

Study of Motivational Factors Affecting the Performance of Builders on Building Construction Projects in the Banggai Archipelago District

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Abstract:- Building construction in Banggai Islands Regency often has problems including delays in project completion, mismatches in quality, cost, and time. One of the causes of problems that often occur is the poor performance of builders due to lack of work motivation and lack of responsibility for work. The purpose of this research is to find out what are the dominant motivational factors that affect the performance of builders, to find out how motivational factors affect the performance of builders, and to find out the handling strategy in improving the performance of builders on building construction projects in Banggai Islands Regency. The research respondents were 30 people including project managers, contractor field supervisors, inspectors, foremen, and head builders. Data collection techniques through questionnaire surveys, interviews, and documentation. Data analysis used *descriptive statistics, relative rank index, and multiple linear regression*. From the results of the analysis, the dominant motivational factors that affect the performance of builders are the provision of wages in accordance with the difficulty of the work, the accuracy of wage payments, the existence of health benefits and health insurance coverage of construction work safety, good working relationships between fellow workers, and good material supply arrangements. These motivational factors have a significant and very strong influence on the performance of builders. Then the handling strategy that can be taken to improve the performance of builders is to build good communication with builders on the project, conduct *briefings* before the builders start work, ensure equipment and materials in accordance with the needs of builders, and make timely payment of wages in order to increase the trust of builders.

Keywords:- Construction Project, Building, Motivational Factors, Craftsman Performance.

I. INTRODUCTION

Banggai Islands Regency is an archipelago prone to natural disasters such as earthquakes and tsunamis. Several years ago, this earthquake occurred on May 4, 2000, at 12:21 WITA. The United States Geological Survey reported that the earthquake had a magnitude of 7.6 M_w with the epicenter at sea about 38 km northeast of Salakan City, the capital of

Banggai Islands Regency. The earthquake killed at least 54 people and injured more than 264 and damaged many buildings. At the time of the natural disaster until now the Banggai Islands Regency government is carrying out continuous development for the development of the Banggai Islands Regency, especially in the construction of buildings.

In building construction, problems often occur including delays in project completion, quality, cost, and time mismatches [1]. From the literature that has been read, one of the causes of problems that often occur is the poor performance of builders due to lack of work motivation and lack of responsibility for work [2]. So there is a need for research on motivational factors that affect the performance of builders and handling to overcome the problems caused, in order to produce maximum and quality work as desired. Therefore, this research was conducted to find out more about what motivational factors affect the performance of builders, How motivational elements affect builders' performance and how handling strategies can improve builders' performance, especially in building construction in Banggai Islands Regency in order to produce maximum and quality work.

The primary goals of this research are to identify the motivating elements that have the greatest influence on builders' performance and to ascertain how these factors affect builders' performance, and to determine the handling strategy in improving the performance of builders on building construction projects in Banggai Islands Regency.

II. LITERATURE REVIEW

A. *Some Concepts and Literature Reviews that are Related and Support the Object of Research are as follows:*

➤ *Definition of Construction Project*

An endeavor that attempts to construct a building and necessitates resources money, labor, materials, and equipment is referred to as a construction project.

An infrastructure building project is referred to as a construction project, and it usually involves engineering and architecture as its primary tasks. The efficiency of resource management determines whether a construction project is successful or unsuccessful. Project management is required for all construction projects [3]. to oversee the use of all

project resources in order to meet the three set deadlines, quality standards, and cost caps. These three limitations are crucial implementation parameters for projects that are frequently linked to project goals.

➤ *Building Construction*

Building construction is the most common type of construction project [4]. This type of building construction emphasizes construction considerations, practical technology, and regulatory considerations. Building or building construction is generally defined as a way or technique of making / erecting a building with measurable standardization, so that it meets the requirements of a strong, durable, beautiful, functional and economical building. Building structure means an object while construction means a technique or way of making (engineering) [5].

➤ *Work Motivation*

Motivation concerns how to instill a sense of passion in subordinates so that they are driven to work hard and give their all in order to achieve organizational objectives [6]. An individual's motivation is what propels them to accomplish goals as effectively as possible [7]. If someone is highly motivated, they will be satisfied with their work because they can realize the company's desired and achievable goals.

