FACTORS AFFECTING MASONRY LABOUR PRODUCTIVITY IN BUILDING CONSTRUCTION PROJECTS NEGATIVELY AND POSITIVELY IN INDIA

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ABSTRACT:

Masonry labour productivity is critical to the success and profitability of construction projects. It is one of the most prevalent reasons of cost and schedule overruns. Addressing these elements in order of relative importance would assist in providing clear understanding of how to improve the productivity of masonry labour in the construction industry. The objective of this paper is to identify the factors affecting masonry labour productivity in building construction projects in the state of Andhra Pradesh, India. Extensive review of factors affecting labour productivity was undertaken and the major positive and negative factors that influence labour productivity were identified. Using content analysis methodology. 38 characteristics having negative influence and 25 characteristic having positive influence on labour productivity relevant to masonry work was taken into consideration. The negative factors were divided into five categories: (1) management team, (2) work force, (3) working conditions, (4) material and equipment, and (5) unforeseen and unfamiliar factors. The positive factors were divided into five categories as well: (1) labour management (2) communication (3) management team (4) supervision & leadership, and (5) use of construction methods. A systematic questionnaire survey to identify the most important factors affecting labour productivity was distributed to industry practitioners. Using Relative Importance Index (RII) method the factors were scored. Based on the RII analysis, a framework for labour productivity for masonry work is proposed to enable overall construction productivity on construction projects involving masonry work.

Keywords: Labour productivity, Building Construction, Relative Importance Index, Factors, India.

INTRODUCTION:

Productivity is one of the most important aspects influencing the construction industry's growth, and it is mostly linked to labour performance (Alaghbari et al., 2019). The "productivity means the total amount of labour involved in it (Input) with the quantity of work completed (output)" (Abdulaziz et al., 2013, Mistry & Bhatt, 2013). Construction is a critical sector of the national economy for countries all over the world, since it traditionally employs a large section of the workforce and contributes significantly to overall revenue (Attar et al., 2012; Alaghbari et al., 2019). Labour costs account for 30 to 50% of total project costs in most of the countries, based on their availability (Jarkas, et al., 2012, Chigara et al., 2014). The construction sector must increase productivity by utilizing personnel and other resources more effectively (Durdyev S et al 2011, El-Gohary K et al 2014). This can be done by adopting new technologies, easy to use materials, and heavy equipment (Ghate et al., 2016; Ghoddousi et al., 2015). Despite various techniques and methodologies, the improving labour productivity remains a challenge, For many years, the construction industry is struggling to increase labour productivity. (Ghodrat et al., 2018, Attar et al., 2012).

It is difficult to improve masonry labour productivity without first knowing the essential factors that influence it. The success of a project is heavily influenced by labour productivity (Rao & Sreenivasan et al., 2015; Hashimhanif et al., 2015). However, it might be influenced by several of the unforeseen factors. Some of the various factors are labour, materials, equipment and supplies, construction methods, politics, money, and the environment (Alaghbari et al., 2019; Chigara et al., 2014; Hammad et al., 2011). Poor labour productivity is one of the main reasons of budget overruns in construction projects. Thus, it becomes very crucial that special consideration is given for improving the labour productivity especially for building sector (Alaghbari et al., 2019; Rad & Kim, 2018). Masonry labourers assist masons and are in charge of carrying materials to the job site and scaffold where masons are

working (Tahir et al., 2015; Tsehayae et al., 2014; Yi, et al., 2014). They mix and transfer grout, cut bricks as needed for corners, arches, and designs, and follow their foreman's instructions (Cox, et al., 2003; Dai, 2003; Doloi et al., 2008) .

