

Analysis of Factors Causing Conflict in the Implementation of Road Construction Projects in Sigi Regency

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ABSTRACT

To manage and prevent conflicts in the implementation of road construction projects in Sigi Regency, it is crucial to understand the factors that lead to conflict as well as the indicators that play a significant role in influencing the occurrence of conflict in these projects and as input for the three components, namely the owner, consultant and contractor in order to handle conflicts and support the success of a project. The object of the research is Expert Staff and Supervisors, Consultants and Contractors. This study used a population of 50 respondents and data processing using the factor analysis method.

The results showed that there are four factors that influence the factors that cause conflict in the implementation of road construction projects in Sigi Regency, the four factors are: technical and labor, time, cost and market, planning and supervision. Indicators that have an important role in the factors causing conflict in the implementation of road construction projects in Sigi Regency are the use of inappropriate work methods (factor coding value of 0.889); Contractor errors in estimating work costs (factor coding value of 0.665); Incomplete drawings and specifications (factor coding value of 0.606); Inaccurate RAB calculations (factor coding value of 0.613).

Keywords: Conflict, construction, road, labor, project

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I. INTRODUCTION

Because there are numerous parties involved, a lot of resources are used, a lot of tasks that need to be finished, and a lot of resources are used, there is a very high likelihood of conflict during the implementation phase of a construction project. [1] Differences in each party's objectives, worldviews, and points of view can give rise to conflict. [2] Conflict occurs when there are differences in goals, both within the individual and in relation to others.

Owners, consultants, contractors, contracts and specifications, human resources, and project conditions are just a few of the many parties involved in a project.

Conflict can arise from a variety of factors. The implementation of a project may be hampered by these factors' effects on productivity and work effectiveness. In order to effectively manage conflicts that arise in road projects, contractors must identify and analyze the root causes of their work organization's conflicts. Furthermore, contractors must be knowledgeable about conflict resolution. As a result, disagreements can be resolved amicably to better accomplish project goals.

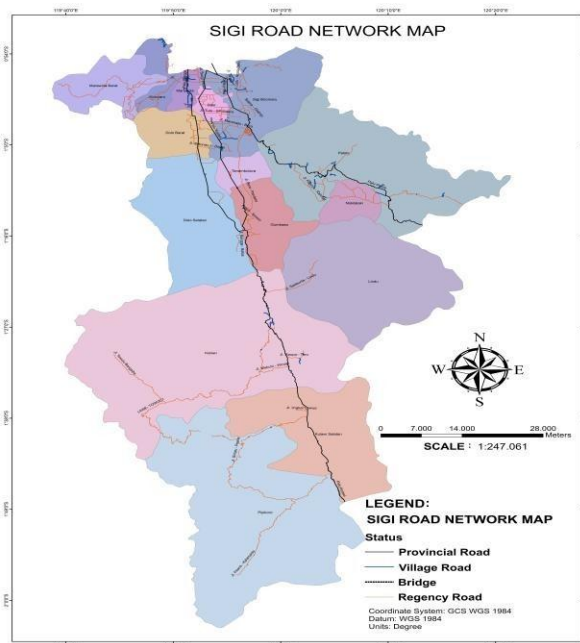


Figure 1 Road Map of Sigi District

II. LITERATURE REVIEW

The following are some ideas and reviews of relevant literature that support the research topic.

1.1 Construction Project

A construction project is a set of one-time, usually brief activities completed in succession. There is a procedure involved in this set of tasks that transforms project materials into buildings as a result of operations.

Because civil projects are dynamic, engineering is necessary throughout the construction phase.[3] which is demonstrated by modifying resources whenever necessary to meet changing needs in the field. As a result, constant evaluation and modification are necessary to finish the project in a timely and effective manner.[4]

1.2 Construction Project Management

In order to accomplish preset organizational goals, management is the process of organizing, planning, directing, and overseeing the work of organizational members as well as the utilization of additional organizational resources.[5] A construction project is an endeavor to produce a building or other infrastructure as the end result.[6] The primary work in the domains of architecture and civil engineering is typically included in this building. Other disciplines like industrial, mechanical, electrical, and so forth are occasionally involved as well.[Construction project management is the process of utilizing available resources effectively and efficiently to apply management functions, such as planning, implementation, and systematic application, to a project in order to achieve optimal project goals.[8] The execution of a significant project necessitates a well-functioning organizational framework. The organization wants to make sure that everything gets done on time and that the end product fulfills development goals.