Providing work motivation to builders is one way to improve the performance of builders. Because giving work motivation can automatically increase the enthusiasm or work enthusiasm of the builders in carrying out work. The leader's efforts in providing work motivation to builders by providing direction and enthusiasm during briefings, providing positive motivation, helping artisan workers in solving a problem that usually occurs at the work site, making timely wage payments, and facilitating all the needs needed by artisan workers in doing work, always approaching and building good communication between the leader and the artisan workers [8].

➤ *Foreman*

The foreman is the person who leads the workers or craftsmen and determines the direction of the quality of work that can be produced by the craftsmen [9]. The foreman's main role is to supervise, coordinate, and organize the team's workload. They are responsible for ensuring that all tasks are done in accordance with the schedule and planning has been set [10].

➤ *Head Builder*

The head builder is a person who is a leader whose job is to direct, repair, justify, and guide building workers so that the building results are in accordance with what is desired [11]. The head builder is a craftsman who has sufficient experience and qualified skills [11]. They have in-depth knowledge of construction techniques and are skilled in performing practical work in the field. The main role of the head mason is to supervise the masons under him, ensuring that the work goes according to the specified standards.

➤ *Builder*

Handymen are personnel who have special skills that are in accordance with the work being carried out. Workers who have skills will work faster in their work [12]. If the work given to the handyman is in accordance with his skills, the handyman's work will be more optimal, on the other hand, if the work given to the handyman is not in accordance with his skills, his work will decrease.

➤ *Motivational Factors Affecting Handyman*

• *Performance*

✓ *Working Wage Factor*

Pay is one instrument that can be used to encourage workers to perform better and take an active part in accomplishing organizational objectives [13]. By providing appropriate worker wages, it will make workers work better. The level of wages is also one of the factors that influence workers' decisions to choose their workplace.

✓ *Work Environment Condition Factor*

One element that may have an impact on worker performance is the workplace [14]. Comfortable working conditions are essential for employees to feel at ease in their workplace. Employee performance will undoubtedly improve as a result of this comfort [15]. On the other hand, workers' personal performance may suffer as a result of their discomfort in the workplace.

✓ *Material and Equipment Factors*

Availability of materials is one of the key elements in construction projects [16]. The availability of materials is crucial to maintaining the caliber of builders' work while avoiding obstacles to productivity. The goal of project material needs planning is to ensure that materials are used effectively and efficiently during work execution, preventing issues from arising from materials not being available when needed. Then the completeness of work tools in this company is the company's obligation to provide it. The importance of the completeness of work tools is very helpful for employees in supporting their performance.

✓ *Occupational Health and Safety Construction Occupational*

The acronym for "health and safety" is "OHS." When trying to increase worker welfare and productivity, safety is crucial. High work safety levels help reduce accidents that result in disease, disability, and death; low work safety levels have a negative impact on health and reduce productivity [17].

The installation of safety signs, also known as occupational safety and health (OHS) signs, is one of the responsibilities that business management must carry out in accordance with national work safety regulations in order to guarantee the health and safety of employees, contractors, and other parties in the company area [18].

➤ *Labor Performance*

Employee performance is defined as their ability to complete assigned tasks successfully. If employee performance is good, then the targets and goals to be achieved in a company will be easier to achieve [19]. Vice versa, if employee performance is poor, then the targets and goals to be achieved in a company will be more difficult to achieve. Employee performance in carrying out their duties can be impacted by a variety of factors in the workplace.

III. RESEARCH METHODS

The research method is one of a series of studies carried out, which will describe the procedures or research techniques that will be used to compile the research [20]. In this study the authors focused on motivational factors that affect the performance of builders on building construction projects in Banggai Islands Regency.

➤ *Data Collection Technique*

In this study, questionnaire surveys, interviews, and documentation were the methods used to collect data. Purposive sampling, which involves choosing participants based on the unique features of the sample that are closely related to the features or attributes of the population, is the technique used to gather this data.

