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Article

Strengthening Community Disaster Resilience Through the Integration of KKN Kebencanaan and PKM-MNM in Padang City

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Abstract

Disaster-prone regions require integrated and participatory approaches to enhance community resilience. This study presents a disaster-themed outreach program conducted by Universitas Andalas, integrating KKN Kebencanaan and the Program Kemitraan Masyarakat Membantu Nagari Membangun (PKM-MNM) Batch II, focusing on emergency disaster response in Kota Padang. The program was implemented across 16 locations using participatory methods, including hazard identification, mapping, clean water provision, disaster data collection, and community education. The results show improved access to clean water, enhanced disaster-related data availability, and increased community awareness of preparedness. The program also strengthened collaboration among stakeholders. This initiative highlights the strategic role of higher education institutions in building disaster-resilient communities.

INTRODUCTION

Indonesia is one of the most disaster-prone countries due to its geographical location and tropical climate, which expose it to various natural hazards such as floods, landslides, earthquakes, and droughts. The country's position as an archipelagic state with complex environmental conditions contributes to the high intensity and diversity of disasters, particularly hydrometeorological hazards such as drought and extreme weather (Maulana & Andriansyah, 2024). Drought poses serious challenges, particularly in urban areas where demand for water is high. Limited access to clean water can disrupt daily activities, reduce sanitation standards, and increase health risks. Clean water is an essential element form living organisms in sustaining life (Chefany et al., 2024). Additionally, low levels of preparedness can exacerbate the impact of disasters, as communities are often not equipped with adequate mitigation strategies (Kusyairi & Addiarto, 2022).

Kota Padang is one of the regions experiencing seasonal drought, resulting in limited water availability for households. This condition is further compounded by uneven infrastructure and limited access to reliable disaster-related data, which reduces the effectiveness of planning and response. Community participation is therefore essential, as disaster risk reduction efforts are closely linked to the level of community involvement and empowerment (Kinanti, 2023). Another important issue is the relatively low level of community awareness and preparedness toward disasters, particularly slow-onset hazards such as drought. Previous studies have shown that community-based disaster mitigation and

education can significantly improve preparedness and reduce disaster risks (Burhan & Sulkiah, 2026) .

To address these challenges, higher education institutions play a strategic role through community engagement. Universitas Andalas implements the Disaster-Themed outreach program (KKN Kebencanaan), integrated with PKM-MNM Batch II, focusing on emergency response and strengthening community resilience. Through a participatory approach, students collaborate directly with communities to identify problems, provide practical solutions, and enhance local capacity. This study aims to analyze the implementation of the KKN Kebencanaan program and its contribution to improving community resilience in disaster-prone areas.

METHOD

This outreach program employed a participatory and action-oriented approach, emphasizing active engagement between students and local communities. Such an approach is widely recognized as effective in community-based disaster risk reduction, as it promotes local involvement, shared responsibility, and sustainability of interventions (Kinanti, 2023). The implementation of the program was carried out through several interconnected stages, including preparation, problem identification, program implementation, and evaluation.

The initial stage involved intensive coordination among university stakeholders, field supervisors, local government authorities, and community leaders. This coordination was essential to ensure that the program aligned with local needs and conditions. A disaster response post (posko) was established as the central hub for coordination, communication, and program management. The posko functioned not only as an operational center but also as a space for collaboration among stakeholders, which is important in strengthening institutional synergy in disaster management (Maulana & Andriansyah, 2024).

Following the preparation stage, problem identification and hazard mapping were conducted through direct field engagement. Students carried out surveys to identify key issues faced by the community, particularly those related to water scarcity and disaster vulnerability. The process involved mapping disaster-prone areas, assessing environmental conditions, and determining priority needs. Data collection was conducted through direct observation and household-level interviews, allowing the integration of both quantitative and qualitative information. This approach is consistent with community-based assessment methods, which emphasize the importance of local knowledge in identifying risks and vulnerabilities (Kusyairi & Addiarto, 2022).

The program implementation phase focused on addressing the identified problems through practical and context-based interventions. One of the primary activities was the installation of clean water storage tanks in selected locations to mitigate the impact of water scarcity during the dry season. In addition, comprehensive disaster data collection was conducted to document household conditions, including socioeconomic status and urgent needs. Furthermore, educational and socialization activities were carried out to enhance community awareness regarding disaster preparedness, water conservation, and simple emergency response measures. Community-based education has been shown to significantly improve preparedness and reduce disaster risks (Burhan & Sulkiah, 2026).