1.3 Conflict

Any adversarial interaction between two or more parties is considered a conflict."[9] A disagreement between two or more groups within an organization that results from having to share limited resources or work activities, or from having different goals, status, values, or perceptions, is referred to as an organizational dispute. Conflict is a warning indicator that something is wrong within the company and that its operations are not being guided by good management practices. Positive or negative conflict is possible. Conflict that is constructive to the accomplishment of organizational objectives—in this example, the objectives of the contracting company or the construction project—is referred to as positive conflict. Negative conflict, on the other hand, can lead to chaos because.[10]

When working on a construction project, the contractor's primary goal is to finish it in accordance with Conversely, the owner demands the best possible facility at the lowest feasible cost.

There appears to be a conflict between each party's objectives, and this conflict may arise from each party's attempts to attain their objectives. Furthermore, the group established to carry out the development project is made up of different disciplines as well as different norms, behaviors, and cultures. As a result, it is evident that the project is being implemented in a competitive setting that may cause conflicts.

1.4 Factors Causing Conflict in Construction Projects

When what is specified in the contract differs from what is carried out in the field, construction projects can become conflicting.[11] In general, it's common knowledge that projects are not being carried out in the field in compliance with the bestek, which includes directives from project directors and supervisors as well as written and/or bestek drawings (contract attachments). Conflict arises due to a variety of factors, namely

- a. Getting Started work implementation project, before the implementation document (contract) has been processed.
- b. Work agreements (contracts) and construction documents are incomplete.
- c. The work process sequence pattern, time program, and critical line (time schedule) are not present when the work is executed.
- d. Unclear flow of document distribution.
- e. Unclear responsibilities.
- f. The generation of variation orders throughout the construction period, by not recording, reporting or anticipating the effect of time and cost changes.
- g. Site Engineer or Field Coordinator who does not master the entire process.
- h. The terms "quality control" and "quality assurance" are not always understood..
- i. There are confusing terms in the contract documents.
- j. There are terms in contract documents that can have double meanings.
- k. Poor project administration.
- l. Approval of cost values or proposed drawings or time programs was not completed, resulting in delays to the work.
- m. Ineffective equipment idle time.
- n. The number of change orders or work changes that result in additional work
- o. Late payment.
- p. There is a difference in the meaning of a foreign- language contract and the same contract in Indonesian.

2.4 Project Risk Factors

A risk is an uncertain event or condition that, if it occurs, might have an impact on the project's objectives in a way that is either positive or negative.

1. Technical and Labor Factors

a number of issues that arise on building sites as a result of a lack of trained workers, low pay, and unsafe construction practices, all of which damage the industry's reputation.[12] The investigation of theft and shortage of materials is one of the most significant issues brought on by inefficient labor productivity, unfavorable weather, and excessive construction timeframes. Regular design modifications brought on by a lack of technical expertise, a lack of direction and support from the client, a disorganized design process, inadequate communication and coordination between the designer and the client, and these factors all contribute to project delays and increased overall costs. In the building sector, where the use of inferior materials leads to structural member defects, rework and repairs, and ultimately delays in the handling of the completed project.

2. Time Factor

The most crucial aspect of planning is time management, which goes hand in hand with figuring out the budget. Determining the project schedule and the length of time required for each task from the beginning to the end of the project is known as time planning. In order to prevent project delays, control is the goal of project scheduling as well. Creating a time schedule is a component of time management in project management. One could argue that preparation is the key to control. A plan would be useless if it did not include any effort to implement control.



