

IDENTIFICATION FACTORS FOR LABOUR PRODUCTIVITY FOR CONSTRUCTION PROJECT

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Abstract— Labour performance is key factor of every successful project. Because of poor labour productivity project may costlier, more completion time of project. Top level management believes that poor labour productivity is one of the primary reasons why construction projects in India exceeded their anticipated budget and schedules. This paper focuses on labour productivity for construction sector. The survey was carried out by a questionnaire survey. The analysis of questionnaire has been done by using RII (Relative important index) method. Total questionnaire distributed 200 among which we have received feedback from 149 site engineers, labour contractors and contractors. The outcome of study is help increase labour productivity and benchmarking. The study has been done for Surat city form Gujarat state only.

Keywords— labour productivity, benchmarking , RII (relative important index)

I. INTRODUCTION

Construction is the world's leading and most tough industry. Construction industries is most economical for every countries now a days. There are so many factors affecting in this industries and decrease the productivity. Productivity is key factor that affecting of any small or medium or large construction industry. So we have to study and identify those factors and find out technique to improve productivity.

II. OBJECTIVE

To identify the factors affecting labour productivity and ranking their factors by RII (Relative important index) method.

III. LITERATURE REVIEW

Productivity can be defined various ways. Productivity can be measure in efficiency of production. It can be defined as ratio of output to inputs used in production process.

Productivity = Output/Input

labour productivity can be defined as ratio of labour hours per month to unit production per month.

Labour Productivity = labour hours per month / unit production per month

Or

Labour productivity = labours / completed work(units)

IV. RESEARCH METHADODOLOGY

Research methodology of this study contains three main steps. The first step includes literature Survey. The literature review was conducted through books, research papers, journals, internet, etc. As the outcome of this step is to identify factors affecting labour productivity. Second step includes the questionnaire survey conducted by 149 experts in the construction industry as a contractor, labour contractor and engineer. The questionnaire is prepared in two parts. The first part contains personal information of respondent is experience, qualification, site details, etc. and the second part contains factors of contractor's failure. The questionnaire is distributed to expert participants of Surat. Third step contains result analysis and concludes with Relative importance index methods.

V. SURVEY OF FACTORS FOR LABOUR PRODCTIVITY

Design of questionnaire survey: A questionnaire survey is designed by identified 51 factors affecting labour productivity.

Part I: this part included a general introduction of Respondents and description of the analysis method.

Part II: this part included a listing of the identified 51 factors affecting labour productivity.

For each question, the respondents having four options as follows: For Relative Importan Index

