# Community Capacity in Dealing with Disasters in Banyumanik Sub-District, Semarang City

*Kapasiti Komuniti dalam Menangani Bencana di Sub-Daerah Banyumanik Kota Semarang*

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ABSTRACT *This study aims (1) to determine the level of community capacity in dealing with landslides in the Banyumanik Sub-District, (2) to analyse various determining factors on community capacity. This research took a population of people living in the Banyumanik Sub-District, Semarang City. Sampling was done applying purposive sampling based on specific considerations or objectives, namely choosing people living around landslides-affected or prone areas. The community capacity assessment in this study developed the capacity indicator framework of the Hyogo Framework for Actions (HFA) consisting of five variables, namely (a) disaster management rules and institutions, (b) early warning and disaster risk assessment, (c) disaster education, (d) reduction of primary risk factors, and (e) development of preparedness in all lines. Data collection was executed by utilizing questionnaires and interviews. It was then analysed by scoring. The results demonstrate that the community capacity in dealing with landslides, in general, is as follows: 38.78% of respondents have low criteria, 36.73% are categorized in the medium criteria, and 24.49% of people possess high category in terms of community capacity.*

**Keywords:** Community capacity, disaster, landslide, Banyumanik sub-District.

## 1. Introduction

The landslide has come about as the most frequent disaster compared to others in Central Java. It happened about 488 times in 2017. Those incidents resulted in many casualties and damage. Twenty-seven victims died or attributed as missing/not found, 47 citizens suffered injuries or illnesses, and 9.3883 people suffered and were displaced. Damages due to landslides included 369 heavily damaged homes, 371 moderately damaged houses, 730 slightly damaged houses, 16 damaged education facilities, 14 damaged worship facilities, and one damaged health facility (BNPB, 2018).

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The landslide disaster turned out to bring a lot of losses, both loss of life and considerable property. In the future, it is necessary to increase the capacity of the community for better disaster management to reduce the occurrence of various losses.

Existing data indicate that landslides in Semarang City have a high frequency. In 2013, 44 landslides occurred, and in 2014, they came about 123 times (Semarang City BPBD, 2014). Landslides in Semarang City show an increase. Escalated damage and losses in terms of property, environmental, and fatality losses always accompany this phenomenon. The increasing number might be due to the low community capacity in managing landslide risk. Some landslide disasters in Semarang City include landslides in Banyumanik Sub-district, namely landslides in Banyumanik Village, Jabung Village, Srondol Wetan, Srondol Kulon Village, Gedawang Village, Pudak Payung Village, and Tinjomoyo Village. Landslides in some villages generally caused casualties and property losses (Semarang City BPBD, 2014).

Semarang City geologically consists of several formations, namely (1) Marine Formation, (2) Damar Formation, (3) Kaligetas/Notopuro Formation, (4) Jongkong Formation, (5) Central Ungaran Formation, and (6) Alluvium Formation. Each geological formation has a different rock. The existence of other rocks allows different types of soil. The rocks are diverse from (1) sedimentary rock formations, (2) limestone, (3) marine layers, volcanic deposits of Mount Ungaran Tengah, old Ungaran volcanic rocks, and volcanic breccia sediments. The existence of rock formations and different soil types grants for different soil textures and variations in various levels of landslide disasters (Thanden et al., 1996). Suppose the condition of community capacity is low, or the community is not ready. In that case, disasters can cause community panic, prolonged suffering, and sadness, such as death, injury, loss of family members and damage to infrastructure, economic stress due to loss of business or employment, loss of wealth, and environmental damage. The high losses incurred due to landslides indicate that disaster management by the community needs to be improved (Hidayati, 2005).

The community faces threats before a disaster strikes and has to bear the risk of loss of life and property due to the disaster. Humans or communities in the context of catastrophe are both objects and subjects of the tragedy itself. In addition, the community must recover both physically and mentally after the incident came about (Lassa & Jonathan, 2009). This study aims to: (a) determine the level of community capacity in dealing with landslides in the Banyumanik Sub-District, and (2) to analyse various determining factors on community capacity.

