The effect of disaster knowledge and public attitudes on the preparedness to face landslide disaster

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Abstract. Landslide often occur in Central Sulawesi province, on 28th of October 2018 an earthquake of 5 to 7.4 on the Richter scale (sr) rocked the city of Palu and along the Palu-Donggala, the epicenter of 27 km Northeast of Donggala and 80 km Northwest of Palu city. The problem was how much the effect of knowledge of disasters and community preparedness influenced the ability to face landslide natural disasters. This study aimed to analyze and test the influence of disaster knowledge and community attitudes towards landslide preparedness by using quantitative methods with an explanatory survey approach. The sample were 99 people from 116,084 people who live in Banawa along with Palu-Donggala and West Palu and Ulujadi Districts, Palu city. The test results used simple regression (t-test) in which there was a positive and significant influence on disaster knowledge and community attitudes towards preparedness. Meanwhile, based on multiple regression testing (F-test), it had a positive effect on disaster knowledge and community attitudes simultaneously and significantly towards landslide preparedness. The value of R square (R²) was 0.797, indicating that knowledge of disasters and community attitudes simultaneously influenced 79.7% of landslide preparedness, the remaining 20.3% was influenced by other variables which were not studied here.

1. Introduction

Disasters that occurred in Indonesia, either directly or indirectly, have become a big challenge for the Government and Indonesia citizens because they can disrupt the country’s welfare system and threaten the population. Natural disasters including syringe landslides occurred in the province of Central Sulawesi, on 28th of October 2018 an earthquake with a magnitude of 5 to 7.4 on the Richter scale (sr) at a depth of 10 km rocked the city of Palu, and along the Palu-Donggala axis. The epicenter of the earthquake which was 27 km at Northeast of Donggala and 80 km at Northwest of the city of Palu, along the Palu-Parigi Moutong, Palu-Tolis experienced landslide [24].

Natural disasters are one of the non-military threats that result in public safety which can interfere with national defense [14]. Apart from being one of the threats on a national scale, natural disaster is also a challenge with a local dimension [7],[15],[25]. Landslides are one type of mass movement of soil, rocks, or a mixture of both [8],[10],[11],[12]. Therefore, the material can descend or exit the slope because of disturbing the stability of the soil or the rock making up the slope [13],[18]. So in this study, the research concluded that landslides are the movement of the mass of soil or rock or a
combination of both down the slope due to the disturbance of the slope stability[8],[10],[11],[12],[13],[26].

A series of events that threaten and disrupt people’s lives and livelihoods, both by natural and/or non-natural factors as well as human factors, can result in human casualties, environment damage, property loss, and psychological impacts[1],[4],[7],[8]. Most of human knowledge is obtained through the eyes and ears[17],[21]. Knowledge of disasters will be needed by people living in disaster-prone areas to minimize disaster risk[6],[26],[27].

Community attitudes are feelings of pleasure, dislike, like or dislike or reactions to stimuli that come from outside[9],[20]. Therefore, attitudes can be described through a choice of positive or negative attitudes[2],[16],[19]. A negative attitude can be identified with dislike/unwillingness, while a positive attitude is manifested by liking/willingness. Attitude is a reaction or response of someone who is still closed to a stimulus or object[6]. Attitude is not yet an action or activity, but it is a predisposition to action or behavior[8]. This attitude is still certain as an appreciation of the object[5].

Given the high risk of landslides and the low capacity of the community in dealing with disasters[14], the problem is how to analyze the effect of knowledge, attitudes, and both on landslide preparedness. Therefore, the researcher intended to examine the community preparedness and the influence of disaster knowledge and community attitudes in dealing with landslides in settlements along the Palu-Donggala axis entitled The Effect of Disaster Knowledge and Public Attitudes on Preparedness for Landslides in Palu Bay. This research aimed to:

- Analyze the effect of disaster knowledge on preparedness to face the landslides along the coast of Palu Bay.
- Analyze the influence of community attitudes on preparedness to face the landslides along the coast of Palu Bay.
- Simultaneously analyze the effect of disaster knowledge and community attitudes towards landslide preparedness along the coast of Palu Bay.

