Social-Ecological Vulnerability and Livelihood Improvement Strategies of Landslide Victims in Pattalikang Village, Gowa Regency in National Security Perspective

Khairunnisa Adri1, Siswo Hadi Sumantri1, Sugeng Triutomo1, Deffi Ayu Puspito Sari2*

1Disaster Management Masters Study Program, Faculty of National Security, Indonesian Defence University, Bogor, Indonesia
2Environmental Engineering Study Program, Faculty of Engineering, Universitas Bakrie, Jakarta, Indonesia
*deffiayu@gmail.com

Abstract. Landslides are caused by natural environmental factors and cultural, environmental factors, such as changes in land use and social conditions. In the event of a landslide disaster in Pattalikang Village, the community had to start over from scratch and improve their livelihoods. This study aims to analyze: (1) the social-ecological vulnerability of landslide in Pattalikang Village; (2) disaster mitigation efforts for the people of Pattalikang Village after landslides; and (3) Strategies for improving the livelihoods of the people of Pattalikang Village after landslides from a national security perspective. This study used a qualitative approach with descriptive-analytical methods. Respondents are from the Pattalikang Village community and representatives from the head of Pattalikang village, the Regional Disaster Management Agency, the Social Service, the Agricultural Service, the Public Works and Housing Agency, and Tagana Gowa Regency. The results showed that: (1) The socio-ecological vulnerability in Pattalikang Village was categorized as vulnerable based on the scoring and weighting of socio-ecological vulnerability factors; (2) Mitigation efforts carried out were planting vetiver in every landslide-prone point and training of disaster risk reduction for community; (3) The strategy used by the communities who are victims of landslides is consolidation and survival strategy as the strength point to rebuild the communities and improving livelihoods after disaster.

1. Introduction
A disaster is an incident or series of incidents that result in victims of human suffering, loss of property, damage to the environment, facilities and infrastructure, and will affect the food security in the region [1]. This is in line with Sudibyakto's opinion [2] and Hakim et al. [3], the result of a disaster is damage, loss, and harm, which can also be in the form of victims of life, property, damage to infrastructure, social environment, and disturbances to the system of life and community livelihoods that were previously established. Meanwhile, over the last three decades, the Loss and Damage (L&D) policy debate has emphasized climate crisis and emergency aspects [4]. Landslides are a type of natural disaster that causes casualties and property of residents. Basically, landslides are a process of balance disturbance, which results in the movement of soil and rock masses from higher to lower locations. According to Sari et al. [5], a landslide is the movement of slope-forming material in debris, rock, soil, or mixed materials moving down or out of the slope. Some of the factors that cause landslides naturally include the morphology of the earth's surface, lithology, soil, hillside, and rainfall [6], [7] also induced by climate change [8]. Climate change is leading to irreversible and existential impacts on vulnerable communities and countries across the globe [4]. One of the affected communities are farmers, in which it is affects livelihoods, with many farmers experiencing losses due to reduced productivity [8]. In addition, the factors that cause landslides can come from human activities, including land use and land conversion,
mining on the slopes of a hilly area, and/or highlands [9]. Therefore, it is necessary to be aware of landslides' occurrence, with measures to minimize the number of casualties and losses to the surrounding community.

According to DiBi BNPB [10], Although the frequency of landslides in Indonesia has decreased recently, it is still the most frequent natural disaster and takes many victims. In 2017, there were 846 incidents; in 2018, there were 473 incidents; and in 2019, there were 340 incidents. Geographically, the landslides in Eastern Indonesia with the highest trend was South Sulawesi, Papua, South Kalimantan, and North Sulawesi, respectively.

According to the Head of the Center for Data, Information and Public Relations of BNPB, Sutopo Purwo Nugroho, in an interview with VoA Indonesia, landslide-prone areas in Indonesia are evenly spread throughout Indonesia, especially in the highlands [11]. Gowa Regency is one of the districts in South Sulawesi Province with an area that is mostly in the form of hilly highlands, which is around 72.26% covering 9 (nine) districts: Parangloe, Tinggimoncong, Buttono Pao, Parigi, Bungaya Districts, and Manuju [12]. Manuju District is a landslide-prone area in Gowa Regency. In the incidents of a landslide disaster in 2019, Manuju District, to be precise in Pattalikang Village, was recorded as the most deaths area. Dozens of people, houses, and several public facilities were buried. The BPBD of South Sulawesi Province noted that if there were 30 people died, 17 others were injured, and there were 611 houses affected in this landslide incident. Even the main bridge as transportation access was severely damaged (cut off), causing the Pattalikang Village to be isolated.