India's labour productivity decreases 2.63% on the year December 2019, compared to 5.35% the year before. The yearly statistics on India's labour productivity growth runs from December 1992 to December 2019, with an average of 5.23 percent. From a peak of 7.89 percent in December 2010 to a low of 1.29 percent in December 2002, the percentages fluctuated from high to low. Labour Productivity Growth is calculated by the CEIC (Census and Economic Information Center) using annual GDP per employed person. The World Bank reports GDP per employed person in international dollars. PPP values are used to compute GDP, which means GDP is converted to 2017 constant international dollars using PPP rates. In December 2020, the country's labour force participation rate dropped to 46.29%

The aim of the study is to identify the factors that have a positive and negative impact on masonry labour productivity in building construction projects in India, as well as to rank the factors that will have the greatest impact on labour productivity in building construction projects in India. This research was carried out in the Andhra Pradesh state. The research was based on data acquired by questionnaire and ranked using the RII approach. All of the variables were predetermined to impact masonry labour productivity, their integrity was not examined.

LITERATURE REVIEW:

Previous researchers have determined numerous factors affecting the labour productivity. Jarkas et al., (2012) in his research analysed the factors affecting labour productivity in Kuwait, they listed out 45 major factors which they further classified it into four categories those are management, technological, labour and external. Found that the clarity of technical specifications was the critical factor affecting labour productivity.

In another research Thomas and Sudhakumar (2015) categorised the labour productivity in 10 major groups those are poor site management, lack of communication, improper supervision, poor material planning, tool and equipment issues, improper drawing management, project management incompetency, craftsmen issues, lack of meetings and poor labour motivation. He identified material waste is the critical factor influencing labour productivity in Kerala. which found that material issues had the greatest impact on productivity.

To fill the gap of Thomas & Sudhakumar (2015); Ghate et al., (2016) conducted a questionnaire survey in the Mumbai region, India discovered that skilled labour, on-site safety, work schedule, availability of material, building method, and other factors impact labour productivity. The most important component in increasing productivity has been stated to be the use of skilled labour. Because competent labour can accomplish more work in the same amount of time with higher quality and precision. Skilled labour, by definition, may create more high-quality work than unskilled labour. Productivity will be significantly greater if it is calculated by the number of hours spent working and the value of work generated. This is due to the fact that experienced labour will be able to create more and rework will be reduced. However, if productivity has been measured by the wages paid to workers and the value of the labour they create, it may not be significantly greater skilled labour costs up to 50% more than unskilled labour. Aside from that, competent labour is frequently found to be in limited supply. One of the primary risks in building construction projects is a labour shortage, which may turn a well-performing project into one with cost and schedule overruns (Ghodrat et al 2018, Attar et al 2012, Rahim et al. 2016). As a result, hiring specialised labour for all jobs is not always possible or financially practical.

To improve the labour productivity Ghodrati et al., (2018) conducted a survey in New Zealand based on role of management strategies to improve labour productivity. He divides the primary elements determining labour productivity into three categories: (1) management, (2) human resources, and (3) external factors. The management strategies are outlined from the literature study, and an expert interview was done who has more than 15 years of experience in the building industry in New Zealand. There are more than 25 senior construction executives from New Zealand's top construction firms. Incentive program, labour management, supervision and leadership, planning, resource scheduling training, communication, construction methodologies and construction management are among the management strategies. The results of the multiple regression analysis (MRA's) top three influential management methods were comparable to those of the t-tests. The results of the t-tests and MRA show that dedicating resources to the dominant strategies are communication and incentive programmes, is most successful than the other strategies in increasing labour productivity. On-site productive living labour is closely linked to the building project. A company's employees are critical to its success (Demirkesen & Bayhan, 2020). A scarcity of skilled personnel is caused by a number of circumstances, including a lack of training, insufficient education programmes, a negative image, a risky site and others (Kim et al., 2020). Macro control of labour resource availability is a long-term and difficult task. Individual employees find the construction business unattractive due to severe working conditions, job insecurity, and a lack of career opportunities, resulting in a progressive loss of labour force (Ayodele et al., 2020). Furthermore, surveys show that China's construction labour market is characterised by extended work tenure, a lack of education, low daily salaries, a lack of job-hunting channels, and informal employment contracts (Wang et al., 2019; Gomez & Raut 2015). Chinese employees' profit-seeking job hopping has a number of negative consequences for their skill development, employment, labour relations, and so on, as well as a significant rise in employer labour expenses (Sun et al., 2019). In construction project management, important uncertainties include the labour market and the availability of skilled workers (Zhong et al., 2018). Management approaches and procedures are also being focused on throughout the field to increase the availability of labour resources. Productivity may be improved by having a flexible labour resource strategy and a consistent labour flow (Thomas et al., 2003). Various optimization methods are developed based on this thinking for firms' and projects' optimal construction labour resource usage. These models have taken variety of management considerations, such as long-term competency development (Wang et al., 2018), individual capability differences within the crew (Fini et al., 2018) and evening and night shift scheduling (Cheng & Tran, 2015), and can help to alleviate the lack of labour resources to some extent. Furthermore, quality control systems for

