

Manpower management in construction projects

Srinivasan N P^{1*}, Saravana Kumar K², Rahul R², Rahulnath S², Rajadurai B², Kumaravel S² and Mukesh P¹

^{1*},¹Assistant Professors, Department of Civil Engineering, M. Kumarasamy College of Engineering, Karur, Tamilnadu-639113, India.

²UG Scholars, Department of Civil Engineering, M. Kumarasamy College of Engineering, Karur, Tamilnadu-639113, India.

Abstract. Construction projects generally involve a long period of construction, huge financial investment and more problems that need to be faced in the development process. Several risk factors have to be encountered, among those one of the major risk factors is Manpower Management. Though the construction sector employs more people than other industries do, its human resource management is still poor and ineffective. This review paper concentrates on a workforce that directly contributes to the building process, labours, site engineers, and engineers or contractors. This study helps engineers or contractors to understand the value of labour resource management in the project to effectively manage them in construction projects. The primary issues in managing labour resources in construction projects have been identified with the help of a literature survey. The major problems identified will be considered for further investigation on manpower management.

Keywords: Construction projects; risk factors; workforce; manpower management; literature survey.

1 Introduction

Risk exists in all building projects to some extent. Risk management needs the capacity to recognise hazard early on and to take swift, smart choices. When hazards manifest, they may make it more difficult to finish development effectively. The largest issue the construction sector is dealing with is a labour shortage. There is a big risk when starting big initiatives that not enough personnel will be available to complete the work or reach productivity goals. Without sufficient labour, the project can experience longer construction timeframes and potential delays in its completion and timely delivery to the client. Construction companies have been having trouble filling openings as demand for their services continues to rise. To fill available roles, some construction businesses have

*Corresponding author : npscem14@gmail.com

started recruiting employees with little to no prior experience in appropriate project management. Risks are higher when a workforce has less knowledge, although this isn't necessarily a bad thing. Such workers won't be as efficient as more experienced workers since they won't have the same skill sets, and they could even need extra supervision when they first start. To keep your staff members on board, provide them with opportunities for training, mentoring, and continual training.

2 Literature findings

This study is related to labours taking part in the construction process. The questionnaire survey has been conducted with various contractors and site engineers in two different methods they are semi-structured interview and structured questionnaire. The feedback received from the survey is analysed. The major factors identified the migration of labours due to low wages, lack of wages on time, inadequate basic amenities, more possibilities of accident, lack of respect, lack of communication, dissatisfaction with a local labour union, inadequate tools and technical support, lack of first aid support within site, lack of provisions like pension, maternity leave, financial aid for their children's education etc., From this research, observed that the contractor or engineer and labour do not have a proper system to maintain the relationship and control among them [1].

On the management characteristics of interest, comments from professionals in the field of building projects were gathered. The significance of ranking and the projected efficacy of each factor were used to assess each procedure's accomplishment. The evaluation method aims to identify the causes of the lack of regional expertise required to manage building projects. The participants were given access to a questionnaire that had been created. The participants are owner (66%), engineer (21%), contractor (9%), supplier (4%). The weight of HR management parameters is planning (35.11%), acquisition (25.52%), team management (20.83%), and team development (18.55%). The weight of HR management tools is planning (15.76%), acquisition (7.85%), team management (25.31%), and team development (51.08%) [2].

Several operations involved in the construction run into difficulties. Resources for projects such as labour, supplies, and equipment, may present challenges. The data were collected from the questionnaire surveys from engineers and contractors and analysed the result through the Likert scale. The factors affecting the labour resources are manpower squabble, low manpower availability, lacking manpower, the discipline of unfavourable manpower, and less solid teamwork. The use of equipment resources by labourers to complete building activity. The factors affecting the equipment resources are high equipment maintenance cost, ownership of rental-buying equipment, ownership of own tools, late mobilization of equipment, device damage, fuel scarcity, and the additional cost of equipment rental. The factors affecting the material resources are theft of materials, delay in material delivery, material quality is below standards, increasing material price, and damage to material delivery and storage [3].

The construction project uses more manpower compared to other fields, but human resource management in a construction project is still insufficient and inadequate. A questionnaire survey had conducted for owners, site engineers and contractors. According to this study, the project's mission, timetable, client consultation, technical duties, client acceptance, monitoring and feedback, communication, management support, and staff are the project's success elements. The labours are divided into four categories. Skilled labours, semi-skilled labours, unskilled labours, and support labours. This study shows that 44% of

labours have an experience of fewer than 5 years and 56% of labours have an experience of more than 5 years. The main problem of human resource management is poor communication between team members, the project manager's role and insufficient teamwork. The improvement methods have also been identified as appointment of experienced project managers, assignment of skilled workers, and improved communication among team members [4].

