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Disaster Preparedness and Mitigation Training for Community Disaster-Preparedness Volunteers in Nagari Surantih, West Sumatra

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ABSTRACT

Disasters can have catastrophic effects on communities, particularly when residents are inadequately prepared to recognise hazards and respond effectively. Within the penta-helix framework, communities are key stakeholders in disaster preparedness. Community participation can be strengthened through community disaster-preparedness volunteers, locally referred to as cadres, who represent local needs and support preparedness and response activities. Capacity-building for these volunteers should include hazard recognition, self-rescue, first aid, and victim evacuation. This community engagement programme aimed to strengthen the capacity of disaster-preparedness groups to recognise hazards, perform self-rescue, provide emergency first aid, and evacuate victims. The pre- and post-training knowledge assessment showed a marked shift: responses classified as poor decreased from 80.0% to 17.3%, whereas responses classified as good increased from 20.0% to 82.7%. Effective disaster management requires well-trained community personnel and strong intersectoral coordination and communication through community-based networks. Continuous and recurrent training should therefore be incorporated into routine supervision and development, with subsequent programmes addressing more advanced and diverse competencies.

Keywords: community empowerment, community volunteers, disaster preparedness, flash floods, mitigation

INTRODUCTION

The world faces increasingly complex challenges from disasters and environmental change, whose frequency and intensity are increasing as a result of climate change. Disasters may also overlap, producing cumulative and cascading impacts (Sohrabizadeh et al., 2021). Although such events can disrupt systems and cause substantial losses, their effects can be reduced through effective preparedness and mitigation (Goniewicz et al., 2023). Preparedness, anticipation, and prevention are therefore essential interventions. Disasters and emergencies can place enormous pressure on infrastructure (Narayanan et al., 2020). Prepared communities are better able to protect critical infrastructure, maintain essential functions during and after an event, and support a timely emergency response (Khorram-Manesh et al., 2021).

Community-empowerment models for disaster risk reduction should be aligned with the needs of independent, community-based public health services. Disasters frequently generate health crises, including deaths, injuries, displacement, disease, shortages of clean water, inadequate sanitation, environmental health hazards, nutritional problems, mental health problems, and disruption of health services. Addressing these consequences requires serious, comprehensive, and multisectoral action. Understanding how local communities recognise and interpret hazards is an essential first step in developing a community-based disaster-mitigation system. Disaster risk can also be reduced by strengthening local capacity. Limited public understanding is one factor contributing to suboptimal mitigation; communities must therefore be prepared to reduce the risk of mass casualties. Community-based disaster education can strengthen resilience and local preparedness (Fu & Zhang, 2024). Within a penta-helix strategy, this approach includes the establishment of community disaster-preparedness volunteers, locally referred to as cadres.

Nagari Surantih is located in Sutera Subdistrict, Pesisir Selatan Regency, West Sumatra, and has a population of 9,428. It borders Lengayang Subdistrict and lies 38.7 km from the regency administrative centre (Pemerintah Nagari Surantih, n.d.). Nagari Surantih covers approximately 6.915 km², and many residents live along riverbanks that are vulnerable to flooding and landslides. It was among the nagari in Pesisir Selatan affected by floods and landslides on 7-8 March 2024, which caused 19 deaths, severely damaged 4,051 houses, and resulted in losses estimated at IDR 1 trillion (Hamzah, 2024).



(a)



(b)

Figure 1. (a) Houses affected by flooding and landslides, (b) the Universitas Andalas disaster-response team coordinating the assessment of post-disaster needs.

The severe consequences of these disasters highlight the need to strengthen mitigation and preparedness. Nagari Surantih has one disaster-preparedness group comprising eight members who represent the nagari at the regency level; however, the group has not yet effectively empowered the community to establish stronger flood- and landslide-preparedness systems. The nagari therefore needs an adequate number of local volunteers with appropriate competence in mitigation and preparedness planning. Following the recent floods and landslides, Nagari Surantih must evaluate and improve its readiness for recurrent events. Despite its high exposure to flooding and landslides, the community's preparedness and mitigation capacity remains limited. According to BPBD, floods occur frequently in Nagari Surantih, yet the nagari lacks an effective system for managing disaster-preparedness and mitigation planning.

Preparing communities for disasters through the establishment of local response teams is therefore essential. Strengthening these teams is also a practical, relatively low-cost strategy for reducing disaster-related harm. The existing eight-member group has

limited planning and implementation capacity and lacks the skills required to support family-level preparedness and mitigate the effects of floods and landslides. This limitation represents an ongoing threat because communities along the Batang Surantih River frequently experience flooding and river overflow. Periods of intense rainfall may trigger floods and landslides, leading to deaths, injuries, and material losses.