## 2. Landslide Concept

Rock collapses and landslides can occur in cities, and the government's expenditure on investigations, implementation of mitigation, and prevention measures to reduce life and economic losses has escalated over time (Kwong et al., 2004). Landslide is one type

of mass or rock mass movement, or the mixing of both that moves down the slope due to the disruption of the stability of the soil and rocks making up the slope (Imanda, 2013: 3). Landslides are a potential mechanism for mobilizing and spreading pollutants (Goransson et al., 2014). Based on Minister of Public Works Regulation No. 22 of 2007, a landslide is a process of mass transfer of soil or rock in an oblique direction from its original position. The gravity effect separates it from the solid mass. It then moves in the form of rotation and transition.

The processes that trigger landslides are absorbing water into the soil and very high slope rates. If the water penetrates the impermeable soil that acts as a sliding plane, the soil becomes very slippery, and weathered soil will move along the slope. According to Fakhruddin, landslides transfer slope-forming material in rocks, rubble, or mixed material that moves down or out of the hill (Fakhruddin 2014). The mass that moves in a landslide is large, so often landslides will bring casualties in the form of environmental damage, agricultural land, settlements, infrastructure, assets, and even loss of human lives. In terms of movement and erosion, there is still some erosion caused by the movement of land mass, namely creep, rock fall, and mudflow. Suripin (2002) defines landslides as a form of decay in which transportation or movement of soil mass occurs at some point in a relatively large volume. Soil movement (landslide), according to the Directorate of Geology and Environmental Management (1996), is a product of the disturbance process of slope balance that causes the movement of soil and rock mass to a lower place. In this article, a landslide is defined as a mass movement whose movement shifts or rotates. The moving material can be in the form of soil and rocks caused by gravity; it is distinguished from other groups in terms of movement and has less water content.

### 2.1 Community Capacity

What influences community capacity are policy, preparedness, and community participation. Community capacity is defined as a combination of all forces in a community or organization that can reduce a disaster's risk or impact (UN-ISDR, 2004). Its building aims to develop a culture of safety, where community members are aware of the dangers they face, know how to protect themselves, and support efforts to protect others and society as a whole.

Community capacity building aims to develop a culture of safety, where community members are aware of the dangers they face, know how to protect themselves, and support efforts to protect others and society as a whole. Institutional strengthening among government, community, and private is a critical factor in disaster management efforts. The community plays a vital role in disaster prevention. Disaster prevention is a series of activities to reduce or eliminate disaster risk, both through reducing the threat of disasters and the vulnerability of parties threatened by disaster (Law No. 24 of 2007). According to Anderson et al. (2013), community capacity is related to resources, skills, knowledge, organizational abilities, and attitudes to respond to danger critically. Community capacity for landslides is the ability that allows communities to increase their resilience to the effects of threats that threaten or damage

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and increase the strength and power of communities to overcome the impact of landslide events or hazards (Paripurno, 2001).

Disaster risk is related to human capacity in dealing with disasters. Human actions in disaster management and management will reduce or minimize the occurrence of disasters and their impacts. The community capacity in disaster-prone areas needs to be investigated and developed in the direction of disaster risk reduction. Also, it is necessary to build institutional capacity in responding to landslide hazards seriously to effectively deal with landslide disasters (Fakhruddin et al., 2014).

There is a lot of research related to landslide hazards/threats and vulnerabilities. However, only a few researchers have focused on community capacity. This condition is an irony as the community is the most affected party when a disaster takes place. Therefore, researchers want to examine further efforts to increase the capacity of the community to minimize losses and casualties due to landslide disasters (Paripurno, 2006; Ahmed, 2013).

The vulnerability and threat of disaster in calculating disaster risk make total community capacity development. The greater the capacity and ability of the community to manage landslide disasters, the smaller the impact of losses and victims will be possible.

## 3. Method

The researchers conducted this study in the Banyumanik Sub-District, Semarang City, Central Java Province, Indonesia, considering that landslides often occur, causing property and human losses. Research on community capacity in dealing with landslides is field research or observational analysis analysed descriptively and quantitatively (Nazir, 2005).

The population of this study was communities living in the Banyumanik Sub-District, Semarang City. Sampling in terrain units was done by utilizing purposive sampling, selected according to specific objectives/considerations, namely those living in landslide-affected or prone areas. 49 people in 13 sample field units were taken as the sample. The researchers took four people in a landslide-medium or high potential field unit that has experienced the disaster. Meanwhile, three people were taken as samples in the field unit with landslide-medium or high potential but has never experienced a landslide. The details can be seen in Table 1. In this research, no study was held on terrain units with a flat to gentle slope. They are assumed to have no threat or danger of zero landslides as they do not have a significant height difference or no gravity. Therefore, the community capacity is considerably not essential to study.

