Bulletin of Engineering Science, Technology and Industry| ISSN(e): 3025-5821
Volumes 3 No. 2 (2025)

SWOT ANALYSIS OF REGIONAL RESILIENCE PLANNING: CASE STUDY OF MEDAN-BERASTAGI ROAD LANDSLIDE (PRAYER SPOT-SIBOLANGIT AND SIBOLANGIT -TONGKEH)

Feby Milanie[1], Abdiyanto[2], Adi Sabar Ginting[3], Hotler Tamba[4], Tony Sirait[5], Mhd. Ali Damanik[6], Anton Sahala Tua Banjarnahor[7], Daniel Horas Kristianto Siringoringo[8], Bety Zannatun[9]
[1,2,3,4,5,6,7,8,9] Universitas Pembangunan Panca Budi, Indonesia.
Email:denggal.lentik@gmail.com, hotlertamba@gmail.com, tonysiraitbro@gmail.com, ali_damanik@yahoo.com, banjanahoranton81@gmail.com, danielkristianto93@gmail.com, betyzannatun321@gmail.com

Received	: 27 February 2025	Published	: 07 May 2025
Revised	: 13 March 2025	DOI	: https://doi.org/10.59733/besti.v3i2.97
Accepted	: 28 March 2025	Publish Link	: https://bestijournal.org/index.php/go

Abstract

This study aims to analyze landslide disaster resilience planning on Jalan Medan-Berastagi using the SWOT approach. The research method used is a case study with data collection through interviews, observations, and documentation. The results of the study indicate that landslide resilience planning on Jalan Medan-Berastagi needs to consider strengths, weaknesses, opportunities, and threats. Planning strategies that can be formulated based on the SWOT analysis include increasing coordination between agencies, adequate budget allocation, utilization of technology, increasing public awareness, development control, and adjustment of spatial plans. SWOT analysis is an effective tool in landslide resilience planning. Landslide resilience planning for the Medan-Berastagi Road needs to take into account existing strengths, weaknesses, opportunities and threats. Planning strategies that can be formulated based on SWOT analysis include improving coordination between agencies, adequate budget allocation, utilization of technology, increasing public awareness, development control, and adjusting spatial plans. Local governments need to improve coordination between related agencies in handling landslides, and allocate adequate budget for landslide mitigation activities. The use of new technology for landslide monitoring and prediction also needs to be optimized, as well as increasing public awareness of landslide risks through socialization and education activities. Development control in landslide-prone areas needs to be tightened, as well as adjustments to regional spatial plans that are adaptive to landslide risks. In the context of identifying types of disaster threats and estimating their impact on the surrounding environment, a study conducted in Sukoharjo Village showed that disaster threats include flooding and household waste, while in Prambon Hamlet and Nitikan Hamlet, the main threat is landslides. The development of sustainable landslide mitigation infrastructure also needs to consider ecological aspects, by integrating nature-based solutions such as land cover vegetation and natural drainage systems. It is important to note that risk identification must be carried out comprehensively by involving a thorough understanding of the project scope, design and specification analysis, and consultation with related parties.(Tinambunan, 2024).

Keywords: ***SWOT Analysis and Regional Resilience Planning***

INTRODUCTION

Disaster Landslides are a serious threat to areas with steep topography and high rainfall, such as the Medan-Berastagi road (Sembahe-Sibolangit and Sibolangit-Tongkeh spots) (Saptawartono et al., 2024). This road is an important transportation route connecting Medan City with the Berastagi tourist area (Sembahe-Sibolangit and Sibolangit-Tongkeh spots), but it is also very vulnerable to landslides which can disrupt the economic and social activities of the community. Therefore, comprehensive and integrated regional resilience planning is essential to reduce the risk and impact of landslides in this region.(Fitriansyah et al., 2024) Regional resilience to disasters is the ability of a region to prevent, reduce, and recover from the impact of disasters effectively and efficiently. Regional resilience planning involves the process of identifying risks, developing mitigation and adaptation strategies, and implementing actions necessary to increase the region's capacity to deal with disasters. Effective regional resilience planning must be based on a deep understanding of regional characteristics, disaster-causing factors, and potential

impacts that may occur. SWOT analysis is a useful tool in strategic planning to identify internal and external factors that can influence the success of a program or policy.(Patel et al., 2024).