Figure 2. Interview with Head of Human Settlements

3. Cost and Market Factors

Uncertain technical specifications, worker dissatisfaction, disloyalty, and poor managerial abilities are the causes of rising labor costs as well as factors affecting worker productivity. Crude oil prices, local taxes and levies, transportation expenses, energy costs, and high operating costs are the primary factors considered in the literature review on rising material costs. Research on the issues brought on by rival companies' competition with regard to contractor performance and better employee training, labor and material control, company growth strategies. Because of a lack of understanding of market demand, contractors acquire valuable information that leads to improper cash flow in the construction sector.

4. Planning and Supervision Factors

A key component of project management is planning. With careful planning, the project's objective will be accomplished. Planning is the cornerstone of monitoring and controlling construction implementation activities. Effective planning is applicable to all work, formal or informal, and is not limited to businesses. If the implementation is not successful, the planning will be ineffective, and it will be a waste of time and money because creating a plan requires significant resources. Because the goal of supervision's level of implementation is to prevent deviations, supervision is therefore necessary for planning to succeed. The preparation that has been done.



Figure 3. Survey of work in the field

2.5 Factor Analysis

One statistical method that can be used to reduce the number of variables, or factors, and provide a relatively simple description is factor analysis. The process of identifying objects or variables based on their similarity is called factor analysis. Factor analysis is the process of analyzing data to identify the main causes of an issue. Factor analysis groups smaller factors together to create a comprehensive summary of data.

Factor rotation is used to make it easier to interpret data when identifying multiple variables that are highly correlated with one another or when some of the variable factor loadings fall below the lowest predefined value. Selecting the variables to be studied, calculating the MSA, or Measure of Sampling, and utilizing the Bartlett test of sphericity method to compute the correlation matrix are the initial steps in the factor analysis process. How to Factor or Extract Information.

III. RESEARCH METHODS

This study employed a descriptive and verification method with a quantitative approach. By doing so, a significant relationship between the variables under investigation will be identified, allowing the conclusions to provide a clearer picture of the subject of the investigation.

Research using the descriptive method is done to characterize independent variables, or variables that stand alone, either on their own or in combination with other variables. No comparisons are made, and these variables are not sought after. On the other hand, research on specific populations or samples with the intention of testing predetermined hypotheses is defined as the verification method.

3.1 Location and Time of Research

The Public Works Office of Sigi Regency conducted research on the individuals responsible for the implementation of road construction projects in 2022. The implementation time of this research is six months.

3.2 Population, Sample and Sampling Technique

A population is an item or subject with specific qualities or numbers chosen by the researcher in order to gather data from which further analysis and conclusions can be made. A Sigi Regency company that provides road construction services and finished a road construction project in 2022 makes up the study's population. The number of characteristics drawn from the current population to represent the entire population that your study will be looking at is the sample itself. In order to ensure that the number obtained is not excessive, the sample is drawn from the scope of the review to be conducted.

A small number and a large number will get closer to the highest possible reliability and validity. A case study approach and research are the two methods used for gathering data in preparation for this study, as follows:

- a Library research,
- b Field research,
- c Collection of necessary field data

3.3 Data Analysis Technique

From the data obtained through questionnaires and interviews using the variables that have been determined, The factor analysis method is used for additional analysis. Processing is facilitated in factor analysis by grouping a large number of variables into several factors with comparable traits and attributes. A set of variables is grouped by first measuring their correlation, after which highly correlated variables are grouped into one factor and relatively lower correlated variables are grouped into other factors.

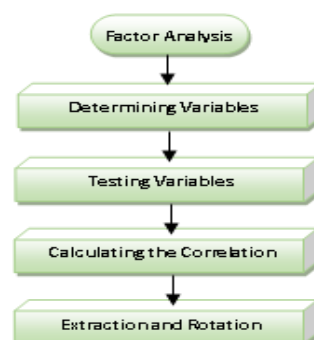


Figure 4. Factor analysis process

IV. RESULTS AND DISCUSSION

Twenty experts, ten department supervisors, ten consultants, and twenty contractors participated in the study. There were fifty responders in all, all of whom had filled out and returned the questionnaire.