Several factors can cause landslides to occur, not only due to natural environmental factors but also by the cultural environment, such as changes in land use and the community's social conditions, which are alleged to be the factors causing landslides. Land use that is not suitable can make landslide disaster-prone to increasing [13]. There is a system to adapt or change to achieve or maintain the level of function and structure that is acceptable in the community that is potentially exposed to the hazard, called capacity. Capacity is one of the factors that determine disaster risk [5]. The use of hilly land planted with horticultural crops such as vegetables and fruits that do not have strong roots is found in Pattalikang village. Apart from that, the Governor of South Sulawesi, Nurdin Abdullah, also said that forest encroachment and illegal mining activities are often carried out in the area [14], [15]. This makes Pattalikang village even more vulnerable to landslides.

The landslide incident certainly has consequences on the lives of the affected people. Disaster can also affect the social and economic resilience of the community, which based on UNISDR in 2012 divided into political-institutional, social, environmental and regional economies [16]. According to Abdurrahim [17], Some research results from previous research on livelihood frameworks are summarized from Chambers and Conway [18], Scoones [19], Carney [20], and Ellis [21] those rural communities in areas with high levels of ecological vulnerability are required to adapt to pressures and shocks and are expected to be able to maintain their livelihood assets by implementing various livelihood strategies that are deemed capable of ensuring their lives and future generations.

This landslide disaster made the people of Pattalikang Village have to start their lives again from scratch. This is due to buried settlements, several village public facilities, and agricultural lands and plantations of residents that greatly affected their lives after the disaster occurred. This incident can also clearly lead to vulnerability to national security. National security has four main elements: national defense, state security, public order, and human security.

Sudarsono in Mukhtar [22] conveyed his thoughts on the national security system where state defense is the function of state government in facing threats from abroad in the context of upholding the nation's sovereignty, safety, honor, and integrity of the Republic of Indonesia, while state security is the function of state government in facing domestic threats, then public order is the function of state government in maintaining and restoring safety, security and public order through law enforcement, protection, protection, and public services. As for human security, it is the state government's function to uphold citizens' basic rights.

Therefore, following the points written in UNDP, human security is the basis of national security where national security produces and creates a sense of security, including a sense of comfort, peace,
serenity, and order. Thus, the following discussion is expected to present research that, in general, aims to assess socio-ecological vulnerability, disaster mitigation efforts, and strategies to improve the livelihoods of landslide victims in Pattalikang Village Manuju District, Gowa Regency.

2. Research Method
This research uses a qualitative approach with a descriptive-analytic method. The descriptive-analytical method is a method that functions to describe or provide an overview of the object under study through data or samples that have been collected as is without analyzing and making generally accepted conclusions [23]. This research was conducted in Pattalikang Village, Manuju District, Gowa Regency, South Sulawesi Province. The research subjects were selected using purposive sampling. The informants in this study were determined using the snowball technique and adjusted to their information needs according to the desired data saturation. To be able to obtain data holistically and integratively, data collection in this study uses three techniques offered by Bogdon [24], namely in-depth interviews (in-depth interviews), participant observation, and study documents. In this study, researchers used two triangulations: triangulation of data sources by conducting in-depth interviews and triangulation of techniques/methods. Following Faisal's statement, this is to achieve the credibility standard of research results, at least use triangulation of methods and triangulation of data sources [25]. In this study, researchers also used the data analysis model proposed by Miles, Huberman, and Saldana [26], namely data collection, data condensation, data display, and drawing a conclusion.