➤ *Data Management Technique*

Data management techniques in this study used 2 data management methods, namely :

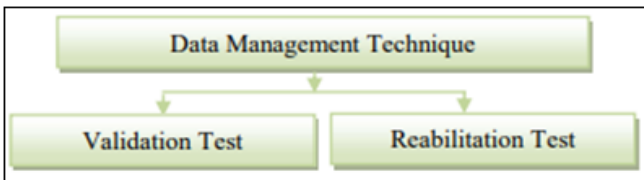


Fig 1 Data Management Process

➤ *Data Analysis Technique*

Analysis is a very important step in research, this is because the data can be given a meaning that is useful in solving problems in research [21]. In this study, the data analysis used is:

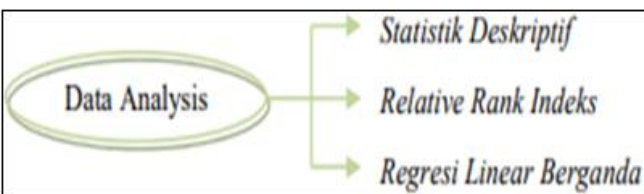


Fig 2 Data Analysis Process

IV. RESULTS AND DISCUSSION

In this study, the writing uses a data collection method using a questionnaire. Where this questionnaire is distributed to project managers, contractor field supervisors, inspectors, foremen, and head builders who are or who work in building construction projects in Banggai Islands Regency.

➤ *Respondent Characteristics*

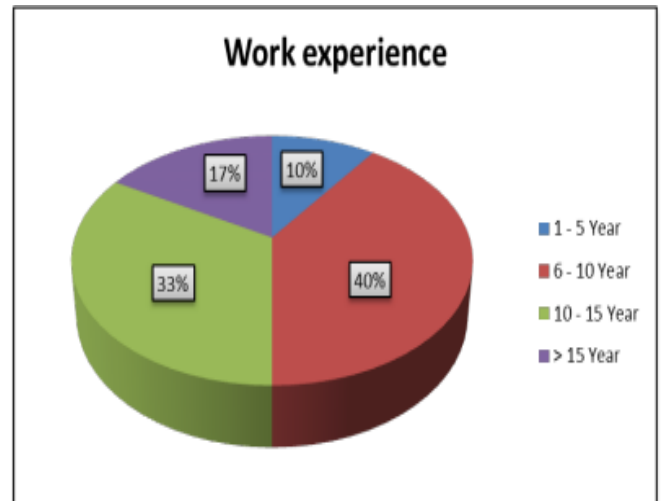


Fig 3 Diagram of Percentage of Work Experience

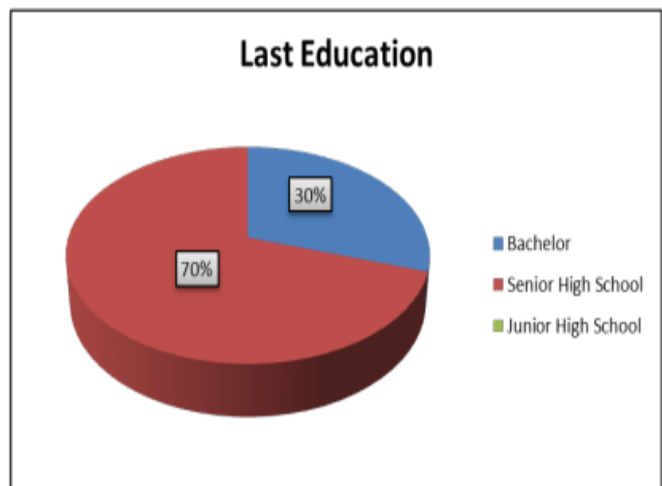


Fig 4 Diagram of Respondents' Last Education

➤ *Validation Test*

The validity test is carried out to determine whether each item in the instrument is valid or invalid, with a distribution (r table) with a significant 5% and N = 30 (number of respondents) obtained table, then the decision rule is if $r_{count} > r_{table}$ means valid, otherwise if $r_{count} < r_{table}$ means invalid [22].