4.1 Respondent Characteristics

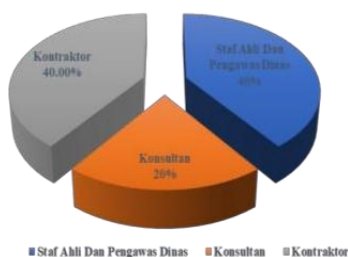


Figure 5. Percentage Diagram of Respondents Based on Position in Work

Based on Figure 5. above, it can be seen that the number of respondents of Expert Staff and Service Supervisors was 40%, the number of Consultant respondents was 20% and the number of Contractor respondents was 40%.



Figure 6: Percentage Chart of Respondents' Length of Service

Based on Figure 6 above, it can be seen that the respondents with the longest work experience are 35 people or 70% with work experience > 5 years then those with work experience of 1 - 5 years are 15 people or 30%.

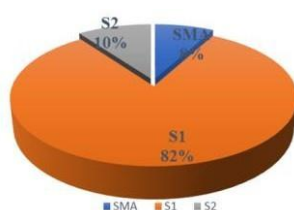


Figure 7. Percentage Diagram of Respondents' Education Based on Gambar 7. above, it can be seen that most of the respondents' last level of education is a Bachelor's degree. Respondents with S1 education amounted to 41 people or 82%, respondents with S2 education level were 5 people or 10%, and respondents with the least level of high school education were 4 people or only 8% of the total respondents.

4.2 Validity Test

The validity test is used to measure whether a questionnaire is valid or not. The questionnaire can be declared valid if the questionnaire is able to reveal something that will be measured by the questionnaire. The level of validity can be measured by comparing the value of r count (correlation item total correlation greater than r table in accordance with the Rule Of Thumbs research model. In this validity test, the researcher tested the responses of up to 50 respondents, using a 95% confidence level or a significance level (α) = 0.05. An r table of 0.273 is obtained. It is also possible to use the significance value (2-tailed) $< \alpha = 0.05$. It is declared that $r_{count} > r_{table}$ is valid and $r_{count} < r_{table}$ is invalid.

$$r = \frac{N(\sum XY) - (\sum X \sum Y)}{\sqrt{[N\sum X^2 - (\sum X)^2][N\sum Y^2 - (\sum Y)^2]}}$$

r = Correlation coefficient
 N = Number of samples
 (respondents) X = Statements score
 Y = Total score

A 95% confidence level or a significance level (α) = 0.05 was used by the researchers to test up to 50 respondents' responses, and the results yielded a rtable of 0.273.



Figure 8. Technical and labor variable validity test results curve



Figure 9. Time Variable Validity Test Results Curve



Figure 10. Validity Test Results Curve for Variable 3. Cost and Market

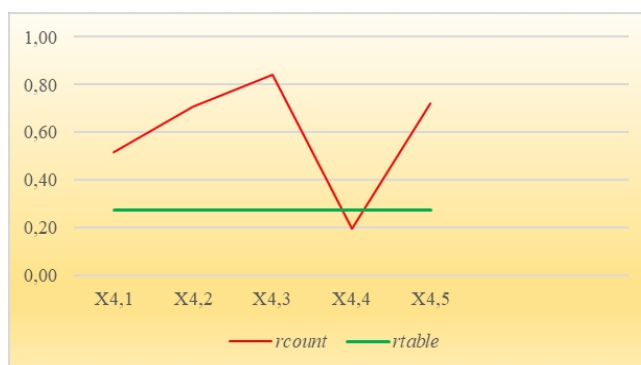


Figure 11. Validity Test Results Curve for Planning and Supervision Variables

All statements can be included in the research questionnaire since, as can be seen from the curve above, all rcount values are greater than the rtable value, indicating that all statements are considered valid.