**Table 1**: Determination of the Number of Samples of Community Capacity for Landslide in Banyumanik Sub District, Semarang City

| No | Terrain Unit Sample | Village Name | Description of Landslide | Number of Samples (person) |
|---|---|---|---|---|
| 1 | D1III6Klg | Jabungan | There has never been a landslide | 3 |
| 2 | S2III6Klg | Ngesrep | There has been a landslide | 4 |
| 3 | S2IV6Klg | Ngesrep | There has been a landslide | 4 |
| 4 | S2V6Klg | Padangsari | There has been a landslide | 4 |
| 5 | V2III6Klg | Pudakpayung | There has never been a landslide | 3 |
| 6 | V2IV6 Dmr | Pudakpayung | There has been a landslide | 4 |
| 7 | D1IV6Kr | Srondol Kulon | There has been a landslide | 4 |
| 8 | S1IV6Kr | Srondol Kulon | There has been a landslide | 4 |
| 9 | S1V6Klg | Srondol Kulon | There has been a landslide | 4 |
| 10 | S1V6Kr | Srondol Kulon | There has been a landslide | 4 |
| 11 | D1IV3Kr | Tinjomoyo | There has never been a landslide | 3 |
| 12 | S1IV3Klg | Tinjomoyo | There has been a landslide | 4 |
| 13 | S2IV3Klg | Tinjomoyo | There has been a landslide | 4 |
| | | Total | | 49 |

*Source*: Research Data Analysis (2018)

The variables studied were community capacity variables, which included five components, namely (a) disaster education, (b) reduction of essential risk factors, (c) disaster management rules and institutions, (d) early warning and disaster risk assessment, and (e) development preparedness on all lines. Data collection on community capacity in dealing with landslides was carried out using a questionnaire. It was then analysed by scoring. Community capacity was analysed by scoring or rating. The data on the community capacity were obtained from the determined instrument. Parameters of community capacity and appreciation can be seen in Table 2.

Table 2: Parameters and Scoring in the Capacity Index

| Parameter | Score | | | | | Percentage (%) |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | |
| Policies/ Regulation | 0 | 1 | 2 | 3 | 4 or more | 20 |
| Early warning | 0 | 1 | 2 | 3 | 4 or more | 20 |
| Education/training | 0 | 1 | 2 | 3 | 4 or more | 20 |
| Reduction of Risk factor | 0 | 1 | 2 | 3 | 4 or more | 20 |
| Preparedness | 0 | 1 | 2 | 3 | 4 or more | 20 |
| Total | | | | | | 100 |

*Source*: Research Data Analysis (2018)

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Various questions in this questionnaire are based on community capacity parameters. Each question has two answers in the instrument, namely "yes" and "no". "Yes" was scored 1, while "no" got 0. The scores were then added up for each parameter. For example, there are six questions regarding the parameters of the early warning system in the questionnaire. If 2 of the 6 questions are answered with "yes" in the questionnaire, the score is 3. If all six questions are answered "no" (0), then the score is 1. On the instrument provided to measure these parameters, 30 questions exist. If a respondent answers "yes", he will continue answering the next questions. The answer to the next question will be used as a description material to explain the community capacity to deal with landslides in the research area. The score obtained was then multiplied by the percentage to bring the community capacity index value. The value of the community capacity index received was consulted with the criteria table for determining community capacity. Therefore, researchers could determine the level of community capacity in dealing with landslides. The total value of the lowest community capacity index = 1. In detail, the steps taken to analyze the level of community capacity are as follows:

a. Determine the lowest number of index values

**Table 3**: The lowest community capacity index (Score 1)

| No | Parameter | Lowest Score | Percentage (%) | Index value |
|---|---|---|---|---|
| 1 | Policies/Regulation | 1 | 20 | 0,2 |
| 2 | Early warning | 1 | 20 | 0,2 |
| 3 | Education/training | 1 | 20 | 0,2 |
| 4 | Reduction of risk factor | 1 | 20 | 0,2 |
| 5 | Preparednees | 1 | 20 | 0,2 |
| | Total | | 100 | **1** |