$$RII = \frac{\sum W}{(A * N)}$$

W = Weighting 1 to 4 each factor by the respondents

A = Highest weight

N = cumulative of respondents

1= not important, 2 = slightly important, 3 = important, 4 = extremely important

VI. ANALYSIS AND DISCUSSION

GROUP	SR. NO	FACTORS	RII	RANK
PHYSICAL FACTORS	A1	SITE CONDITION	0.8725	1
	A2	POOR HEALTH OF LABOUR	0.6745	20
	A3	POOR RELATION AMONG WORKERS	0.6678	21
	A4	LABOUR AGE	0.703	15
	A5	LABOUR ABSENTEEISM	0.656	34
	A6	WORKING DAYS PER WEEK	0.7332	16
	A7	FREQUENCY OF WORKING OVERTIME	0.656	29
	A8	MATERIAL STORAGE LOCATION	0.6577	23
	A9	SAFETY AT WORKPLACE	0.6997	8
ECONOMIC FACTORS	B1	CURRENCY FLUCTUATION	0.6628	19
	B2	CASH SHORTAGE	0.646	24
	B3	WRONG ESTIMATION MATHOD	0.698	14
	B4	IMPORT/EXPEROT RESTRICTIONS	0.6326	41
	B5	CHANGE MATERIAL PRICE	0.6359	37
	B6	OVER STACKING	0.6191	32
PSYCHOLOGICAL FACTORS	C1	BEHAVIOR OF HIGHER AUTHORITY /LEADERSHIP	0.8289	2
	C2	UNEXPECTED SITE CONDITIONS	0.6191	44
	C3	UNFAVORABLE LOCATION OF PROJECT	0.6359	26
	C4	POOR CONDITION OF CAMPING	0.6208	38
	C5	LABOUR COMMITMENT	0.6124	47
	C6	MOTIVATION	0.6393	25
	C7	INCENTIVES	0.6242	31
	C8	WORKING REWARDS	0.6258	40
	C9	WORK TRAINING AND SKILL	0.6896	13
	C10	LOW AMOUNT OF PAY	0.6795	17
ORGANIZATIONAL FACTORS	D1	DELAY IN WORK AWARDING AFTER TENDERING	0.6007	46
	D2	DELAY IN APPROVAL OF WORK DONE	0.7181	7
	D3	DISPUTE BETWEEN STAKE HOLDERS	0.6107	33
	D4	POOR PLANING AND SCHEDULING	0.6711	3
	D5	REWORK DUE TO CHANGE IN GOVERNMENT POLICIES	0.604	48
	D6	GOVERNMENT LAG IN APPROVING PLANS	0.5872	50
	D7	IMPROPER ACQUISITION OF LAND BY OWNERS CAUSES DELAY	0.6174	35
	D8	LEGAL ISSUES	0.6426	30
	D9	CHANGE IN REGULATIONS	0.6091	36
ENRONMENTAL FACTORS	E1	WEATHER CONDITIONS	0.8003	4
DESIGN FACTORS	F1	MATHEMATICAL ERROR	0.6091	45
	F2	SURVEY MISTAKES	0.755	9
	F3	COMPLEXITY OF DESIGN	0.5587	51
MATERIAL FACTORS	G1	DELAY IN MATERIAL TRANSPORTION	0.7869	10
	G2	WRONG PROCUREMENT OF MATERIALS	0.6091	42
EQUIPMENT FACTORS	H1	EQUIPMENT SHOTAGE	0.646	18
	H2	DELAY IN EQUIPMENT TRANSPORTATION	0.604	49
PROJECT FACTORS	I1	DELAY IN FINAL INSPECTION	0.7332	12
	I2	DELAY DUE TO REWORK	0.6242	34
	I3	POOR SUPERVISION	0.7299	11
	I4	LACK OF SKILLED AND EXPERINCED LABOUR	0.7198	5
	I5	LABOUR STRIKE	0.6107	43
	I6	SHORTAGE OF LABOUR	0.6409	27
	I7	EFFICIENCY OF MANPOWER	0.6292	22
EXTERNOAL FACTORS	J1	ACCIDENTS	0.807	6
	J2	QUALITY AND EFFICIENCY OF RESOURCES	0.6426	11

Table 1: The ranking of the factors by the combined sample of Engineer contractors and Labour contactors

SR. NO	FACTOR	RII	RANK
A1	SITE CONDITION	0.8958	1
E1	WEATHER CONDITIONS	0.8646	2
I4	LACK OF SKILLED AND EXPERINCED LABOUR	0.8333	3
D2	DELAY IN APRROVAL OF WORK DONE	0.8125	4
G1	DELAY IN MATERIAL TRANSPORTION	0.8021	5
C9	WORK TRAINING AND SKILL	0.7813	6
J1	ACCIDENTS	0.7604	7
F2	SURVEY MISTAKES	0.75	8
B3	WRONGE ESTIMATION MATHOD	0.7292	9
A4	LABOUR AGE	0.7083	10

Table 2 : top 10 factors identify by contractors

SR. NO	FACTOR	RII	RANK
C1	BEHAVIOR OF HIGHER AUTHORITY /LEADERSHIP	0.8852	1
A1	SITE CONDITION	0.8699	2
E1	WEATHER CONDITIONS	0.8495	3
J1	ACCIDENTS	0.824	4
F2	SURVEY MISTAKES	0.8189	5
I3	POOR SUPERVISION	0.8087	6
I1	DELAY IN FINAL INSPECTION	0.7985	7
G1	DELAY IN MATERIAL TRANSPORTION	0.7781	8
A6	WORKING DAYS PER WEEK	0.7577	9
C10	LOW AMOUNT OF PAY	0.7398	10

Table 3 : top 10 factors identify by Engineers

SR. NO	FACTOR	RII	RANK
C1	BEHAVIOR OF HIGHER AUTHORITY /LEADERSHIP	0.8704	1
A4	LABOUR AGE	0.8611	2
A9	SAFETY AT WORKPLACE	0.8333	3
G1	DELAY IN MATERIAL TRANSPORTION	0.8148	4
J1	ACCIDENTS	0.8056	5
I4	LACK OF SKILLED AND EXPERINCED LABOUR	0.787	6
A1	SITE CONDITION	0.7685	7
D2	DELAY IN APRROVAL OF WORK DONE	0.7593	8
D4	POOR PLANING AND SCHEDULING	0.7407	9
A5	LABOUR ABSENTEEISM	0.7222	10

Table 4 : top 10 factors identify by Labour contractor

VII. CONCLUSIONS

According to questionnaire survey site condition, behavior of higher authority/ leadership and accidents are major affecting factors in construction line and decrease labour productivity. If higher authority / leadership is provide good training for labour, behavior is good with labours, proper supervision on site then we increase our productivity.

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