4.3 Reliability Test

Measuring the measurement tool's reliability stage comes next, if its validity has been established. A reliability test determines a questionnaire's consistency, and the Cronbach's Alpha value in research is used to determine the impact of an independent variable on a dependent variable.

Table 1. Reliability Test Results

Variables	Cronbach's Alpha	Description
Technical (X) ₁	0,799	Reliable
Human resources (X) ₂	0,834	Reliable
Cost (X) ₃	0,787	Reliable
Project (X) ₄	0,637	Reliable

Based on table 1, it can be seen that the values obtained are all Cronbach's Alpha values > 0.60, so it can be concluded that all variables are reliable.

4.4 KMO (Keiser Meyer Olkin) test and Bartlett's test

The Keise Meyer Olkin test and Bartlett's test shortened as KMO, are used to assess a variable's viability in terms of whether or not factor analysis can be used to process it further. The data in this study can be factor analyzed if the KMO test results show a KMO value > 0.50 to 1.0 and significant Bartlett's <0.05. [13].

Table 2. KMO Test and Bartlett's Test Results

<i>KMO and Bartlett's Test</i>		
<i>Kaiser-Meyer-Olkin Sampling Measure</i>		0,793
<i>Sufficient</i>		
<i>Bartlett's Test of Sphericity</i>	<i>Approx, Chi-Square</i>	888,160
	<i>Df</i>	253
		<u>0,000</u>

Table 2 above presents the KMO and Bartlett's Test results. The KMO calculation yields a value of 0.793, while the Bartlett's Test of Sphericity yields a value of significantly 0.000.

Because the KMO value > 0.5 and Bartlett's significance < 0.05, this means that the indicators can be predicted and analyzed further.

4.5 MSA (Measure of Sampling Adequacy) Test

The Measure of Sampling Adequacy test, or MSA, is an additional metric for evaluating the intercorrelation between variables and the applicability of factor analysis. Anti-Image Matrices are helpful in identifying which variables are appropriate for factor analysis. If the study's Anti-Image If the MSA of the matrices diagonal value is less than or equal to 0.50, further analysis of the indicator may be conducted.



Figure 12. Initial MSA Testing Result Curve

Figure 12 above shows that there is one indicator studied that has a value of <0.5 , so researchers need to remove the sub factor item and retest.

Table 3. KMO Test Results and Bartlett's Test After Exclusion

<i>KMO and Bartlett's Test</i>		
<i>Kaiser-Meyer-Olkin Measure of Sampling Adequacy,</i>		0,812
Bartlett's Test of Sphericity	Approx, Chi-Square	850,135
	Df	231
		0,000

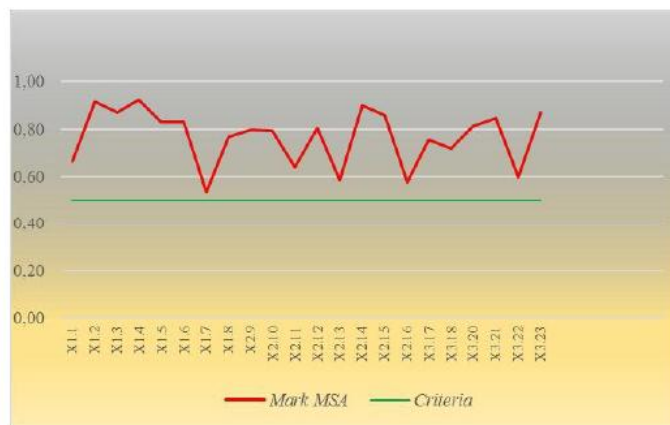


Figure 13. Second MSA Testing Results Curve

Figure 13 above shows the results of the MSA test analysis, Specifically, the diagonal value of Anti-Image Matrices. It is known that all indicators under study have a value of >0.5 , indicating that the findings of this analysis are satisfactory and that factor analysis can proceed to the next stage.

4.6 Estimated Communalities

The portion of the variance of a variable item that can be explained for by its primary cause is known as its communalities. The value requirement for communities is more than 0.5. The eigenvalues on the current factors are added up to get this value.