3. Result and Discussion

3.1 The Socio-Ecological Vulnerability of Pattalikang Village to Landslides
To determine socio-ecological vulnerability, researchers used weighting and scoring in determining the factors of vulnerability. The description of the conditions based on each factor and the scoring is described in Table 1.

| Dimensions          | Vulnerability Factors     | Condition Description                                                                 | Score |
|---------------------|---------------------------|---------------------------------------------------------------------------------------|-------|
| Human and Population| Education Level           | Most of the family heads in Pattalikang Village graduated from elementary school       | 4     |
|                     | Health Status             | There are health workers in Pattalikang Village but still with minimal health facilities | 2     |
|                     | Birth Rate                | The population continues to increase. It can be seen from the data that the birth rate has increased every year | 3     |
|                     | Death Rate                | The death rate is low. Because Pattalikang Village already has health personnel and health facilities | 1     |
| Physical and Building| Risky house building      | All parts of the house under the landslide area are buried by the ground. There is only one house that leaves the kitchen not buried by landslide. | 4     |
|                     | Availability of Facilities| Pattalikang Village already has facilities and infrastructure, education, transportation, electricity, and others. | 2     |
|                     | Supporting capacity       | The location of people's residence is right on the edge of the cliff. Limited flat area in Pattalikang Village | 3     |
Dimensions | Vulnerability Factors | Condition Description | Score
---|---|---|---
Social | Poverty | Society is arguably a little poor. Because the majority of houses around the avalanche area are cement floored, they have a toilet with enough house area for all family members. The average community also has assets. | 1
Social capital | | People living in Pattalikang Village are relatives or family. The relationship causes every decision taken always involves the entire social group. | 3
Accessibility | | Pattalikang village is accessible by land route. The road to Pattalikang Village is fairly good and smooth | 1
Economy | Dependence on natural resources | Most of the people in Pattalikang village work as farmers or planters. So that people's lives are quite dependent on farming | 3
Agricultural productivity | In general, agricultural productivity has been in line with capacity. | 2
Alternative livelihoods | People in Pattalikang Village generally only work as farmers. | 4
Nature and environment | Slope | Based on the Final Report of RP12-JM Gowa Regency Year 2015-2019, Pattalikang Village is included in an area with a very steep slope | 4
Deforestation | Most of the land that was supposed to serve as a forest was converted as a place to live. | 3
Land use | Along the way in Pattalikang Village, the plants seen on the slopes are crops in the form of corn, bananas, and lemongrass. Some are also seen planted with brown trees that are no longer producing | 4

After that, calculation and vulnerability results are carried out by weighting according to Table 2 as follows.

**Table 2. Vulnerability Assessment Calculations and Results**

| Dimensions | Vulnerability Factor | Skor x Bobot | Nilai |
|---|---|---|---|
| Humans & Populations | Education Level | 4 x 0,05 | 0,20 |
| | Health Status | 2 x 0,05 | 0,10 |
| | Birth Rate | 3 x 0,05 | 0,15 |
| | Death Rate | 1 x 0,05 | 0,05 |
| Physical and Building | Risky House Building | 4 x 0,08 | 0,32 |
| | Facility Availability | 2 x 0,06 | 0,12 |
| | Supporting Capacity | 3 x 0,06 | 0,18 |
| Social | Poverty | 1 x 0,08 | 0,08 |
| | Social Capital | 3 x 0,06 | 0,18 |
| | Accessibility | 1 x 0,06 | 0,06 |
| Economy | Dependency on natural Resources | 3 x 0,08 | 0,24 |
| | Agricultural Productivity | 2 x 0,06 | 0,12 |
| | Alternative Livelihoods | 4 x 0,06 | 0,24 |
| Nature | Slope | 4 x 0,08 | 0,32 |
Deforestation  
Land Use  
Total Score  

Based on the calculation and results of vulnerability assessment in Pattalikang Village in Table 2, a total value of 2.78 indicates that Pattalikang Village belongs to the vulnerable category. Where the population is largely unable to deal with the threat of disaster. Judging by each dimension, each dimension has a vulnerability factor with a diverse score. In the human dimension and population, education level is the factor with the highest score, which is 4 (four). This indicates that the level of education is strongly related to vulnerability to disasters. Because a person with a high level of education can be indicated to choose a safe place to live from disaster-prone areas and have the ability to anticipate disasters.