Tabel 1 Pearson Correlation Validation

	Rcount	Rtable	Description
X1.1	0.692**	0.361	Valid
X1.2	0.791**		Valid
X1.3	0.674**		Valid
X2.1	0.759**		Valid
X2.2	0.612**		Valid
X2.3	0.617**		Valid
X3.1	0.733**		Valid
X3.2	0.656**		Valid
X3.3	0.632**		Valid
X4.1	0.627**		Valid
X4.2	0.610**		Valid
X4.3	0.785**		Valid

From the Pearson Correlation table, it can be concluded that all question items are valid with $r_{count} > r_{table}$ with the criteria for interpreting the correlation index (r) between 0.600 and 0.799, which means that the correlation index is high so that the data on each indicator can be analyzed further.

➤ *Reliability Test*

In order to assess the consistency and stability of respondents' responses to questionnaire-style questions about motivational factors that impact builders' performance, a

reliability test was used in this study [23]. The Reliability Test's decision-making framework is based on:

- If $\alpha > r_{table}$ then it is said to be consistent (reliable)
- If $\alpha < r_{table}$ then it is said to be inconsistent (unreliable)
- Item inquiry also said reliable also value *Cronbach's alpha* above 0.600.

Table 2 Reliability Statistics

Number of Question Items	Cronbach's Alpha Test Value SPSS	Cronbach's Alpha Test Value Minimal	Description
12	0.840	0.600	Good and very reliable

Based on the reliability test results, the data or question items may have up to 12 the Cronbach's Alpha value is 0.840. Because the *Cronbach's* value obtained is $0.840 > r_{table}$ (0.361), it is said to be consistent (reliable) and the *Cronbach's value* is included in the *Cronbach's value* range of 0.81 - 1.00 which means very reliable, it is concluded that the answers given by the respondents are very satisfying, so that further data analysis can be continued.

➤ *Relative Rank Indeks (RRI) Analysis*

From the results of research on several building construction projects in Banggai Islands Regency, there are 4 dominant motivational factors that affect the performance of builders. From the results of respondents' answers to the questionnaire, then the data is processed by finding the Relative Rank Index (RRI) value of each answer for all research variables to identify motivational factors that affect the performance of builders. The following is an example of the relative rank index (RRI) calculation formula, namely :

- *Example of Calculation on Questionnaire Number 1*

$$\begin{aligned}
 n &= 5 \\
 N &= 30 \\
 i &= 1, 2, 3 \dots n \\
 l_i &= 5 = 30
 \end{aligned}$$

- *(Number of Respondents' Answers on each Interval Scale)*

$$\begin{aligned}
 x_i &= i = 1 \text{ to } 5 \\
 x_i &= i = 1 \text{ sampai dengan } 5
 \end{aligned}$$

- *Solution :*

$$\begin{aligned}
 nN &= 5 \times 30 = 150 \\
 l_i \times x_i &= 5 \times 30 = 150 \\
 \sum l_i \cdot x_i &= 150
 \end{aligned}$$

$$\begin{aligned}
 RRI &= \frac{1}{nN} \left(\sum_{i=1}^i l_i x_i \right) \\
 &= \frac{1}{150} (150) \\
 &= 1
 \end{aligned}$$

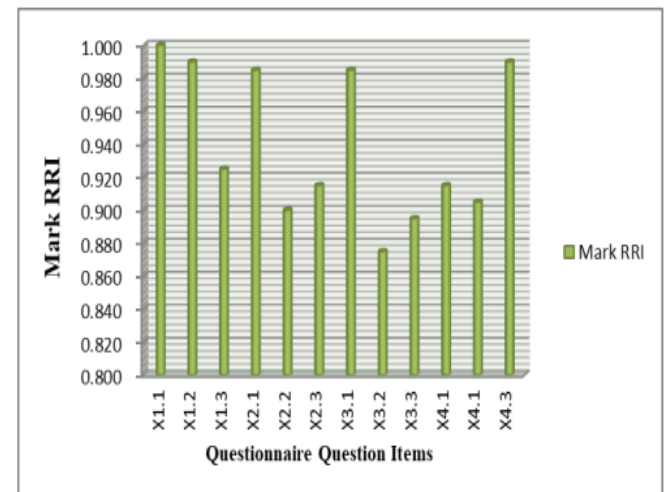


Fig 5 Relative Rank Index Diagram to Obtain the

Relative Rank Index (RRI) value of the For each variable, the number of questionnaire answers is divided by the multiplication between the number of respondents and the highest value of the answer choices in the questionnaire, then the RRI values are arranged from largest to smallest value.