*Source*: Research Data Analysis (2018)

b. Determine the highest number of index values

**Table 4**: The Highest Community Capacity Index Score (Score 5).

| No | Parameter | Lowest Score | Percentage (%) | Index value |
|---|---|---|---|---|
| 1 | Policies/ Regulation | 5 | 20 | 1 |
| 2 | Early worning | 5 | 20 | 1 |
| 3 | Education/training | 5 | 20 | 1 |
| 4 | Reduction of Risk factor | 5 | 20 | 1 |
| 5 | Preparednees | 5 | 20 | 1 |
| | Total | | 100 | 5 |

*Source*: Research Data Analysis (2018)

The highest total community capacity index value = 5

c. Calculate the range of index values = the sum of the highest index values minus the sum of the lowest index values = 5 – 1 = 4
d. Determine the criteria. This study used five criteria of community capacity (very low, low, medium, high, very high).
e. Determine the index value interval, the index value range divided by the community capacity criteria used = 4/5 = 0.8.
f. Make a table of community capacity criteria classes with interval classes of community capacity index values, as shown in Table 5.

**Table 5:** Criteria for Determining Community Capacity Level

| No. | Community Capacity Class | Index Value Interval |
|---|---|---|
| 1 | Very Low | 1 - < 1,8 |
| 2 | Low | 1,8 – <2,6 |
| 3 | Medium | 2,6 - <3,4 |
| 4 | High | 3,4 - < 4,2 |
| 5 | Very High | 4,2 - 5 |

*Source*: Research Data Analysis (2018)

## 4. Results and Discussion

### 4.1 Research Area Description

This research was conducted in the Banyumanik Sub-District, Semarang City, Central Java. The Banyumanik Sub-District ranges at 3,092.60 Ha or 8.04% of the Semarang City area. Banyumanik Sub-District consists of 11 villages, namely Banyumanik, Gedawang, Jabung, Ngesrep, Padangsari, Pedalangan, Pudak Payung,

Srondol Kulon, Srondol Wetan, Sumur Boto, and Tinjomoyo Villages. The Banyumanik Sub-District area is on average > 500 meters above sea level. Its topography varies from flat (0-2%) to steep (> 40%). It possesses a maximum rainfall of 2265 mm/yr and minimum rainfall of 1483 mm/yr. According to Schmidt Ferguson, this study area has a climate type C (slightly wet) with a not much different Q value (the ratio between the average dry month to the average wet month).

## 4.2 Community Capacity in Dealing with Landslide Disasters in Banyumanik Sub-District

Based on the tabulation results and analysis of research data, Table 6 portrays the description of the community capacity in dealing with landslides in the Banyumanik Sub-District. Based on Table 6, the community capacity in dealing with landslides is as follows: 38.78% of respondents have low criteria, 36.73% are categorized in the medium criteria, and 24.49% of people possess high category in terms of community capacity. Its average value has a moderate criterion of 2.63. This data is elaborated in Table 7 and Figure 1.

**Table 6**: Data on Community Capacity in Dealing with Landslide disasters in Banyumanik Sub-District

| No | Value Interval | Criteria | Frequency | Percentage (%) |
|---|---|---|---|---|
| 1 | 1 < 1.80 | Very low | 0 | 0,00 |
| 2 | 1,80 < 2,60 | Low | 19 | 38,78 |
| 3 | 2,60 < 3,40 | Medium | 18 | 36,73 |
| 4 | 3,40 < 4,20 | High | 12 | 24,49 |
| 5 | 4,20 < 5 | Very High | 0 | 0,00 |
| Total | | | 49 | 100,00 |

*Source*: Research Results (2018)

**Table 7**: Community Capacity of Each Village in Banyumanik Sub-District

| No | Village | Number of Terrain Units | Capacity Index Value | Value Criteria |
|---|---|---|---|---|
| 1 | Jabungan | 1 | 2,60 | Medium |
| 2 | Ngesrep | 2 | 2,20 | Low |
| 3 | Padangsari | 1 | 2,20 | Low |
| 4 | Pudakpayung | 2 | 2,80 | Medium |
| 5 | Srondol Kulon | 4 | 3,05 | Medium |
| 6 | Tinjomoyo | 3 | 3,20 | Medium |
| Average Capacity Value | | | 2.63 | Medium |

*Source*: Research Results (2018)

