

Community Adaptive Capacity in Facing Flood Disasters in Makassar City

Hidayah Muhallim¹, Rahmat Muhammad², Sawedi Muhammad³, Muhammad Ilham Dhani Asriawan⁴

^{1,2,3,4}Departemen Sosiologi, FISIP, Universitas Hasanuddin, Indonesia

E-mail: hmuhallim@gmail.com, rahmatmuhammad131@gmail.com, msawedi@gmail.com,
muhammadilhamdhaniasriawan@gmail.com

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Abstract: *Urban flooding is an increasing environmental risk in various developing cities, including Makassar. The dynamics of urbanization, spatial changes, and the pressures of urban development have increased community vulnerability to flooding. In this context, community adaptive capacity is a key element in building urban resilience to disaster risks. This study aims to analyze how community adaptive capacity is formed in response to flooding in Makassar City and to identify the role of social capital, socio-economic conditions, and disaster governance in strengthening urban social resilience. This research uses a qualitative approach with a case study design. Data were obtained through in-depth interviews with various key informants, including academics, local government officials, community members, and resilient women's groups, and is supported by analysis of policy documents and statistical data. This approach allows the study to capture the dynamics of interactions between the community, government, and local institutions in addressing urban flood risk. The results indicate that community adaptive capacity in Makassar City is formed through repeated collective experiences with flooding, which then generates local knowledge in interpreting disaster warnings and determining adaptation strategies appropriate to environmental conditions. These adaptation strategies include physical adjustments to households, strengthening social solidarity within communities, and utilizing social networks to disseminate information and assistance during disasters. Furthermore, the existence of community organizations such as Disaster Preparedness Villages plays a crucial role in strengthening community preparedness through training activities, evacuation simulations, and coordination with the*

government. Therefore, strengthening urban social resilience requires an integrated approach involving adaptive spatial planning policies, strengthening community social capital, and increasing community participation in disaster mitigation systems.

INTRODUCTION

Climate change and the increasing frequency of natural disasters have become major global concerns, encouraging governments, international organizations, and researchers to develop disaster risk reduction policies and adaptive governance strategies. Indonesia is among the countries with the highest disaster risk due to its geographical, geological, hydrological, and demographic characteristics, making floods one of the most recurrent and destructive hazards. Flood disasters not only cause loss of life but also generate significant economic, social, environmental, and cultural impacts that threaten sustainable community development (Adiyoso, 2018). In recent years, Makassar City has experienced recurring flood events with increasing intensity, resulting in widespread disruption to public services, infrastructure, and local livelihoods. These conditions demonstrate that flood management should not rely solely on structural mitigation but also on strengthening the capacity of communities to adapt to disaster risks.

Adaptive capacity has been recognized as a fundamental component of community resilience because it reflects the ability of individuals and communities to anticipate, cope with, recover from, and adjust to hazardous events. According to Smit and Wandel (2006), adaptive capacity refers to the capability of social systems to respond to environmental changes while minimizing potential damage and utilizing available opportunities. In the context of flood disasters, adaptive capacity encompasses physical, social, institutional, and economic dimensions that collectively determine how effectively communities prepare for, respond to, and recover from disasters (Adiyoso, 2018). Therefore, strengthening adaptive capacity has become an essential strategy for reducing vulnerability and promoting long-term resilience in flood-prone areas.

The effectiveness of adaptive capacity is influenced by multiple interconnected factors, including local knowledge, social capital, economic resources, institutional support, infrastructure availability, and access to information. Communities possessing strong local knowledge and social networks are generally more capable of implementing preventive measures and mobilizing collective action during disasters. Conversely, limited financial resources, inadequate infrastructure, and weak institutional coordination often constrain community resilience and delay post-disaster recovery (Adger et al., 2005; Smith & Petley, 2009). Previous studies have also emphasized that higher adaptive capacity significantly reduces disaster vulnerability and enhances community resilience through disaster education, social participation, early warning systems, and collaborative governance (Wisner et al., 2004).