From the results of the questionnaire that has been distributed question no. 1 the provision of wages in accordance with the difficulty of the work RRI value of 1.000, question no. 2 the accuracy of wage payments RRI value of 0.990, question no. 3 the provision of overtime wages and bonuses RRI value of 0.925, question no. 4 Good cooperative relations between fellow workers RRI value of 0.985, question no. 5 conducive and safe workplace conditions RRI value of 0.900, question no. 6 weather changes RRI value of 0.915, question no. 7 Good material supply arrangements RRI value of 0.985, question no. 8 Good work schedule arrangements RRI value of 0.875, question no. Good work equipment RRI value of 0.895, question no. 10 Good work safety program RRI value of 0.915, question no. 11 availability of work safety signs RRI value of 0.905, and question no. 12 the existence of health benefits and health insurance coverage of construction work safety RRI value of 0.990.

The following motivating variables have an impact on the performance of builders who place in the top 5 overall:

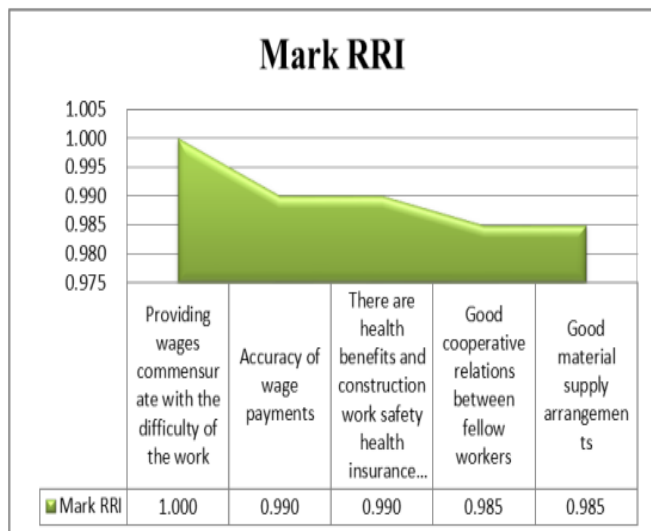


Fig 6 Dominant Factors

The first dominant factor affecting the performance of builders is the provision of wages in accordance with the difficulty of the work as it happens in the field where the project implementation of the wage system is an important issue because it concerns the sustainability and welfare of their lives. Therefore, it is not surprising that artisan workers ask for wages that are paid with the level of difficulty of the work and how much risk is faced in the work, the higher the difficulty of the work, the higher the payment to the artisan workers.

The accuracy of wage payments is the second major factor influencing builders' performance. In the field where the project is being completed, if wages are not paid according to the agreement, as is frequently the case in projects, particularly in the Banggai Islands Regency, artisan workers will go on strike until their wages are paid. Because wages are another type of compensation, employers may pay employees for labor or services rendered in order to meet their needs.

The third dominant factor affecting the performance of builders is the existence of health benefits and health insurance coverage of construction work safety as it happens. In the field where the project is carried out on each job,

builders usually ask the owner whether there is a construction safety health guarantee or there are benefits if the builders experience work injuries or accidents. Because construction health safety is not only to provide protection for construction workers and other people who are in the workplace so that their safety is guaranteed, but also to control risks to equipment, assets and production sources so that they can be used safely and efficiently to avoid accidents and occupational diseases. Effective and efficient occupational health and safety protection can boost productivity and improve mason performance if implemented and applied through an OHS management system.

The fourth dominant factor affecting the performance of builders is a good working relationship between fellow workers. Besides being able to create a sense of mutual support, good relationships between employees and coworkers can also improve the performance of builders and can help each other at work sites so that work can be completed according to plan both from time, cost, and quality of work.

The fifth dominant factor affecting the performance of builders is a good material supply arrangement as it happens in the field where the project implementation delays in entering materials will greatly hamper the work of builders or can even temporarily stop the work.