In the context of landslide resilience planning for the Medan-Berastagi Road (Sembahe-Sibolangit and Sibolangit-Tongkeh spots), SWOT analysis can be used to identify the strengths and weaknesses of the region in dealing with disasters, as well as opportunities and threats that may arise from the external environment. Regional resilience is becoming increasingly important in the context of climate change and increasing frequency of natural disasters. Indonesia, as an archipelagic country located on the Pacific Ring of Fire, has a high level of vulnerability to various types of disasters, including earthquakes, volcanic eruptions, floods, and landslides.(Maulana & Andriansyah, 2024).

Therefore, comprehensive regional resilience planning is a must to protect communities, infrastructure, and the environment from the adverse impacts of disasters. Disaster mitigation is a series of efforts to reduce disaster risk, with risk defined as the probability of harm or the expectation of death and property damage resulting from the interaction between disasters and vulnerability.(Maulana & Andriansyah, 2024). Regional resilience planning must consider various aspects, including disaster risk identification, vulnerability assessment, development of mitigation strategies, and increasing community capacity in dealing with disasters.(Rendrarini et al., 2024). Effective mitigation strategies require a thorough understanding of the characteristics of the area, including geological, hydrological, and socio-economic conditions.

The Medan-Berastagi road is a vital transportation route connecting Medan City with the Karo highlands, known for its agricultural and tourism potential. However, this area is also vulnerable to landslides, especially during the rainy season. Landslides can cause transportation disruptions, infrastructure damage, and even loss of life. Given the importance of this road to the economy and community mobility, regional resilience planning that focuses on landslide mitigation is crucial. For this reason, the application of SWOT analysis can be a very useful instrument. SWOT analysis is a strategic planning method used to evaluate internal and external factors that can affect the success of a project or organization. Internal factors include strengths and weaknesses, while external factors include opportunities and threats.

SWOT analysis provides a systematic framework for identifying and analyzing key factors relevant to regional resilience planning along the Medan-Berastagi Road. By understanding the existing strengths and weaknesses, as well as the opportunities and threats that may arise, stakeholders can develop more effective and sustainable mitigation strategies. The SWOT analysis method involves identifying internal strengths, internal weaknesses, external opportunities, and external threats relevant to an issue or project. Strengths are positive internal attributes that provide an advantage, while weaknesses are negative internal aspects that hinder progress. Opportunities are positive external factors that can be utilized to achieve goals, while threats are negative external factors that can hinder the achievement of goals.

It is important to note that SWOT analysis is not just a list of these factors, but also involves an in-depth analysis of how these factors interact and influence each other. Thus, SWOT analysis can help in formulating strategies that leverage strengths to seize opportunities, overcome weaknesses to avoid threats, or even turn threats into opportunities. Strategy evaluation plays an important role in measuring the success of policy implementation and achieving strategic goals.(Agusnawati et al., 2024). Strategy evaluation acts as a monitoring mechanism that ensures continuous fulfillment of quality standards, optimization of operational performance, and strengthening of competitiveness.(Agusnawati et al., 2024).

In the context of regional resilience planning along the Medan-Berastagi Road (Sembahe-Sibolangit and Sibolangit-Tongkeh spots), SWOT analysis can be used to identify strengths and weaknesses in the existing landslide risk management system, as well as opportunities to improve regional resilience and threats that need to be watched out for. SWOT analysis also allows stakeholders to prioritize the most effective and efficient mitigation actions, and to develop adequate contingency plans in the face of potential landslide disasters. This study uses a structured literature study method, with data obtained from relevant literature through a careful identification and selection process.(Agusnawati et al., 2024). In addition, in-depth analysis of various sources of information was conducted to ensure comprehensive and relevant data.

THEORETICAL REVIEW

2.1. Concept of Regional Resilience

Regional resilience is the ability of a region to prevent, reduce, and recover from the impacts of disasters quickly and efficiently. This concept encompasses various aspects, including physical, social, economic, and

OPEN ACCESS

environmental resilience. Physical resilience relates to disaster-resistant infrastructure and buildings, as well as effective early warning systems.

Social resilience includes the ability of communities to help each other and work together in the face of disasters, as well as the existence of adequate social support systems. Economic resilience relates to the ability of a region to maintain economic activity after a disaster, as well as the existence of economic diversification that reduces dependence on vulnerable sectors. Environmental resilience includes the ability of ecosystems to recover from the impacts of disasters, as well as the existence of sustainable natural resource management. Regional resilience can be improved through various efforts, including disaster-adaptive spatial planning, development of disaster-resistant infrastructure, increasing community awareness and capacity, and developing effective early warning systems.(Feri et al., 2024).