subcontractor selection might be beneficial (Abbasianjahromi et al., 2018). Liang et al. (2019) created a competence model to aid businesses in properly assessing worker skills that may impact safety performance. Lack of material, insufficient drawings, incompetent supervisors, lack of tools and equipment, labour absenteeism, poor communication, training, bad site layout, inspection delay, and rework are the most important problems, according to Makulsawatudom et al. (2004) surveyed on Thailand.

METHODOLOGY:

The approach used in this study was based on a literature review, and a structured questionnaire survey was used to collect data from construction workers. The survey approach was effective for collection of data on the factors that required for rating. The population for this study comprised contractor, site engineers, project managers and consultants who involved in building projects. Factors impacting labour productivity positively and negatively that were adopted in earlier studies described in the literature review, A detailed questionnaire were prepared. Initially, a pilot research was carried out with 16 construction managers, 12 contractors who involved in building projects, 38 negative and 25 positive Factors were identified for this survey. Before being given to the respondents, the questionnaire was pretested for relevance and clarity. 8 contractors and 6 project engineers were chosen at random from the two sample frames for the pre-tests (Tabachnick & Fidell 2007). This helped in the improvement of the questionnaire's design and appeal for a higher response rate (Tavakol & Dennick 2011).

The masonry labour productivity affecting negatively has categories five groups those are Workforce, management team, working conditions, material and equipment, unforeseen and unfamiliar factors. Positive elements were further divided into five categories: labour management, communication, management team, supervision and leadership, and use of construction methods. Table 6 & 7 lists the groupings of factors impacting masonry labour productivity factors in building construction projects.

To generate a reasonably sample of that population, Equation (1) was used. (Wael Alaghbari et.al 2017).

$$n = \frac{m}{1 + \left(\frac{m-1}{N}\right)} \qquad (1)$$

Where, n = sample size of limited population

m = unlimited population

N = available population

In total of 86 responses was collected respondents include project managers, Contractors and site engineer. As a result, the responses to the study were sufficient to determine the impact of masonry labour productivity determinants in the construction industry. In India, there are a variety of construction projects. On the basis of their personal experiences, respondents were asked to score the factors which affecting labour productivity negatively and positively, criteria mentioned in Table 6 & 7. taking into consideration various characteristics like as time, cost, and quality. The individual's opinions on the presented inquiries was evaluated using a Likert scale for this study. On a scale of 1-extremely low, 2- low 3- moderate, 4- high and 5- very high, respondents were asked to rate the factors impacting the productivity in building construction projects. For ranking factors, the RII technique was used. RII can be calculated by using the following equation.

$$RII = \frac{\sum_{i=1}^{n} [w_i x_i]}{AN} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{5(n_5 + n_4 + n_3 + n_2 + n_1)}$$

Where,

W = Weight assigned by the respondents from 1 to 5

A = Highest Weight

N = Total no. of respondents participated in the survey.

X = Frequency of each weightage.