In contrast to other businesses, the construction sector presents unique problems for human resources. The construction industry in India is highly segmented. Several unorganized workers in the industry work on a subcontracting basis. The need for construction services fluctuates from project to project in a dynamic environment. Contractual arrangements underpin how the construction sector functions. Various contract kinds have evolved. It mostly relies on the scope and kind of work, unique design requirements, yearly funding requirements, and complexity. The huge construction firm must deal with issues such as workforce planning, demand in the industry, reliance on transient labour, the industry's reputation, managing work-life balance, and safety risks. To achieve the project's goals, the construction business must coordinate these many groups of employees, contractors, and suppliers [5].

The management of resources may be divided into five categories: time, money, machinery, materials, and human resources. The management of human resources is crucial to the building projects since it is challenging to choose competent and unskilled labour and assign them to certain tasks at specific times. Contractors, supervisors, and other skilled workers are among the unskilled workers, which also includes masons and mistri. Through a questionnaire survey, a journal paper analysis, and a literature review, the information is gathered from employees of various construction enterprises. The assignment of roles and duties to the project's workers must be handled by human resource management, which entails the activities of role analysis, role specification, recruiting of temporary and permanent labour, performance evaluation, and communication with employees. People who are frightened of heights shouldn't be chosen since worker safety is paramount while working at high elevations without safety equipment like ropes, jackets, goggles, etc. To prevent further issues, these should be detected throughout the task allocation process [6].

This paper is about performance management, recruitment, and selection. The decision of an employee to leave a firm due to retirement or a better job offer, organisational growth that needs an urgent workforce, and changes in the global environment necessitating different qualified workers can all act as recruiting catalysts. The four proficiency levels for performance management in the construction industry are defined in this paper. These levels include demonstrating fundamental subject-matter knowledge or understanding, applying knowledge to analyse results of actions, managing and developing action plans to reduce negative effects, offering advisory services, and enhancing performance based on extensive experience tasks in the construction sector which require varying levels of competence include safety regular audits, handling environmental consequences, risk management, safe operation reward system, safety or sustainability impacts, supervising subcontractors and suppliers, communication, Health & safety compliance and control system planning [7].

For any organisation to operate effectively, especially one in the construction sector, personnel is a valuable resource. To determine the problems that human resource management faces, a questionnaire survey has been done. The proper people must be hired, the correct processes must be created, employees must be assisted in gaining the

appropriate skills, the workforce must be motivated and retained, an innovative culture must be fostered, and succession planning must be addressed. The cost of the construction training courses is greater, the employees have short-term contracts, there are more different sorts of learning points, the process is time-consuming, and the workers lack initiative, among other problems with the integrated training programme for workers. The HR department's biggest complaint is that motivating and keeping the personnel is a big problem. College and newspapers are the main recruitment channels, and hiring unskilled labour has negative effects like project delays and project cost increases [8].

Employee development possibilities include training activities, professional development, product development and management, mentoring, training, strategic planning, important employee recognition, and the growth of an organization, to name just a few. The main purpose of human development resources is to create personnel that can help businesses accomplish their objectives. The three categories of planned human resources development, skill development, and career development are how managers approach the development of human resources. The levels of enhancing human resources include productivity gains, an enhancement in financial results, an upgrade in HR results, and an upgrade in organisation performance results. The Kirkpatrick model, which incorporates reaction, learning, behaviour, and results and is employed in modern research, is one technique the company may use to access its training system [9].

To decrease project failures, the construction business might provide efficient safety actions. However, no research has been done to investigate the impact of the safety atmosphere, work circumstances, attitude toward risk, cognitive bias, and risk perception on the uncertain behaviour of labourers using a quantitative method. A questionnaire survey has been prepared and gathering feedback from various site engineers, contractors, and owners has. The analysis of the conceptual framework is used to analyse the outcomes. The uncertainty behaviour of construction workers is significantly positively influenced by their mental bias and mindset toward risk. Construction workers' risk-taking behaviour is significantly impacted negatively by risk perception and working circumstances, whereas the safety atmosphere has no discernible impact [10].

One of the reasons for cost and time overruns in building projects is the low productivity of the workforce. Many variables affect labour productivity, including design variables, execution plan variables, material variables, equipment variables, labour variables, health and safety variables, supervision variables, working time variables, project variables, quality variables, financial variables, leadership and coordination variables, organisational variables, consultant variables, and external variables. Goal misalignment, disputes over contracts, problems monitoring productivity, an absence of dedication to continuous improvement, and a lack of personnel focus are all obstacles to raising labour productivity. The suitable employee training, motivation of employees toward the entire project, prompt payment of workers, the systematic flow of work, proper in-time supervision, advanced site layout, upholding professionalism, amenities for workers, efficient use of industrial equipment and automation systems, and designed to improve planning are all guidelines for increasing labour productivity [11].