The next dimensions are physical and building. The house building factor is at risk of having a 4 (four) score, which means it is very vulnerable in Pattalikang Village. This factor is the most visible and measurable physical vulnerability. Therefore, the shape and position of the house determine its condition when a disaster occurs. In addition, most of the fatalities in each disaster result from a lack or even lack of development planning. Whereas in the construction of buildings, in accordance with the mandate of the Building Law No. 28 of 2002, the Ministry of Pupr has emphasized the importance of fulfilling the requirements of building reliability, especially aspects of safety, comfort, health, convenience, and the security of the building and its environment. This gives an idea that each development site should have aspects that suit its environment. But what happened in Pattalikang Village is that the existence of a house building located right on the cliff is not in accordance with the construction. The urgency to increase in resilience and encourage compliance with security standards by implementing the indicators of incentives and penalties. However, the lack of commitment among stakeholders disaster caused the indicator less than optimal [16].

Then in the social dimension, the social capital factor has a score of 3 (three), which is also the highest score among other vulnerability factors in the social dimension. Furthermore, in the economic dimension, the highest score factor is the alternative factor of livelihood. This is because the majority of people in Pattalikang village have only one livelihood and have no other alternative. People who do not have alternative livelihoods we assume as a less established society. So it is the same as that stated by Macchi in Himbanwan [27] that a person whose livelihood is well established his condition is not vulnerable compared to those whose work is not yet established. This is because people with established groups will be better able to anticipate or mitigate disasters.

The last dimension in weighting and scoring the vulnerability factor is the natural dimension. Natural dimension has 2 (two) vulnerability factors with a score of 4 (four) in the field assessment, namely slope and land use. Pattalikang village is included in the district of Manuju. Based on the Final Report of RP12-JM Gowa Regency year 2015-2019 (2019), there are eight districts that are highlands: Parangloe, Manuju, Tinggi Moncong, Tombolo Pao, Bungaya, Bontolmpangan, Tompo Bulu, and Biring Bulu. Kemiringin slopes manuju district is estimated at 0-40 degrees.

Pattalikang village, as previously stated, is in the highlands with a fairly steep level of slopes. This makes, land use in Pattalikang Village must be in accordance with the procedure. Be it planted plants or the establishment of buildings. From the field review results, most of the cliffs are planted by trees that are far away, causing land openings, banana trees, and lemongrass plants.

On the other hand, most people's livelihoods are as maize farmers, so the land in Pattalikang Village is mostly planted with corn. In addition, the establishment of buildings right on the edge of the cliffs resulted in erosion-prone when rainfall is high. This is in line with Karnawati[28], stating that land use can be a controlling factor of land movement and can make Land movement risk increase because it affects land cover. Land cover in the form of forest crops will reduce erosion. Land cover in settlements, rice fields, and ponds will be prone to erosion. Especially with the land that is without cover.
3.2 Mitigation Efforts

Mitigation is an activity carried out before a disaster as an effort to reduce risks and prevent the impacts that arise. Furthermore, by creating a safe condition, which intensified the movement of disaster risk reduction, the strategy to reduce the disaster risk can be done [5]. In order to make the Disaster risk reduction more effective and useful, both innovative products and approaches are necessary, which approaches and frameworks can lead to changes and influences on people's thinking and behaviour [29].

In Law No.24 of 2007 on Disaster Management, mitigation can be done through physical development as well as awareness and improvement of disaster management capabilities. Although Pattalikang Village is morphologically a village with landslide-prone conditions due to the high slope level, the Regional Disaster Management Agency (BPBD) Gowa Regency has never previously held socialization or counseling related to landslide disasters to local communities before the landslide disaster in 2019.

The landslide disaster in early 2019 in Pattalikang Village surprised many. This is because similar incidents have never happened in their area. However, this landslide disaster event should be an alarm for the community and the government that this disaster could happen again in the region or in other regions with morphology and the same state of the region because natural disasters are repetitive. This opinion has also been expressed by Robert Meyer and Howard Kunreuther [30] that in observation, history must be prone to repeating itself, and perhaps nothing is more true than a disaster. In order to provide more effective responses and building disaster-resilient societies, the development of localized innovations by conduct a survey among representatives of academia, practitioners, the private sector, and the government collect information on the most effective and useful innovations will reduce the disaster risk in the future [29].