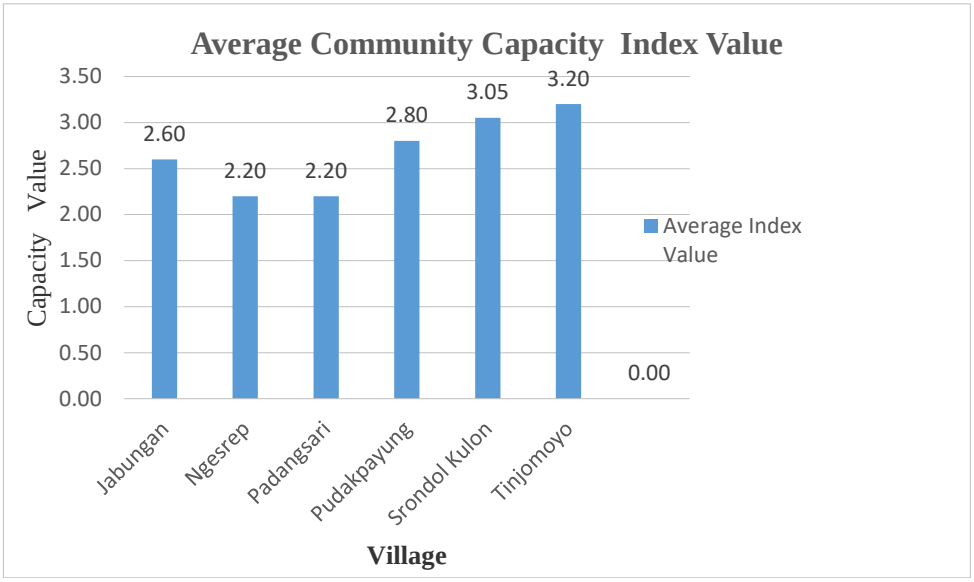


**Figure 1**: Community Capacity Values of Each Village in Banyumanik Sub-Districtin Dealing with Landslides.
*Source*: Research Results (2018)

In more detail, the community capacity in each sub-variable can be described as follow:

a. Disaster management rules and institutions

**Table 8**: Data on Community Capacity in Rules and Institutions

| No | Value Interval | Criteria | Frequency | Percentage (%) |
|---|---|---|---|---|
| 1 | 0,2 < 0,36 | Very low | 7 | 14,29 |
| 2 | 0,36 < 0,52 | Low | 8 | 16,33 |
| 3 | 0,52 < 0,68 | Medium | 16 | 32,65 |
| 4 | 0,68 < 0,84 | High | 18 | 36,73 |
| 5 | 0,84 < 1 | Very High | 0 | 0,00 |
| | Total | | 49 | 100,00 |

*Source*: Research Results (2018)

Table 8 portrays several points on the community capacity in terms of rules and institutions, namely 14.29% of the respondents are categorized very low, 16.33% of the respondents are low, 32.65% of the respondents are moderate, and 36.73% of respondents are high. Its average value has a medium criterion with a capacity value of 0.56. Its data based on terrain units can be seen in Table 9.

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**Table 9:** Community Capacity of Each Village in Terms of Rules and Institutions in Dealing with Landslides in Banyumanik Sub-District

| No | Village | Number of Terrain Units | Capacity Index Value | Value Criteria |
|---|---|---|---|---|
| 1 | Jabungan | 1 | 0,80 | High |
| 2 | Ngesrep | 2 | 0,40 | Low |
| 3 | Padangsari | 1 | 0,40 | Low |
| 4 | Pudakpayung | 2 | 0,40 | Low |
| 5 | Srondol Kulon | 4 | 0,65 | Medium |
| 6 | Tinjomoyo | 3 | 0,73 | High |
| Average Capacity Value | | | 0,56 | Medium |

*Source*: Research Results (2018)

c. Early warning system

**Table 10**: Community Capacity in Early Warning Systems

| No | Value Interval | Criteria | Frequency | Percentage (%) |
|---|---|---|---|---|
| 1 | 0,2 < 0,36 | Very low | 15 | 30,61 |
| 2 | 0,36 < 0,52 | Low | 18 | 36,73 |
| 3 | 0,52 < 0,68 | Medium | 12 | 24,49 |
| 4 | 0,68 < 0,84 | High | 4 | 8,16 |
| 5 | 0,84 < 1 | Very High | 0 | 0,00 |
| Total | | | 49 | 100,00 |

*Source*: Research Results (2018)

Table 10 demonstrates several points on the community capacity in terms of the early warning system, namely 30.61% of the respondents are classified very low, 36.73% of the respondents studied are low, 24.49% of the respondents are moderate, and 8.16% of the respondents are high. No participant is categorized very high. Its average value is low, with a capacity value of 0.36. The data based on terrain units can be seen in Table 11 as follows.

