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Analysis of Risk Factors Affecting Road Work Construction Failure in Sigi District

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Abstract:- One of the causes of project failure is work risks that often occur at work locations. The aim of this research is what risk factors influence road work in Sigi Regency and what indicators have an important role in influencing roads in Sigi Regency. The 50 respondents in this study included expert staff and service supervisors, consultants and contractors. Data analysis uses Factor Analysis. The Planning and Conflict Management factor is the factor that has the highest variance value when compared to other factors, namely 26.323%, which makes this factor a risk factor with a greater influence on road work in Sigi Regency compared to other factors. Indicators that have an important role in the risk factors that influence road work in Sigi Regency are changes in the contents of documents while the contract is running, inaccurate project evaluations in terms of time and duration, changes in government policy, increases in tax prices while the work is in progress, and By not following the provisions according to the contract.

Keywords:- *Project, Construction, Risk Factors, Road.*

I. INTRODUCTION

The growth of the road network has a substantial impact on a number of areas, including local and international tourism, foreign investment, and regional development.[1] In this research, the researcher focuses on the construction sector, in the development of road network infrastructure, because of the importance of road construction in the future, for the development of the Sigi Regency area. Construction is usually referred to as a “risky” activity. Risks and uncertainties have the potential to be detrimental construction project, not only because of the high rate of work accidents especially those involving fatalities, but also because of the environmental and economic sector, construction is usually associated with temporary and poor working conditions.[2] Construction sites present a number of health risks, including exposure to physical risks like noise, vibration, and extremely hot temperatures. In addition, there are a number of other significant risks that go unnoticed, like airborne particles and other chemical contamination.

Construction projects also face more risks compared to other industries due to their complexity. Risks can lead to reduced performance, increased costs, scheduling delays, and ultimately project failure.[3] This research seeks to determine what factors arise from construction project risks in the development of road network infrastructure in Sigi Regency, by identifying potential losses or failure of a project that can affect construction work in the development of road network infrastructure. By considering this, the researcher made the factors that influence road work the initial target in the research carried out.

Basically, knowledge of risk management concepts is necessary for the construction business to grow. The idea of risk management is not new; it has long been applied with the help of professional judgments. In construction projects, risk management involves identifying the triggering factors that could negatively affect the project's budget or quality baseline, quantifying the potential effects of those risks, and putting policies in place to manage and mitigate those effects. Risk management minimizes adverse consequences on construction project performance in terms of cost, time, and quality and assists key project participants, contractors or developers, consultants, and suppliers in carrying out their responsibilities.[4]

Risk management plays an important role in research conducted by researchers to find out more about the extent to which the concept of risk response actions in project management responds to the dominant risk factors that influence road work in Sigi Regency, so that it can overcome losses from a project being carried out. , by looking at the previous statements of experts, the researcher took the concept of risk response actions in project management as the second target of the research carried out.

The aim of this research is to find out the risk factors that influence the failure of road construction work in Sigi Regency and to know the indicators that have an important role in influencing roads in Sigi Regency.

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II. LITERATURE REVIEW

The following are some ideas and studies from the literature that are relevant to and validate the research object:

A. Construction Industry

The foundation of the construction business is urban projects, most of which involve building real estate and associated infrastructure.[5] Another facet of the construction industry is the maintenance and modification of already-existing structures and infrastructure. Three primary segments comprise the construction sector as a whole. Building Construction: This covers commercial, institutional, industrial, single-family, and multifamily residential structures, among others. Highways, infrastructure, heavy construction, and civil engineering This covers infrastructure projects such as sewers, roads, bridges, tunnels, and other constructions.[6]

B. Highway Construction

Highway construction is an integral part of sustainable development and has a vital role in the quality of life[7] the main benefits of highway projects can include savings in travel time and vehicle operating costs, reduced traffic accident rates, and lower highway emissions and have the potential to to create jobs as well as promote trade, highway projects are also commonly used to counter economic downturns.[8]

C. Classification of Roads According to Systems and Functions

The Road Network System in Indonesia is divided into 2 road network systems including primary and secondary road networks, this has been regulated byPP No. 34 Tahun 2006 Tentang Jalan.

- *Primary Road Network*

It is a road network system that plays a role in distribution services within an area that connects the national territory to the provincial capital, district/city capital, sub-district, sub-district and lower levels.[10] Apart from that, this road network functions as a link between the provincial capital areas.

- *Secondary Road Network*

The secondary road network is a road network system that plays a role in distribution services in an urban area connecting primary function areas, secondary functions to lower levels.[11] The secondary road network system according to its function is divided into 3 roads, including, Secondary Arterial Roads which are connecting roads between primary areas. with secondary areas. The minimum design speed is 30 km/hour with a minimum design road width of 8 meters. Secondary Collector Roads are roads that serve collector transportation for the benefit of the community that connect areas within the city. The minimum design speed is 20 km/hour with a minimum design road width of 7 meters. Secondary Local Roads are roads that connect the road network within the city with residential areas. The minimum design speed is 10 km/hour with a minimum design body width of 5 meters.

D. Project Risk Factors

Risk can be defined as the possibility of experiencing a loss or gain multiplied by the size of each.[12] Risk elements that lead to lower quality, cost overruns, and delays in projects. Each of them classifies various risk factors into internal and exterior dangers that could occur during a building project. This study established and applied the categories that correspond to both internal and external risks to evaluate risk management techniques in road construction projects.

