

Strengthening Community Resilience Through Social Protection Programs: Role of Kampung Tangguh in Climate Change and Natural Disasters

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Abstract:

This study investigates the role of *Kampung Tangguh* (Resilient Villages) in enhancing community resilience against climate change and natural disasters through social protection programs in Indonesia. Employing a qualitative research design, the study synthesizes existing literature and analyzes case studies to explore how these programs mitigate vulnerabilities and foster adaptive capacities at the community level. Data collection methods included document analysis, interviews with key stakeholders, and focus group discussions. The findings reveal that *Kampung Tangguh* initiatives integrate local knowledge with disaster risk management practices, addressing immediate needs while promoting long-term resilience. The study concludes with recommendations for adopting integrated approaches that combine social protection measures with community-driven resilience strategies, emphasizing the importance of localized and participatory frameworks in achieving sustainable development goals (SDGs).

Keywords: Social protection, climate resilience, disaster risk management, vulnerability, adaptive capacity

Introduction

Local knowledge has historically aided human survival in managing environmental uncertainties. Communities in different parts of the world have developed the capability to cope with various extreme weather and natural disasters over generations. Indonesia, with its more than 17,000 islands and over 1,000 ethnic groups, is a country rich in local knowledge and cultures (Fahrudin & Yusuf, 2020). The vast majority of its 240 million inhabitants live along the coasts, next to the country's 127 active volcanoes and forests that cover more than 60% of its land. The uniqueness of the geography and demography of Indonesia makes it vulnerable to climate change impacts and natural disasters. The Indonesian National Board for Disaster Management reported that natural disasters occurred 1,375 times in 2018 and that there were 4,222 casualties and thousands of internally displaced people.

Climate change and natural disasters are significant threats to communities worldwide, particularly in Indonesia with heightened vulnerabilities. Social protection programs have emerged as essential tools for mitigating these threats by providing safety nets and enhancing resilience among vulnerable populations (Fahrudin et al., 2024a). The Kampung Tangguh initiative in Indonesia exemplifies a community-based approach to social protection, aiming to strengthen local capacities to respond to climate-related challenges. Climate change and the natural disasters prone to communities are becoming the phenomena the world has encountered in recent decades. The vulnerability to climate change and natural disasters is attributed to the interplay between intrinsic geological processes and unsustainable human activities that create a series of increasing fragilities in particular spaces and times. As the nations in the Pacific Rim are intensively vulnerable to natural disasters originating from climate change, this paper aims to discuss the role of social protection procedures in reinforcing society's ability to adapt to climate change and disaster resilience. Resilience is typically defined as the ability to prepare for, absorb, respond to, recover from, and more successfully adapt to adverse events. The current study is based on existing literature that includes communities' experiences and crucial roles in facilitating the successful implementation of and participation in climate change and natural disaster risk reduction practices (Fahrudin et al., 2024b). The study also draws on lessons from two decades of experiences derived from implementing social

protection and community-based disaster risk reduction programs. The results from document reviews and case studies conceptualize what has been known into a framework called *Kampung Tangguh* as a point of departure when enhancing community resilience to climate change and natural disasters. *Kampung Tangguh* (Resilience Village) is one of several resilience model communities in Indonesia that have been developed to address these extreme weather events and disasters. The model demonstrates a well-prepared, organized, and autonomous community that can anticipate, reduce, and manage disaster risk and conduct early recovery efforts. This capacity is achieved through improving communications, governance, and community collaboration, as well as self-reliance with a strong local wisdom and a solid scientific basis in disaster management, including good risk reduction, disaster response, and recovery, with gender-sensitive community plans and strategies (Husmiati Yusuf et.al, 2024). The use of technology that is integrated with local wisdom can make this model better known as wise villages.