This study primarily focuses on the many labour-related variables that have a significant influence on project productivity. The factors influencing productivity are documentation, technical, management, resources, safety, wages, and others. Delays in approving permission drawings, modifications to permission drawings, and site inspections are the elements that have an impact on the paperwork. Errors in the drawings, a lack of

expertise, a lack of construction knowledge, and the building techniques used are the elements impacting the technical characteristics. Improper scheduling, resource allocation, and planning are the elements influencing management. Materials' quality, their rising cost, a lack of tools and equipment, and these issues all have an impact on resources. Lack of safety training, hazardous working circumstances, and on-site safety precautions are the variables impacting the safety measures. Lower earnings, disparities in pay scales, and late payments are variables that reduce labour productivity. Age, absenteeism, and poor health of workers are the other factors that affect labour productivity [12].

A quality construction building project requires several crucial elements, with labour playing a significant role. Lacking adequate labour control, irrational scheduling, a lack of leadership, late payments, and poor communication between site management and labourers are all variables that have an impact on management. Delays in responding to data requests, rework, variance during implementation, the accuracy of technical requirements, and the degree of collaboration between design disciplines are technical variables that impact labour productivity. Lack of labour supervision, arbitrary planning, a lack of qualified labour, labour ability, and payment delay are the production variables that rank highest. The ranking of productivity categories is human or labours, management, technological and external factors [13].

The effectiveness of teams in the intricate process of transforming inputs into outputs in diverse construction projects is referred to as construction labour productivity. The metrics for measuring labour productivity in the construction industry are made up of both objective and subjective elements. The parameters are activity level parameters, project level parameters, organization level parameters, provincial level parameters, national level parameters, and global level parameters. Workforce and crew, supplies and supplies, tools and equipment, foremen, task and location property, project delivery and contract, engineering and instruction, project complexity, health, safety, and the atmosphere, construction management, project best practices, project shareholders' nature, and product development are the factors that affect the different parameters [14].

The focus of this study is on labour management techniques, workforce issues, and labour force influences in building construction projects. Workforce planning, hiring, screening, training and development, motivation, safety, and health are all aspects of labour management. Low pay, frequent employee retention, a lack of trained labour, disrespect for workers' time, a lack of education, communication issues, an inadequate safety apparatus at work, and an inadequate safety understanding are the workforce issues caused by poor labour relations practises. Good employee management methods may increase labour productivity by improving working conditions, employee happiness, labour recognition, workplace amenities, and working relationships with society, good relations between labour and superintendents, good health and safety conditions, and a high amount of payment. Factors of reducing labour productivity by poor labour management practices are poorly skilled workers, workers not satisfied, poor supervision methods, misunderstandings between workers, personal problems of workers, working overtime, and inspection delays [15].

Finding the element impacting construction productivity is the aim of the article. Bad site conditions, a lack of expertise, a disjointed supply chain, a lack of initiative, poor planning, a lack of commercial management, and ineffective site management are all issues that hinder the productivity of the construction industry. Work overload and rework, the order of events, the distribution of resources, communication, and inspection delays are the

elements that affect bad site conditions. The factors affecting the lack of competency include bad building practices, inadequate technology and construction knowledge, poor people's capabilities and excellence, continuous changes in work locations, and skilled workers. The logistics and supply chain, equipment, a lack of knowledge, and alternative building methods are the variables affecting the scattered supply chain. Labour availability and safety restrictions are the main causes of the lack of commitment. Planning, incomplete planning, managing, and having too many people working at one location are all issues that can lead to incorrect planning. Inadequate site management is influenced by equipment failure, unfavourable conditions of employment, and slow supervision [16].

One of the key factors in the construction field that contributes to its existence and expansion is labour productivity. Construction labour productivity is influenced by human or labour factors such as labour experience and skill, leadership and site management effectiveness, instruction and communication clarity on the job site, absences from the job site, managing and overseeing subcontractors, and labour education level. The availability of materials on-site, providing all drawing details while working, supplying the required equipment and tools on-site, the wages paid to labourers, the services rendered on-site, and the type of work management are control factors that affect the performance of the construction labour force. The interruption of work, architectural and structural design, correctness and degree of project specifications, equipment needed for project tasks, and the amount of work available each day are technical and technological elements that impact construction labour productivity. The supply of resources on the market, political and security situations, economic conditions in the nation, the type of the project site, climate, and the surrounding environment are all external variables that impact labour construction productivity [17].