2. Method

Quantitative data analysis used primary data from questionnaires that were filled in by the head of the family, or someone who was mature enough and representable[13]. Questionnaires are efficient data collection techniques if researchers know for sure the variables to be measured and know what can be expected from respondents[22],[23]. The variable of this study consisted of independent variables and dependent variables. Independent variable is a variable that affects other variables or which causes changes or the emergence of dependent variables. While the dependent variable is a variable that is influenced or becomes a result, because of the existence of independent variables[23]. In this study the independent variable consisted of Disaster Knowledge (X₁) and Community Attitudes (X₂), while for the dependent variable was preparedness (Y).

This research was conducted in coastal areas along Palu Bay, precisely in the Banawa District of Donggala Regency and West Palu District, and Ulujadi District, Palu City. The area, which was 147.57 ha, with 5 villages and 21 villages was a prone area for landslides in Palu Bay. This research was conducted from July 2019 to December 2019. The population in this study were people who lived in locations that have experienced landslides and from locations that have a high potential for landslides. The limit of this study was the number of residents in the coastal area of Palu Bay, which was 116,084 people. The sampling technique from this study used probability sampling techniques with a simple random sampling system (simple random sampling). All members in the population had the same probability or opportunity to be chosen as samples[22],[23].

Univariate analysis can also be called descriptive analysis. The distribution analyzed descriptively in this study consisted of descriptive analysis of respondents 'characteristics, descriptive results of respondents' answers to the questionnaire that had been previously distributed to the public, each item questions/statements represented the variables in this study namely, knowledge of disaster, community attitudes and preparedness.
This analysis was included in the correlation analysis. If the results of the correlation test indicated that there was a sufficient correlation between the independent variable and the dependent variable, then regression analysis might be continued to determine the effect of several independent variables on the dependent variable.

**Hypothesis (H1)**

H₀: β₁ = 0 or H₀: accepted, the conclusion is that there is no positive and significant influence on the attitude of the community towards preparedness in the face of landslides along the coastal area of Palu Bay.

H₁: β₁ ≠ 0 or H₀: rejected, then there is a positive and significant influence on the attitude of the community towards preparedness in the face of landslides along the coastal area of Palu Bay.

**Hypothesis (H2)**

H₀: β₂ = 0 or H₀: accepted, the conclusion is that there is no positive and significant influence on the attitude of the community towards preparedness in the face of landslides along the coastal area of Palu Bay.

H₁: β₂ ≠ 0 or H₀: rejected, then there is a positive and significant influence on the attitude of the community towards preparedness in the face of landslides along the coastal area of Palu Bay.

**Hypothesis (H3)**

H₀: β₁ = β₂ = 0 or H₀: accepted, the conclusion is that there is no positive influence on disaster knowledge and simultaneous and significant community attitudes towards preparedness in the face of landslides along the coastal area of Palu Bay.

H₁: β₁ ≠ β₂ ≠ 0 or H₀: rejected, then the conclusion There is a positive influence of disaster knowledge and community attitudes simultaneously and significantly towards Preparedness to face landslides along the coastal area of Palu Bay.

### 3. Results and Discussion

#### 3.1. Results

The basis of this assessment was done by summing each statement divided into each assessment score then making a percentage in each statement number [22],[23]. Furthermore, the frequency of the respondent's statement was made into the three variables described in the tables as follows,

**Table 1. Disaster Knowledge Index (X₁)**

| Valid | Frequency | Percent | Cumulative Percent |
|-------|-----------|---------|--------------------|
| Less  | 30        | 30.3    | 30.3               |
| enough| 27        | 27.3    | 57.6               |
| good  | 42        | 42.4    | 100.0              |
| Total | 99        | 100.0   | 100.0              |

Source: results of data processing of researchers, 2019

**Table 2. Community Attitude Index (X₂)**

| Valid | Frequency | Percent | Cumulative Percent |
|-------|-----------|---------|--------------------|
| Disagree | 1       | 1.0     | 1.0                |
| Agree  | 73        | 73.7    | 74.7               |
| good   | 25        | 25.3    | 100.0              |
| Total  | 99        | 100.0   | 100.0              |