**Table 11**: Community Capacity of Each Village in Terms of Early Warning System in Dealing with Landslides in Banyumanik Sub-District

| No | Village | Number of Terrain Units | Capacity Index Value | Value Criteria |
|---|---|---|---|---|
| 1 | Jabungan | 1 | 0,20 | Very Low |
| 2 | Ngesrep | 2 | 0,30 | Very Low |
| 3 | Padangsari | 1 | 0,20 | Very Low |
| 4 | Pudakpayung | 2 | 0,40 | Low |
| 5 | Srondol Kulon | 4 | 0,45 | Low |
| 6 | Tinjomoyo | 3 | 0,60 | Medium |
| Average Capacity Value | | | 0,36 | Low |

*Source*: Research Results (2018)

d. Education and training in disasters

**Table 12**: Community Capacity in Disaster Education

| No | Value Interval | Criteria | Frequency | Percentage (%) |
|---|---|---|---|---|
| 1 | 0,2 < 0,36 | Very low | 0 | 0,00 |
| 2 | 0,36 < 0,52 | Low | 25 | 51,02 |
| 3 | 0,52 < 0,68 | Medium | 8 | 16,33 |
| 4 | 0,68 < 0,84 | High | 16 | 32,65 |
| 5 | 0,84 < 1 | Very High | 0 | 0,00 |
| Total | | | 49 | 100,00 |

*Source*: Research Results (2018)

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Table 12 implies several points on the community capacity in terms of education and training: 51.02% of the respondents are categorized low, 16.33% of the respondents are medium, and 32.65% of the respondents are high. No respondent is classified very high. Its average value is moderate, with a capacity value of 0.53. The data based on terrain units can be seen in Table 13 as follows.

**Table 13**: Community Capacity of Each Village in Terms of Education and Training in Dealing with Landslides in Banyumanik Sub-District

| No | Village | Number of Terrain Units | Capacity Index Value | Value Criteria |
|---|---|---|---|---|
| 1 | Jabungan | 1 | 0,40 | Low |
| 2 | Ngesrep | 2 | 0,40 | Low |
| 3 | Padangsari | 1 | 0,60 | Medium |
| 4 | Pudakpayung | 2 | 0,60 | Medium |
| 5 | Srondol Kulon | 4 | 0,60 | Medium |
| 6 | Tinjomoyo | 3 | 0,60 | Medium |
| Average Capacity Value | | | 0,53 | Medium |

*Source*: Research Results (2018)

e. Mitigation For Reduction of basic risk factors

**Table 14**: Community Capacity in Mitigation for Reducing Basic Risk Factors in Disaster

| No | Value Interval | Criteria | Frequency | Percentage (%) |
|---|---|---|---|---|
| 1 | 0,2 < 0,36 | Very low | 0 | 0,00 |
| 2 | 0,36 < 0,52 | Low | 15 | 30,61 |
| 3 | 0,52 < 0,68 | Medium | 19 | 38,78 |
| 4 | 0,68 < 0,84 | High | 15 | 30,61 |
| 5 | 0,84 < 1 | Very High | 0 | 0,00 |
| Total | | | 49 | 100,00 |

*Source*: Research Results (2018)

Regarding mitigation for reducing basic risk factors, Table 14 implies several points on the community capacity in terms of education and training, namely 30.61% of the respondents are low, 38.78% of the respondents are moderate, 30.61% of the respondents studied are high. Meanwhile, no respondent is classified very high. Its average value is medium, with a capacity value of 0.63. The data based on terrain units can be seen in Table 15.

**Table 15**: Community Capacity of Each Village in Terms of Mitigation for Reducing Basic Risk Factors in Dealing with Landslides in Banyumanik Sub-District

| No | Village | Number of Terrain Units | Capacity Index Value | Value Criteria |
|---|---|---|---|---|
| 1 | Jabungan | 1 | 0,80 | High |
| 2 | Ngesrep | 2 | 0,50 | Low |
| 3 | Padangsari | 1 | 0,60 | Medium |
| 4 | Pudakpayung | 2 | 0,60 | Medium |
| 5 | Srondol Kulon | 4 | 0,65 | Medium |
| 6 | Tinjomoyo | 3 | 0,60 | Medium |
| Average Capacity Value | | | 0,63 | Medium |