2.2. SWOT Analysis

SWOT analysis is a strategic analysis tool used to evaluate the internal and external factors that affect an organization or project.(Amalia et al., 2024). Internal factors include strengths and weaknesses, while external factors include opportunities and threats. Strengths are internal characteristics that provide a competitive advantage, while weaknesses are internal characteristics that hinder performance. Opportunities are favorable external conditions, while threats are unfavorable external conditions. The SWOT matrix is a visual tool that presents the results of a SWOT analysis in an easy-to-understand format. This matrix consists of four quadrants, namely the strengths-opportunities quadrant, the weaknesses-opportunities quadrant, the strengths-threats quadrant, and the weaknesses-threats quadrant. Each quadrant contains strategies that can be taken based on a combination of relevant internal and external factors.(Rashid, 2024). Strengths and weaknesses relate to the company's resources and capabilities, while opportunities and threats relate to the external industry environment.(Rashid, 2024). SWOT analysis helps identify strategic areas where a company can build a competitive advantage. By developing the right marketing strategy based on a thorough SWOT analysis, a company can improve its performance and achieve sustainable growth as per its target.(Haque et al., 2024). Especially when business competition in the world is getting tighter, and geopolitical shifts greatly affect geoeconomics, which has an impact on the national economy.(Haque et al., 2024).

2.3. Landslide on the Medan-Berastagi Road

Jalan Medan-Berastagi (spot sembahe-sibolangit and sibolangit-tongkeh) is a vital transportation route connecting Medan City with the Berastagi tourist area. This area has steep topography and high rainfall, making it prone to landslides. Landslides on Jalan Medan-Berastagi can cause transportation disruptions, economic losses, and even loss of life. Environmental damage is also a major concern, as it can affect the balance of the ecosystem and the quality of life of the surrounding community.(Mislan et al., 2024).

Several factors that caused the landslide on the Medan-Berastagi Road include changes in land use, deforestation, and uncontrolled development. Landslide mitigation efforts on the Medan-Berastagi Road have been carried out, such as the construction of retaining walls, drainage, and reforestation. The importance of comprehensive risk management was also highlighted, including regular monitoring of geological and hydrological conditions, as well as increasing public awareness of landslide risks and how to deal with them.

Photos of the Landslide on November 8, 2024

Publish by

A resident looks at a passenger bus that fell into a ravine due to a landslide in Sibolangit Village, Sibolangit District, Deli Serdang Regency on Thursday (11/8/2024). (KOMPAS.com/GOKLAS WISELY)

METHODOLOGY

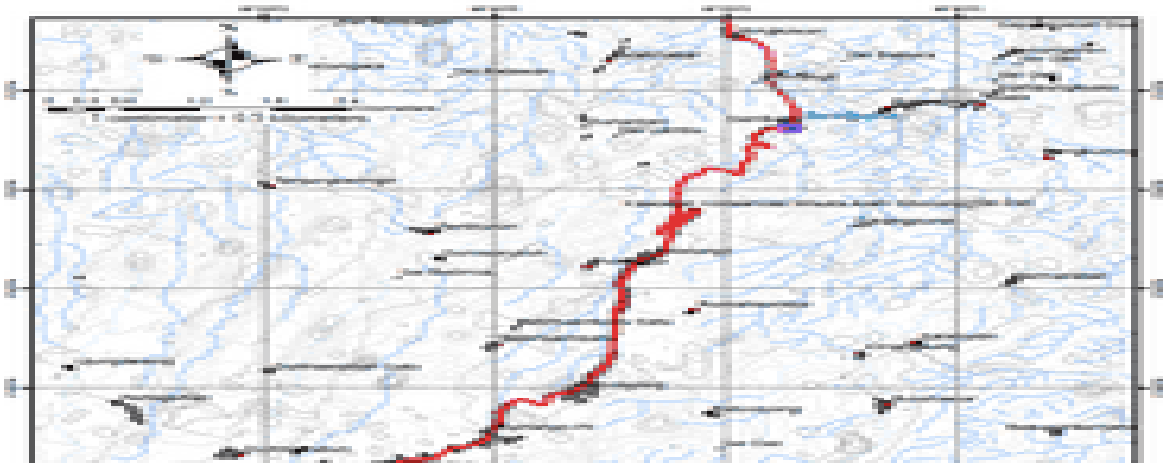
3.1. Research Methods

This research uses a case study method with a qualitative and quantitative approach.