Source: results of data processing of researchers, 2019
Table 3. Preparedness Index (Y)

|           | Valid | Frequency | Percent | Percent | Percent |
|-----------|-------|-----------|---------|---------|---------|
| Not ready | 1     | 1,0       | 1,0     | 1,0     |
| Ready     | 56    | 56,6      | 56,6    | 57,6    |
| Very ready| 42    | 42,4      | 42,4    | 100,0   |
| Total     | 99    | 100,0     | 100,0   |         |

Source: results of data processing of researchers, 2019

The requirement to do a regression analysis was to do a classic assumption test. Multiple linear models will be more appropriate to use and produce more accurate calculations if the following classic assumptions can be fulfilled according to their standards:

The results of this normality test obtained residual values (differences that exist) form a curve such as images such as bells, bell-shaped curve both sides of the curve widen to infinity.

![Graph of Histogram of Normality Test](image)

**Figure 1.** Graph of Histogram of Normality Test

Source: results of data processing of researchers, 2019

Referring to Figure 1 Histogram graph, it can be seen that the histogram graph provides a distribution pattern that forms images such as bells which means that data is normally distributed.
Multicollinearity test to see whether a high correlation between independent variables was existed in a multiple linear regression model. The criteria was measuring the level of association/closeness of the relationship if the tolerance value was higher than 0.1 and VIF (Variance Inflation factor) was smaller than 10, so there was no multicollinearity. Multicollinearity test used SPSS 22 software. The results were obtained in Table 4 below:

| Model                  | Tolerance | VIF   |
|------------------------|-----------|-------|
| 1 (X₁) knowledge of disaster | .663      | 1.508 |
| (X₂) people’s attitudes | .663      | 1.508 |

a. Dependent Variable: (Y) Preparedness
Source: results of data processing of researchers, 2019

Based on Table 4, it can be concluded that there was no multicollinearity (tolerance value) between independent variables, this was proved by the value of the Variance Inflation Factor (VIF) of 1.508, which was smaller than 10; 1.508 <10. The purpose of this test was to test whether in a regression model, there was an inequality of variance from residuals from one observation to another. The results of the analysis stated that there was no multicollinearity between independent variables, this was evidenced by the value of the Variance Inflation Factor (VIF) of 1.508, which was smaller than 10; 1.508 <10. so that it can be concluded that there was no multicollinearity problems between independent variables, so it was feasible to use analyzing data results.

The purpose of this test was to test whether in a regression model, there was an inequality of variance from residuals from one observation to another. If the variance of the residuals from one observation to another was fixed then it was called homoskedasticity, and if the variance was different then it was called heteroscedasticity. A good regression model is not heteroscedasticity. The numerical data produced in this study were carried out heteroscedasticity test using SPSS 22 software. The results are shown in the following Figure 3:

![Scratch plot Graph of the Heteroscedasticity Test](image)

**Figure 3.** Scratch plot Graph of the Heteroscedasticity Test
Source: Results of data processing of researchers, 2019

Based on Figure 3 Scatterplot above, it appears that the points spread randomly and did not form a certain clear pattern, and spread both above and below the number 0 on the Y axis. This means that there was no heteroscedasticity in this study (Glejser test, meaning see the SPSS regression model)[3],[16], so that a decent regression model was used to predict community preparedness against landslides based on input of disaster knowledge variables and community attitudes.
Hypothesis test results in this study was to determine the effect of disaster knowledge (independent variable X1) and public attitudes (independent variable X2) on preparedness (dependent variable Y) face community landslides along the Palu bay.