Figure 2. (a) Coordination with the Regional Disaster Management Agency (BPBD) on the post-flood response plan; (b) flood debris resulting from inadequate mitigation.

BPBD Pesisir Selatan, the partner organisation, identified a high risk of floods and landslides in Nagari Surantih alongside limited community capacity for preparedness planning and mitigation. The existing disaster-preparedness group comprises eight members who represent the nagari at the regency level; this coverage is inadequate for a population of 9,428 and the area's level of risk. The group also has limited capacity to develop flood- and landslide-preparedness plans. Members are not yet able to reliably recognise warning signs, conduct evacuation and rescue, provide first aid, or support affected residents after a disaster. Their capacity to disseminate preparedness information and select appropriate community-education methods is also limited.

METHOD

The following activities were implemented to address the priority issues identified with the partner:

Formation of Local Disaster-Preparedness Groups in Nagari Surantih

The primary intervention for strengthening flood- and landslide-preparedness planning in Nagari Surantih was the formation of local disaster-preparedness groups responsible for improving community readiness. Prospective members were recruited in accordance with the principles and standards of the National Disaster Management Agency (BNPB), with attention to commitment, active participation, gender equality, and inclusivity. The groups' responsibilities included capacity building; disseminating disaster-related information and education; and collaborating with relevant stakeholders to develop a stronger preparedness and mitigation system.

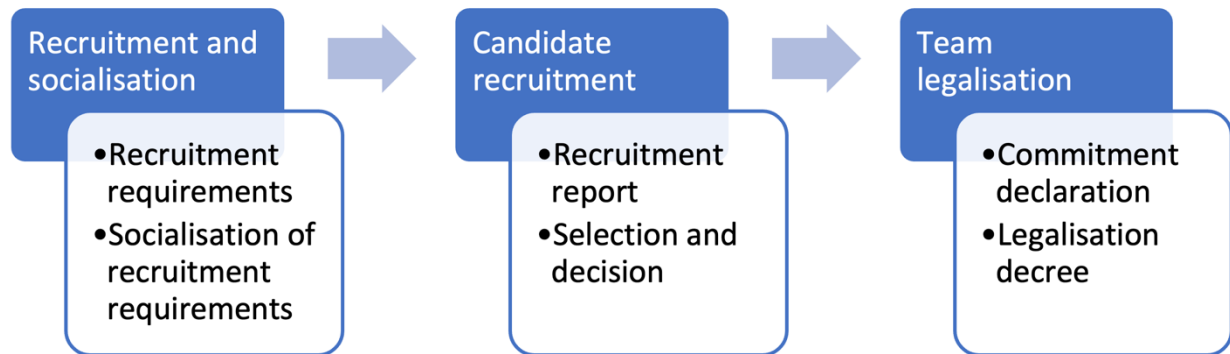


Figure 1. Process for establishing disaster-preparedness groups

Development of an Innovative Flood- and Landslide-Preparedness and Mitigation Model

To strengthen the capacity of disaster-preparedness groups established at the jorong, RW, and RT levels in Nagari Surantih, a flood- and landslide-preparedness model was implemented. The training covered hazard identification; assessment of flood and landslide risks; recognition of flash-flood and landslide warning signs; rescue and evacuation procedures; first aid for affected persons; and post-disaster impact management.