To investigate if there are any construction productivity problems through questionnaire survey in order to ascertain project managers' perceptions of this aspect. A relative importance index was used to rank the components (RII). Lack of materials, inadequate drawings, inspection delays, a lack of tools and equipment, poor communication, bad site condition, variation orders, and planning overtime are all variables that have the potential to reduce production. The top eight issues influencing productivity in the construction sector are a shortage of materials, supervisory delays, a lack of tools and equipment, rework, absenteeism, interference, poor communication, and an unorganised site[18].

The availability of unskilled workers will be growing, and the lack of high-quality skills in the labour market is becoming less. Evaluation of different management strategies and considering the contradictive interests of owner, contractors, and craftsmen is essential. The factors which influence the construction skills shortfall are required new technologies, growth in self-employment, poor image of the industry, high mobility, dissatisfaction with a labour organization, site safety, quality of work, cultural differences, problem related to issues of women in construction, and drain of the workforce. The length and level of effort determine how effectively the building sector performs. To maximise investment and construction plans, the production functions in the construction industry are applied. The pay for multi-skills will be sufficient to encourage employees to upgrade new skills[19].

A good technique to learn about the state of managerial skill development in the construction sector is through personnel estimation. 360-degree assessment centres serve as evaluation tools. 620 managers participated in the analysis, which was done in 5 construction sectors. The assessment centre demonstrates how evaluation results are applied

to human management issues. The issues identified include enhancing the precision of determining the level of competency development about function, creating and implementing training programmes, managing knowledge and talent, designing career paths, creating an employee pool, and enhancing the effectiveness of hiring and staff progression. The evaluation's results showed a serious lack of progress in management skill development. The organisational reluctance of a construction corporation to acknowledge the stage of management skill development. The specific goals of personnel estimation, the characteristics of the organisational environment under construction, the knowledge and skills profile, the performance assessment of the particular management and positions, and the level of specialized training will all have a direct bearing on the quality of the evaluation findings produced by this tool [20].

Employers and workers may use effective diversity in workplace management as a strategy to develop positive relationships and ensure an organization's success. This study examines how well employees perform in the construction sector. 180 employees of 18 construction businesses completed a standardised questionnaire to collect the primary data. Effective diversity in workplace management is strongly correlated with high employee performance because effective diversity in workplace management is thought to improve both organisational and employee effectiveness. The performance of employees and effective diversity in workplace management is not mediated by the flimsy negative link between conflict and effective diversity in workplace management. Businesses functioning in a volatile business climate are looking for ways to increase their effectiveness and competitiveness, and there is a weak negative association between conflict and employee productivity in those organisations [21].

Construction industries in India face a major demand for quality infrastructure from the housing, transportation and development segments. The factors that are challenged the assumption and application of HR practices in the construction industry of India are manpower planning practices, performance management practices, compensation practices, training and development practices and safety issues. The shortage of critical skill sets and the dynamic nature of work leads to costly delays in projects, thus reducing the credibility of the organization. The Indian construction industry does not have effective human resources practices in place to leverage the potential of the workforce. The key challenges faced by HR professionals in the Indian construction industry are challenges associated with manpower planning, challenges associated with performance management practices, safety-related challenges, and challenges associated with training and development [24].

Several construction companies are operating in a unorganised way. The success of construction enterprises is impacted by several risks and causes. The following things impact building projects: poor planning, ineffective management, a lack of resources, a competent workforce, environmental risks, and sociological and political problems. Strategic management and the idea of effective teamwork are things the construction industry wishes to put into practice. The workforce working in construction is dealing with several problems, including unsafe working conditions, poor work guidance, unsettling work, intense work, delayed working hours, lack of social acknowledgement, poor salaries, inadequate security, unsanitary surroundings, inadequate food accommodations, inadequate education, non-skilled labourers, lack of implementation and scheduling freedom, and inadequate technical support. Power to make decisions, reduced oversight, modifications to the control structure, increased responsibility, job scheduling, unique responsibilities, an efficient feedback mechanism, and power allocation are notions that inspire labour via job enlargement [25].

3 Conclusion

The major factors mentioned in this study include lack of knowledge, lack of experience, delayed payments, poor worker coordination, poor wages, bad work scheduling, design modifications, lack of workforce safety, tool maintenance, and disregarding safety procedures. The productivity element, which has a significant influence on finishing the project within the allotted budget and period, must be well under control. To enhance employee relations and to stop cost breakdowns, construction organisations must give managing staff training with greater attention. The administration should create a secure and efficient atmosphere, as well as facilities like contemporary tools, restaurants, and refreshing rooms. These facilities must be ensured in common places within the work site. The deviations from the typical flow of work impair recruitment levels and management personnel available on-site must be well-trained to manage any issues that arise during project execution.

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