The final stage involved evaluation and follow-up of the implemented programs. The effectiveness of each activity was assessed based on community responses and observed outcomes. The collected data were analyzed to generate recommendations for future actions and to support evidence-based decision-making by local authorities. Continuous evaluation is essential to ensure the sustainability and effectiveness of disaster-related community service programs (Kinanti, 2023).

RESULT AND DISCUSSION

The implementation of the Disaster-Themed outreach program demonstrated significant contributions to improving community resilience, particularly in addressing water scarcity, strengthening disaster data systems, and enhancing community awareness. These outcomes are supported by field observations and documentation obtained during program activities.

One of the most prominent results was the improvement of clean water access through the installation of storage tanks in residential areas (Fig. 1). The activity involved direct collaboration between students and community members, ensuring that the facilities were installed in locations that were accessible and beneficial for daily use. This participatory approach not only facilitated the technical implementation but also encouraged a sense of ownership among the community. The availability of clean water significantly reduced the dependence on distant water sources and improved hygiene and sanitation conditions. Such interventions are recognized as essential components in strengthening community resilience to disasters (Maulana & Andriansyah, 2024).



Figure 1. Installation of clean water storage tanks in residential areas to improve water accessibility

In addition to infrastructure development, the program also contributed to strengthening disaster data systems through household-level surveys (Fig. 2). Students conducted direct interviews with residents to collect detailed information regarding socioeconomic conditions, disaster impacts, and immediate needs. This process enabled the collection of both qualitative and quantitative data, providing a more comprehensive understanding of local vulnerabilities. The data obtained serve as a valuable resource for supporting targeted interventions, improving planning, and enhancing disaster response strategies. Furthermore, the participatory nature of the data collection process increased community awareness of the importance of accurate information in disaster management, in line with findings from previous studies (Kusyairi & Addiarto, 2022).



Figure 2. Household-level disaster data collection conducted through direct interviews with community members.

Another key outcome of the program was the enhancement of community awareness and preparedness through educational and socialization activities (Fig. 3). These activities were conducted in an interactive manner, allowing community members to actively engage in discussions and share experiences related to disaster events. The materials delivered focused on practical aspects such as water conservation, early response measures, and simple mitigation strategies that can be applied at the household level. This participatory learning approach proved effective in improving community understanding and readiness to respond to potential disaster situations. Previous research has shown that community-based education plays a crucial role in increasing disaster preparedness and reducing risks (Burhan & Sulkiah, 2026).



Figure 3. Community education and socialization activities on disaster preparedness

Furthermore, the program highlighted the importance of multi-stakeholder collaboration in disaster risk reduction. The establishment of a coordination post (posko) facilitated communication and coordination among students, local authorities, and community members. This structure ensured that all activities were aligned with local needs and conditions while also strengthening institutional relationships. Effective collaboration among stakeholders is essential in addressing complex disaster challenges and ensuring the sustainability of interventions (Kinanti, 2023).

Despite these positive outcomes, the sustainability of the program remains a key consideration. While the provision of clean water infrastructure and improved data systems provides immediate benefits, their long-term effectiveness depends on continued maintenance, monitoring, and community engagement. The willingness of the community to participate in and maintain the implemented programs is a positive indicator; however, ongoing support from local authorities and institutions is still required. Therefore, sustained collaboration and follow-up actions are necessary to ensure that the benefits of the program can be maintained and expanded.

Overall, the results demonstrate that the integration of participatory approaches, practical interventions, and collaborative frameworks can effectively enhance community resilience. The program not only addressed immediate needs but also contributed to building long-term capacity, supporting the role of outreach programs as a strategic tool in disaster risk reduction.

CONCLUSION

The Disaster-Themed outreach program (KKN Kebencanaan) integrated with PKM-MNM Batch II has demonstrated significant contributions to enhancing community resilience in Kota Padang. The program effectively addressed key issues such as water scarcity, lack of disaster data, and low community awareness.

Through a participatory approach, the program not only provided immediate solutions but also empowered communities to better prepare for future disasters. Furthermore, it strengthened collaboration between academia, government, and society, highlighting the strategic role of universities in disaster management.

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