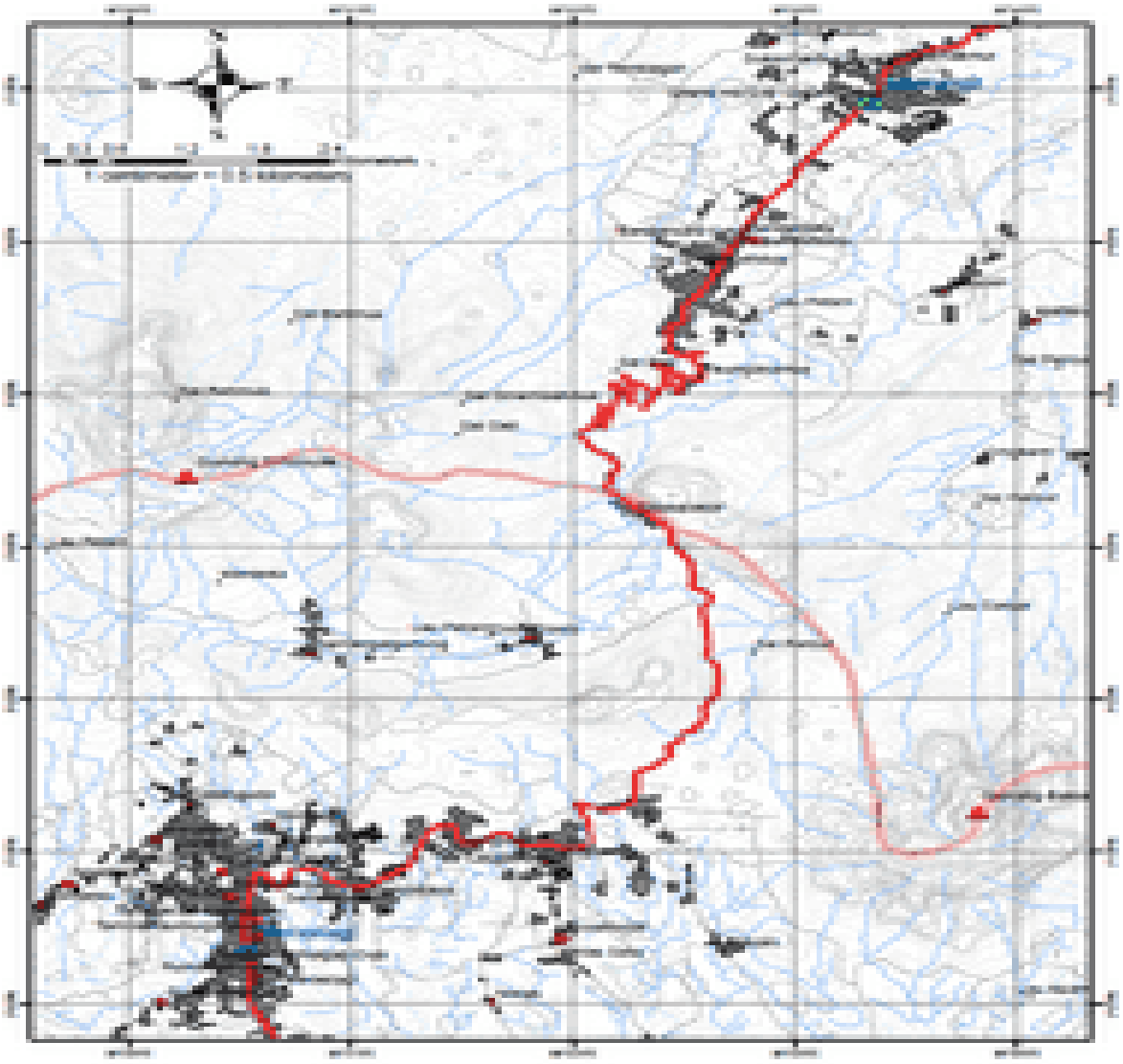
Data collection was conducted through in-depth interviews with various related parties, such as local governments, Regional Disaster Management Agencies, community leaders, and residents affected by landslides.

Image: Landslide-prone spots in the Medan-Berastagi road area (Sembahe-Sibolangit and Sibolangit-Tongkeh spots)

Field observations are conducted to observe the physical conditions of the area, infrastructure, and community activities that have the potential to influence landslide risk. Secondary data was collected from various sources, such as landslide incident reports, regional spatial plans, rainfall data, and previous studies on landslide disasters in this area. The collected data was analyzed using SWOT analysis to identify strengths, weaknesses, opportunities, and threats relevant to landslide resilience planning on the Medan-Berastagi Road. Qualitative analysis was conducted to interpret interview and observation data, and to formulate planning strategies appropriate to the regional context. Quantitative analysis was conducted to measure the level of landslide risk based on rainfall data, land slope, soil type, and other factors that affect slope stability. The results of the SWOT analysis are used as a basis for formulating policy recommendations and actions needed to increase regional resilience to landslide disasters. It is important to note that this study also considers social, economic and environmental aspects in regional resilience planning, and involves active participation of the community in the decision-making process.