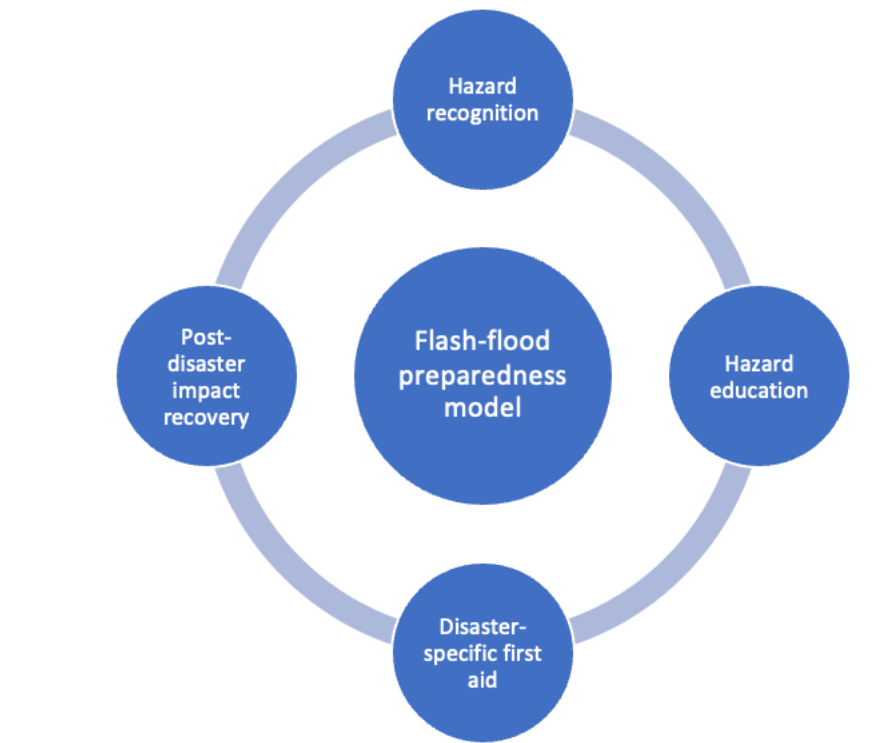


Figure 2. Flood- and landslide-preparedness model

Training in Methods for Community Education on Disaster Preparedness and Mitigation

The programme strengthened the groups' capacity to disseminate and communicate information about flood and landslide preparedness and mitigation through interactive approaches, including community-based disaster simulations.

Table 1. Target outputs

Intervention	Target outputs
Formation of community disaster-preparedness volunteer groups in Nagari Surantih	• A disaster-preparedness volunteer empowerment programme is available. • A formal decree (SK) establishing the volunteers is issued. • Consensus is reached on the volunteers' main duties and functions. • Volunteers participate in the empowerment programme. • The number of flood- and landslide-preparedness groups in the nagari increases.
Development of disaster-preparedness planning and flood- and landslide-mitigation capacity	• Volunteers participate in discussions on flood- and landslide-preparedness and mitigation planning. • Training is delivered on hazard identification, flood and landslide risk, and warning signs. • Rescue and evacuation procedures, first aid, and post-disaster response are simulated. • Volunteers participate in community surveillance for flood- and landslide preparedness and mitigation. • Capacity for flood- and landslide-preparedness planning and mitigation is improved.
Training in community-education methods for disaster preparedness and mitigation	• Groups can organise and plan community education on disaster preparedness and mitigation. • Volunteers conduct community-based simulations. • Community disaster-preparedness behaviour improves.

RESULTS AND DISCUSSION

Following the programme, outcomes were evaluated using participant characteristics and a pre- and post-training assessment of flash-flood-preparedness knowledge, as presented below:

Table 2. Participant characteristics

Characteristics	Frequency	Percentage (%)
Gender		
Female	5	20.9
Male	19	79.1
Employment status		
Employed	24	100.0
Unemployed	0	0.0

As shown in Table 2, most participants were male (79.1%), and all participants were employed (100%).



Figure 3. Presentation by a resource person from the Faculty of Nursing, Universitas Andalas

Table 3. Distribution of flash-flood-preparedness knowledge before and after training

Knowledge level	Before training		After training	
Category	Frequency	Percentage (%)	Frequency	Percentage (%)
Poor	120	80.0	26	17.3
Good	30	20.0	124	82.7
Total	150	100.0	150	100.0

Note. Frequencies are presented as recorded in the source dataset; each pre- and post-training distribution totals 150 responses.

The pre-training assessment contained 120 responses (80.0%) classified as poor and 30 (20.0%) classified as good. After training, 26 responses (17.3%) were classified as poor and 124 (82.7%) as good. Thus, the proportion of responses classified as good increased by 62.7 percentage points. These descriptive findings indicate a substantial improvement in flash-flood-preparedness knowledge following the programme. Reviews of disaster education similarly emphasise that structured, context-appropriate education can strengthen preparedness knowledge and response capacity (Torani et al., 2019; Permana et al., 2022).

Training quality and frequency are important determinants of disaster preparedness and response capacity (Torani et al., 2019). Effective programmes use systematic, goal-oriented exercises to develop specific competencies and progressively challenge participants without overburdening them. Because training resources, including time, funding, and facilities, are often limited, training methods must also be feasible for the organisations that implement them (Baetzner et al., 2022).



Figure 4. Community disaster-preparedness volunteers (cadres) attending the training session

Well-trained community disaster-preparedness volunteers are essential for managing mass-casualty situations that may arise during disasters. More programmes are needed to strengthen disaster-management preparedness, particularly in countries at high risk of disasters (Baetzner et al., 2022). Volunteers should be equipped to serve as community health extenders, with adequate first-aid knowledge and skills and a positive attitude towards continued practice. Timely first aid can reduce disaster-related mortality and address the medical, public health, and emotional consequences of disasters as part of comprehensive disaster management (Hargono et al., 2023).