Figure 14. Community Estimation Analysis Result Curve

Figure 14 above shows the value of the variables studied whether they are able to explain the factors or not. Variables are considered capable of explaining factors if the Extraction value for all variables is > 0.50 . And based on the results above, the Extraction value for all variables is greater than 0.50.

4.7 Factor Extraction

The goal of factor extraction is to determine how many factors are used to present the data and how much each factor contributes to the phenomenon under study. Factors will be created from components that satisfy the condition that their eigenvalue is greater than one. The eigenvalue arrangement is always sorted from largest to smallest in order to determine the total number of factors formed from the extraction results.

Table 4. Factor Extraction Results

Com	<i>Total Variance Explained</i>					
	<i>Initial Eigenvalues</i>			<i>Sums of Squared Extraction</i>		
	<i>po</i> <i>nent</i>	<i>Total</i>	<i>% of</i> <i>Variance</i>	<i>Cumu</i> <i>lative %</i>	<i>Total</i>	<i>% of</i> <i>Variance</i>
1	9.165	41.659	41.659	9.165	41.659	41.659
2	3.492	15.874	57.534	3.492	15.874	57.534
3	1.491	6.777	64.311	1.491	6.777	64.311
4	1.422	6.465	70.776	1.422	6.465	70.776
5	1	4.325	75.101			
6	1	3.455	78.556			
7	0	3.240	81.796			

8	0	2.924	84.720
9	0	2.560	87.280
10	0	2.148	89.428
11	0	2.077	91.505
12	0	1.823	93.328
13	0	1.368	94.696
14	0	1.089	95.785
15	0	1.038	96.823
16	0	0	97.521
17	0	0	98.162
18	0	0	98.731
19	0.096	0	99.168
20	0.080	0	99.532
21	0.067	0	99.837
22	0.036	0	100.000

The values of each analyzed variable are displayed in Table 4 above. For example, if there are four factors derived from the analysis of twenty-two sub-factors, each of these four factors has an eigenvalue greater than 1. These factors are Component 1 (eigenvalue of 9.165 > 1 with variance of 41.659%), Component 2 (eigenvalue of 3.492 > 1 with variance of 15.874%), Component 3 (eigenvalue of 1.491 > 1 with variance of 6.777%), and Component 4 (eigenvalue of 1.422 > 1 with variance of 6.465%). The relative significance of each factor in determining the variance of the 22 sub-factors under analysis is shown by the eigenvalue.

By adding up the variant values, one can determine the impact of the four sub-factors as follows: 41,659% + 15.874% + 6.777% + 6.465% = 70,775%. A scree plot graph, which is a plot of eigenvalues against the number of factors that have been extracted, is another method to view the number of new factors formed.

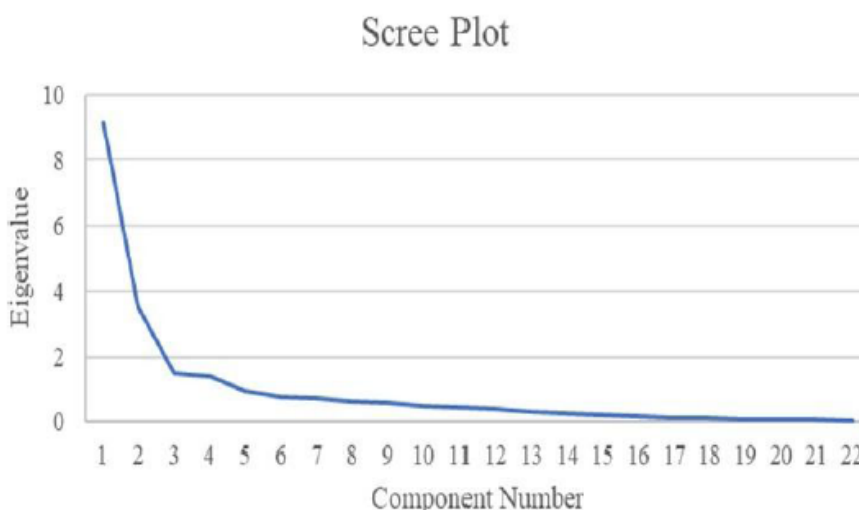


Figure 15. Scree Plot Curve

From Figure 15 above, the Scree Plot curve shows the > 1.00) There are 4 component points with values greater than 1, that 4 new factors will be formed (number of factors that will be formed,s.