Despite the growing body of literature on disaster management, previous studies have predominantly focused on technical mitigation measures, engineering approaches, or government-led disaster management systems. Comparatively fewer studies have examined flood resilience from the perspective of community adaptive capacity, particularly by integrating social, economic, institutional, and environmental dimensions into a comprehensive analytical framework. Moreover, empirical evidence explaining how these dimensions interact within urban flood-prone communities remains limited, especially in rapidly developing cities such as

Makassar. This limitation indicates an important research gap in understanding community-centered adaptation strategies and their contribution to disaster resilience.

Based on these considerations, this study investigates the adaptive capacity of communities in responding to flood disasters in Makassar City. Specifically, the research examines the social, economic, institutional, and environmental factors shaping community adaptation while identifying key constraints that hinder resilience building. By addressing the existing research gap, this study contributes to the development of community-based disaster risk reduction strategies and provides empirical evidence to support more inclusive and adaptive flood management policies in urban Indonesia (Meijerink & Huitema, 2010).

METHOD

This study employs a qualitative approach with a case study design to comprehensively explore the governance and politics of flood disaster management in Makassar City. A qualitative approach was selected because it generates descriptive data in the form of written or spoken words regarding the observed behavior of subjects within their natural setting (Moleong, 2006). The research execution is scheduled over a twelve-month period, from January to December 2025, covering the preparation phase, field data collection, and final report drafting. The study focuses geographically on Biringkanaya District and Manggala District within Makassar City, South Sulawesi Province. These two areas were strategically selected based on a multi-tiered filtering of disaster data: South Sulawesi ranks high nationally in flood incidence (National Disaster Management Authority [BNPB], 2025; Katadata, 2025; SIANDALAN Sulsel, 2025), and local historical displacement data from 2024 indicates that Biringkanaya and Manggala suffered the most severe social impacts in Makassar City (Metrotvnews, 2024; Tribun Makassar, 2024).

The data sources in this research are classified into two primary categories: primary data and secondary data. Primary data were gathered directly through in-depth interviews with 16 key, primary, and supporting informants representing various stakeholders, including the Regional Disaster Management Agency (BPBD), Social Services, Spatial Planning Agency, Environmental Services, Regional House of Representatives (DPRD), district heads (Camat), sub-district heads (Lurah), academics, NGOs, journalists, and affected residents. The total number of informants was determined based on the data saturation principle, whereby data collection ceased when no new or incremental information emerged to enrich the analysis (Glaser & Strauss, 1967). Meanwhile, secondary data encompass national and regional regulatory documents (such as Law No. 24 of 2007 and the Makassar City Regional Spatial Plan [RTRW]), disaster vulnerability maps, community socio-economic data, planning and budget documents, and media news archives.

Informant selection was conducted purposefully using a *purposive sampling* technique by setting specific criteria aligned with the research focus (Afrizal, 2015). Informants were categorized into three groups: key informants (decision-makers in the bureaucracy and legislative bodies), primary informants (affected citizens and local officials at sub-district/district levels directly managing or experiencing flood impacts), and supporting informants (academics, environmental activists, journalists, and community groups such as the Disaster Resilient Village and Resilient Women Community). This sampling strategy ensures that all collected information originates from actors possessing relevant institutional authority, administrative capacity, or empirical lived experience.

Data collection was carried out through two primary techniques: semi-structured in-depth

interviews and document analysis (Faisal et al., 1990). Semi-structured interviews allowed the researcher to pose questions flexibly and deeply while adhering to a pre-formulated interview guide. Additionally, the documentation technique involved gathering, compiling, and analyzing official files, government reports, spatial maps, and reputable news articles to enrich contextual understanding and triangulate empirical field findings.

Data analysis followed the interactive model proposed by Miles and Huberman, consisting of three concurrent streams of activity that occurred continuously throughout the research process: data reduction, data display, and conclusion drawing or verification (Afriзал, 2015; Miles & Huberman, 1994). Data reduction involved selecting, abstracting, and categorizing field notes into overarching thematic codes. The reduced data were then presented through structured narrative text and qualitative matrices to facilitate systematic interpretation. Subsequently, conclusion drawing was conducted iteratively by identifying emerging patterns, causal relationships, and thematic configurations, which were continuously verified against field data throughout the study.