III. RESEARCH METHODS

The research method is one of a series of research carried out, which will describe the research procedures or techniques that will be used to compile the research. In this research the author focuses on risk factors that influence road work in Sigi Regency.[13]

A. Research Place

In this research, the researcher took the research location which focused on road work at the Sigi Regency Public Works Department, on the road work project for the 2022 to 2023 budget year, namely:

- Handling Long Segment Improvement of Jalan Kamarora A - Dusun I (CV. Agri Mitra Pembangunan)
- Handling of Long Segment Improvements on Tanggarawa Batas Road (PT. Panca Jaya Anugrah)
- Improvement of Strategic Village Roads, Jalan Poros SP 1 Bulupontu (CV. Mulia Raya)
- Handling Long Segment Improvements on Jalan Rahmat – Tongoa (CV. Ernas Perdana)
- District Road Improvement. Sigi City (CV. Palu Mandiri Sejati)

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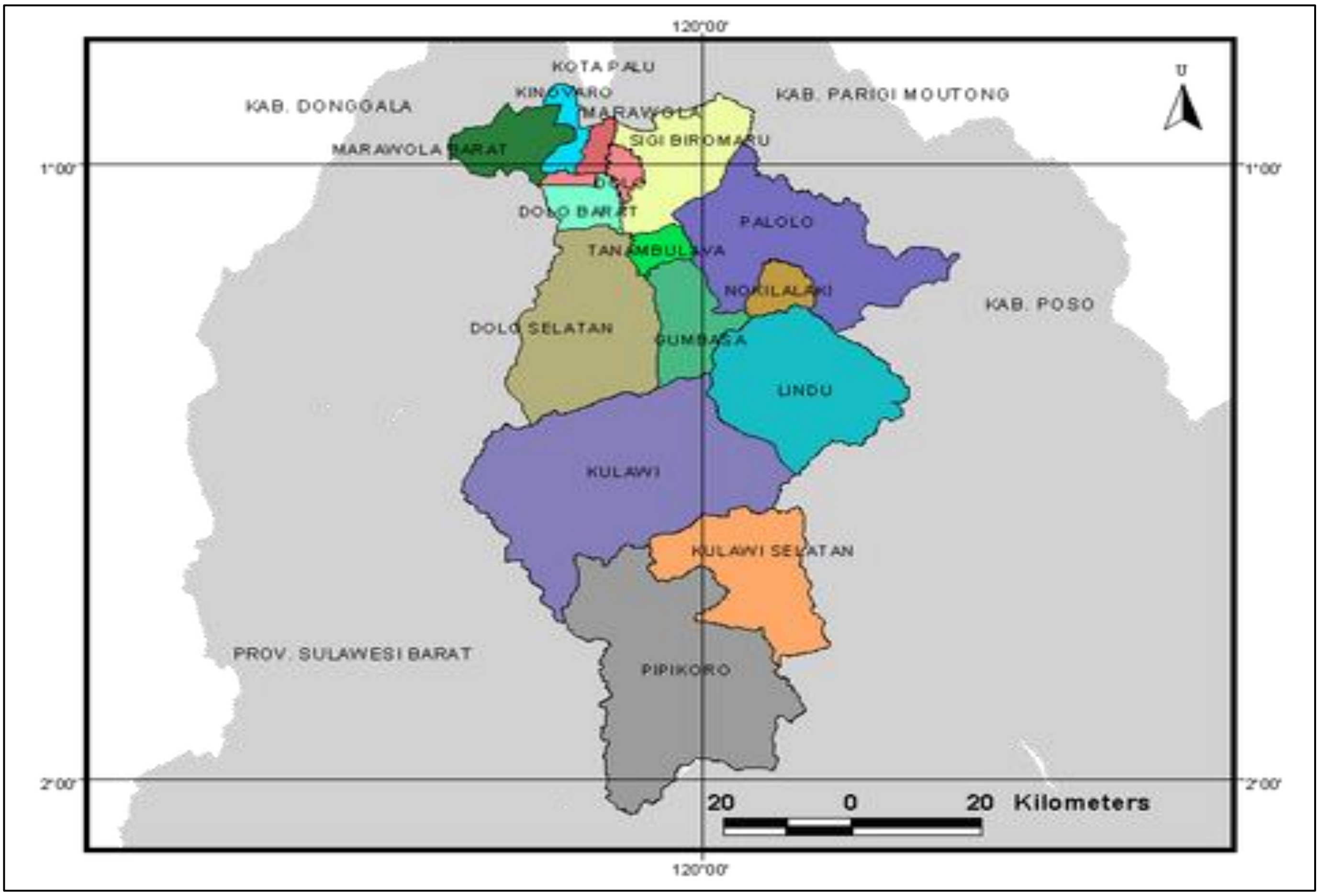

Fig 1: Map of Sigi Regency Area

B. Data Collection Technique

Data collection techniques in this research use 2 data management methods, namely:

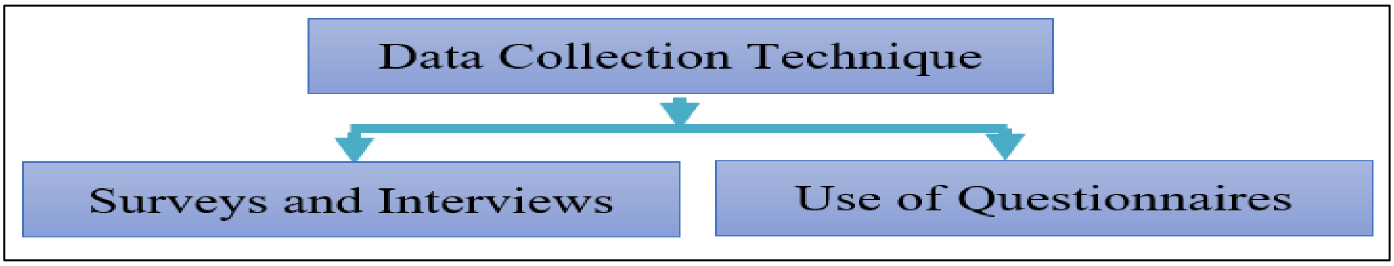

Fig 2: Data Collection Process

C. Research Instrument

A questionnaire that the researcher created himself was the research tool employed in this study.[14] An instrument for collecting data on observed natural and social events is called a research instrument. Therefore, the purpose of using research instruments is to find out as much as possible about a problem, a natural occurrence, or a social phenomenon. This study's instrument, a Likert scale, measures a person's or a group's attitudes, views, and perceptions of a social phenomenon with the goal of producing accurate data.The following is an explanation of the 5 point Likert scale, namely:

Table 1: Questionnaire Answer Criteria

No	Assessment criteria	Likert Scale
1	Strongly Agree (SS)	5
2	Agree (S)	4
3	Doubtful (RR)	3
4	Disagree (TS)	2
5	Strongly Disagree (STS)	1

D. Data Analysis

Factor analysis is one of the quantitative statistical analysis methods used in this study to analyze data using the Statistical Product and Service Solution (SPSS) program.[15]

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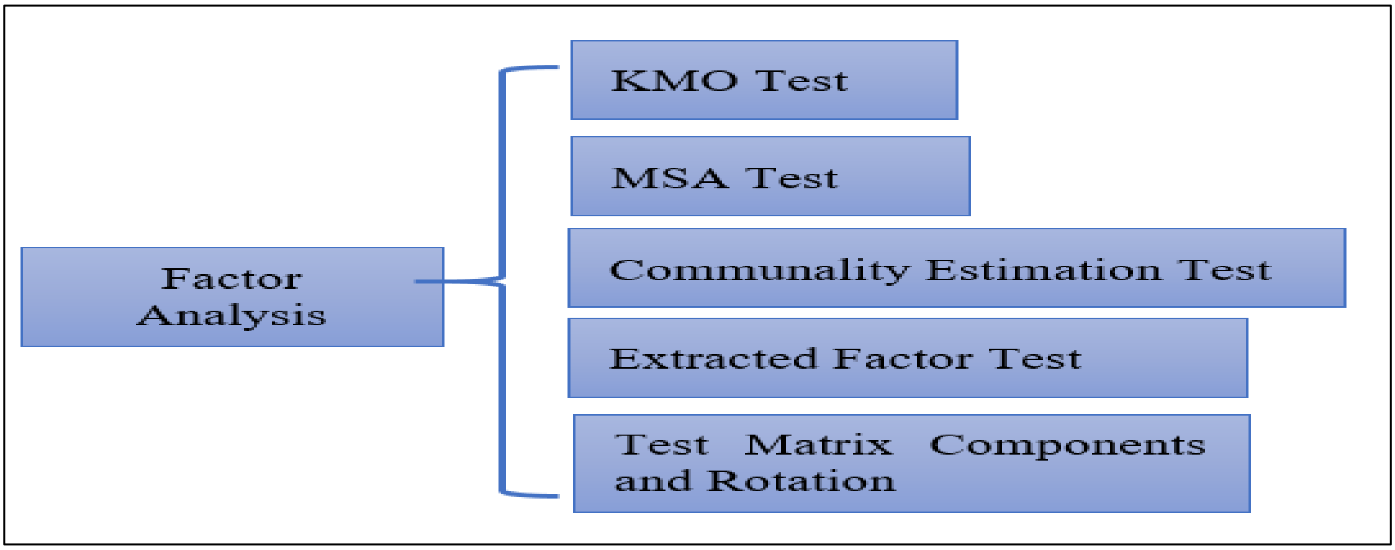

Fig 3: Factor Analysis

IV. RESULTS AND DISCUSSION

In this research, those chosen as research objects by the researcher are those that describe the characteristics/traits of the object. Below we will explain the general characteristics of respondents according to their level of education and work experience.