Road Map Image: Sembahe – Sibolangit



Road Map Image: Sibolangit- Berastagi

3.2. Research Approach

The research approach used in this study is a qualitative approach with a case study method. The qualitative approach allows researchers to understand the landslide phenomenon of Jalan Medan-Berastagi (spot sembahe-sibolangit and sibolangit-tongkeh) in depth and comprehensively.

3.3. Data Collection Techniques

Data collection techniques used in this research include document studies, interviews, and observations.

a. Document Study: Data is collected from various relevant documents, such as research reports, government regulations, and statistical data.
b. Interviews: Interviews were conducted with various stakeholders, such as local government officials, geologists, local communities, and road users.
c. Observation: Observations were conducted at the research location to directly observe the physical and social conditions associated with landslides.

3.4. Data Analysis

Data analysis is carried out through several stages, namely data reduction, data presentation, and drawing conclusions.

Data reduction is done by selecting and focusing data that is relevant to the research objectives. Data presentation is done by presenting data in narrative and tabular form.

3.5. Data Validity

Data validity was tested using data triangulation.

Data triangulation is a research method used to increase the credibility and validity of research findings (Kumar, 2023). Data triangulation involves cross-checking information from multiple sources or using multiple methods to collect information and interpret results (Kumar, 2023). Data triangulation can be applied in a variety of fields, including social sciences and market research (Kumar, 2023).

The following is a description of how data triangulation works:

Multiple Data Sources: Researchers use multiple sources to collect information (Kumar, 2023). For example, using self-reported data and observed data (Data Triangulation, 2023).

Multiple Methods: This involves using a mix of qualitative and quantitative methods (Olsen et al., 2004). For example, surveys (quantitative data) and interviews (qualitative data) (Data Triangulation, 2023).

Purpose: The purpose is to validate data, verify findings, and identify inconsistencies in the data set (Donkoh, 2023). By comparing and contrasting different types of data, researchers can gain a more comprehensive understanding of the phenomenon being studied (Data Triangulation, 2023). It also helps identify bias and increase the validity of the study (Data Triangulation, 2023).

RESULTS AND DISCUSSION

4.1. Identification of SWOT Factors in Landslide Resilience Planning for the Medan-Berastagi Road (Sembahe-Sibolangit and Sibolangit-Tongkeh spots).

Strength

The Medan-Berastagi road area (Sembahe-Sibolangit and Sibolangit-Tongkeh spots) has several strengths that can support landslide resilience planning.

- ✓ First, there is a commitment from the local government to increase preparedness and handling of landslide disasters.
- ✓ Second, the existence of related institutions such as BPBD and the Public Works Department which have experience in handling landslide disasters.
- ✓ Third, there is support from local communities who have local knowledge about the characteristics of the area and the potential risk of landslides.
- ✓ Fourth, the availability of data and information about previous landslide events that can be used as a basis for mitigation planning.
- ✓ Fifth, the potential of natural resources that can be utilized for slope stabilization, such as land cover vegetation and local materials.
- ✓ Sixth, there is support from local government in landslide mitigation efforts.
- ✓ Seventh, the availability of adequate natural resources for the development of landslide mitigation infrastructure.

Weakness

OPEN ACCESS

On the other hand, this area also has several weaknesses that need to be addressed in landslide resilience planning.

- ✓ First, limited budget and human resources trained in handling landslide disasters.
- ✓ Second, the lack of coordination between related agencies in planning and implementing landslide mitigation programs.
- ✓ Third, low public awareness of landslide risks and the preventive measures that need to be taken.
- ✓ Fourth, damage to road and drainage infrastructure worsens slope conditions and increases the risk of landslides.
- ✓ Fifth, uncontrolled changes in spatial planning and land conversion, which cause increased erosion and land degradation.
- ✓ Sixth, budget limitations for landslide mitigation activities.

Opportunity

There are several opportunities that can be utilized to increase the landslide resistance of the Medan-Berastagi Road area (Sembahe-Sibolangit and Sibolangit-Tongkeh spots).