Figure 5. Post-disaster first-aid simulation

The programme also included a first-aid simulation. Determining the success of first-aid training requires a scientifically robust evaluation. Systematic reviews recommend objective performance measures such as accuracy, completion time, and the sequence of actions, particularly in simulated scenarios that approximate real emergency behaviour (Sihvo et al., 2022). Simulation-based approaches are also commonly included in community disaster education (Permana et al., 2022). The observation instrument used in this programme provided a practical means of documenting simulation performance; however, its validity and reliability should be established before it is treated as a formal outcome measure.

CONCLUSION

The programme was associated with a marked improvement in flash-flood-preparedness knowledge, with responses classified as good increasing from 20.0% before training to 82.7% afterwards. Effective disaster management requires well-trained community personnel, particularly in post-disaster settings. Programme development should be supported by close coordination and strong community-based communication networks across all sectors involved in disaster management. Community disaster-preparedness volunteers have important roles throughout preparedness, emergency response, and recovery. Continuous and recurrent training should therefore be integrated into routine supervision and development, followed by advanced programmes that address a broader range of competencies.

REFERENCES

- Baetzner, A. S., Wespi, R., Hill, Y., Gyllencreutz, L., Sauter, T. C., Saveman, B. I., Mohr, S., Regal, G., Wrzus, C., & Frenkel, M. O. (2022). Preparing medical first responders for crises: A systematic literature review of disaster training programmes and their effectiveness. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, 30(1), 76. <https://doi.org/10.1186/s13049-022-01056-8>
- Fu, Q., & Zhang, X. (2024). Promoting community resilience through disaster education: Review of community-based interventions with a focus on teacher resilience and well-being. *PLOS ONE*, 19(1), e0296393. <https://doi.org/10.1371/journal.pone.0296393>
- Goniewicz, K., Sarker, M. N. I., & Schoch-Spana, M. (2023). Reimagining natural hazards and disaster preparedness: Charting a new course for the future. *BMC Public Health*, 23, 581. <https://doi.org/10.1186/s12889-023-15497-y>
- Hamzah, F. (2024, March 15). Cerita masyarakat yang kehilangan rumahnya akibat banjir bandang di Pesisir Selatan. *Tempo.co*. <https://www.tempo.co/lingkungan/cerita-masyarakat-yang-kehilangan-rumahnya-akibat-banjir-bandang-di-pesisir-selatan-77520>
- Hargono, A., Artanti, K. D., Astutik, E., Widodo, P. P., Trisnawati, A. N., Wardani, D. K., & Lioni, E. (2023). Relationship between disaster awareness and disaster preparedness: Online survey of the community in Indonesia. *Journal of Public Health in Africa*, 14(9), 2376. <https://doi.org/10.4081/jphia.2023.2376>
- Khorram-Manesh, A., Dulebenets, M. A., & Goniewicz, K. (2021). Implementing public health strategies: The need for educational initiatives - a systematic review. *International Journal of Environmental Research and Public Health*, 18(11), 5888. <https://doi.org/10.3390/ijerph18115888>
- Narayanan, A., Finucane, M., Acosta, J., & Wicker, A. (2020). From awareness to action: Accounting for infrastructure interdependencies in disaster response and recovery planning. *GeoHealth*, 4(8), e2020GH000251. <https://doi.org/10.1029/2020GH000251>
- Pemerintah Nagari Surantih. (n.d.). Profil Nagari Surantih. Retrieved July 20, 2026, from <https://surantih.pesisirselatankab.go.id/>
- Permana, I., Said, F. M., Umar, N. S., & Budhiana, J. (2022). Disaster preparedness education among community: What is effective? An integrative literature review. *Open Access Macedonian Journal of Medical Sciences*, 10(G), 1-8. <https://doi.org/10.3889/oamjms.2022.8373>

- Sihvo, M., Hiltunen, L., & Kärkkäinen, T. (2022). How to evaluate first aid skills after training: A systematic review. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*, 30(1), 56. <https://doi.org/10.1186/s13049-022-01043-z>
- Sohrabizadeh, S., Yousefian, S., Bahramzadeh, A., & Vaziri, M. H. (2021). A systematic review of health sector responses to the coincidence of disasters and COVID-19. *BMC Public Health*, 21, 709. <https://doi.org/10.1186/s12889-021-10806-9>
- Torani, S., Majd, P. M., Maroufi, S. S., Dowlati, M., & Sheikhi, R. A. (2019). The importance of education on disasters and emergencies: A review article. *Journal of Education and Health Promotion*, 8, 85. https://doi.org/10.4103/jehp.jehp_262_18

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