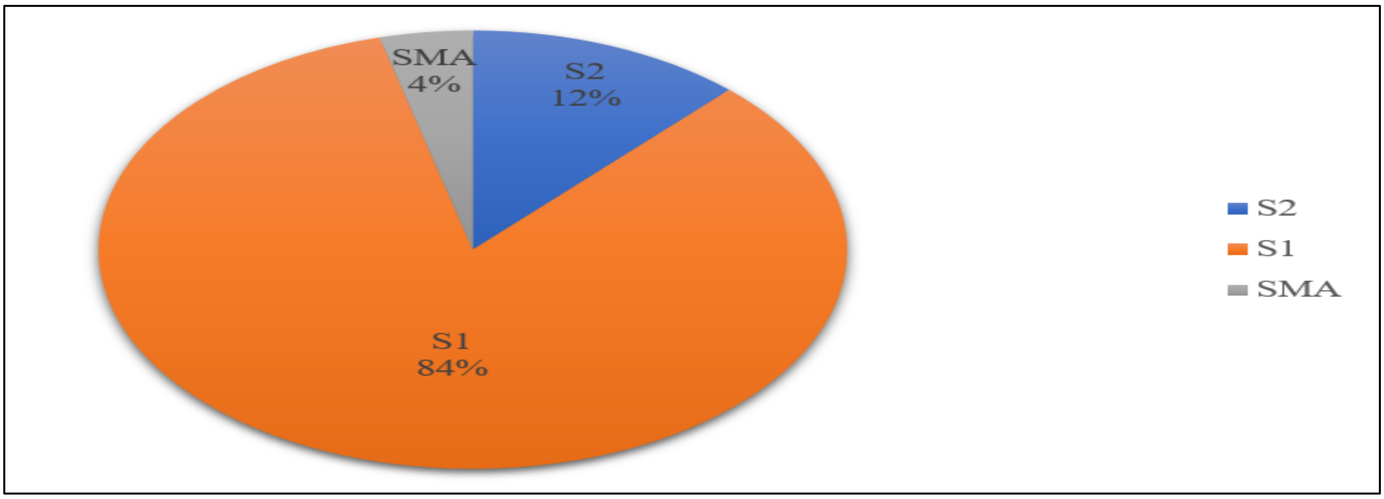

Fig 4: Percentage Diagram of Respondents' Last Education

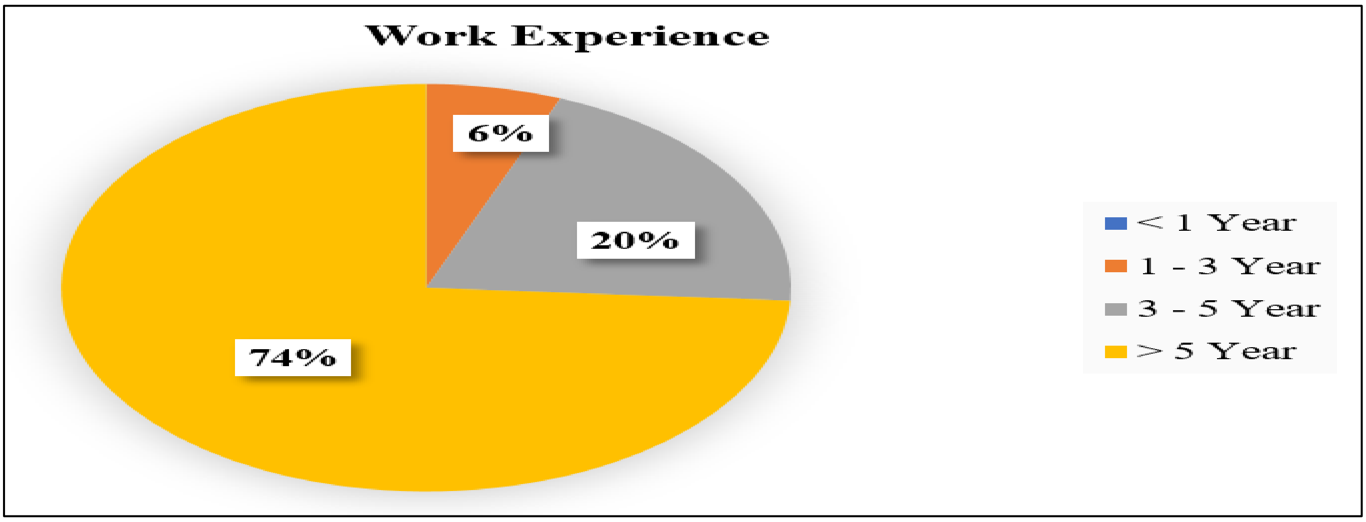

Fig 5: Work Experience Percentage Diagram

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A. Validation Test

A validity test is used to determine the validity of a questionnaire. If a survey is able to provide information on what it is intended to measure, it might be considered valid.[16] The Rule of Thumbs research model's computed r value (item correlation, total correlation is greater than r table) can be used to compare the level of validity. A significant value (2-tailed) < α = 0.05 is another option. Using a 95% confidence level or a significance threshold of α = 0.05, the researcher tested the answers of 50 respondents in this validity test and found a rtable of 0.273. The following table displays the validity tests that were performed for this study.

Table 2: Research Variable Validity Test Results

	r_{count}	r_{table}	Information
X1.1	0.742	0.273	Valid
X1.2	0.749		Valid
X1.3	0.708		Valid
X1.4	0.723		Valid
X1.5	0.610		Valid
X2.1	0.804		Valid
X2.2	0.820		Valid
X2.3	0.742		Valid
X2.4	0.874		Valid
X2.5	0.826		Valid
X3.1	0.732		Valid
X3.2	0.666		Valid
X3.3	0.784		Valid
X3.4	0.796		Valid
X3.5	0.763		Valid
X4.1	0.769		Valid
X4.2	0.759		Valid
X4.3	0.831		Valid
X4.4	0.775		Valid
X4.5	0.740		Valid
X5.1	0.844		Valid
X5.2	0.809		Valid
X5.3	0.720		Valid
X5.4	0.728		Valid
X5.5	0.645		Valid

It is evident from table 2's validity test results that every statement item employed in this study is intended to measure a political variable. Examining the values of rcount and rtable can help determine whether a statement is valid or invalid; if rcount > rtable, the statement is considered valid. All of the statements in the above table are considered genuine because their computed r values exceed their r table values. As a result, all of the statements can be included in research questionnaires.