- ✓ First, there is support from the central government and donor agencies for disaster management programs.
- ✓ Second, the development of information and communication technology that can be used for landslide early warning systems and dissemination of information to the public.
- ✓ Third, increasing public awareness about the importance of protecting the environment and reducing disaster risks.
- ✓ Fourth, the potential for collaboration with universities and research institutions to develop innovative landslide mitigation technology.
- ✓ Fifth, there is an opportunity to develop landslide mitigation-based ecotourism, which can increase community income and promote environmental awareness.
- ✓ Sixth, there is new technology that can be used to monitor and predict landslides.
- ✓ Seventh, increasing public awareness of landslide risks.

Threat

The Medan-Berastagi road area (Sembahe-Sibolangit and Sibolangit-Tongkeh spots) also faces several threats that could hinder efforts to increase landslide resilience in the area.

- ✓ First, climate change causes an increase in extreme rainfall and the frequency of landslides.
- ✓ Second, uncontrolled population growth and urbanization, which increases pressure on land and natural resources.
- ✓ Third, economic activities that damage the environment, such as illegal mining and clearing land for agriculture without paying attention to soil conservation.
- ✓ Fourth, lack of law enforcement against spatial planning violations and environmental destruction.
- ✓ Fifth, the social and economic vulnerability of communities to the impacts of landslides, which can worsen conditions of poverty and inequality.
- ✓ Uncontrolled development in landslide-prone areas.

Identification of internal and external factors, as outlined above, is a crucial step in a comprehensive SWOT analysis. Internal factors include strengths that can be leveraged to achieve regional resilience goals, as well as weaknesses that need to be addressed or minimized.(Feri et al., 2024).

External factors include opportunities that can be utilized to improve regional resilience, as well as threats that need to be anticipated and addressed. Multiple regression analysis can be used to measure the impact of these variables on the effectiveness of disaster response services.(Bangun & Widaningsih, 2024). By understanding these factors, the formulation of appropriate and effective strategies in regional resilience planning can be carried out.

4.2. SWOT Analysis in Landslide Resilience Planning for the Medan-Berastagi Road (Sembahe-Sibolangit and Sibolangit-Tongkeh spots).

Based on the identification of SWOT factors, a SWOT analysis was then carried out to formulate a landslide resilience planning strategy for the Medan-Berastagi Road (Sembahe-Sibolangit and Sibolangit-Tongkeh spots).

OPEN ACCESS

4.3. Landslide Resilience Planning Strategy for the Medan-Berastagi Road (Sembahe-Sibolangit and Sibolangit-Tongkeh spots) Based on SWOT Analysis

Based on the SWOT analysis, several landslide resilience planning strategies for the Medan-Berastagi Road (Sembahe-Sibolangit and Sibolangit-Tongkeh spots) can be formulated.

SO Strategy :

Utilize your strengths to seize existing opportunities.

For example, increasing the commitment of local governments and community support in utilizing funds from the central government to develop an information technology-based landslide early warning system.

WO Strategy:

Overcoming existing weaknesses to seize existing opportunities.

For example, improving coordination between related agencies and increasing public awareness in utilizing collaboration with universities to develop innovative landslide mitigation technology.

ST Strategy :

Utilize existing strengths to overcome existing threats.

For example, increasing local government commitment and community support in utilizing data and information about previous landslide incidents to enforce the law against spatial planning violations and environmental destruction.

WT Strategy :

Overcoming existing weaknesses to avoid existing threats. For example, increasing the budget and trained human resources and increasing public awareness in addressing climate change and uncontrolled population growth by implementing sustainable spatial planning and developing environmentally friendly agriculture. It is important to note that these strategies need to be implemented in an integrated and sustainable manner, and involve the active participation of all stakeholders.Local governments need to improve coordination between related agencies in handling landslides, and allocate adequate budget for landslide mitigation activities. The use of new technology for landslide monitoring and prediction also needs to be optimized, as well as increasing public awareness of landslide risks through socialization and education activities.(Utami et al., 2024). Development control in landslide-prone areas needs to be tightened, as well as adjustments to regional spatial plans that are adaptive to landslide risks.

One approach that can be implemented is the development of a community-based early warning system, which involves active participation of residents in monitoring and reporting potential landslides. The importance of building strong partnerships with various stakeholders, including the private sector, non-governmental organizations, and local communities, also needs to be emphasized.(Bigwanto et al., 2024). Through effective collaboration, diverse resources and expertise can be mobilized to achieve sustainable regional resilience goals. In the context of identifying the types of disaster threats and estimating their impact on the surrounding environment, a study conducted in Sukoharjo Village showed that disaster threats included flooding and household waste, while in Prambon Hamlet and Nitikan Hamlet, the main threat was landslides.(Rendrarini et al., 2024).