*Source*: Research Results (2018)

f. Preparedness plan for all lines

**Table 16**: Community Capacity in Preparedness

| No | Value Interval | Criteria | Frequency | Percentage (%) |
|---|---|---|---|---|
| 1 | 0,2 < 0,36 | Very Low | 0 | 0,00 |
| 2 | 0,36 < 0,52 | Low | 15 | 30,61 |
| 3 | 0,52 < 0,68 | Medium | 19 | 38,78 |
| 4 | 0,68 < 0,84 | High | 11 | 22,45 |
| 5 | 0,84 < 1 | Very High | 4 | 8,16 |
| Total | | | 49 | 100,00 |

*Source*: Research Results (2018)

In reference to preparedness for all lines, Table 16 points out several points on the community capacity, namely 30.61% of respondents are classified low, 38.78% of respondents are medium, 22.45% of respondents are high, and 8.16% of the respondents are very high. Its average value is moderate, with a capacity value of 0.56. The data based on terrain units can be seen in Table 17.

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**Table 17**: Community Capacity of Each Village in Terms of Preparedness in All Lines in Dealing with Landslides in Banyumanik Sub-District

| No | Village | Number of Terrain Units | Capacity Index Value | Value Criteria |
|---|---|---|---|---|
| 1 | Jabungan | 1 | 0,40 | Low |
| 2 | Ngesrep | 2 | 0,60 | Medium |
| 3 | Padangsari | 1 | 0,40 | Low |
| 4 | Pudakpayung | 2 | 0,60 | Medium |
| 5 | Srondol Kulon | 4 | 0,70 | High |
| 6 | Tinjomoyo | 3 | 0,67 | Medium |
| Average Capacity Value | | | 0,56 | Medium |

*Source*: Research Results (2018)

### 4.3 Determining Factors on Community Capacity in Facing Landslides

Several factors can affect the level of the community capacity in dealing with landslides, namely:

(a) Level of education, training, and skills in response to landslides. This study has clearly shown that the low score still dominates. However, the higher the public education level, the higher the community capacity to the danger of landslides. Any training in dealing with landslides will improve community skills so that their capacity tends to increase.
(b) Knowledge of preparedness in all lines. Preparedness is a series of actions taken to anticipate disasters through organization and appropriate and efficient steps. Currently, some of the preparedness in the research area is still low. If the community's knowledge is high enough, then their capacity also tends to escalate.
(c) Mitigation efforts to reduce basic risk factors. Mitigation is an effort to reduce disaster risk through physical development, awareness, and capacity building in dealing with disaster threats. Currently, mitigation efforts to reduce the primary risk factors are in moderate criteria. If mitigation efforts are better for the community, it will tend to increase community capacity.
(d) Rules and institutions in disaster management. Some people still have no idea of Law No. 24 of 2007 on disaster management and the institution that manages disasters, namely BPBD (Regional Disaster Management Agency). With the existence of rules and institutions that the community does not know, their capacity is assumed to be low. The increasing capacity requires adequate information about specific regulations and institutions in disaster management.
(e) Existing early warning system. Early warning is a series of activities to warn the community about the possibility of a disaster occurring in a place by the

authorized institution. Early warnings these days have not worked well or are considerably low. If the early warning available to the community goes well, then the community capacity tends to be better.

(f) Experiences of past disasters. The disasters experienced by the community give a particular impression. People who have experienced a disaster will be more careful and realize their position as people living in a disaster area. This experience will increase community capacity.

(g) Caring attitude towards hazards and disasters. People with a caring for disasters attitude will tend to have higher community capacity.

(h) Capacity and economic conditions. The higher the ability in the economic-business sector to restore the economy, the higher the capacity to landslide disasters.

(i) Information network. Good information networks, easy access, and well-established information management about disasters tend to increase community capacity in dealing with disasters.

(j) Cooperation in existing organizations in the community. Cooperation in disaster organizations in the community and good coordination-relationship of both will tend to increase the capacity of the community.

## 5. Discussion

Based on the results, the low score still dominates the community capacity in dealing with landslides. The high capacity is just generally found in landslides-experienced areas.

In reference to regulations and institutions in disaster management, most people already know about the laws governing disasters in Semarang City. Various media such as television, newspaper, and online websites have accommodated fast and adequate information for people. BPBD stated that the government has socialized landslides to the sub-district level—which is forwarded to any head of villages. Some villages have already known that even at the RT/RW (neighbourhood) level, but some have not. Therefore, some people have no idea on the existence of regulations or laws on disaster management.