B. Reliability Test

If a measurement tool is declared valid, then the next stage is to measure the reliability of the measurement tool.[17] A reliability test determines the consistency of a questionnaire in research that uses Cronbach's Alpha to quantify the impact of an independent variable on a dependent variable.

Table 3: Reliability Test Classification Table

Factor	**Cronbach's Alpha**	**Information**
Management and Finance (X1)	0.722	Reliable
Market (X2)	0.868	Reliable
Technical (X3)	0.754	Reliable
Law (X4)	0.726	Reliable
Politics (X5)	0.807	Reliable

Table 3 above illustrates the Cronbach's Alpha values, which are 0.722, 0.868, 0.754, 0.726, and 0.807 for the attached analysis. The variable is considered dependable if its Cronbach's Alpha value is greater than 0.60. Nevertheless, the variables utilized are unreliable if the Cronbach's Alpha value is less than 0.60. All of the collected data have Cronbach's Alpha values more than 0.60, indicating that the variables are either appropriate or dependable for use as measuring tools in research surveys.

C. Factor Analysis

The stages of the factor analysis process are selecting appropriate indicators for factor analysis by carrying out the KMO and Bartlett's Test, MSA Test, then determining the

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number of factors by extracting indicators and rotating factors and finally naming the factors.[18]

- *KMO Test (Keiser Meyer Olkin) and Bartlett's Test before Discharge*

To ascertain whether or not a variable may be further processed using factor analysis, two tests are used: Bartlett's test and the KMO test (Keiser Meyer Olkin).[19] In this research, if the KMO test results obtain a KMO value of > 0.50 to 1.0 and are significant Bartlett's < 0.05 then the data can be subjected to factor analysis. The results of the KMO test and Bartlett's test in table 4 are as follows:

Table 4: Previous KMO Test and Bartlett's Test Results Issued

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,672
Bartlett's Test of Sphericity	Approx. Chi-Square	650,546
	df	300
	Sig.	0,000

According to the KMO and Bartlett's Test results in Table 4 above, the KMO calculation result is 0.672, and the significant value for the Bartlett's Test of Sphericity is 0.000. Since the Bartlett's value is significant at less than 0.05 and the KMO value is greater than 0.5, it is possible to anticipate and study the signal further.

- *MSA (Measure of Sampling Adequacy) Test Before Release*

The Measure of Sampling Adequacy (MSA) test is an additional metric employed to assess factor analysis appropriateness and intercorrelation between variables.[20] The Anti-Image Matrices are a valuable tool for identifying and classifying variables that warrant factor analysis. This indication can be further examined if the diagonal value of the Anti-Image Matrices is This research obtained MSA ≥ 0.50.

Table 5: MSA Test Results Before Release

Sub Factors	MSA value	Criteria	Information
X1.1	0.422	> 0.50	Not MSA Eligible
X1.2	0.723	> 0.50	MSA Eligible
X1.3	0.761	> 0.50	MSA Eligible
X1.4	0.582	> 0.50	MSA Eligible
X1.5	0.709	> 0.50	MSA Eligible
X2.1	0.759	> 0.50	MSA Eligible
X2.2	0.819	> 0.50	MSA Eligible
X2.3	0.474	> 0.50	Not MSA Eligible
X2.4	0.767	> 0.50	MSA Eligible
X2.5	0.614	> 0.50	MSA Eligible
X3.1	0.673	> 0.50	MSA Eligible
X3.2	0.702	> 0.50	MSA Eligible
X3.3	0.598	> 0.50	MSA Eligible
X3.4	0.565	> 0.50	MSA Eligible
X3.5	0.607	> 0.50	MSA Eligible
X4.1	0.567	> 0.50	MSA Eligible
X4.2	0.694	> 0.50	MSA Eligible
X4.3	0.522	> 0.50	MSA Eligible
X4.4	0.376	> 0.50	Not MSA Eligible
X4.5	0.442	> 0.50	Not MSA Eligible
X5.1	0.797	> 0.50	MSA Eligible
X5.2	0.744	> 0.50	MSA Eligible
X5.3	0.644	> 0.50	MSA Eligible
X5.4	0.815	> 0.50	MSA Eligible
X5.5	0.762	> 0.50	MSA Eligible

The findings of the MSA test analysis, specifically the diagonal value of the Anti-Image Matrices, are displayed in table 5 above. It is known that a number of the indicators under study have values less than 0.5, so researchers must eliminate these subfactor items and conduct retesting.

- *KMO Test and Bartlett's Test After Discharge*

Table 6: KMO Test Results and Bartlett's Test After Release

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,735
Bartlett's Test of Sphericity	Approx. Chi-Square	516,059
	df	210
	Sig.	0,000

The KMO calculation result is 0.735 and the Bartlett's Test of Sphericity value is 516.509 at a significance level of 0.000, according to table 6 above, which also includes the results of the Bartlett's Test. The indicator can be predicted and subjected to additional analysis because the KMO value is greater than 0.5 and the Bartlett's significance is less than 0.05. Hence, the data in this study are deemed practicable, and the next step of the data analysis process can involve retesting the MSA values for the remaining variables.