To ensure data credibility and trustworthiness, this study employed triangulation techniques combining source, method, investigator, and theoretical triangulation (Denzin & Lincoln, 2009; Helaluddin & Wijaya, 2019). Data validity was established by comparing observational notes with interview transcripts, cross-referencing public statements with private accounts, and consolidating findings across diverse stakeholder perspectives and official documentation. Although this study acknowledges technical limitations—such as potential constraints in individual officials' representation of institutional dynamics and the complexity of isolating global climate change effects from local structural variables—this systematic methodological design ensures that the qualitative findings remain valid, objective, and academically rigorous.

RESULTS AND DISCUSSION

a. Community Social Capital as the Foundation of Adaptive Capacity

The findings demonstrate that community adaptive capacity in Makassar is strongly influenced by the existence of social capital, which functions as the primary mechanism enabling residents to anticipate, respond to, and recover from recurrent flood disasters. The empirical evidence indicates that adaptive practices are not solely dependent on physical infrastructure but are also reinforced by collective action, mutual trust, and social networks developed within local communities. Residents consistently emphasized that cooperation among neighbors during flood events has become an informal yet effective disaster response mechanism.

Interviews with community leaders, neighborhood representatives, members of the Disaster Preparedness Group (*Kelompok Siaga Bencana*), and local residents revealed that mutual assistance (*gotong royong*) remains deeply embedded in everyday social interactions. During flood emergencies, community members voluntarily assist vulnerable households, protect personal belongings, distribute emergency supplies, and organize temporary evacuation efforts before formal government assistance arrives. Informants from flood-prone neighborhoods also explained that community initiatives, including routine environmental clean-up and drainage maintenance, are organized collectively as preventive measures against flooding.

These findings indicate that adaptive capacity is socially constructed through continuous interaction among community members rather than emerging solely from institutional intervention. Social trust encourages information sharing, accelerates collective decision-making, and strengthens disaster preparedness at the neighborhood level. Similar observations have been reported by Adger et al. (2005), who argue that social capital enhances collective resilience by

facilitating cooperation and knowledge exchange during environmental disturbances. Likewise, Smit and Wandel (2006) emphasize that adaptive capacity is fundamentally determined by the availability of social resources and the ability of communities to mobilize them under conditions of uncertainty.

Nevertheless, the study also found that the effectiveness of social capital varies across communities. Informants explained that neighborhoods with stronger organizational structures and more active community participation demonstrate higher levels of preparedness than areas where social interaction has weakened. This finding suggests that strengthening community participation remains an essential strategy for improving disaster resilience in urban environments.

b. Institutional Support and Collaborative Disaster Governance

The research findings reveal that institutional capacity constitutes another important dimension shaping community adaptive capacity. Informants from the Regional Disaster Management Agency (BPBD), district offices, village administrations, and community organizations consistently emphasized that flood management has gradually shifted from an emergency-response approach toward disaster risk reduction through community participation.

According to government officials interviewed in this study, disaster preparedness programs have been implemented through community-based disaster education, evacuation simulations, early warning dissemination, and the establishment of Disaster Preparedness Groups (*Kelompok Siaga Bencana*). These initiatives seek to improve local preparedness while encouraging residents to actively participate in disaster risk reduction rather than relying exclusively on government intervention.

Community representatives acknowledged that institutional support has improved public awareness regarding flood preparedness. However, they also reported several persistent challenges, including limited coordination among government agencies, uneven program implementation across flood-prone areas, insufficient funding, and inadequate maintenance of drainage infrastructure. Some residents stated that assistance frequently arrives after floodwaters have already caused significant disruption, indicating that institutional responsiveness remains inconsistent across locations.