RESULTS AND DISCUSSION:

The factors affecting labour productivity positively and negatively in building construction project sites in India. The negative factors have divided into 5 groups a total of 38 factors. as well as 25 positive factors were selected and divided into 5 groups as shown in Table 6 &7 and shown in Figure 1. Factors were ranked using RII values with the greatest value indicating the highest rank for both negative and positive factors affecting on masonry labour productivity factors studied.
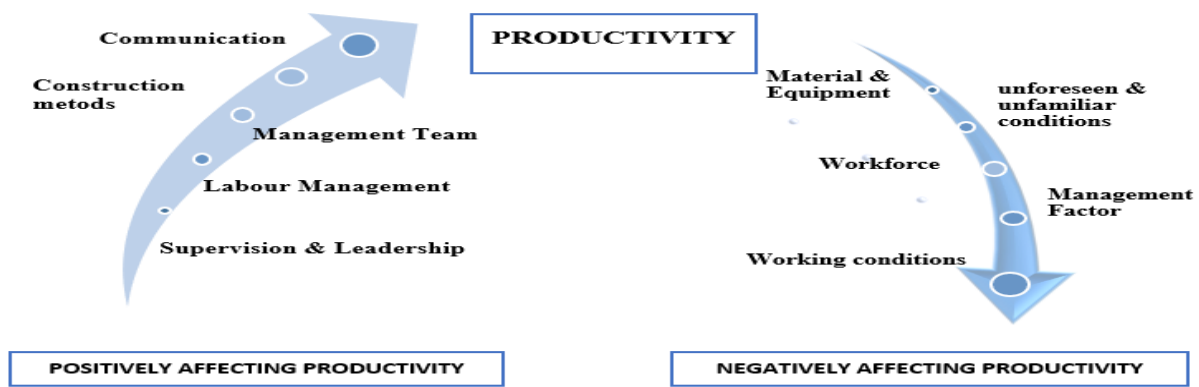
Figure 1: Category of positive and negative factors affecting labour productivity **NEGATIVE FACTORS:**

RII of Management Factor

Table1: Relative Important Index of Management Factor

Factors	N	RII (%)	RANK
Poor Supervision Method	86	74.88	1
Poor Relation Among Workers And Superintendent	86	71.86	2
Poor Leadership Skill	86	66.74	3
Method Of Construction	86	62.79	4
Incomplete/Revise Drawings	86	65.81	5
Variations/Change Orders During Execution	86	63.48	6
Incompetent Supervisors	86	61.39	7
Inspection Delay	86	62.09	8
Lack Of Periodic Meeting With Labour	86	58.83	9
Lack Of Labour Surveillance	86	58.60	10

The management aspects were separated into 10 categories, as indicated in the Table1. Poor supervision methods are ranked first in this category with a RII of 74.88%, while poor relations between workers and superintendent are placed second with a RII of 71.86%. With a RII of 66.74%, bad leadership skills were ranked third.

Lack of supervision encourages workers, particularly those employed directly, to participate in non - work activities, such as taking many unplanned breaks, waiting idle, or even leaving the job site during working hours to attend to personal affairs. Direct labour monitoring is essential to avoid defective and non-conforming work to contractual requirements, reducing the cost of rework and the related delays to current activities.

RII of Workforce:

TTable 2: Relative Important Index of Workforce

Factors	N	RII (%)	RANK
Less experience of workers	86	73.48	1
Lack of skill	86	73.25	2
Payment delay	86	72.55	3
Lack of empowerment	86	72.55	4
Poor relation among workers	86	68.60	5
Low labour commitment	86	67.20	6
Lack of labour recognition program	86	65.58	7
High workforce absenteeism/turnover	86	64.41	8
Low amount of pay	86	64.18	9
No financial rewards	86	61.86	10

The workforce aspects were separated into 10 categories, as indicated in the Table 2. Less experience of workers is ranked first in this category with a RII of 73.48%, while Lack of skill are placed second with a RII of 73.25%. With a RII of 72.55%, payment delay was ranked third.