4.8 Matrix Components and Rotation

Finding some of the most prominent items in each section is the next step. By examining the highest value of each factor, it is still difficult to identify the dominant sub-factor or indicator based on the extraction results. For this reason, it is necessary to rotate the factors in order to more clearly determine the factors that enter the three factors formed.

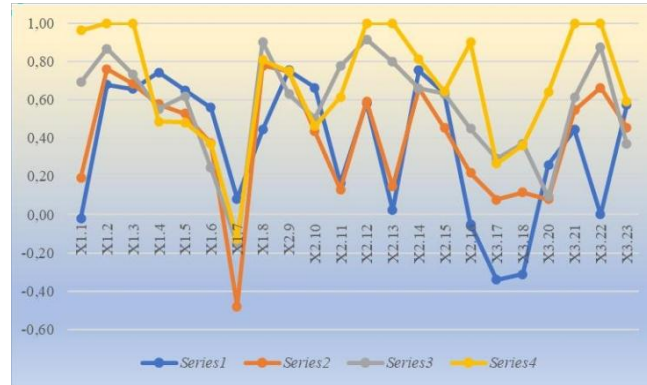


Figure 16. Rotation curve of matrix components

Figure 16 indicates that all factors examined have a greater influence than other factors on the factors causing conflict in the implementation of road construction projects in Sigi Regency. It shows that every variable has a loading factor value greater than 0.3.

Based on the findings of a study employing the factor analysis method with fifty respondents, four factors were identified as influencing the factors causing conflict in the implementation of road construction projects in Sigi Regency which are divided into 22 sub-factors, this means that there is one initial sub-factor that is not considered to be a factor influencing the Factors Causing Conflict in the Implementation of Road Construction Projects in Sigi Regency.

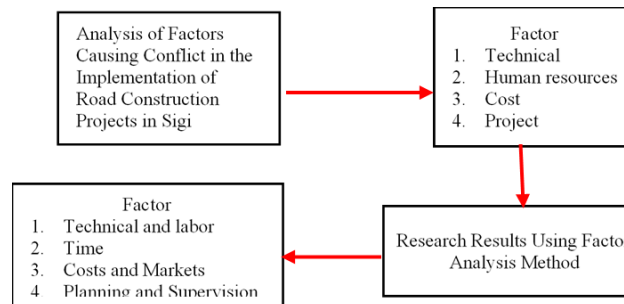


Figure 17. Prior to and following factor analysis, the number of factors

4.9 Established Factors

To assess the variables that are crucial in determining the likelihood of conflict during the execution of road construction projects in Sigi Regency, this research was carried out by looking at the loading factor value of 4 (Four) factors consisting of 22 (Twenty Two) variables, where

When it comes to influencing the likelihood of conflict during the execution of road construction projects in Sigi Regency, the variable with the highest loading factor value is the one that matters most [14].

Technical and labor factors are formed from a combination of thirteen sub-factors, namely the use of inappropriate work methods, confusion of the term quality control with quality assurance, natural disasters, damage or loss of construction materials in the field, accidents during construction, delays in work, unclear division of work, duties, and responsibilities, placement of personnel not in accordance with their expertise, inappropriate number of workers, poor communication and cooperation between personnel in the project team, differences in the work experience of each project personnel, the duration of the project contract is too short and the idle time of equipment is not effective.[15]

The Time Factor is the result of the interaction of three sub-factors: incomplete work time measurement, owner payment delays, and contractor errors in estimating work costs. Time is of the essence when it comes to the successful execution of road construction projects. Two metrics are used to gauge this: the results attained and

the completion date. Achievement This achievement is contingent.