These empirical findings highlight the importance of collaborative disaster governance involving government institutions, local communities, civil society organizations, and other stakeholders. Meijerink and Huitema (2010) argue that adaptive governance depends upon institutional flexibility, stakeholder participation, and continuous learning processes. The present findings support this perspective by demonstrating that institutional effectiveness increases when disaster management responsibilities are shared between formal authorities and local communities.

c. Socio-Economic Constraints on Community Adaptive Capacity

Although communities have developed various adaptation strategies, the findings indicate that socio-economic conditions continue to constrain their adaptive capacity. Interviews with residents revealed that household income, employment stability, housing conditions, and access to financial resources significantly influence their ability to prepare for and recover from flood disasters.

Many informants explained that repeated flooding damages household assets, interrupts economic activities, and increases recovery costs. Families with limited financial resources often postpone house repairs, lack access to flood-resistant construction materials, and experience difficulties replacing damaged equipment or household necessities. Consequently, vulnerable households remain exposed to recurring disaster risks despite possessing substantial local

knowledge regarding flood management.

Environmental conditions further exacerbate these socio-economic challenges. Informants consistently identified inadequate drainage systems, uncontrolled urban development, river sedimentation, and increasing residential density as major factors contributing to recurrent flooding. Community members also emphasized that environmental degradation has reduced the natural capacity of surrounding ecosystems to absorb excessive rainfall, thereby increasing flood frequency and severity.

These findings correspond with previous studies indicating that adaptive capacity depends upon access to economic resources, environmental quality, and institutional support (Smith & Petley, 2009). Wisner et al. (2004) similarly argue that disaster vulnerability is largely produced through unequal access to resources rather than the hazard itself. Therefore, strengthening adaptive capacity requires integrated interventions addressing both environmental management and socio-economic inequality.

d. Integrating Community Adaptive Capacity for Urban Flood Resilience

The findings suggest that community adaptive capacity in Makassar represents the interaction of four interrelated dimensions: social, institutional, economic, and environmental capacity. Rather than functioning independently, these dimensions reinforce one another in shaping community resilience against recurrent flooding.

The empirical evidence demonstrates that social capital provides the foundation for collective adaptation, institutional support enhances organizational preparedness, economic resources determine recovery capability, and environmental management reduces long-term exposure to flood hazards. Informants consistently emphasized that effective flood adaptation requires continuous collaboration among government agencies, local communities, disaster volunteers, academic institutions, and civil society organizations.

These findings contribute to the broader literature on community-based disaster risk reduction by demonstrating that adaptive capacity should be understood as a dynamic and multidimensional process rather than a fixed community characteristic. Consistent with Smit and Wandel (2006), adaptive capacity evolves through continuous learning, institutional interaction, and resource mobilization. Likewise, Adger et al. (2005) emphasize that resilience is strengthened when communities possess sufficient social networks, institutional legitimacy, and economic resources to respond collectively to environmental change.

Accordingly, this study proposes that strengthening flood resilience in Makassar should prioritize integrated community-based disaster governance. Policy interventions should move beyond structural flood control by simultaneously reinforcing social participation, improving institutional coordination, expanding community access to economic resources, and promoting environmentally sustainable urban planning. Such an integrated approach will enhance the long-term adaptive capacity of urban communities facing increasingly frequent climate-related flood disasters.

CONCLUSION

This study demonstrates that community adaptive capacity is a fundamental determinant of urban resilience in responding to recurrent flood disasters in Makassar City. The findings reveal that adaptive capacity extends beyond individual technical abilities and is instead shaped by the interaction between social capital, institutional support, economic resources, and environmental conditions. Strong community networks, mutual trust, collective action, and local knowledge enable residents to anticipate, respond to, and recover from flood events more

effectively, while community-based institutions such as the *Kelompok Siaga Bencana* (Disaster Preparedness Groups) strengthen coordination between local communities and government agencies. However, adaptive capacity remains uneven across communities because socio-economic inequalities, limited financial resources, inadequate infrastructure, and institutional constraints continue to increase the vulnerability of low-income households to recurring flood risks.