Table 5. Disaster knowledge Summary (X1) model of (Y) preparedness

| Model | R    | R Square | Adjusted R Square | Standard Error of the Estimate |
|-------|------|----------|-------------------|-------------------------------|
| 1     | .659a| .435     | .429              | .06197                        |

a. Predictors: (Constant), Disaster Knowledge (X1)

Source: Results of research data processing, 2019

Table 6. Coefficients of the Effect of Disaster Knowledge (X1) on preparedness (Y)

| Coefficientsa | Model | Unstandardized ed Coefficients | Unstandardized ed Coefficients |
|---------------|-------|--------------------------------|--------------------------------|
| B             | Std.Error | Beta | t         | Sig.         |
| (Constant)    | .438   | .035   | 12,423   | .000         |
| Disaster Knowledge (X1) | .439   | .051   | 8,634    | .000         |

a. Dependent Variable: Preparedness (Y)

Source: Results of research data processing, 2019

In Table 6, it can be seen that in column B at Constant (a) is 0.438, while the value of disaster knowledge (b) is 0.439 so that the regression equation is obtained as follows:

\[ Y = a + b \times X \]

(1)

\[ Y = 0.438 + 0.439 \times X \]

(2)

From the above output, it can be seen that the value of \( t_{\text{count}} = 8.634 \) with a significance value of 0.000 < 0.05, \( H_0 \) was rejected, which means that there was a positive and significant influence on people's attitudes toward preparedness in facing the landslide along the coast of Palu Bay.

Table 7. Model Summary of Community Attitudes (X2) towards (Y) Preparedness

| Model Summary |
|---------------|
| Model | R    | R Square | Adjusted R Square | Standard Error of the Estimate |
|-------|------|----------|-------------------|-------------------------------|
| 1     | .873a| .762     | .760              | .04020                        |

b. Predictors: (constant), Community attitudes (X2)

Source: Results of research data processing, 2019

Table 8. Coefficients Effect of Community Attitudes (X2) on Preparedness (Y)

| Coefficientsa | Model | Unstandardized ed Coefficients | Unstandardized ed Coefficients |
|---------------|-------|--------------------------------|--------------------------------|
| B             | Std.Error | Beta | t     | Sig.     |
| (Constant)    | .087   | .037   | 2,348 | .000     |
| Community Attitudes (X2) | .921   | .052   | 17,627 | .000     |

b. Dependent Variable: Preparedness (Y)

Source: Results of research data processing, 2019
In Table 8, it is shown that in column B at Constant (a) is 0.087, while the value of community attitudes (b) is 0.921 so that it obtains the regression equation as follows:

\[ Y = a + bX \]

\[ Y = 0.087 + 0.921 \]

Coefficient \( b \) is called the regression direction coefficient and states the change in the average variable \( Y \) for each change in variable \( X \) is equal to one unit, if \( b \) is positive then there will be an increase while if the value of negative \( b \) means a decrease.

So that the equation can be translated as:

- The constant of 0.086 indicated that if there was no value of the attitude of the community, the preparedness value is 0.087.
- Regression coefficient (X) community attitudes of 0.921 confirmed that at every addition to 1 value of community attitudes \( (X_2) \), the preparedness value increased by 0.921.

From the output above, it can be seen the value of \( t \) count = 17.627 with a significance value of 0.000 < 0.05, so \( H_0 \) was rejected, which means that there was a positive and significant influence on people's attitudes toward preparedness in facing the landslide along the coast of Palu Bay.

**Table 9. Correlations of disaster knowledge \( (X_1) \) and community attitudes \( (X_2) \) on Preparedness \( (Y) \)**

| Model | R   | R Square | Adjusted R Square | Standard Error of the Estimate |
|-------|-----|----------|-------------------|-------------------------------|
| 1     | .893a | .797     | .793              | .03731                        |

C. Predictors: (constant), Knowledge of seismicity \( (X_1) \), Community attitudes \( (X_2) \)

Source: Results of research data processing, 2019

**Table 10. Anova Effect of seismic Knowledge \( (X_1) \), Community attitudes \( (X_2) \) on Preparedness \( (Y) \), ANOVAa**

| Model       | Sum of Square | Df  | F   |
|-------------|---------------|-----|-----|
| Regression  | .525          | .037| .000|
| Residue     | .134          | .052| .873| .000|
| Total       | .659          |     |     |

a. Dependent Variable: Preparedness \( (Y) \)
b. Predictors: (Constants), Disaster knowledge \( (X_1) \) and Community attitudes \( (X_2) \)

Source: Results of research data processing, 2019

From Table 10, it can be seen that \( F \) count = 188.598 with a significance level of 0.000 < 0.05, then the regression model can be used to predict the preparedness variable.