- *MSA (Measure of Sampling Adequacy) Test after Release*

Table 7: MSA Test Results After Issue

Sub Factors	MSA value	Criteria	Information
X1.2	0.718	> 0.50	MSA Eligible
X1.3	0.745	> 0.50	MSA Eligible
X1.4	0.694	> 0.50	MSA Eligible
X1.5	0.844	> 0.50	MSA Eligible
X2.1	0.665	> 0.50	MSA Eligible
X2.2	0.603	> 0.50	MSA Eligible
X2.4	0.807	> 0.50	MSA Eligible
X2.5	0.699	> 0.50	MSA Eligible
X3.1	0.799	> 0.50	MSA Eligible
X3.2	0.715	> 0.50	MSA Eligible
X3.3	0.754	> 0.50	MSA Eligible
X3.4	0.665	> 0.50	MSA Eligible
X3.5	0.696	> 0.50	MSA Eligible
X4.1	0.669	> 0.50	MSA Eligible
X4.2	0.668	> 0.50	MSA Eligible
X4.3	0.625	> 0.50	MSA Eligible
X5.1	0.772	> 0.50	MSA Eligible
X5.2	0.697	> 0.50	MSA Eligible
X5.3	0.821	> 0.50	MSA Eligible
X5.4	0.826	> 0.50	MSA Eligible
X5.5	0.786	> 0.50	MSA Eligible

- *Factor Extracted*

Finding out how many factors are employed to convey data and how much each component contributes to the studied phenomena is the aim of factor extraction.[21] This analysis can produce a smaller number of variables than the number of variables processed.

Principal Component Analysis is the method employed in this study for factor extraction.[22] The methodology utilized in this study is based on Eigen values, variance percentages, and scree plots to ascertain the number of components collected. Components meeting the requirement of an eigenvalue > 1 will be used to build factors. Largest to smallest eigenvalues are always arranged in this manner. Table 9 below provides information on how many factors were produced from the extraction results:

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Table 8: Factor Extraction Results

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	Variance	%	Total	% of Variance	%
1	6,120	29,141	29,141	6,120	29,141	29,141	5,318	26,323	26,323
2	3,611	17,196	46,337	3,611	17,196	46,337	3,176	17,125	40,448
3	1,520	7,240	53,576	1,520	7,240	53,576	1,950	10,284	49,732
4	1,327	6,317	59,893	1,327	6,317	59,893	1,877	9,939	58,671
5	1,277	6,080	65,973	1,277	6,080	65,973	1,533	8,302	65,973
6	0,988	4,706	70,679						
7	0,873	4,158	74,838						
8	0,859	4,092	78,930						
9	0,678	3,228	82,159						
10	0,614	2,926	85,085						
11	0,536	2,552	87,637						
12	0,476	2,265	89,901						
13	0,410	1,951	91,852						
14	0,370	1,762	93,614						
15	0,291	1,386	95,000						
16	0,251	1,195	96,196						
17	0,241	1,146	97,342						
18	0,196	0,932	98,274						
19	0,168	0,801	99,075						
20	0,114	0,544	99,619						
21	0,080	0,381	100,000						

It is evident from table 9 above, which displays the values of each variable examined, that five factors were produced from the twenty-one sub-factors examined. Every one of the six factors has an eigenvalue greater than 1. These are Component 1 (eigenvalue = 5.318 > 1; variance = 26.323%), Component 2 (eigenvalue = 3.176 > 1; variance = 17.125%), Component 3 (eigenvalue = 1.950 > 1; variance = 10.284%), Component 4 (eigenvalue = 1.877 > 1; variance = 9.939%), and Component 5 (eigenvalue = 1.533 > 1; variance = 8.302%). The relative significance of each component in determining the variance of the 21 sub-factors under analysis is shown by the eigenvalue. In order to ascertain the impact of the five sub-factors

$$26{,}323\% + 17{,}125\% + 10{,}284\% + 9{,}939\% + 8{,}302\% = \mathbf{71,973}\%$$

The amount of variance that can be explained by the five factors that were formed amounts to 71.973%, indicating the extent of the influence that risk factors have on the implementation of factors that influence road construction failure in Sigi Regency. Other factors outside the indicators used in this research account for the remaining 28.027% of the variance. Furthermore, the next analysis can proceed because the cumulative variance value is 71.973%, exceeding 60% of the necessary cumulative variance. 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. The steepest point on the scree plot indicates the formation of new components and Based on the Scree Plot image, the number of factors that will form (Initial Eigenvalues > 1.00) is shown graphically. Five component points have values more than 1, indicating that five new factors have created.