The study contributes to the growing literature on community-based disaster risk reduction by demonstrating that urban resilience is a dynamic process resulting from the integration of community social capital and adaptive disaster governance rather than from structural mitigation measures alone. These findings suggest that strengthening urban flood resilience requires policies that promote participatory disaster management, enhance institutional collaboration, expand community-based preparedness programs, improve investment in flood mitigation infrastructure, and integrate disaster risk reduction into urban spatial planning. By emphasizing the complementary roles of community initiatives and government intervention, this research provides empirical evidence to support more inclusive, adaptive, and sustainable flood governance strategies for rapidly urbanizing cities facing increasing climate-related disaster risks.

REFERENCES

- Adiyoso, Wignyo. 2018. *Manajemen Bencana: Pengantar dan Isu-Isu Strategis*. Jakarta: Bumi Aksara
- Adger, W. N., Arnell, N. W., & Tompkins, E. L. (2005). Successful adaptation to climate change across scales. *Global environmental change*, 15(2), 77-86.
- Afrizal. 2015. *Metode Penelitian Kualitatif: Sebuah Upaya Mendukung Menggunakan Penelitian Kualitatif dalam Berbagai Disiplin Ilmu*. Jakarta : Rajawali Pers.
- BPBD Kota Makassar.(2024).*Laporan kejadian bencana Kota Makassar*.
- Badan Penanggulangan Bencana Daerah Kota Makassar.
- Badan Penanggulangan Bencana Daerah Provinsi Sulawesi Selatan. (n.d.). *Data Bencana*. Si-Andalan. Diakses pada 11 Desember 2025, dari <https://siandalan.sulselprov.go.id/data>.
- Badan Pusat Statistik Kota Makassar. (2025). *Kota Makassar dalam angka 2025*. BPS Kota Makassar.
- Databoks. (2025, November28).*Provinsi di Indonesia yang Paling Sering Dilanda Banjir hingga Akhir 2025*. Katadata.Diakses pada 7 Maret 2026, dari <https://databoks.katadata.co.id/lingkungan/statistik/69294bca4a532/provinsi-di-indonesia-yang-paling-sering-dilanda-banjir-hingga-akhir-2025>
- Glaser, B. (2009). Anselm L. Strauss (1967) *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Chicago: Aldine Publishing Co. Glaser *The Discovery of Grounded Theory: Strategies for Qualitative Research 1967*.
- Moleong, L. J. (2006). A. *Metode Penelitian*. Bandung: PT Remaja Rosdakarya
- Meijerink, S., & Huitema, D. (2010). Policy entrepreneurs and change strategies: Lessons from sixteen case studies of water transitions around the globe. *Ecology and Society*, 15(2), 21. <https://doi.org/10.5751/ES-03509-150221>
- Smith, K., & Petley, D. N. (2009). *Environmental hazards: Assessing risk and reducing disaster* (5th ed.). Routledge.
- Smit, B., & Wandel, J. (2006). Adaptation, adaptive capacity and vulnerability. *Global Environmental Change*, 16(3), 282–292. <https://doi.org/10.1016/j.gloenvcha.2006.03.008>
- Pemerintah Kota Makassar. (2023). *Peraturan daerah Kota Makassar tentang Anggaran*

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- Pendapatan dan Belanja Daerah Tahun Anggaran 2023*. Pemerintah Kota Makassar.
- Pemerintah Kota Makassar. (2025). *Peraturan daerah Kota Makassar tentang Anggaran Pendapatan dan Belanja Daerah Tahun Anggaran 2025*. Pemerintah Kota Makassar.
- Tribun Timur (2024, Desember 22). *1.403 Warga Makassar Mengungsi Akibat Banjir*. Tribunnews Makassar. Diakses pada 11 Desember 2025, dari <https://makassar.tribunnews.com/2024/12/22/1403-warga-makassar-mengungsi-akibat-banjir>
- Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2004). *At Risk: Natural hazards, people's vulnerability and disasters* (2nd ed.). Routledge.