**Table 11. Disaster Knowledge Coefficient \( (X_1) \) and Community Attitudes \( (X_2) \) on Preparedness \( (Y) \), Coefficientsa**

| Model                  | Unstandardized ed Coefficients | Unstandardized ed Coefficients |
|------------------------|--------------------------------|--------------------------------|
|                        | B       | Std.Error | Beta  | t       | Sig. |
| (Constant)             | .082    | .034      |       | 2.381   | .019 |
| Disaster Knowledge \( (X_1) \) | .153    | .038      | .230  | 4.072   | .000 |
| Community Attitudes \( (X_2) \) | .780    | .060      | .739  | 13.098  | .000 |

c. Dependent Variable: Preparedness \( (Y) \)

Source: Results of research data processing, 2019

In Table 12, it can be seen in column B at Constant (a) is 0.086, while the value of community attitudes (b) is 0.921 so that the regression equation is obtained as follows:
\[ Y = a + b_1X_1 + b_2X_2 + e \]  
\[ Y = 0.082 + 0.153 + 0.780 \]  

So that the equation can be translated:

- The constant of 0.082 indicated that if there was no value of disaster knowledge and public attitudes, then the preparedness value was 0.082.
- Regression coefficient \((X_1)\) Disaster knowledge of 0.153 stated that every addition to 1 value of disaster knowledge \((X_1)\), the preparedness value increased by 0.153.
- Regression coefficient \((X_2)\) community attitudes of 0.780 stated that every addition to 1 value of the attitude of the community \((X_2)\), the preparedness value increased by 0.780.

From the above output, it can be seen that the value of \(t_{\text{count}} = 13.098\) with a significance value of 0.000 < 0.05, \(H_0\) was rejected, which means there was a positive influence of disaster knowledge and community attitudes simultaneously and significantly on preparedness in the area along the coast of Palu Bay.

### 3.2. Discussion

The description of the disaster knowledge variable described the distribution of 99 respondents' answers from 9 questions regarding the knowledge of disasters about landslides that had been declared as valid. The data distribution included the average and percentage of the total score of the results of the respondents' answers about measuring knowledge about landslides. Based on these data, it can be described that the percentage reached 42.4% or 42 respondents' answers about the disaster knowledge variable of the community on the coast of Palu Bay. Individually, disaster knowledge of individuals had good criteria. Furthermore, the index level in Table 1 as the disaster knowledge of the people in the coastal area of Palu Bay had sufficient levels, with an average value of 68,273.

The description of the community attitude variable described the distribution of respondents' answers of 99 respondents out of 14 statements regarding the attitudes towards landslide hazards that had been declared valid. Data distribution included the average and percentage of the total score of the results of the respondents' answers about measuring attitudes towards landslide hazards. Based on the data, it can be described that the percentage reached 73.7% or 73 respondents chose the answer option ‘agree’, as in Table 2 Index Level \((X_2)\) of Community Attitudes, overall the people in the coastal areas of Teluk Palu were at the agreed level, with an average value of 70,687.

Descriptions for attitude variables described the distribution of 99 respondents' answers from 26 statements on preparedness against landslide hazards that had been declared valid. Data distribution included the average and percentage of the total score of the results of the respondents' answers about measuring attitudes towards landslide hazards. Based on the answer data, preparedness for landslide hazards reached 56.6% or 56 respondents chose ‘ready’ answer option, as in Table 3, where the index level \((Y)\) of Preparedness, overall the coastal area of Palu Bay was at the ready level, with an average value average of 73,78.

The requirement to do a regression analysis was to do a classic assumption test. Multiple linear models would be more appropriate to use and produce more accurate calculations if the following classic assumptions could be fulfilled according to their standards:

This test was conducted to determine whether the residual values (differences that exist) studied had a normal or abnormal distribution. Residual values that are normally distributed will form a curve that forms an image such as a bell, bell-shaped curve. Both sides of the curve extend to infinity. Referring to Figure 1 Histogram graph, it can be seen that the histogram graph provides a distribution pattern that forms an oval-like image which means that data was normally distributed. In connection with that, figure 2 of the P-Plot graph, shows the points following and approaching the diagonal line so that it can be concluded that the regression model meets the assumption of normality so that the regression model was feasible to be used to predict preparedness.

