the factors in two group management and technical that affects the labor productivity in construction site. And one group factor management related classified in detail. Total 20 factors are identify. And we have summarized the previous work on literature review. And one types of method Analytic hierarchy process were defined in this paper. That one types of method are generally used to simplify the difficult problem easily and give the general idea to evaluate the factors that affects the labor productivity in construction fields.

Key Words: Labor productivity, Analytic hierarchy process.

1. INTRODUCTION

Some studies connected to labor productivity are represent for construction industry in past. Some of them were connected to manipulative to achieve of productivity factors. Accomplish improved labor productivity requires complete study of the actual labor cost. Different labors have different variables disturbing their productivity levels. the main anxiety have been productivity, cost, quality, and time For every project. In today's , one of the major anxiety for any organization is to get better their productivity, instead of the effective and competent conversion of resources into marketable products and calculate business profitability. The definition of labor productivity is the quantity of goods and services created by a creative factor (manpower) in the unit of time. Labor productivity generally relates manpower in terms of labor cost to the amount of outputs produced. The perfect productivity (1) may be achieve with a 40-hr work week, with person taking all the holidays and voyage days as designed all of the engineering drawings would be 100% complete.

2. LITERATURE REVIEW

Mistry soham (2013) discussed critical factors affecting labor productivity in construction project. According to him Labor productivity is one of the smallest amount considered areas within the construction trade. Productivity improvements attain maximum cost savings with minimum asset. Due to the reality that earnings limits

are little on construction projects, cost savings related with productivity are critical to attractive a successful contractor. The chief hold up to improving labor productivity is measured labor productivity. The main objective of this paper is to find critical factors affecting labor productivity. A investigation was performed in south Gujarat region, on civil contractors. He were analyzed Total 51 feedbacks through the Relative Importance Index (RII) and Analytic hierarchy process(AHP) techniques. Five most critical factors from RII Technique are Skill Of Labor, Delay in payments, Shortage Of Materials, Clarity Of Technical Specification, and Motivation of Labor. And five most factor According to AHP Technique are High Wind, High/Low Temperature, Motivation of Labor, Rain, and Physical Fatigue. Contractors will working on these factors to get better labor productivity in construction projects.

Hasan hamouda (2015) discussed enhancing labor productivity within construction industry through AHP. According to him construction is a labor concentrated industry. Although, labor productivity has been focus of study by a lot of researchers, a deeper understanding is still necessary to improve labor productivity. The main aim of this paper is to analyze critical factors affecting labor productivity in the Gaza Strip. And the aims to formulate a labor productivity model by using the Analytical Hierarchy Process (AHP). In this paper thirty critical factors associated to labor productivity were recognized and categorized into six groups: experience, psychological,

physical, supervision and leadership, time and workload, and external factors. Based on the Analytical Hierarchy Process approach, a questionnaire form was planned and sent in to sixty contractors, Engineers to bring out the view on how labor productivity might be affected. A total of 56 feedbacks were identify through the AHP. The results indicated that Job lack of incentive scheme, satisfaction& security, drug use, skill& experience, overtime and weather changes have a important impact on labor productivity. In addition, the developed AHP models provides a structure that can assist managers in estimateing multiple factors and hence successfully get better labor productivity.

S. thiyagarajan (2016) discussed factors affecting labor efficiency. According to him Construction activity are costly and normally cause in arguments and claims, which is usually affects improvement of construction projects. In the construction industry, it is necessary to find the weakness of particular activity in order to explain and overcome them. This chapter represent the possible solutions and give general idea for the factors affecting the onsite labor productivity that was analyzed on the check of the brick work and plastering work that was approved in the site. Furthermore some of these suggestions have been implemented in the site to progress of productivity. A construction company should identify each activity of its process to find out what the barriers are to improving productivity.

Vishal sherekar (2016) discussed impact of factor affecting on labor productivity in construction project. His study aims to find out the factors disturbing the labor productivity of housing construction projects in the Pune by deep literature review and complete questionnaire form with experienced contractors and engineers. The questionnaire was sent to 100 people for collecting their judgment amongst them 50 judgements were taken from little construction projects and 50 judgment are taken from huge construction projects. There are 35 crucial factors associated to labor productivity were recognized and categorized into eight groups: physical, psychological, capital, experience, external, time and workload, supervision and leadership and safety. To analyses of the well-known factors are done by multi-criteria decision analysis Analytic Hierarchy Process (AHP) method. The result indicated that the three important factors affecting on labor productivity of little construction projects in Pune are drug use, Renumeration, Ignore Safety Precautions and in huge construction projects top three factors are level of training, job satisfaction, and work planning scheduling.

Rajen B. Mistry (2016) discussed evaluation of factor affecting labor productivity in construction project. According to his study the aims to identifying the factors affecting labor productivity of Building construction projects in the South Gujarat. To do so, As per sample size 350 Stakeholders act in construction industry. They were successfully completed a structured questionnaire survey ranked. The factors were identified according to analytical hierarchy process. The seven main groups are used in this paper is: technical, materials, labor, safety and quality equipments, external & environmental. The analysis of the identified factors indicated that the top ten important factors that are behave negatively role in affecting labor productivity of building construction projects in South Gujarat are: low quality raw material, quality inspection delay, working at high places, rework, delay in arrival of material, lack of material, payment delay, equipment shortage, lack of labor skill.