Therefore, a quick and appropriate step is needed from the government. So, in the incident of a landslide disaster, it can minimize the impact and risk. Inadequate involvement or encouragement of the government in preparing vulnerable communities causes community’s readiness to effectively respond upon receiving early warning for disaster is limited [31]. Landslide disaster is related to the human soul and material, property, and people's livelihood. So that if there is a repeat of the disaster can make the community get up and start over. Ferris, Petz, and Stark [32] have a similar view, that repeated natural disasters contribute to poverty as much as damaging material goods and draining social capital. Based on the research results in Pattalikang Village, data obtained from interviews and observations that after the landslide occurred, the local government carried out various mitigation activities. Among them is the planting of vetiver or fragrant root crops. Fragrant root crops are bioengineering soils in plant-based technology that serve to overcome problems regarding soil surface and erosion of river slopes [33].

The selection of fragrant roots is one of the government's mitigation measures because the fragrant roots are signaled to have roots as strong as steel with a depth of up to two meters underground. In addition, fragrant roots can also grow in decades with little or no care. This is in accordance with the stated by Sittadewi [34] that the fragrant root has a deep root penetration system and has the ability to bind good soil and can live in various types of soil. The way fragrant roots work to withstand the rate of water and erosion material is to form a dense living fence when they are planted at close range, thus reducing the flow speed. But although fragrant roots are considered to be a solution plant for landslide prevention, Supriyanto, a senior plant researcher at the Southeast Asian Region Centre for Tropical Biology (SEAMEO BIOTROP), expressed his opinion that although fragrant roots can be used as a buffer plant to avoid avalanches, tree planting remains a better option for the long term in an avalanche-prone area [35].

In addition to fragrant root planting activities, the government also implements mitigations that are non-structural such as socialization to the affected communities. This implementation has basically been carried out by the government in this case handled by the BPBD Gowa regency after the disaster occurred, but from the BPBD got some obstacles that caused the activity did not run to the maximum, namely: (1) The quality and quantity of human resources are inadequate. The number of members available in BPBD Gowa regency is considered insufficient and capable of conducting socialization/counseling/disaster simulation/forming a volunteer forum on disasters, in this case, landslide disaster. Based on the results of previous interviews, the disaster community (Destana) in
Gowa regency was only formed in two villages, namely in Bili-bili Village, Bontomarannu SubDistrict, and Panakkukang Village, Pallangga District. (2) Low knowledge and apathy of society. The landslide disaster in Pattalikang Village is a new thing for them, so the knowledge of the community related to landslide disaster is still relatively minimal. (3) There are no evacuation signs available. The existence of these evacuation signs is important because its existence can provide guidance to the community in order to get to a safe location in the event of a disaster or other emergency. So, it can increase the awareness and concern of people who are in disaster-prone areas.

3.3 Livelihood Improvement Strategies in a National Security Perspective

A catastrophic event always leaves wounds and sorrows for every survivor. But efforts to rise from the downturn must be made to be able to continue living. The landslide disaster that hit the community in Pattalikang Village did swallow a huge loss. There were 20 houses severely damaged and 21 fatalities, causing survivors and affected communities to need strategies to be able to rebuild their livelihoods. Based on the research results in the field, people who are victims of landslide disasters have one main capital in improving their lives, namely spirit. The spirit to be able to rise again and move on is the strength of the people in Pattalikang Village so that little by little, they can get out of their downfall from the landslide disaster in 2019. This is in line with Bastaman's view [36] that after facing suffering and tragic experiences, self-understanding and discovery of life's meaning will arise even if it has to go through several stages first. But in the end, the spirit of life and passion will increase, then will consciously commit themselves to do various activities that are more directed.

In the early days of disasters, all community activities, activities, and productivity were hampered and even stopped completely. So that in those times, the government took a role to help the people, victims of landslide disasters, in order to survive by providing assistance in the form of fulfillment of basic needs to the compensation of heirs. This is stated in Regulation of the Minister of Social Affairs No. 4 of 2015 concerning Direct Assistance in the form of Cash for Disaster Victims that, in addition to meeting basic needs such as clean water and sanitation, food, clothing, and health, in landslide disasters, social assistance provided include house building materials, life insurance, temporary housing contents, and beneficiary compensation.

The subject of house building and temporary housing stuffing is also discussed in the Regulation of the Head of the National Disaster Management Agency No. 11 of 2008 concerning Guidelines for Rehabilitation and Reconstruction that the provision of community home improvement assistance is a form of assistance from the government as a stimulant to help the community repair their homes that have been damaged by the disaster in order to be re-inhabited. It is more clearly conveyed that the government assistance in the form of materials, components of the house, or money of the amount is determined based on the results of verification and evaluation of the level of damage to the house experienced. However, assistance in this form is not accepted by the landslide victims in Pattalikang Village even though their houses are flattened to the ground or only one part of the house remains. BPBD Gowa regency chose not to relocate the landslide disaster survivors and did not make permanent housing because of land constraints. The characteristic of the community that is considered to still have kinship between each other in Pattalikang Village also causes the community to be reluctant to move from landslide-prone areas in Pattalikang Village.