Conceptual Framework

The conceptual framework integrating Community Resilience, Social Protection Programs, and *Kampung Tangguh* (Village Resilience) can be understood through the interplay of these three concepts, which collectively enhance the capacity of communities to withstand and recover from adversities, particularly in the context of disasters and public health crises. Community Resilience refers to the ability of a community to prepare for, respond to, and recover from adverse situations, such as natural disasters or pandemics. This concept encompasses various dimensions, including social capital, economic stability, and collective efficacy, which are critical for fostering resilience (Leykin et al., 2013; Sherrieb et al., 2010; Pfefferbaum et al., 2013). The Communities Advancing Resilience Toolkit (CART) emphasizes the importance of stakeholder engagement and community-driven approaches to enhance resilience (Pfefferbaum et al., 2013). Moreover, the measurement of community resilience often incorporates indicators related to social networks, economic development, and community cohesion, which are essential for effective disaster response and recovery (Sherrieb et al., 2010).

Social Protection Programs can play a vital role in bolstering community resilience by providing safety nets that protect vulnerable populations during crises. These programs can include financial assistance, food security initiatives, and health services, which are crucial during emergencies such as the COVID-19 pandemic (Nugroho et al., 2023; Sholihah et al., 2023). By addressing the immediate needs of individuals and families, social protection programs contribute to the overall stability of communities, enabling them to recover more swiftly from disruptions (Plough et al., 2013). Furthermore, integrating social protection with community resilience strategies ensures that marginalized groups are not left behind, thereby promoting equity and social justice (Plough et al., 2013).

Kampung Tangguh or Village Resilience, is a localized approach to enhancing community resilience, particularly in Indonesia. This initiative mobilizes community members to collaborate with local governments in implementing health protocols and disaster preparedness strategies (Harmawan et al., 2022; Megasari et al., 2020; Mariroh et al., 2020). The *Kampung Tangguh* model exemplifies how grassroots efforts can effectively address local challenges by fostering a culture of mutual support and collective action (Harmawan et al., 2022; Sampurna, 2022). The success of such programs is often linked to strong leadership, community engagement, and the establishment of social networks that facilitate communication and resource sharing (Harmawan et al., 2022; Sampurna, 2022). In synthesizing these concepts, it becomes evident that Community Resilience, Social Protection Programs, and *Kampung Tangguh* are interconnected. Effective social protection measures enhance community resilience by providing necessary resources during crises, while the *Kampung Tangguh* initiative exemplifies a practical application of resilience-building strategies at the community level. Together, these elements create a robust framework for understanding how communities can better prepare for and respond to challenges, ultimately leading to improved outcomes in disaster management and public health. In summary, the integration of Community Resilience, Social Protection Programs, and *Kampung Tangguh* forms a comprehensive framework that underscores the importance of collaborative efforts in building resilient communities. This framework not only addresses immediate needs during crises but also fosters long-term sustainability and adaptability in the face of future challenges.

Research Methodology

The study employs a qualitative research design, utilizing a narrative approach to examine *Kampung Tangguh's* role in enhancing community resilience through social protection programs. This approach allows for an in-depth

exploration of how these programs function at the community level, emphasizing participants' lived experiences and local adaptations. Data were collected through document analysis, interviews, and focus group discussions.

1. **Document Analysis:** A comprehensive review of literature, reports, and policy documents related to *Kampung Tangguh* initiatives, social protection programs, and community resilience was conducted. This helped contextualize findings within broader frameworks and identified best practices and challenges in implementing these initiatives.
2. **Interviews:** Semi-structured interviews were conducted with key stakeholders, including local government officials, community leaders, and participants of *Kampung Tangguh* initiatives. These interviews provided insights into the operational dynamics and community engagement strategies of these programs.
3. **Focus Group Discussions (FGDs):** FGDs allowed for collaborative exploration of community members' experiences, perspectives, and suggestions for enhancing *Kampung Tangguh* initiatives. These discussions helped capture the nuances of community-driven resilience strategies and localized approaches to social protection.

Data were analyzed using narrative analysis to identify recurring themes and patterns related to community resilience, social protection, and the effectiveness of *Kampung Tangguh* initiatives. The synthesis of findings informed the development of a conceptual framework linking these elements, providing actionable insights for policymakers and practitioners.