The community capacity associated with the early warning system is also ranging from very low to low criteria. Most Banyumanik Sub-District areas have no early warning system for landslide hazards. No collaboration exists between the community and other agencies, nor is there any information regarding the early warning of landslides. Besides, there is no evacuation route built.

In terms of education, skills, and training, the low criteria still dominate. The results point out that most communities' education and skills are still low. Specific training to develop community capacity in managing disasters is absent. Moreover, most areas have no landslide simulation activities. The study results also demonstrate that most areas have no community or government facilities to access information about landslides.

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Another sub-variable, namely mitigation to reduce basic risk factors, is still low to medium. The results convey that in most areas: (a) social activities in the effort to reduce threats and vulnerability to landslide disasters are still low, (b) special requirements in constructing buildings related to landslide disaster risks have not been applied, (c ) information or regional maps that illustrate the distribution of landslide-prone areas is not sufficient, and (d) special preparations made by the community in dealing with landslide threats is still weak.

In terms of preparedness on all lines, most areas still possess low to medium criteria—the high criterion is only few. When it comes to landslides, decision-making is put on the head of the RT/RW, religious, Karangtaruna, or other community leaders. The results exemplify that in most areas: (a) policies governing the landslide management have not yet existed; (b) landslide emergency response mechanisms to reduce risk through preventive measures are also absent. This condition relates to the preparation in the field of infrastructure and non-infrastructure. Infrastructure activities incorporate determining refugees' place or location, such as schools, mosques, and village halls. Non-infrastructure preparation consists of special allocation funds by the community deriving from citizens' contributions, government assistance, donations from the private sector, and even from political parties; (c) the location determined as a place of refugees in the case of landslides is unclear, (d) logistics assistance in the effort to deal with an emergency landslide is not yet available, (e) funds allocated for disaster management at the village level is absent, (f) no special officers at the RT level who are responsible as decision-makers regarding landslides, and (g) there is no specific mechanism in the post-disaster recovery process.

Fakhrudin et al. (2014) propose that low to moderate criteria require institutional capacity in responding to dangerous events or various disasters so that disaster risk management can be more effective. Meanwhile, Susanti et al. (2017) emphasize that multiple efforts are urgently needed to increase public awareness and preparedness for potential landslides. This can be started by observing environmental and climatic conditions, including the land's physical condition and rainfall. Public awareness, significantly increasing vigilance during the rainy season with high intensity, is needed. The determination of an appropriate evacuation route also affects the rescue process if a landslide occurs.

Even a person's concern for disasters might support community capacity building, both through independently surviving and helping others. His effort will indirectly strengthen the community capacity. Notably, a caring attitude towards fellow human beings will engage the community in mitigating landslides to reduce the risk.

A landslide might bring victims, losses, and damage. However, it can be a meaningful experience to support better community capacity building. People who have experienced landslides, have survived them, or have seen them directly can make themselves aware of managing disasters. Their experiences encourage better survival instincts and struggles. The practical consequences are that their capacity in reducing disaster risks gets escalated.

## 6. Conclusion

Several conclusions drawn from this study are: (1) the community capacity in dealing with landslides consists of three criteria, namely low, medium, and high. Most areas are still categorized as low to moderate, and the high criterion is still weak. The low generally occurs in areas that have potential landslides but have never experienced any. Meanwhile, the medium to high community capacity commonly exist in areas that have experienced landslides, both with various losses and damage or without any; (2) multiple factors determine the level of community capacity in dealing with landslides, namely: (a) the community knowledge on rules and institutions in the landslide management, (b) the presence of experience on disasters, (c) the presence of the early warning system, (d) the level of community awareness of disasters ( e) the levels of education, training, and skills in landslide disaster management, (f) the economic levels, (g) the mitigation activities to reduce basic risks, (h) the preparedness on all lines, (i) the existence of a network of cooperation within the organization, and (j) the presence of information networks in the community,

Departing from the results, some suggestions that can be given are: (1) Government agencies such as BPBD should encourage the community to upgrade their capacity in dealing with landslides, and (2) Government agencies, village officials, community leaders, private parties, and academics must work together in managing landslides to reduce various losses.

This study still has limitations in terms of community capacity variety and its determining factors. A practical model in increasing community capacity has not been made. Therefore, further research concerning "a model of increasing community capacity in dealing with landslides to reduce the risks" might be conducted.

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