Effective scheduling of techniques, tools, and project execution timelines is essential to success. The implementation of development has distinct project objectives when it comes to construction projects. While project owners prioritize project costs, quality, and implementation time, implementing contractors place more emphasis on project objectives than project management.

Cost and Market factors are formed from a combination of four sub-factors, namely incomplete drawings and specifications, late mobilization of materials and equipment, poor quality workers and incorrect use of materials, skilled labor and implementation methods.

One of the things that can make the work easier is the state of the market and costs. It is a given that the work will not proceed as planned if these cost and market considerations are not satisfied. For instance, an erratic rise in the cost of goods might result in losses, and a shortage of fuel could make it more difficult to complete the job. In these situations, the contractor is crucial in driving up labor and material costs as well as providing various market price information. Similarly, unfinished drawings and specifications may result in expenses that exceed the budgeted amount.

The two sub-factors of erroneous RAB calculations, inadequate management, coordination, and supervision make up the factor of planning and supervision. Conflicts frequently arise during construction projects because of inadequate planning and oversight. Therefore, in order to accomplish the goals of the work and prevent the conflicts that frequently arise at the work site, a strong planning and supervision system is required. This conflict is a prerequisite for happening.

incompatibility of values or desired outcomes. Because workplace conflicts can lead to uncomfortable circumstances at the workplace, they can also lower productivity.

4.10 Results of Direct Observation of Project Work in the Field

Technical and labor factors in carrying out road construction work in Sigi Regency that often occur are the inappropriate placement of the number of workers, which hinders the timely completion of the work, due to natural disasters, floods and landslides which are difficult to predict, so the asphaltting process often experiences problems. the technical or skilled personnel used do not match the bid results during the procurement auction, delays in the distribution of funds from the center to the regions disrupt work implementation activities in the field and there are design changes from the initial plan.

The time factor that often becomes a conflict between the owner and the contractor is the inappropriate determination of the time duration by the implementer, resulting in the planned progress not being in accordance with the work in the field. As a result, there will be deviations from the work plan. On the other hand, there are also projects that have exceeded the planned progress but cannot be paid for by the owner because they are related to the source of funds used, such as special allocation funds (DAK), the distribution of which is regulated by technical instructions by the relevant ministry which have not been transferred to the regional treasury.

Cost and market factors in implementation that often occur in road construction work in Sigi Regency are related to materials and materials used by implementers, such as fuel which is sometimes often not available in the field or usually experiences sudden price increases. Likewise, the prices used for materials such as asphalt and cement often change or arrive at the site late, thus affecting the planned progress.

One of the planning and supervision factors which sometimes becomes a conflict in road work in Sigi Regency is the lack of supervision from the supervisory consultant while the work is in progress, as a result there are several work items which are carried out not in accordance with the technical specifications, as well as implementers who do not coordinate well with other parties. owner or supervisor, resulting in the work not proceeding according to the agreed plan.

V. CONCLUSIONS

The factors causing conflict in the implementation of road construction projects in Sigi Regency are influenced by four factors, which are as follows: Technical and labor

- a. Time
- b. Cost and Market
- c. Planning and Supervision

According to the results of the factor analysis test, the total amount of influence produced by all of these factors was 70.775%, with other factors having an insignificant influence on the remaining 29.225%..

Technical and labor factors, with the highest Variance value of 41.659%, are the factors that have the greatest influence in the factors causing conflict in the implementation of road construction projects in Sigi Regency. With a variance value of 6.465%, the Planning and Supervision factor is the least significant.

When it comes to the factors that lead to conflict during the execution of road construction projects in the Sigi Regency, the following indicators are crucial:

- a. Use of inappropriate work methods (factor loading value of 0.889)
- b. Error contractor in estimating cost of work (loading factor value of 0.665)
- c. Incomplete drawings and specifications (factor loading value of 0.606)
- d. Inaccurate RAB calculation (loading factor value of 0.613)

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