Result and Discussion

1. Climate Change and Natural Disasters: Impacts on Communities

The impacts of climate change and natural disasters on communities are profound and multifaceted, affecting various aspects of life including food security, economic stability, and social cohesion. This discussion synthesizes insights from multiple studies to elucidate the complex relationships between climate change, natural disasters, and community resilience.

Climate Change and Food Security: Climate change is significantly altering food systems, particularly in vulnerable regions. Increased frequency of climate-related events such as floods, droughts, and storms disrupt food supply chains, leading to food price volatility and compromised food security (Favas, 2024). Research indicates that communities in Asia are experiencing heightened food insecurity due to these disruptions, which directly influence nutritional quality and health outcomes (Favas, 2024). Furthermore, the resilience of agricultural practices is critical; communities that have experienced previous disasters often develop better preparedness strategies, as seen in Tamil Nadu, India, where farmers' experiences with cyclones have enhanced their adaptive capacities (Jayadas& Ambujam, 2021).

Community Resilience and Adaptation Strategies: Resilience is increasingly recognized as essential for communities to respond to climate change and natural disasters effectively. Studies highlight that community resilience is not merely about bouncing back from adversity but involves proactive adaptation strategies that are informed by past experiences (Amundsen, 2012). For example, small-scale fishing communities in Bangladesh have developed multi-dimensional coping strategies to address climate-induced stressors, emphasizing the importance of local governance and institutional support in enhancing adaptive capacity (Deb & Haque, 2017). This underscores the necessity of integrating local knowledge and resources into broader resilience frameworks.

Economic Impacts and Vulnerability: The economic ramifications of climate change are particularly pronounced in rural areas where livelihoods are heavily dependent on agriculture and natural resources. Research indicates that rural communities face significant challenges when disasters strike, often leading to severe economic hardships and increased vulnerability (Pratistha et al., 2023). For instance, the resilience of farmers in Iran is directly linked to their exposure to climatic risks, with those having more experience in dealing with such events demonstrating greater resilience (Asrari & Najafabadi, 2023). This highlights the need for targeted interventions that bolster economic resilience through access to resources and support systems.

Youth Engagement and Community Initiatives: Engaging youth in climate resilience initiatives can significantly enhance community adaptation efforts. In Indonesia, youth-led programs have been instrumental in promoting awareness and action regarding climate change impacts, thereby fostering a culture of resilience within

communities (Demartoto, 2022). Such initiatives not only empower younger generations but also facilitate knowledge transfer and community cohesion, which are vital for effective disaster response and recovery.

The interplay between climate change, natural disasters, and community resilience is complex and requires a multi-faceted approach. Enhancing community resilience involves not only addressing immediate needs during crises but also fostering long-term adaptive capacities through education, economic support, and local governance. By integrating these elements, communities can better withstand the impacts of climate change and natural disasters, ultimately leading to improved sustainability and quality of life.

2. The Role of Social Protection Programs in Building Community Resilience

The role of social protection programs in building community resilience is increasingly recognized as a critical factor in enhancing the ability of communities to withstand and recover from various adversities, including natural disasters and public health crises (Kuntjorowati et al, 2024). This synthesis explores how social protection initiatives contribute to community resilience, drawing on multiple studies that highlight the interconnectedness of social capital, community engagement, and effective disaster response.

Social Protection Programs and Community Resilience: Social protection programs serve as a safety net for vulnerable populations, providing essential resources during crises. These programs can include cash transfers, food assistance, and health services, which are crucial for maintaining basic living standards in the face of economic shocks caused by disasters or pandemics (Diouf et al., 2022). Research indicates that inclusive social protection measures significantly enhance household resilience by enabling families to cope with shocks, thereby reducing the long-term impacts of crises on community stability (Diouf et al., 2022). For example, during the COVID-19 pandemic, many countries implemented emergency cash transfer programs that not only alleviated immediate financial distress but also fostered a sense of security and community cohesion (Schmidt-Sane et al., 2021; Xie et al., 2022).