One of the major issues affecting the labour productivity is a lack of experience of workers and Lack of skill, demonstrating that labour plays an important role in obtaining higher productivity in various building projects. Manpower requirements (skilled, semi-skilled and unskilled) will be greater in building construction projects including several masonry tasks. Contractors must utilise sufficiently skilled people in order for a building construction project to be successful. When skilled labour is unavailable then the contractors is forced to execute and complete the work with semi-skilled/unskilled labour, resulting in productivity issues.

RII of Working conditions:

Table 3: Relative Important Index of Working conditions

FACTORS	N	RII (%)	RANK
Poor work planning	86	75.34	1
Unrealistic scheduling	86	73.48	2
Working 7 days per week	86	64.88	3
Labour interface and congestion	86	63.25	4
Frequency of working overtime	86	62.32	5
Design complexity	86	61.39	6
Unsafe working conditions	86	61.16	7
Accidents	86	60.93	8
Working at heights	86	58.83	9
Inadequate safety plan	86	57.90	10

The working conditions aspects were separated into 10 categories, as indicated in the Table 3. Poor work planning is ranked first in this category with a RII of 75.34%, while Unrealistic scheduling are placed second with a RII of 73.48%. With a RII of 64.88%, Working 7 days per week was ranked third.

Poor work planning and Unrealistic scheduling are the major factors. Poor work planning and Unrealistic scheduling may result in resource overloading on a regular basis. Inadequate poor planning can also lead all or majority of the workforce to be idle owing when there is a lack of sufficient material. It may be possible to avoid this by carefully planning the task and conducting sufficient proper checks. In this scenario, scheduling software can also aid without adding too much overhead.

RII of unforeseen & unfamiliar conditions:

Table 4: Relative Important Index of unforeseen & unfamiliar conditions

FACTOR	N	RII (%)	RANK
Stringent inspection	86	63.25	1
Rework	86	62.09	2
Weather conditions	86	61.16	3
Use of information and communication technologies	86	58.83	4

The Unforeseen & Unfamiliar conditions aspects were separated into 4 categories, as indicated in the Table 4. Stringent inspection is ranked first in this category with a RII of 63.25%, while Rework are placed second with a RII of 62.09%. With a RII of 61.16%, Weather conditions was ranked third.

It disrupts the normal flow of labour, forcing masonry employees to follow the management team's strict rules. Workers must be properly trained and understand how to use information and communication technology on the job. Workers will require the supervision of skilled and trained supervisors in order to work efficiently. Rework causes delays and cost overruns, which have an impact on project productivity. If modifications are made late, they have a significant impact on project productivity.

RII of Material and Equipment:

Table 5: Relative Important Index of Material and Equipment

FACTOR	N	RII (%)	RANK
Equipment And Tools Shortages	86	62.79	1
Bad Condition Of Tools And Equipment	86	62.55	2
Material Shortages	86	60.69	3
Unsuitable Material Locations	86	56.74	4

The Material and Equipment factor aspects were separated into 4 categories, as indicated in the Table 5. Equipment and tools shortages is ranked first in this category with a RII of 62.79%, while Bad condition of tools and equipment are placed second with a RII of 62.55%. With a RII of 60.69%, Material shortage was ranked third.

To complete the assigned activity properly, workers require a minimum and good working condition of tools and equipment. If the wrong and bad condition tools or equipment are offered, labour productivity might suffer. Because workers must spend extra time transporting essential supplies from inconvenient storage sites, the size of the building site and the location of material storage have a substantial influence on masonry labour productivity

Poor condition of tool and equipment maintenance can lead to frequent breakdowns, causing site management to devise other strategies to keep the crew from idling. To avoid productivity losses, it is also necessary to repair damaged machines and plants as soon as possible. If suitable resources and materials are not available on time at the workplace, construction productivity suffers, which can have a long-term influence on the budget and schedule performance of construction projects.