Multicollinearity test aimed to see whether there was a high correlation between independent variables in a multiple linear regression model. The criteria was measuring the level of association / closeness of the relationship if the tolerance value was higher than 0.1 and VIF (Variance Inflation
factor) was smaller than 10, so there was no multicollinearity. Multicollinearity test used SPSS 22 software. The results in Table 4 show that there was no multicollinearity (tolerance value) between independent variables, this is evidenced by the value of Variance Inflation Factor (VIF) of 1.508, which was smaller than 10; 1.508 < 10. Therefore, it can be concluded that there was no multicollinearity problems between independent variables, so it was feasible to use analyzing data results.

The purpose of this test was to test whether in a regression model there was an inequality of variance from residuals from one observation to another. If the variance of the residuals from one observation to another was fixed, it was called homoskedasticity; and if the variance was different, it was called heteroscedasticity. A good regression model was not heteroscedasticity.

Based on Figure 3 Scatterplot above, it appears that the points spread randomly and did not form a certain clear pattern, and spread both above and below the number 0 on the Y axis. This means that there was no heteroscedasticity in this study (Glejser test, the meaning can be seen in the SPSS regression model), so that a decent regression model was used to predict community preparedness against landslides based on input of disaster knowledge variables and community attitudes.

Hypothesis testing in this study was conducted to determine the level of influence between the independent variables and the dependent variable, either partially or simultaneously, or test the research hypothesis that has been predetermined. In this study the analysis was conducted to determine the effect of disaster knowledge and community attitudes towards preparedness in facing community landslides in the coastal area of Palu Bay.

Referring to Table 5, it explains the magnitude of the regression value or influence (R) which was equal to 0.659 and determinant coefficient (R²) R Square of 0.435 which implies that the influence of disaster knowledge variables (X₁) toward the preparedness variable was 43.5%, while the rest was influenced by other variables.

In Table 6, it can be seen in column B that Constant (a) was 0.438, while the value of disaster knowledge (b) was 0.439 so that the regression equation was obtained as equation (1) and (2). Coefficient b is called regression direction coefficient and states the change in the average variable Y for each change in variable X is equal to one unit, if b is positive then there will be an increase while if the value of negative b means a decrease. So that the equation can be translated as:

- The constant of 0.438 stated that if there was no disaster knowledge value, then the preparedness value was 0.438.
- Regression coefficient (X) of Disaster knowledge was 0.439 confirmed that every addition to 1 value of disaster knowledge (X₁), the preparedness value increased by 0.439.

From the hypothesis 1 test, it was known that the value of \( t_{\text{count}} = 8.634 \) with a significance value of 0.000 < 0.05, \( H₀ \) was rejected, which means that there was a positive and significant influence on people's attitudes toward preparedness to face landslides in the area along the coast of Palu Bay.

Referring to Table 7, it explains the magnitude of the regression value or influence (R) which was equal to 0.873 and determinant coefficient (R²) R Square of 0.762 which implied that the influence of the community attitude variable (X₂) on preparedness variable was 76.2%, while the rest was influenced by other variables. In Table 8, it can be seen at column B that Constanta (a) was 0.087, while the value of community attitudes (b) was 0.921 so that it was obtained that the regression equation was as equation (3) and (4). So that the equation can be translated as:

- The constant of 0.087 stated that if there was no value of the attitude of the community, the preparedness value was 0.087.
- Regression coefficient (X) community attitudes of 0.921 stated that every addition to 1 value of community attitudes (X₂), the preparedness value increased by 0.921.

From the hypothesis 2 test, it was known that the value of \( t_{\text{count}} = 17.627 \) with a significance value of 0.000 < 0.05, then \( H₀ \) was rejected, which means that there was a positive and significant influence on people's attitudes toward preparedness in facing the landslide along the coast of Palu Bay.