Nevertheless, BPBD Gowa regency, as the executor of rehabilitation after the landslide disaster in Pattalikang Village, continues to carry out its duties. It is to improve public infrastructure and facilities, namely houses of worship and streets covered by avalanches, social-psychological recovery by bringing in a team of psychologists from the Makassar State University (UNM) and Hasanuddin University (UNHAS), and health recovery. Although not all scopes of post-disaster rehabilitation carried out by BPBD Gowa regency, BPBD Gowa Regency has carried out the implementation of rehabilitation in accordance with Article 56, Government Regulation No. 21 of 2008 concerning Disaster Management that the scope of post-disaster rehabilitation implementation is carried out through activities: improvement of the disaster area environment, improvement of public infrastructure and facilities, provision of assistance for community home improvement, socio-psychological recovery, health
services, reconciliation and conflict resolution, social, economic and cultural recovery, restoration of security and order, restoration of government functions, and restoration of public service functions.

White [37] made groups of livelihood strategies into three groups: survival strategies, consolidation strategies, and accumulation strategies. However, most of the people who were victims of the landslide disaster in Pattalikang Village used the survival strategy as a strategy of their livelihoods at the beginning of the disaster. Survival strategy is a strategy carried out by communities that process limited natural resources, just to simply continue living without saving or just venture capital[38].

In the process of surviving post-disaster, they rely on help from social services and volunteers. After that, they carried out their respective defense strategies, both by controlling income and expenses, reducing expenses, and receiving financial assistance in this case in the form of beneficiary compensation provided by the Gowa Regency Social Service. Compensation of heirs by some families who are left behind is used to rebuild his house, repair the graves of his family who were victims of the disaster, or used as a living fund for them because the land suitable for planting is still not able to be planted.

Through more than a year after the landslide occurred, the people of Pattalikang Village have slowly been able to be more stable in survival. So, his strategy began to turn into a consolidation strategy. Consolidation strategy is a strategy carried out by households and meeting the basic needs of households and set aside as their income to save. This strategy is carried out by the people of Pattalikang Village in a way that is: (1). Utilization of the yard, as a solution to meet the needs that can not only be met if farming corn alone, the community victims of landslide disaster in Pattalikang Village also plant the yard with lemongrass, chili, bananas, or other crops. This plant fills almost the entire yard, which will then be sold in the market or to the steamer. This becomes an alternative plant chosen by the community because of its care that does not require a great effort but still has a selling value. (2) Transmigration and meeting the needs of transmigration are also carried out by the landslide victims in Pattalikang Village to eliminate the trauma of landslide disaster events. Some people choose to migrate to Malaysia as TKI / TKW. This is considered to be able to improve their lives. This thought is in line with what Saleh stated [38] that a person will move from an area with a lower benefit value to an area with a higher benefit value.

Each choice of livelihood improvement strategy undertaken by the landslide victims in Pattalikang Village aims to provide comfort and safety for themselves in continuing their lives. People's resurgence in Pattalikang Village is solely to avoid chronic threats such as hunger, disease, depression, and other life disorders. The government has performed its obligations in providing security for victims of landslide disasters by fulfilling basic rights as citizens that include safety both from physical threats, achieving a good quality of life, guaranteeing human rights, but communities as victims of landslide disasters have the most important role in rebuilding their civilization.

4. Conclusion

Based on the description of the results of the research and discussion above, it can be concluded that Pattalikang Village is included in the area that is vulnerable to landslides. This is based on the calculation of vulnerability by multiplying the score by each weight and then summed cumulatively, then obtained a total value of 2.78. Following up on the landslide disaster in Pattalikang Village, the government, in cooperation with business institutions and local communities, has made various efforts in the mitigation of landslide disasters. The efforts that have been made are; 1) Planting fragrant roots by all levels of government at landslide-prone points in Gowa Regency, especially in Pattalikang Village as an area affected by landslides, 2) Socializing to people affected by landslides and people living in landslide-prone areas. However, in the implementation of this mitigation effort, the government, which in this case is commanded by BPBD Gowa Regency, has some constraints in its implementation. Among them are 1) Inadequate quality and quantity of human resources, 2) Low knowledge and the tendency of apathy from the community, 3) The unavailability of evacuation signs.