RII of the overall negative factors affecting productivity:

The overall factors which affecting labour productivity negatively has been ranked as shown in table 6. The top five factors which influencing more the masonry labour productivity in building construction projects are poor work planning, poor supervision method, less experience of workers, unrealistic schedule, lack of skill respectively. The poor work planning is ranked first in the overall negative factors with an RII of 75.34. while the poor supervision method is placed second with an RII of 74.88, with an RII of 73.48 the less experience of workers and unrealistic schedule has ranked third, with an RII of 73.25 the lack of skill has ranked fifth. The greater attention has to pay for the top five factors which shown in table 6. The factors which are less affecting the labour productivity and the RII < 0.5 is lack of periodic meetings with labour, working at heights, use of information and communication technology, lack of labour surveillance, inadequate safety plan and unsuitable material location has less significant value, which effect less and pay less attention for this factor which has less significant value.

Table 6: Relative Important Index of overall negative labour productivity factors

NEGATIVE	RII (%)	OVERALL RANK
Poor work planning	75.34	1
Poor supervision method	74.88	2
Less experience of workers	73.48	3
Unrealistic scheduling	73.48	3
Lack of skill	73.25	5
Payment delay	72.55	6
Lack of empowerment	72.55	6
Poor relation among workers and superintendent	71.86	8
Poor relation among workers	68.60	9
Low labour commitment	67.20	10
Poor leadership skill	66.74	11
Method of construction	65.81	12
Lack of labour recognition program	65.58	13
Working 7days per week	64.88	14
High workforce absenteeism/turnover	64.41	15

Low amount of pay	64.18	16
Incomplete/revise drawings	63.48	17
Labour interface and congestion	63.25	18
Stringent inspection	63.25	18
Variations/change orders during execution	62.79	20
Equipment and tools shortages	62.79	20
Bad condition of tools and equipment	62.55	22
Frequency of working overtime	62.32	23
Incompetent supervisors	62.09	23
Rework	62.09	25
Little or no financial rewards	61.86	26
Inspection delay	61.39	27
Design complexity	61.39	27
Unsafe working conditions	61.16	29
Weather conditions	61.16	29
Accidents	60.93	31
Material shortages	60.69	32
Lack of periodic meeting with labour	58.83	33
Working at heights	58.83	33
Use of information and communication technologies	58.83	33
Lack of labour surveillance	58.6	36
Inadequate safety plan	57.9	37
Unsuitable material locations	56.74	38

POSITIVE FACTORS:

The factors that positively affect labour productivity are divided into five major categories, each with five subcategories, all of which will improve labour productivity on masonry building construction projects in India. The five major categories are communication, construction methods, management team, labour management, supervision & leadership as shown in table 7, by conducting questioner survey the results has been obtained by using RII method, as per the results the Giving laborers clear and direct instructions has got the first rank with an RII of 75.58%, by using lean construction technique the productivity will increase and this got second rank with an RII of 74.88%, with an RII of 73.95%, BIM (Building Information Modelling) got third rank.Table 7: Relative important index of positive factors affecting labour productivity

S.NO	CRITERIA	SUB- CRITERIA	RII (%)	RANK
1	Labour Management	Using repeating construction crews	66.97	10
		Increasing the number of laborers	66.27	13
		Using part-time laborers	64.18	17
		More number of skilled laborers	61.86	22
		Creating a sense of ownership or control for individual tasks	59.76	24
2	Communication	Giving laborers clear and direct instructions	75.58	1
		Clear roles and responsibility	73.02	4
		Regular and effective communication on construction status with project stakeholders	72.79	5
		Effective site communication	71.62	6
		There is a better flow of information between workers	66.97	10