In the use of this analysis, some things that can be proven are the shape and direction of the influence that occur between the independent variable and the dependent variable, and it can determine
the prediction of the value of each independent variable on the dependent variable if a condition occurs. This condition is the fluctuation of the value of each independent variable presented in the regression model.

Referring to Table 9, it can be explained that the magnitude of the regression value or influence (R) was equal to 0.893 and determinant coefficient (R^2) R Square of 0.797 which implied that the influence of disaster knowledge variables (X_1) and public attitudes (X_2) jointly influenced preparedness variable by 79.7%, while the rest was influenced by other variables which were not included in this study.

In Table 12, it can be seen in column B that Constant (a) was 0.082, while the value of community attitudes (b) was 0.153 so that the regression equation was obtained as equation (5) and (6). So that the equation can be translated as:

- The constant of 0.082 stated that if there was no value of disaster knowledge and public attitudes, then the preparedness value was 0.082.
- Regression coefficient (X_1) Disaster knowledge of 0.153 confirmed that every addition to 1 value of disaster knowledge (X_1), the preparedness value increased by 0.153.
- Regression coefficient (X_2) community attitudes of 0.780 indicated that every addition to 1 value of the attitude of the community (X_2), the preparedness value increased by 0.780.

Referring to Table 12, we can see the value of the Residual Standard, which was a standardized residual value. This study had a residual standard value for disaster knowledge that was equal to 0.230 and the residual standard value on community attitudes was 0.739. Thus, according to the theory that if the value std. Residuals are getting closer to 0, the regression model is better at making predictions, and conversely the further it is from 0 or more than 1 or -1, the better the regression model in making predictions is, so it can be concluded that the regression model influences disaster knowledge and community attitudes toward preparedness facing landslides along the Palu Bay region in making predictions.

4. Conclusions

Base on the results of research on the influence of disaster knowledge and community attitudes towards preparedness in the face of landslides along the coastal area of Palu Bay, the authors can draw some conclusions, as follows:

- Disaster Knowledge had a positive and significant influence on preparedness in facing the landslides, disaster knowledge variables also had a value (R^2) R Square of 0.435, which meant that the disaster knowledge variable affected the preparedness variable by 43.5%, while the rest was influenced by other variables.
- Community attitudes had a positive and significant influence on preparedness in facing the landslides, community attitude variables also had a value (R^2) R Square of 0.762, which meant that the community attitude variable affected the preparedness variable by 76.2%, while the rest was influenced by other variables.
- Disaster Knowledge and Community Attitudes simultaneously had a positive and significant influence on aversion to landslides, disaster knowledge variables and community attitudes also had a value (R^2) R Square of 0.797 which meant that disaster knowledge variables and community attitude variables together affected the preparedness variable by 79.7%, while the rest was affected by other variables.

Based on the results of research carried out along the coastal area of Palu Bay, it can be seen that unless disaster knowledge being applied into real behavior or actions, it will not significantly improve the community preparedness in facing the landslides.

Research that takes samples of community areas along the coast of Palu Bay, is academically expected to make theoretical contributions, such as:

- For the development of defense science to improve resilient community preparedness in facing disasters as a concrete manifestation of increasing national security as a factor in efforts
to improve national defense. Landslides are non-military threats that must be addressed by all Indonesian citizens, to achieve these goals we need to increase community preparedness in facing disasters, so that in the future a strong community will be created so that national security can be maintained and will automatically strengthen national defense.

- For the development of disaster management knowledge about disaster risk reduction through increased preparedness. This can be done by improving disaster knowledge, both socialization and disaster rehearsals, especially landslides and prioritizing people living in areas with high potential for disaster.

For higher education, it can synchronize curriculum, outcomes, and literacy (technology, humans, and the environment) in dealing with students facing natural disasters. Therefore, monitoring, socialization, seminars, cooperation involving the community and private companies and agencies/institutions are needed to jointly contribute to increasing awareness in behavior so that a caring and alert attitude in facing landslide disasters will increase welfare and security human.

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