➤ *Multiple Linear Regression Data Analysis*

Multiple linear regression is used to analyze the effect or predict independent variables, namely variable X with one dependent variable, namely variable Y [24]. The equation used to calculate multiple linear regression uses the equation:

$$Y = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + e$$

• *Simultaneous Test (F Test)*

The F test measures the equation's significance and is used to assess the combined impact of the independent variables (X) on the independent variable (Y). With the provisions of sig value <0.05 or Fcount> Ftable [25]. The simultaneous test results (F test) of each variable question item in this study are:

Table 3 Simultaneous Test (F Test)

Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.878	4	1.720	.000 ^b
	Residual	2.488	25	.100	
	Total	9.367	29		

From the results of the F test, the sig value is obtained. 0.000 <0.05 and the Fcount value is 17.278> 2.530 which means the factors motivation jointly affects the performance of builders.

• *Partial Test (T Test)*

The effect of each independent variable (X1, X2, X3, and X4) separately on the dependent variable (Y) is measured using the T test, also known as a partial test. This test can be done by comparing Thitung and Ttabel so that the sig value.

<0.05 or the value of Thitung> Ttabel. [26] The partial test results (T test) of each variable question item in this study are:

Table 4 Partial Test (T Test)

Model		Unstandardized Coefficients		Unstandardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.913	3.144		-.290	.774
	Faktor Upah Kerja					
	Faktor Kondisi Lingkungan Kerja	.412	.117	.526	3.529	.002
	Faktor Material dan Peralatan	.299	.143	.292	3.204	.004
	Faktor Kesehatan Keselamatan Kerja Konstruksi	.330	.123	.393	3.345	.003

- From the Results of the T Test Test, the Sig Value is Obtained.

0.000 < 0.05 and the value of the work wage factor is Thitung > 2.042, the value of the work environment conditions is Thitung 3.204 > 2.042, the value of the material and equipment factor is Thitung 3.345 > 2.042, the value of the construction work safety health factor is Thitung 3.389 > 2.042 means that individually the factors of work wages, work environment conditions, material and equipment factors, construction health and safety factors affect the performance of builders.

- Coefficient of Determination (R²)

The degree to which the independent variable (independent) contributes to the dependent variable is indicated by the coefficient of determination (R²) [27]. The

Model Summary table displays the R-Square (R²) value. The Coefficient of Determination (R²) value ranges from 0 to 1. Nearly all of the information required to predict the dependent variable (dependent) is provided by the independent variable (independent) if the value is near to 1. The ability of the independent variables (independent) to explain the dependent variable (dependent) is severely limited if the R² value is decreasing. The value of R-Square (R²) is classified as :

- ✓ Strong if the R-Square (R²) value is more than 0.67
- ✓ Moderate if the R-Square (R²) value is more than 0.33 but lower than 0.67
- ✓ Weak if the R-Square (R²) value is more than 0.19 but lower than 0.33.

Table 5 Model Summary Test Results

Model Summary									
						Change Statistics			
Model	R	R	Adjusted	Std. Error	R Square	F	df1	df2	Sig. F
		Square	R Square	of the Estimate	Change				
1	.857 ^a	0.734	0.692	0.31548	0.734	17.278	4	25	0.000

From the Model Summary test results table, the R-Square (R²) value is 0.734 or 73.4%, which indicates that the motivation factor in influencing the performance of builders is 73.4% or strong, while the rest is the same. 26.6% (1 - 0.734) is explained by other variables other than the independent variables outside the study.

- Multiple Linear Equations

Multiple linear regression analysis is used to prove the extent of the influence of motivational factors on artisan performance with the equation:

$$Y = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + e$$

The outcomes of the analysis using multiple linear regression were

$$Y = -0.913 + 0.412 (\text{labor wage}) + 0.299 (\text{working condition environment}) + 0.330 (\text{material and equipment}) + 0.396 (\text{construction occupational safety health}) + 0.05$$

The result of the regression equation and the interpretation of the multiple regression analysis is that the constant value (a) is negative, -0.913. In general, a negative constant value is not a reason to conclude that the equation is wrong. The constant value (a) is negative, namely -0.913, which means that if work wages, environmental working conditions, materials and equipment and health and safety of construction work are equal to zero (0), then the performance of builders has decreased. Work wages have a positive impact on artisan performance, as indicated by the work wage regression coefficient of 0.412, the working condition environment regression coefficient of 0.299, the material and equipment regression coefficient of 0.330, and the construction work safety and health regression coefficient of 0.396, which all indicate positive effects on artisan performance.