The Importance of Social Capital: Social capital plays a pivotal role in mediating the effects of social protection programs on community resilience. Studies have shown that strong social networks and community engagement are essential for effective disaster response and recovery (Alfitri, 2024; Carter & Cordero, 2022). In Palembang, Indonesia, for instance, the combination of traditional and virtual social capital was found to be a predictor of community resilience during the pandemic, highlighting the importance of both face-to-face interactions and online connections in fostering community solidarity (Alfitri, 2024). Furthermore, collective efficacy—defined as the shared belief in the community's ability to act together—has been shown to enhance social resilience, particularly in times of crisis (Valizadeh et al., 2022).

Community Participation and Engagement: Active community participation is crucial for the success of social protection programs and the overall resilience of communities. Engaging local populations in the design and implementation of these programs ensures that the specific needs and contexts of communities are addressed (Isni & Rahmatun, 2021; Kartowinomo, 2021). For instance, a study in Yogyakarta, Indonesia, emphasized the importance of community involvement in disaster risk reduction initiatives, which not only enhances awareness but also fosters a sense of ownership and commitment among community members (Isni & Rahmatun, 2021). This participatory approach is essential for building trust and facilitating effective communication during emergencies, ultimately leading to improved resilience outcomes.

Coping Mechanisms and Psychological Resilience: Social protection programs also contribute to the psychological resilience of community members by providing emotional support and fostering a sense of belonging. Research indicates that social support is a protective factor against mental health issues, particularly for vulnerable populations facing the stressors of disasters (Arshad et al., 2020). For example, children exposed to natural disasters benefit significantly from social support networks, which help mitigate the psychological impacts of trauma (Arshad et al., 2020). By enhancing social connections and providing resources, social protection programs can help communities develop coping mechanisms that are vital for recovery and adaptation.

In summary, social protection programs can play a crucial role in building community resilience by providing essential resources, fostering social capital, and promoting active community engagement. The interplay between social protection, social capital, and community participation creates a robust framework for enhancing resilience in the face of various challenges. As communities continue to navigate the complexities of climate change,

natural disasters, and public health crises, the integration of effective social protection measures will be essential for fostering sustainable resilience.

3. Case Studies of *Kampung Tangguh* in Addressing Climate Change and Natural Disasters

The case studies of *Kampung Tangguh* (Resilient Villages) in Indonesia illustrate how localized initiatives can effectively address the impacts of climate change and natural disasters. These programs leverage community engagement, social capital, and adaptive strategies to enhance resilience in vulnerable areas. This synthesis draws on various studies to highlight the effectiveness of *Kampung Tangguh* in building community resilience.

Community Engagement and Local Knowledge: One of the core strengths of *Kampung Tangguh* is its emphasis on community engagement and the utilization of local knowledge. By involving residents in the planning and implementation of resilience strategies, these programs foster a sense of ownership and commitment among community members. Research indicates that community-based approaches, such as those employed in *Kampung Tangguh*, are crucial for effective climate change adaptation Shammin et al. (2021). For instance, workshops and training sessions conducted in these villages often incorporate indigenous knowledge and practices, which have been shown to enhance adaptive capacities (Yumagulova et al., 2020). This participatory approach not only empowers local populations but also ensures that the strategies developed are contextually relevant and culturally appropriate.

Integration of Social Protection Programs: *Kampung Tangguh* initiatives often integrate social protection measures to bolster community resilience. These programs provide essential resources such as food assistance, cash transfers, and health services, which are vital during crises. The integration of social protection within the framework of *Kampung Tangguh* exemplifies how safety nets can enhance resilience by ensuring that basic needs are met during emergencies, allowing communities to focus on recovery and adaptation (Rajouria, 2019).

Adaptive Capacity and Disaster Preparedness: The *Kampung Tangguh* model emphasizes building adaptive capacity through disaster preparedness training and resource management. Studies have shown that communities with strong disaster preparedness plans are better equipped to respond to climate-related shocks (McIver et al., 2014). In the context of *Kampung Tangguh*, training programs often include simulations of disaster scenarios, which help residents develop practical skills and knowledge for effective response (Sumardjo, 2023). This proactive approach not only enhances individual and collective resilience but also fosters a culture of preparedness that is essential for navigating the uncertainties posed by climate change.