3	Management Team	Materials and supply chain management	67.44	8
		Improvement of equipment and tools	67.2	9
		Periodic meeting with labour	66.97	10
		Material management	63.95	18
		Safety, healthy and Wages	63.02	20
4	Supervision & Leadership	Providing project management training for the site supervisors	66.27	13
		Improving first-line leadership which may include training / coaching / mentoring.	64.41	16
		Enhancing leadership and decision making for the supervisors.	63.95	18
		For managing workforce there will be sufficient number of supervisors.	62.32	21
		Experienced supervisors	60.93	23
5	Use of construction methods	Lean Construction	74.88	2
		BIM (Building Information Modelling)	73.95	3
		Industrialization	69.76	7
		Modularization	66.27	13
		Constructability	58.83	25

When employees in a firm have effective communication skills, they are more likely to hold one another responsible. Because clear instructions are provided via efficient workplace communication, employees know exactly what is expected of them. This enhances responsibility, which in turn boosts productivity. There will be no motivation to improve if there is no responsibility in the workplace. It becomes clear where the firm is now, where it needs to go in the future, and what measures need to be done to get there with the support of effective communication among management and staff. All of this information gives all staff clear directives, which improves productivity and reduces uncertainty. Employees' jobs become less stressful, quicker, more efficient, and happier when they are given clear instructions.

The second top factor is Lean construction, labour productivity requires lean techniques that focus on removing waste, improving customer satisfaction, and increasing efficiency. To achieve this, continuous improvement initiatives must be developed and implemented to identify and eliminate areas of poor productivity and waste. This is where the lean concept comes to help. The third factor is BIM with an RII of 73.95%, One of the key advantages of utilising BIM is increased productivity, which is the top statistic that companies hope to improve when they implement the technology. Specifically, BIM achieves this benefit through reducing project management, improving communication and coordination, detecting problems early, reducing rework, and lowering costs, all of which increase productivity.

It is clearly observed that constructability has the less significant value among all but the same criteria which is construction method is important to increase the labour productivity. The management should implement this positive factor which will improve the masonry labour productivity to overcome from the negative factors.

Table 8: Relative Important Index of overall positive factors

S.NO	CRITERIA	Average RII%	RANK
1	Communication	71.996	1
2	Construction methods	68.738	2
3	Management team	65.716	3
4	Labour Management	63.808	4
5	Supervision & Leadership	63.576	5