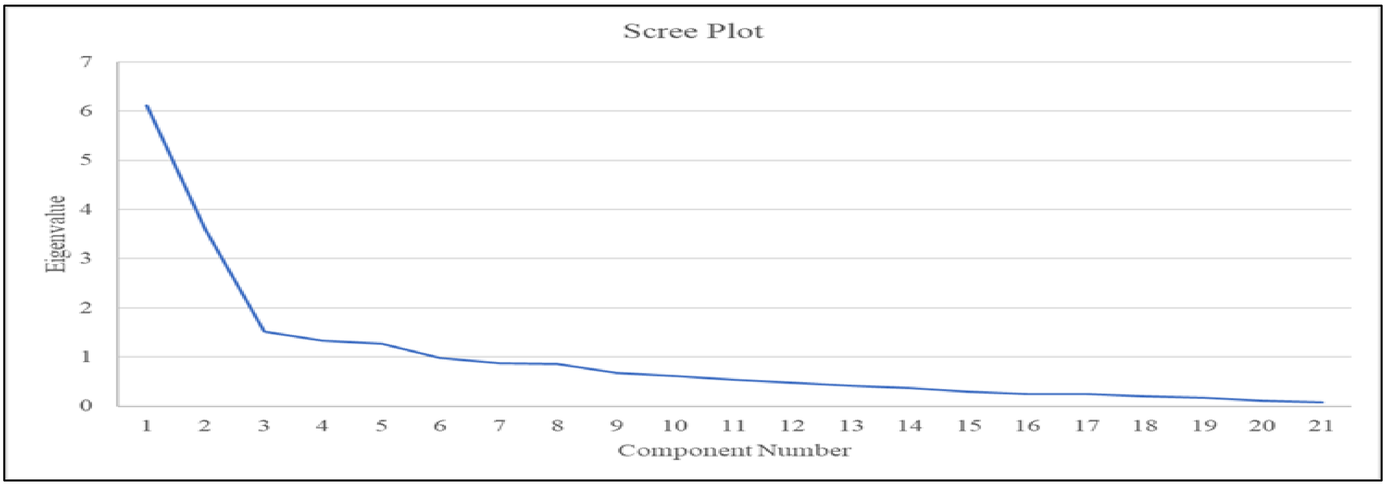

Fig 6: Scree Plot

Table 9: Rotated Component Matrix

Rotated Component Matrix					
	Components				
	1	2	3	4	5
X1.2	0.841	0.066	-0.131	0.045	0.112
X1.3	0.763	0.156	0.101	-0.014	0.193
X1.4	0.033	-0.103	0.749	-0.372	-0.030
X1.5	0.768	-0.061	0.034	-0.210	-0.105
X2.1	0.522	-0.088	-0.049	0.077	-0.082
X2.2	0.110	0.014	0.028	0.006	0.805
X2.4	0.516	-0.146	0.110	-0.079	0.487
X2.5	0.466	-0.238	0.580	0.213	0.138
X3.1	0.016	0.770	-0.301	0.230	-0.044
X3.2	-0.089	0.695	-0.450	0.260	-0.061
X3.3	0.140	0.677	-0.152	-0.093	-0.178
X3.4	-0.026	0.785	0.261	0.183	0.073
X3.5	-0.159	0.646	-0.156	-0.089	0.210
X4.1	-0.028	0.127	-0.162	0.780	0.066
X4.2	0.016	0.586	0.236	0.304	-0.122
X4.3	-0.046	0.187	-0.024	0.846	-0.098
X5.1	0.819	-0.039	-0.049	-0.024	0.266
X5.2	0.651	0.006	0.356	-0.155	0.306
X5.3	0.757	0.213	0.242	-0.060	-0.256
X5.4	0.731	-0.136	0.439	-0.018	0.073
X5.5	0.640	-0.137	0.493	0.139	0.199

Able 11 of the rotational component matrix presents the factor analysis results. It indicates that all variables have loading factor values more than 0.3. This indicates that, in comparison to other factors, all risk factors examined have an impact on road construction in Sigi Regency.

D. Formed Factors

Five risk variables are identified by the previously processed and evaluated research results as having an impact on the failure of road development in Sigi Regency. Planning, technical, market, legal, and economic management factors are these five factors.[23] The magnitude of the influence produced by these five risk factors on road work in Sigi Regency is equal to71.973%, while the remaining 28.027% came from other factors outside of the indicators used in this research. Apart from that, at the factor analysis stage there is one sub-factor that cannot be processed further because the Measure of Sampling Adequacy (MSA) value is less than 0.5 (does not meet the requirements) which is considered to have no influence on road work in Sigi Regency.