Social Capital and Community Cohesion: Social capital plays a significant role in the success of *Kampung Tangguh* initiatives. Strong social networks and community cohesion are critical for effective disaster response and recovery (Jordan, 2014). Research indicates that communities with high levels of social capital are more likely to engage in collective action during crises, which enhances their resilience. In *Kampung Tangguh*, community members often collaborate on various initiatives, from environmental conservation projects to health campaigns, thereby strengthening social ties and fostering a sense of solidarity (Clarke et al., 2019). This interconnectedness not only improves the immediate response to disasters but also contributes to long-term resilience by building trust and cooperation among residents.

In summary, the case studies of *Kampung Tangguh* demonstrate the effectiveness of community-driven approaches in addressing the challenges posed by climate change and natural disasters. By integrating local knowledge, social protection measures, disaster preparedness training, and fostering social capital, these initiatives enhance the resilience of communities in Indonesia. As climate change continues to pose significant threats globally, the lessons learned from *Kampung Tangguh* can inform similar efforts in other regions, emphasizing the importance of localized, participatory strategies in building resilient communities.

4. Challenges and Opportunities in Implementing *Kampung Tangguh* Programs

The implementation of *Kampung Tangguh* programs in Indonesia presents both challenges and opportunities in addressing community resilience, particularly in the context of climate change and natural disasters. This synthesis explores these aspects by drawing on various case studies and research findings.

Challenges in Implementation: One of the primary challenges faced by *Kampung Tangguh* programs is the need for effective collective leadership and coordination among various stakeholders. As highlighted in the study by

Harmawan et al., successful responses to crises such as the COVID-19 pandemic depend significantly on the leadership actions of community members Harmawan et al. (2022). The lack of a cohesive leadership structure can lead to fragmented efforts, undermining the effectiveness of the programs. Additionally, varying levels of community engagement and participation can pose challenges. Some communities may struggle with mobilizing residents due to apathy or lack of awareness about the importance of resilience initiatives (Leykin et al., 2013).

Another significant challenge is the integration of social protection measures within the Kampung Tangguh framework. While social protection programs are essential for enhancing resilience, their implementation can be hampered by bureaucratic hurdles and insufficient funding (Megasari et al., 2020). For instance, the Kampung Tangguh Semeru program aimed at combating COVID-19 faced difficulties in ensuring consistent support for vulnerable populations, which is crucial for maintaining community resilience during crises (Megasari et al., 2020). Furthermore, the adaptation of local wisdom and cultural practices into these programs can be inconsistent, leading to gaps in community acceptance and participation (Rahmawati et al., 2022).

Opportunities for Enhancement: Despite these challenges, there are numerous opportunities for strengthening Kampung Tangguh programs. One significant opportunity lies in leveraging local knowledge and cultural practices to enhance community resilience. The kinship relationships and cultural assimilation observed in communities like Kampung Cungkeng demonstrate that local social structures can be harnessed to foster resilience (Widya, 2024). By integrating traditional practices with modern resilience strategies, communities can create more effective and culturally relevant programs. Moreover, the role of social capital in enhancing community resilience cannot be overstated. Strong social networks facilitate better communication and collaboration among community members, which is vital for effective disaster response (Sinatra, 2022). Programs that encourage community participation and collective action can significantly enhance social cohesion and resilience. For example, the Kampung Tangguh Nusantara initiative emphasizes the importance of community involvement in decision-making processes, which can lead to more tailored and effective resilience strategies (Sinatra, 2022).