The development of sustainable landslide mitigation infrastructure also needs to consider ecological aspects, by integrating nature-based solutions such as land cover vegetation and natural drainage systems.

Photos of Documentation of Temporary Response to the Sembahe-Sibolangit Landslide Disaster:

OPEN ACCESS


BAHU JALAN
AMBLAS

CONCLUSION AND SUGGESTIONS

5.1. Research Conclusion

Based on the research results and discussion, it can be concluded that SWOT analysis is an effective tool in landslide resilience planning on the Medan-Berastagi Road (Sembahe-Sibolangit and Sibolangit-Tongkeh spots).

Based on the research results and discussion, the following conclusions can be drawn:

1. SWOT analysis can be used as an effective tool in landslide resilience planning for the Medan-Berastagi Road (Sembahe-Sibolangit and Sibolangit-Tongkeh spots).
2. SWOT factors that need to be considered in landslide resilience planning for the Medan-Berastagi Road (Sembahe-Sibolangit and Sibolangit-Tongkeh spots) include strengths, weaknesses, opportunities and threats.

5.2. Policy Implications

The results of this study have several policy implications, including:

1. Local governments need to improve coordination between related agencies in handling landslides.(Arifin et al., 2025).
2. Local governments need to allocate adequate budget for landslide mitigation activities.

5.3. Further Research Suggestions

Further research can be conducted using more quantitative methods to measure the impact of landslide resilience planning strategies on Jalan Medan-Berastagi (spots Sembahe-Sibolangit and Sibolangit-Tongkeh). Analysis and formulation of appropriate strategies will help in realizing areas that are more resilient to landslide disasters.(Sitompul, 2024). Optimizing the effectiveness of implementing an integrated dynamic archival information system requires facilitation of adequate infrastructure provision, strengthening technical capabilities for users, improving application business processes, improving system reliability, periodic and continuous control, and improving application security.(Utami et al., 2024).Although digitalization of public services can increase transparency, efficiency, and accessibility of services, further optimization is still needed.(Arifin et al., 2025). This indicates that the use of information technology in the public sector must be supported by sustainable investment in infrastructure, digital literacy training, and collaboration between regional apparatus organizations.(Arifin et al., 2025).

Notes:

OPEN ACCESS

To obtain in-depth analysis, it is recommended to use GIS software such as ArcGIS for risk mapping. Rainfall data can be obtained from BMKG Deli Serdang/Karo Station.

REFERENCES

Varnes, D. J.. Slope instability types and processes. Transportation Research Board, National Research Council. 1996.

Cruden, D. M.. Varnes, D. J.. Landslide types and processes. Landslides: Investigation and mitigation. 1996.

Highland, L. M.. Bobrowsky, P.. The landslide handbook—A guide to understanding landslides. Reston, VA: US Geological Survey. 2008.

Kompas.com/Goklas Wisely

BNPB. (2022). Laporan Risiko Bencana Indonesia. Jakarta.

BPBD Sumatera Utara. (2023). Data Kejadian Longsor di Kabupaten Karo dan Deli Serdang.

UNISDR. (2015). Sendai Framework for Disaster Risk Reduction.

Varnes, D.J. (1978). Slope Movement Types and Processes. Landslide Analysis.

Agusnawati, R., Nurfadillah, N., Wiradana, N., & Muktamar, A. (2024). Efektivitas Evaluasi Strategi dalam Manajemen Pengendalian Mutu Organisasi. Indonesian Journal of Innovation Multidisipliner Research, 2(1), 87. https://doi.org/10.69693/ijim.v2i1.148

Amalia, W. N., Kuswanti, A., & Tayibnapis, R. G. (2024). Analisis SWOT pada Teknologi Digital Pembangunan Berkelanjutan (Studi pada Aplikasi Rekosistem). Jurnal Teknologi Terapan G-Tech, 8(3), 1940. https://doi.org/10.33379/gtech.v8i3.4675

Arifin, Z., Subagja, I. K., & Hakim, A. (2025). Digital Governance: Studi Kasus Digitalisasi Pelayanan Publik Terpadu di Kabupaten Serang. Jurnal Sosial Teknologi, 5(1), 1105. https://doi.org/10.59188/jurnalsostech.v5i1.31861