The Positively affecting factor aspects were separated into 5 categories, as indicated in the table 8. Communication is ranked first in this category with a RII of 71.996, while use of construction methods are placed second with a RII of 68.738. With a RII of 65.716, Management team was ranked third, Labour management was ranked fourth with a RII of 63.808 and supervision & leadership get fifth rank with a RII of 63.576. It is clearly observed that labour management, supervision & leadership has less significant value when compare to others. To obtain maximum masonry labour productivity, proper attention is required to create better working conditions. Employees who get clear and specific instructions, roles, and responsibilities as a result of effective communication are able to perform in accordance with what is expected of them. Increased responsibility leads to increased workplace productivity.
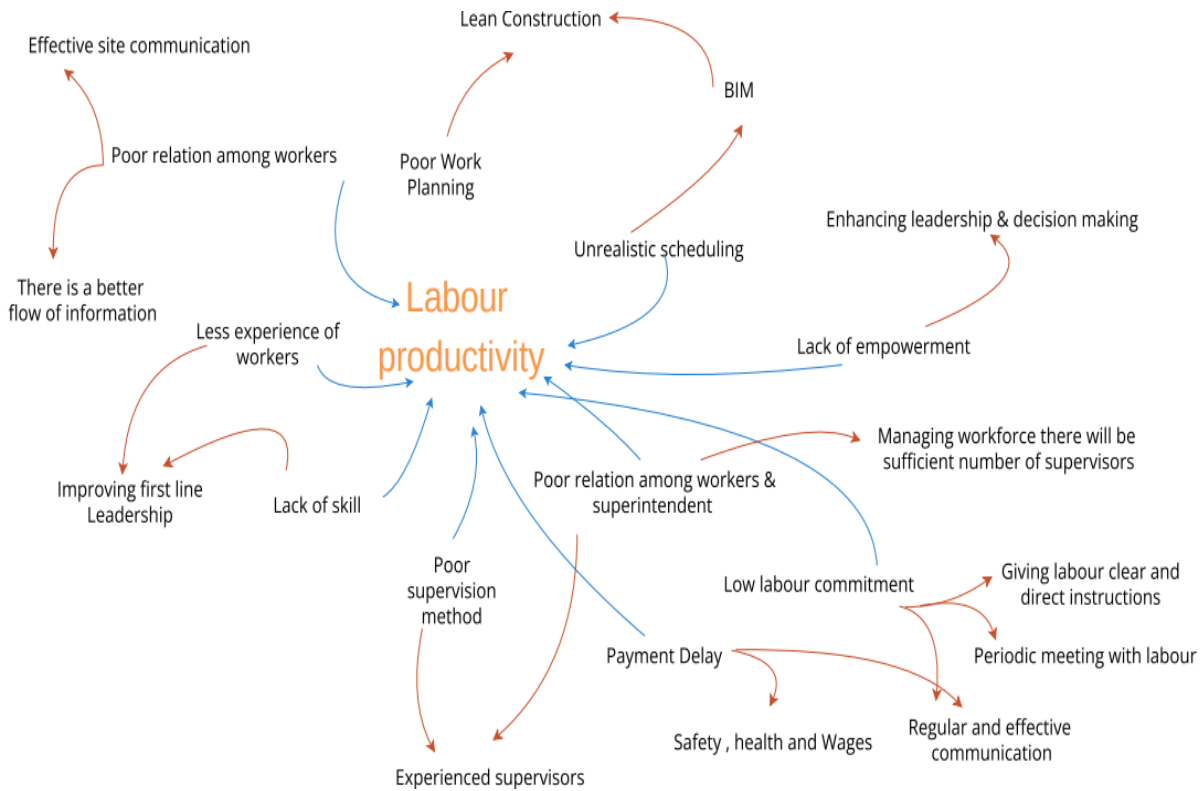
Figure 2: Conceptual model of masonry labour productivityDifferent factors affecting masonry labour productivity negatively and positively are explained above. Figure 2 shows the top 10 factors that negatively affect productivity and their recommended measures based on positively affecting factors that may overcome the negative factors. The arrows in blue colour represent negative factors that decrease productivity, while the arrows in maroon colour represent positive factors that may overcome the negative factors. The negative factors are picked based on their rank, as shown in Table 6, which has a high significant value, and the positive factors are chosen having the potential to improve productivity, as shown in Table 7.

CONCLUSION:

This study looked at the factors that affecting masonry labour productivity, both positively and negatively, and found a total of 38 negatively affecting factors and 25 positively affecting factors. The data received from respondents using the questionnaire survey technique was further reduced by utilising the RII approach to rate them. Poor work planning, poor supervision methods, and less experience of workers are the top three factors that negatively influence labour productivity. The least important element in the study is determined to be unsuitable material location, which is unusual. The top factor on positively affecting labour productivity is giving labour clear and direct instruction, lean construction and BIM (Building Information Modelling) are the three major factors which will improve the masonry labour productivity positively and least significant factor in the study is found to be constructability.

The total five groups of labour productivity factors which affect negatively are management team, work force, working conditions, material and equipment and unforeseen and unfamiliar factors. The total of 25 positive factors was divided into five groups those are labour management, communication, management team, supervision & leadership, and use of construction methods. In most Indian construction sites, low labour productivity is a constant issue. However, on building sites, labour productivity is rarely assessed, therefore the losses are never discovered. The research has identified elements that have a negative and positive influence on masonry labour productivity in India, the findings will assist building construction professionals in their attempts to enhance productivity.

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