Table1: Framing of factors in two group

S.N.	Group name	Sub factors
1.	Management	
1.1		Labor supervision
1.2		Method of construction
1.3		Delay in payment
1.4		Lack of construction managers leadership
1.5		Late arrival, early quit, and frequent unscheduled breaks
1.6		Sequence of work
1.7		Communication between Site Management and Labor
1.8		Storage location
1.9		Labor Interference and congestion
1.10		Incentive scheme
2.	Technical	
2.1		Clarification in technical specification
2.2		Extents of variation/change order during execution
2.3		Delay in responding to request for information
2.4		Rework
2.5		Stringent inspection by the engineer
2.6		Delay in inspection by the engineer
2.7		Site restricted access
2.8		Design complexity level
2.9		Compatibility and consistency among contract documents
2.10		Team sprit among various design team

3. MANAGEMENT RELATED FACTOR-

3.1. Labor supervision

labor supervision is a work of supervisor, foreman, foreperson and the boss of group or labors and workers, whose work at construction sites, factories or any other industries. The supervisor is control, instruct, take care and give the information of any work the workers and labors.

3.2. Method of construction

Method of construction is define as the, when on the construction site the proper techniques and procedure are followed during any construction or experiment. All the construction works are basically classified according to particular field. In these field include as treatment of foundation, moving of earth, steel erection etc. In these function proper procedure are applied for different project like as highway, buildings dams and tunnel construction etc.

3.3. Delay in payment

Payment is very necessary in construction fields or any other factories, industries, organization. Because the payment is very important for supply the raw material to successfully complete the work on construction sites. Delay in payment, when the suppliers are not supply the materials on time or lately delivers the material and the owner of a project are in loss in any other work, then the lack of money on the owner or contractor they do delay in payment. It is known as delay in payment.

3.4. Lack of construction managers and leadership

In the construction field, the construction managers leadership term is very important because the leader of the project is lead all the workers and labors. And he is explained, motivates and trained the workers and labors for their works. When the lack of construction managers leadership in the field then who is properly explained the workers for their work and who is motivate them. So, on the field construction managers leadership is necessary.

3.5. Late arrival, early quit and frequent unscheduled breaks

In the construction field late arrival, early quit and frequent unscheduled breaks are not good for projects or labor productivity. Because the time management is very important in any fields, institution and organization. When the Engineers, contractors, supervisor and labors are lately come to the construction field in this reason the project is delay time to time and the early quit of workers and contractors and the unscheduled breaks by these person the project is delay and it is not good for maintain the labor productivity.

3.6. Sequence of work

The term sequence of work is very important for successfully complete the project on time. In this field the sequence of work is include the survey of site, layout, excavation, earth moving and foundation.

3.7. Communication between site management and labor

It is very important to labor and site management or contractors that they are talk easily together. If the communication will not proper between the site management and labor during this the workers may be leave the site or project. In this reason, the labor productivity is affect and the project is delay. So that the communication between site management and labor is necessary and required to complete the project successfully.

3.8. Storage location

The various types of materials are store in any one place to protect the rain or any other problem is known as storage location. In the storage location the various materials are cement bag, steel, sand, aggregate, door, window etc. store in construction site. If the storage location is very near as well as on the construction site, so it is good for workers to take the materials easily to the construction site.

3.9. Labor interference and congestion

When the construction site workers or the industries workers are work on site or factories don't interfere their work. Because of these workers are disturbed and not concentrate their work on field. In this reason the workers are ever leave their work.

3.10. Incentive scheme

Incentive scheme is not good term for the construction work. Incentive scheme is define as when the workers are

work in one company then the other company is motivate those workers for work their company for profit our company or loss the other company is called incentive scheme.

4. ANALYTIC HIERARCHY PROCESS

The Analytic Hierarchy Process (AHP) is a multi criterion decision-making method and it is firstly introduced by T.L. Saaty (1977 and 1994). The AHP has concerned the behave of lots of researchers mainly due to the good mathematical property of the method and in this the required enter data are rather simple to obtain. The AHP is a decision supportive tool which can be used to easily resolve composite decision problems. In this the multi-level hierarchical formation of criteria, objectives, sub-criteria, and alternatives. The relevant data are consequent by using a set of pair-wise comparisons. These comparisons are find to obtain the weights of the decision criteria, and the relative criteria calculate of the alternatives in terms of each individual decision criteria.

Then, the AHP process can be done physically or mechanically by the Expert Choice, AHP software:

1. Arrange the pair-wise comparison matrix
2. Determine the priority vector for a criteria, sub criteria
3. Determine the consistency ratio, **CR**
4. Determine λ_{\max}
5. Determine the consistency index, **CI**
6. After calculate the CR and for determining the CI select suitable value of the random consistency ratio, **RI**
7. To check the consistency index is consistent or not.

5. CONCLUSION

The second biggest sector of the industry Is the construction industry in India. Labor productivity is very important to any project of the construction field and any other industries or factories. Because of this the overall project cost is decrease 30% to 40%. In this paper we define the management related factor. These factors are very important role in construction fields to define the labor productivity and also give the general idea of AHP method and show its criteria to find out the consistency index and for ranking of factors. The highest value of AHP shows the higher impact factor. According to these factors we can manage and control the labor productivity on sites.

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