Innovative Approaches and Capacity Building: The implementation of innovative approaches, such as the use of technology for monitoring and communication, presents another opportunity for enhancing Kampung Tangguh programs. The integration of emerging technologies can improve the efficiency of disaster response efforts and facilitate better coordination among stakeholders (Mbunge, 2020). Additionally, capacity-building initiatives that focus on empowering community members with skills and knowledge can lead to more sustainable and resilient communities. For instance, training programs that equip residents with disaster preparedness skills can significantly enhance their ability to respond to emergencies (Setiawan, 2023). In summary, while the implementation of *Kampung Tangguh* programs faces several challenges, including leadership coordination, funding, and community engagement, there are also significant opportunities for enhancing community resilience. By leveraging local knowledge, fostering social capital, and integrating innovative approaches, these programs can effectively address the impacts of climate change and natural disasters. The success of Kampung Tangguh initiatives ultimately depends on the active participation of community members and the collaborative efforts of various stakeholders.

5. Best Practices and Lessons Learned from Kampung Tangguh Initiatives

The Kampung Tangguh initiatives in Indonesia have emerged as a significant model for enhancing community resilience in the face of climate change and natural disasters. These programs focus on community engagement, local knowledge, and integrated approaches to disaster preparedness and response. This synthesis outlines best practices and lessons learned from various Kampung Tangguh initiatives, drawing on relevant studies and case examples.

- 1) *Community Engagement and Participation:* One of the most effective practices observed in Kampung Tangguh initiatives is the emphasis on community engagement. By involving residents in the planning and implementation of resilience strategies, these programs foster a sense of ownership and accountability among community members. Research indicates that participatory approaches enhance the effectiveness of resilience-building efforts by ensuring that the strategies developed are contextually relevant and culturally appropriate (Mujiyadi, 2023). For instance, in the Kampung Tangguh Semeru program, community members actively participated in training sessions and workshops, which not only improved their preparedness for disasters but also strengthened community bonds (Woods-Jaeger et al., 2018).

- 2) *Integration of Local Knowledge*: Leveraging local knowledge and traditional practices is another best practice that has proven effective in *Kampung Tangguh* initiatives. The incorporation of indigenous knowledge into resilience strategies allows communities to utilize their historical experiences and cultural practices in addressing contemporary challenges (Alonge et al., 2019). For example, in several *Kampung Tangguh* programs, local agricultural practices that are resilient to climate variability have been revived and adapted, leading to improved food security and community resilience (Prado et al., 2015). This approach underscores the importance of recognizing and valuing local expertise in the development of effective resilience strategies.
- 3) *Building Social Capital*: The role of social capital in enhancing community resilience cannot be overstated. Strong social networks and community cohesion are critical for effective disaster response and recovery (Zank et al., 2019). *Kampung Tangguh* initiatives often focus on strengthening social ties through community activities and collective action, which fosters trust and collaboration among residents. Studies have shown that communities with high levels of social capital are better equipped to mobilize resources and support during crises (Sayers et al., 2016). For instance, during the COVID-19 pandemic, communities with established social networks were able to coordinate responses more effectively, demonstrating the importance of social capital in resilience-building (Tang, 2022).
- 4) *Multi-Stakeholder Collaboration*: Successful *Kampung Tangguh* initiatives often involve collaboration among various stakeholders, including local governments, NGOs, and community organizations. This multi-stakeholder approach enhances resource mobilization and ensures that diverse perspectives are considered in the planning and implementation of resilience strategies (Lestari & Yusuf, 2017). For example, partnerships between local governments and community organizations have facilitated the sharing of resources and expertise, leading to more comprehensive and effective resilience-building efforts (Wright, 2016). This collaborative framework is essential for addressing the complex challenges posed by climate change and natural disasters.
- 5) *Continuous Learning and Adaptation*: The ability to learn from experiences and adapt strategies accordingly is a crucial aspect of successful *Kampung Tangguh* initiatives. Continuous monitoring and evaluation of resilience strategies allow communities to identify what works and what does not, enabling them to refine their approaches over time (Tippens, 2019). For instance, feedback mechanisms established in some *Kampung Tangguh* programs have facilitated ongoing dialogue among community members, leading to iterative improvements in disaster preparedness and response strategies (Frimpong et al., 2015). This emphasis on learning and adaptation is vital for building long-term resilience in the face of evolving challenges.