Although the landslide disaster resulted in a loss of life and material losses, the survivors of the landslide still had to continue their lives. Little by little, the survivors can rise because of their strength,
which is the spirit to move on. In the phase of their rise from the landslide disaster, the victims gradually improved their livelihoods: survival strategies and consolidation strategies. In addition, assistance from the local government to the central government (Ministry of Social Affairs) in ensuring their lives at the beginning of the landslide disaster made them able to survive until now. This gives an idea that in the perspective of national security, disaster management is a civil affair with the government's holder of responsibility. The government has performed its obligations in providing security for landslide victims by fulfilling basic rights as citizens that include safety from physical threats, the achievement of post-disaster quality of life, and guarantees of human rights.

References

[1] D. A. Puspito Sari, I. Listiyowati, T. Nefianto, and Lasmono, “The Discrepancy between The Programs and Disaster Management Policy in Klapanunggal District, Bogor, West Java,” IOP Conf. Ser. Earth Environ. Sci., vol. 135, p. 012011, Mar. 2018.

[2] H. . Sudibyakto, Manajemen Bencana di Indonesia Ke Mana. 2011.

[3] F. A. Hakim, J. Banjarmahor, R. S. Purwanto, H. K. Rahmat, and I. D. K. K. Widana, “Pengelolaan obyek pariwisata menghadapi potensi bencana di Balikpapan sebagai penyangga ibukota negara baru,” Nusant. J. Ilmu Pengetah. Sos., vol. 7, no. 3, pp. 607–612, 2020.

[4] R. Mechler et al., “Loss and Damage and limits to adaptation: recent IPCC insights and implications for climate science and policy,” Sustain. Sci., vol. 15, no. 4, pp. 1245–1251, 2020.

[5] D. A. P. Sari, S. Innaqa, and S. Safrilah, “Haz ard, Vulnerability and Capacity Mapping for Landslides Risk Analysis using Geographic Information System (GIS),” IOP Conf. Ser. Mater. Sci. Eng., vol. 209, no. 1, p. 01206, 2017.

[6] D. J. Varnes, Landslide Hazard Zonation: A Review of Principle and Practice. Paris: UNESCO, 1984.

[7] G. I. Tejakusuma, “Ancaman Bencana Longsor,” Alami, vol. 12, no. 2, pp. 72–75, 2007.

[8] D. A. P. Sari, F. Falatehan, D. S. Irawan, G. Sedana, and R. Rahim, “Mitigation and Adaptation Analysis of the Climate Change Impact Using Sustainable Livelihood Model,” Int. J. Eng. Technol., vol. 7, no. 2.5, pp. 108–114, 2018.

[9] H. K. Rahmat, H. Pratikno, F. A. I. Gustaman, and D. Dirhamisyah, “Perspesi Risiko dan Kesiaapiagaan Rumah Tangga dalam Menghadapi Bencana Tanah Longsor di Kecamatan Sukaraja Kabupaten Bogor,” SOSIOHUMANIORA J. Ilm. Ilmu Sos. dan Hum., vol. 6, no. 2, pp. 25–31, 2020.

[10] DiBi, Tren Kejadian Bencana 10 Tahun Terakhir. Jakarta: BNPB, 2019.

[11] F. Wardah, “BNPB: 40,9 Juta Warga Indonesia Tinggal di Daerah Rawan Longsor,” VoaIndonesia.com, 2019.

[12] “Profil Kabupaten Gowa,” 2018.

[13] S. Ritohardoyo, Inventarisasi Permukiman Rawan Kabupaten Banjar-negara Propinsi Jawa Tengah Patrawidiya. Yogyakarta: Fakultas Geografi Universitas Gadjah Mada, 2015.

[14] A. Haq, “Satu Dusun di Gowa Diterjang Longsor, 20 Orang Hilang,” Kompas.com, 2019.

[15] A. Haq, “Gubernur Sulsel: Tambang Liar Punya Andil Besar Longsor Gowa,” Kompas.com, 2019.