The results showed the regression coefficient value of work wages (0.412), the regression coefficient value of the working condition environment (0.299), the regression coefficient value of materials and equipment (0.330), and the regression coefficient value of construction occupational safety health (0.396). Because 0.412 > 0.299, 0.330, and

0.396, it is concluded that work wages are the variable that has a greater influence on the performance of builders.

➤ *Handling Strategies to Improve Handyman Performance at Project Construction Building in Banggai Islands Regency*

Handling strategies are needed to improve the performance of builders in carrying out work and handling strategies are made to overcome the obstacles that often occur at the work site. The following are the handling strategies equipped to improve Handyman Performance on Building Construction Projects in Banggai Islands Regency, namely :

- *Build Good Communication with the Workers on the Project*

Project failure is caused by ineffective communication[28]. Various negative aspects that will apply if communication in construction projects does not run effectively have been identified in various literature, construction project delays are one of the consequences.



Fig 7 Meeting between the Project Owner and Foremen and Masons

Communication that is often carried out between the owner or project leader and builders, occurs during the project. There are many things that must be discussed with builders. Starting from the payroll system, daily or borong, material procurement, work plans, and so on. In order for communication to be well established, a meeting or meeting is usually held between the project leader or owner and the artisan workers at least 3 times a week, usually in the afternoon after the work schedule is completed so as not to interfere with work time, or artisan rest hours. This meeting usually discusses the availability of materials, the progress of the work, and the next work plan.

- *Conduct a Briefing before the Workers Start Work*

Briefings between the project manager and the foreman and head fitter are conducted weekly to organize the work plan and targets set [29].



Fig 8 Availability of Materials at the Project

First the project leader gives brief explanations or directions to the builders so that the builders better understand what will be done in accordance with the plan.

- *Ensure Equipment and Materials are in Line with the Builder's Needs*

Material or material is the amount of material needed to complete the work in one unit of work [30]. The materials used in the project must be in accordance with the planned technical specifications. Material availability at the site according to the planned schedule.



Fig 9 Briefing before Starting Work Every Day before Starting Work, a Briefing is Conducted.

Location Every day the project leader controls the needs materials in the field so that the work of builders is not disrupted due to lack of materials in the field so that builders also have no reason to be lazy to work due to incomplete materials.

- *Make Wage Payments on Time to Increase the Trust of Builders*

Wages are the main component in an employment agreement between employers and employees. The employment agreement contains the amount of wages and the time when the wages are paid. If the wages are paid late at the specified time, then the worker's right to receive wages is not properly fulfilled by the employer.



Fig 10 Payer of Wages to the Head Craftsman

Paying attention must be paid to the timing of wages because if there is a delay in payment of wages it will have an impact on the implementation of the project. Because if wages are paid late then the craftsmen will stop working so that the project work will not run optimally.

V. CONCLUSIONS

➤ *Drawing Conclusions from the Research Results that have been Methodically Discussed in the Preceding Chapters, it can be said that :*

- From the results of the Relative Rank Index analysis, the dominant motivational factors that affect the performance of builders are the first dominant factor affecting the performance of builders, namely the provision of wages in accordance with the difficulty of work with an RRI value of 1,000, the second dominant factor affecting the performance of builders is the accuracy of wage payments with an RRI value of 0.990, The third dominant factor affecting the performance of builders is the existence of health benefits and construction safety health insurance coverage with an RRI value of 0.990, The fourth dominant factor affecting the performance of builders is a good working relationship between fellow workers with an RRI value of 0.985, and The fifth dominant factor affecting the performance of builders is a good material supply

arrangement with an RII value of 0.985.

- From the results of multiple linear regression analysis, it is found that these motivational factors have a significant and very strong influence on the performance of fitters.
- Handling strategies that can be taken to improve the performance of builders are building good communication with builders in the project, conducting briefings before the builders start work, ensuring equipment and materials are in accordance with the needs of builders, and making timely payment of wages in order to increase the trust of builders.

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