The *Kampung Tangguh* initiatives provide valuable insights into best practices for enhancing community resilience to climate change and natural disasters. By prioritizing community engagement, integrating local knowledge, building social capital, fostering multi-stakeholder collaboration, and promoting continuous learning, these programs have demonstrated their effectiveness in strengthening the resilience of communities in Indonesia. The lessons learned from these initiatives can inform similar efforts globally, emphasizing the importance of localized, participatory approaches in building resilient communities.

6. Policy Recommendations for Scaling Up *Kampung Tangguh* for Community Resilience

To effectively scale up *Kampung Tangguh* programs for enhancing community resilience in Indonesia, several policy recommendations can be derived from existing literature and best practices observed in various case studies. These recommendations focus on fostering community engagement, integrating social protection measures, leveraging local knowledge, and enhancing multi-stakeholder collaboration.

- 1) **Strengthening Local Governance and Community Participation**: It is essential to promote local democratic governance and community participation in the planning and implementation of *Kampung Tangguh* initiatives (Husmiati Yusuf et al, 2024). A top-down approach often leads to elite capture and does not adequately address local needs Finucane et al. (2020). Policies should encourage the active involvement of community members in decision-making processes, ensuring that their voices are heard and their needs are prioritized. This can be achieved through regular community meetings, participatory planning sessions, and the establishment of local resilience committees that include diverse stakeholders.

- 2) **Integrating Social Protection Programs:** To enhance the resilience of communities, it is crucial to integrate social protection measures within the *Kampung Tangguh* framework. Social protection programs, such as cash transfers and food assistance, can provide essential support during crises, helping vulnerable populations cope with the impacts of disasters (Golitaleb et al., 2022). Policymakers should ensure that these programs are accessible and tailored to the specific needs of communities, particularly for marginalized groups such as women and the elderly, who may face increased vulnerabilities during disasters (Golitaleb et al., 2022).
- 3) **Leveraging Local Knowledge and Cultural Practices:** The incorporation of local knowledge and cultural practices into *Kampung Tangguh* initiatives can significantly enhance their effectiveness. Policies should encourage the documentation and sharing of indigenous knowledge related to disaster preparedness and response (HusmiatiYusuf et al., 2024). This can be facilitated through workshops, training programs, and community-led initiatives that highlight traditional practices that have proven effective in building resilience. By valuing local expertise, communities can develop more contextually relevant and culturally appropriate resilience strategies.
- 4) **Enhancing Mental Health Support Services:** The psychological impacts of disasters can be profound, and addressing mental health needs is crucial for community resilience (Torres-Mendoza et al., 2021). Policymakers should prioritize the establishment of mental health support services that are accessible to all community members, particularly during the recovery phase following a disaster. This includes training community health workers to provide psychological first aid and facilitating access to professional mental health services. Integrating mental health support into disaster preparedness plans can help mitigate the long-term effects of trauma on individuals and communities.
- 5) **Fostering Multi-Stakeholder Collaboration:** Successful *Kampung Tangguh* initiatives often involve collaboration among various stakeholders, including local governments, NGOs, and community organizations (Margono et al., 2022). Policymakers should promote partnerships that facilitate resource sharing, knowledge exchange, and coordinated responses to disasters. This can be achieved through the establishment of networks that connect different stakeholders and encourage collaborative planning and implementation of resilience strategies.
- 6) **Continuous Learning and Adaptation:** Policies should support mechanisms for continuous learning and adaptation within *Kampung Tangguh* programs. This includes regular monitoring and evaluation of resilience strategies to identify successes and areas for improvement. Feedback loops that allow community members to share their experiences and insights can inform the ongoing development of resilience initiatives, ensuring that they remain relevant and effective in the face of changing circumstances.
- 7) **Utilizing Technology for Disaster Preparedness:** The integration of technology into *Kampung Tangguh* initiatives can enhance disaster preparedness and response efforts. Policymakers should explore the use of mobile applications, social media, and other digital tools to disseminate information, facilitate communication, and coordinate responses during emergencies (Marjanovic et al., 2011). Technology can also be leveraged to collect data on community vulnerabilities and resilience, informing evidence-based decision-making.