[16] D. A. P. Sari, F. Rumambi, and R. Nurmasari, “Social Economic Resilience in Facing Land and Forest Fire Disaster (Case Study in South Sumatra Province),” J. Terap. Manaj. Dan Bisnis, vol. 4, no. 1, p. 10, 2019.

[17] A. Y. Abdurrahim, “Kerentanan Ekologi dan Strategi Penghidupan Pertanian Masyarakat Desa Persawahan Tadah Hujan di Pantura Indramayu,” J. Kependud. Indones., vol. 9, no. 1, p. 25, 2014.

[18] C. Chambers and C. Conway, “Sustainable Rural: Practical Concepts for The 21st Century,” in IDS Discussion Paper 296, Brighton: IDS, 1991.

[19] I. Scoones, “Sustainable Rural Livelihoods: Framework for Analysis,” in IDS Working Paper 72, Sussex: IDS, 1998.
[20] D. Carney, *Sustainable Rural Livelihoods: What contribution can we make?* London: DFID, 1998.

[21] F. Ellis, *Household Strategies and Diversity in Developing Countries.* Oxford: Oxford University Press, 2000.

[22] S. Mukhtar, “Keamanan Nasional: Antara Teori dan Prakteknya di Indonesia,” *Sociae Polites*, 2011.

[23] S. Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, dan R&D.* Bandung: Alfabeta, 2009.

[24] R. Bogdon, *Qualitative Research for Education: An Introduction to Theory and Methods.* Boston: Allyn and Bacon, 1998.

[25] S. Faisal, *Penelitian Kualitatif: Dasar-dasar dan Aplikasi.* Malang: YA3, 1992.

[26] M. B. Miles, A. M. Huberman, and J. Saldana, *Qualitative Data Analysis, A Methods Sourcebook.* USA: Sage Publications, 2014.

[27] G. Himbawan, “Penyebab Tetap Bermukimnya Masyarakat Di Kawasan Rawan Banjir Kelurahan Tanjung Agung Kota Bengkulu,” Universitas Dipenegoro Semarang, 2010.

[28] D. Karnawati, *Bencana Alam Gerakan Massa Tanah di Indonesia dan Upaya Penanggulangannya.* Yogyakarta: Jurusan Teknik Geologi FT UGM, 2005.

[29] T. Izumi, R. Shaw, R. Djalante, M. Ishiwatari, and T. Komino, “Disaster risk reduction and innovations,” *Prog. Disaster Sci.*, vol. 2, p. 100033, 2019.

[30] M. Robert and K. Howard, *Why We Underprepare For Disaster.* Pennysylvania: Wharton School Press, 2017.

[31] D. Perera, J. Agnihotri, O. Seidou, and R. Djalante, “Identifying societal challenges in flood early warning systems,” *Int. J. Disaster Risk Reduct.*, vol. 51, p. 101794, 2020.

[32] E. Ferris, D. Perz, and C. Stark, *The Year of Recurring Disasters: A Review of Natural Disaster In 2012.* London: The Brookings Institution London School of Economics Project On Internal Displacement, 2013.

[33] Anonim, “Soil Bioengineering For Upland Slope Stabilization,” in *Research Report Research Project WA-RD 491.1 Soil Bioengineering For Slope*, Washington State Transportation Center (TRAC) University of Washington, 2001.

[34] E. H. Sittadewi, “Peran Vegetasi Dalam Aplikasi Soil Bioengineering,” *J. Sains dan Teknol. Mitigasi Bencana*, vol. 12, no. 2, 2017.

[35] K. Katriana, “Vetiver Hanya Dapat Menahan Longsor Jangka Pendek,” *Antaranews.com*, 2020.

[36] H. D. Bastaman, *Meraih Hidup Bermakna Kisah Pribadi Dengan Pengalaman Tragis.* Jakarta: Paramedina, 1996.

[37] C. White, “Household Strategies: Their Conceptual Relevance and Analytical Scope in Social Research,” *J. Sociol.*, vol. 36, no. 2, pp. 275–292, 2002.

[38] S. E. Saleh, *Strategi Penghidupan Penduduk Sekitar Danau Limboto Provinsi Gorontalo.* Gorontalo: Universitas Negeri Gorontalo Press, 2014.