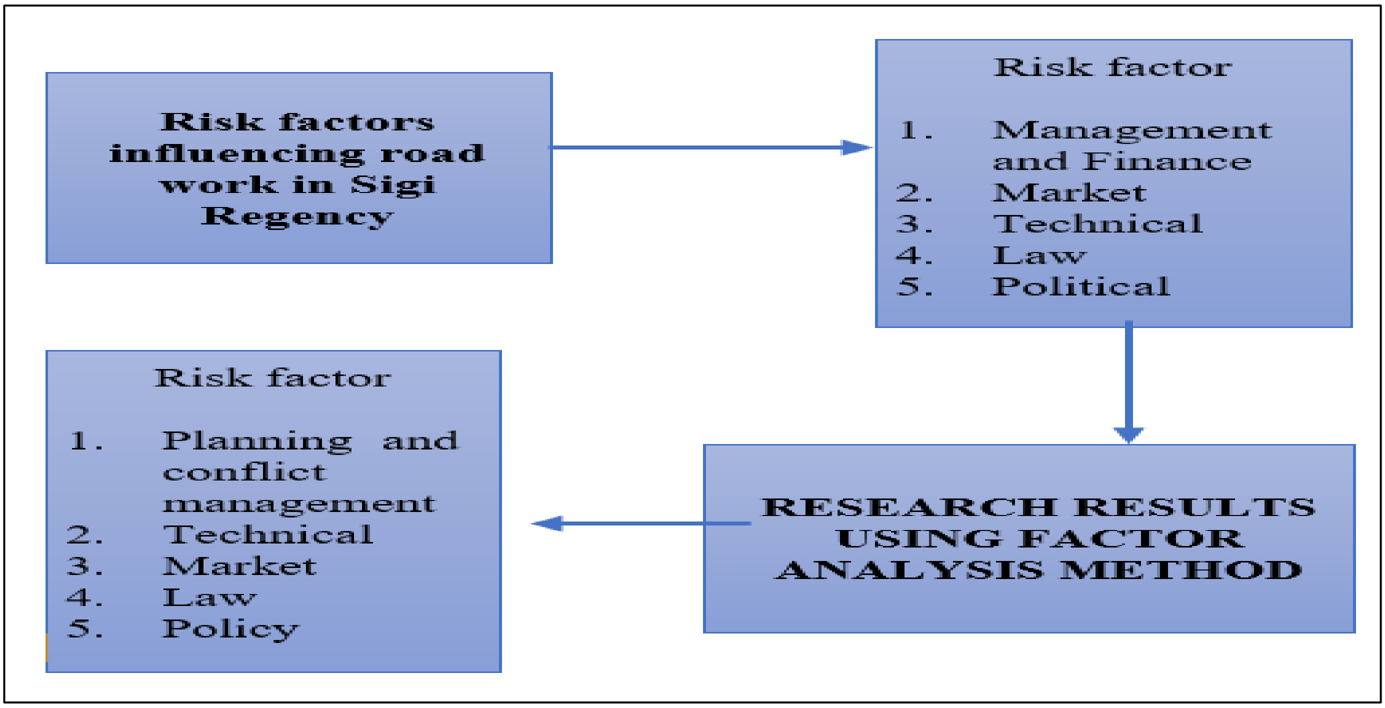

Fig 7: Number of Factors before and after Factor Analysis

The questionnaire variables originally numbered 25 (twenty five), after the KMO/MSA test was carried out, there were only 21 (twenty one) variables/statements that met the requirements to be included in the factor analysis. In this research, the factors formed are still 5 factors but have different factor names according to the grouping of sub-factors in accordance with factor analysis research.

E. Discussion of Formed Factors

The five factors formed are planning management factors, technical factors, market factors, legal factors and policy factors.

Factor 1 (Planning and conflict management) is a combination of 10 sub-factors, namely inaccurate project evaluation in terms of time and duration, ineffective teamwork, cost estimates in implementation, increase in crude oil prices, increase in transportation costs, policy changes government, Conflict of interest between political elites, Slow economic growth, Bribery and corruption in construction procurement, and Procurement auction arrangements.

In the implementation of road work in Sigi Regency, conflicts often occur due to poor planning management. Therefore, good planning management is very necessary so that the objectives of the work can be carried out well and avoid conflicts that often occur at work locations. This conflict is a condition where there is a mismatch between the values or goals to be achieved, both within the individual and in his relationships with other people. Conflict can also reduce work productivity because if there is conflict in the work environment, it can cause a situation of discomfort at the work location. With planning management, all parties involved know and understand where each work should be directed. So you can achieve project completion with optimal time, cost and resource efficiency, while ensuring proper quality and safety.

Factor 2 (Technical) is a combination of 6 sub-factors, namely shortage of skilled labor, shortage of materials, bad weather, changes in work design, lack of technical knowledge, guidance and support from agencies, errors in construction contract documents.

Technical factors are anything that often occurs at a work site that is related to the use of resources in a production process which aims to increase the productivity of the work. If these technical factors are not met properly, problems with physical obstructions or changing conditions will arise, especially due to time delays for redesign work and which will increase cost overruns and project delays, the work will not be carried out well and in accordance with the agreed plans.

Factor 3 (Market) is a combination of 2 sub-factors, namely unpredictable price fluctuations and fuel scarcity. Market factors are one of the things that can facilitate the progress of work. If these market factors are not met then it is certain that the work will not proceed according to the agreement. Because unpredictable increases in the price of goods can cause losses and fuel scarcity can also hinder the implementation of work, in this case contractors play a very important role in increasing labor costs, increasing material costs, and various information about market prices.

Factor 4 (Legal) is a combination of 2 sub-factors, namely not following the provisions according to the contract, and changes in the contents of the document while the contract is running. Legal factors relate to the provisions that have been agreed upon by project implementers in the form of documents or contractual agreements. If changes to the documents occur while the contract is in progress, it can cause delays in project completion, causing the parties involved in the contract to incur additional costs. Therefore, to achieve good project implementation, you must follow the provisions in the agreed contract.

Factor 5 (Policy) consists of 1 sub-factor, namely the increase in tax prices when work takes place. Policy factors greatly influence the implementation of road work in Sigi Regency, especially the increase in tax prices. If an increase in tax prices occurs while work is in progress then automatically the price of materials, production costs and fuel prices will also increase so that the project experiences losses due to the sudden increase in material prices and not in accordance with the initial plan.

V. CONCLUSION

The magnitude of the influence produced by these five risk factors on road work in Sigi Regency is equal to71.973%, while the remaining 28.027% came from other factors outside of the indicators used in this research. The Planning and Conflict Management factor is the factor that has the highest variance value when compared to other factors, namely 26.323%, which makes this factor a risk factor with a greater influence on road work in Sigi Regency compared to other factors. Meanwhile, the Policy Factor is the factor that has the lowest variance value of the five factors formed, namely %, which makes this factor the risk factor with the lowest influence on road work in Sigi Regency compared to the previous four factors.8,302.

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