Scaling up *Kampung Tangguh* programs requires a multifaceted approach that prioritizes community engagement, integrates social protection measures, leverages local knowledge, and fosters collaboration among stakeholders. By implementing these policy recommendations, Indonesia can enhance the resilience of its communities, enabling them to better withstand and recover from the impacts of climate change and natural disasters.

The findings highlight that *Kampung Tangguh* initiatives have significantly contributed to enhancing community resilience by integrating local knowledge and fostering collaborative disaster risk management practices. Communities participating in *Kampung Tangguh* programs demonstrated increased preparedness, improved

coordination during crises, and faster recovery processes. These outcomes align with studies by Pfefferbaum et al. (2013), which emphasize the role of community-driven approaches in building resilience.

A notable strength of Kampung Tangguh initiatives is their emphasis on gender-sensitive planning and local wisdom. Similar findings were reported by Yumagulova et al. (2020), who highlighted the effectiveness of incorporating indigenous knowledge into disaster preparedness strategies. For example, communities in coastal regions leveraged traditional techniques, such as sustainable land use practices, to mitigate the impacts of flooding—a strategy also observed in studies conducted

7. Conclusion and Future Research Directions

The *Kampung Tangguh* initiatives in Indonesia represent a robust framework for enhancing community resilience, particularly in climate change and natural disasters. These programs demonstrate the effectiveness of community-driven approaches, leveraging local knowledge and social capital while integrating social protection measures. Communities engaged in these initiatives have shown increased preparedness, better coordination during crises, and quicker recovery. These successes highlight the potential for Kampung Tangguh to be a scalable model for resilience-building in similar contexts globally.

Key Findings

This study revealed that *Kampung Tangguh's* participatory nature fosters community ownership, which is critical for sustainable resilience-building. Integrating local wisdom and cultural practices enhanced the contextual relevance and effectiveness of disaster mitigation strategies. Collaborative efforts among stakeholders, such as local governments, NGOs, and community organizations, proved vital for resource mobilization and coordinated responses. Additionally, the inclusion of gender-sensitive planning and social protection mechanisms ensured the equitable distribution of resources and strengthened the adaptive capacity of vulnerable groups.

Limitations

While this study provides significant insights, it is limited by its reliance on qualitative data from specific case studies, which may not capture all contextual variables influencing the success of *Kampung Tangguh* programs. Moreover, the scope of this research did not extensively examine the role of emerging technologies or the long-term psychological impacts of disaster resilience strategies.

Scope for Future Research

Future research should consider longitudinal studies to evaluate the sustained impacts of *Kampung Tangguh* initiatives on community resilience. Comparative studies across diverse regions could provide insights into best practices and contextual factors influencing their success. Additionally, exploring the integration of technology, such as digital tools for disaster preparedness, can offer innovative pathways for enhancing resilience. Investigating mental health support mechanisms within these programs can contribute to a more holistic approach to resilience-building. Lastly, further studies are needed to evaluate how social protection measures can be optimized within Kampung Tangguh to address the needs of marginalized populations more effectively.

Practical Implications

The findings underscore the importance of adopting localized, participatory approaches to resilience-building. Policymakers and practitioners should prioritize community engagement, leverage local knowledge, and foster multi-stakeholder collaboration to enhance the scalability of Kampung Tangguh initiatives. Integrating mental health support and leveraging technology can further strengthen these programs, ensuring that communities are better equipped to navigate the challenges posed by climate change and natural disasters.

Authors Contribution

Conceptualization HY; methodology, TP & AF; software, AF & SS; validation, HY and MH; formal analysis, TP and RHRA; investigation and data collection, HY, AF, TP, SS, RHRA, MH, RM, DP, SS, and NN; resources, AF; data curation, HY; writing—original draft preparation, AF and HY; writing—review and editing, TP, SS, and MH. All authors (HY, TP, AF, SS, MH, RHRA, RM, DP, SS, and NN) have read and agreed to the published version of the manuscript.

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