Bangun, A., & Widaningsih, Rr. A. (2024). Pengaruh Sistem Teknologi Informasi, Komunikasi dan Partisipasi Komunitas Terhadap Efektivitas Pelayanan Tanggap Bencana (Studi kasus di BPBD Kota Semarang). Serat Acitya, 13(2), 166. https://doi.org/10.56444/sa.v13i2.2063

Bigwanto, A., Widayati, N., Wibowo, M. A., & Sari, E. M. (2024). Lean Construction: A Sustainability Operation for Government Projects. Sustainability, 16(8), 3386. https://doi.org/10.3390/su16083386

Feri, F., Murti, I., & Hariyoko, Y. (2024). Analisis Swot (Strengths, Weaknesses, Opportunities And Threats) Pada Peningkatan Pelayanan Transportasi Umum Di Surabaya. Praja Observer., 4(6), 63. https://doi.org/10.69957/praob.v4i06.1676

Fitriansyah, H., Ajrina, F. I., Caesar, M. Y., & Maulidya, H. A. (2024). Evaluasi Rencana Tata Ruang Wilayah Kota Pangkalpinang Tahun 2011-2030 Berdasarkan Sebaran Kerawanan Banjir. Specta Journal of Technology, 8(3), 197. https://doi.org/10.35718/specta.v8i3.1204

Haque, M. G., Yasir, M., Suradji, R., & Istianingsih, I. (2024). Benefits of SWOT Analysis in Marketing Strategy for Sustainable Business Management. Return Study of Management Economic and Bussines, 3(3). https://doi.org/10.57096/return.v3i3.218

Maulana, A., & Andriansyah, A. (2024). Mitigasi Bencana di Indonesia. Comserva Jurnal Penelitian Dan Pengabdian Masyarakat, 3(10), 3996. https://doi.org/10.59141/comserva.v3i10.1213

Mislan, M., Khoirunisa, N., Rahmiati, R., Djayus, D., & Supriyanto, S. (2024). Kajian Penggunaan Lahan dan Kondisi Topografi di Sub DAS Karang Mumus, Kota Samarinda. Jurnal Akuatiklestari, 7(2), 107. https://doi.org/10.31629/akuatiklestari.v7i2.6397

Patel, S. K., Nanda, A., Singh, G., & Patel, S. (2024). A review of disasters in Jammu and Kashmir, and Ladakh region in India [Review of A review of disasters in Jammu and Kashmir, and Ladakh region in India]. International Journal of Population Studies, 6(1), 69. https://doi.org/10.18063/ijps.v6i1.1180

Rashid, A. (2024). Untitled. https://doi.org/10.55277/researchhub.vq5dnd6h

Rendrarini, D., Fatmawati, L. E., Susila, C. B., Meifani, N. I., Sukadi, S., Tristono, T., & Susilo, H. (2024). Identifikasi Jenis Ancaman Bencana Dan Perkiraan Dampaknya Pada Lingkungan Sekitar. Jurnal Penelitian Dan Pengabdian Kepada Masyarakat Unsiq/Jurnal Penelitian Dan Pengabdian Kepada Masyarakat UNSIQ, 11(2), 93. https://doi.org/10.32699/ppkm.v11i2.6730

OPEN ACCESS

Saptawartono, S., Murati, F., Iashania, Y., & Wijaya, D. A. K. (2024). Dampak Negatif Kegiatan Penambangan Emas Tanpa Izin (Peti) Terhadap Lingkungan Dan Sosial-Ekonomi Masyarakat Di Provinsi Kalimantan Tengah. Jurnal Teknik Pertambangan., 24(2), 66. https://doi.org/10.36873/jtp.v24i2.13370

Sitompul, R. M. K. (2024). Analysis And Formulation of Marketing Strategies in Third Party Logistics (3pl) to Increase Sales. Jurnal Bisnis Strategi, 33(1), 19. https://doi.org/10.14710/jbs.33.1.19-24

Tinambunan, Y. (2024). Manajemen Risiko Dalam Proyek Konstruksi: Evaluasi Dan Pengembangan Model. 3(1), 10. https://doi.org/10.58471/jeami.v3i01.599

Utami, Y., Khairi, H., & Sartika, I. (2024). Efektivitas Penerapan Sistem Informasi Kearsipan Dinamis Terintegrasi di Pemerintah Kabupaten Kendal Provinsi Jawa Tengah. Action Research Literate, 8(4), 649. https://doi.org/10.46799/arl.v8i4.297