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Community Participation in Local Disaster Risk Reduction and Management: A Scoping Review of Strategies, Outcomes, and Barriers

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Abstract: *Community participation is widely recognized as a foundation of local disaster risk reduction and management (DRRM), yet the meaning of participation and the approaches used to sustain it vary considerably across settings and phases of the disaster cycle. This scoping review mapped the strategies used to involve communities in local DRRM planning, preparedness, response, and recovery; the outcomes associated with these approaches; and the barriers that limit meaningful participation. Guided by the Arksey and O'Malley framework, Levac and colleagues' refinements, JBI methodological guidance, and PRISMA-ScR, the review applied a Population-Concept-Context lens. The population included residents, community volunteers, local leaders, civil society organizations, and other local actors; the concept was community participation in DRRM; and the context was local or community-level disaster governance. A targeted search of web-accessible peer-reviewed studies, reviews, and authoritative policy guidance published from 2004 to 21 June 2026 was conducted. Twenty-six substantive sources were charted. Five themes emerged: (1) participatory risk assessment and co-designed local plans anchor participation in the planning stage, (2) community committees, volunteers, drills, and early warning systems operationalize preparedness, (3) community networks and feedback mechanisms strengthen local response, (4) locally led needs assessment, recovery planning, and livelihood support enable more accountable recovery, and (5) meaningful participation depends on power-sharing, inclusive representation, trust, resources, and institutional follow-through. An emergent framework is proposed to show how local context and system enablers shape participation across the DRRM cycle, activate shared ownership and collective capability, and support relevant plans, preparedness, timely response, equitable recovery, and resilience. The review concludes that community participation should be treated as an ongoing governance practice rather than a one-time consultation activity.*

Keywords: Community participation, Disaster risk reduction and management, Local and Community-based disaster risk reduction,

1. INTRODUCTION

Disaster risk is experienced locally. Communities are the first to encounter warnings, make household-level decisions, organize evacuation, assist neighbors, protect livelihoods, and begin recovery long before outside assistance is fully mobilized. For this reason, disaster risk reduction and management (DRRM) cannot be understood only as a technical or emergency-service function. It is also a local governance process through which residents, local officials, civil society organizations, volunteers, and other actors identify risks, set priorities, mobilize resources, and decide how protection and recovery will be pursued. The Sendai Framework for Disaster Risk Reduction 2015-2030 places people at the center of disaster risk governance and calls for collaboration among people at the local level, including the dissemination of disaster-risk information through community-based organizations (United Nations Office for Disaster Risk Reduction [UNDRR], 2015).

Community participation is especially important because hazard information, risk maps, warning systems, and formal plans are most effective when they are interpreted through local realities. Residents hold situated knowledge about flood routes, unstable slopes, household vulnerability, caregiving needs, informal communication networks, seasonal livelihood patterns, and the locations of people who may be unable to evacuate independently. Participatory approaches can therefore make DRRM plans more contextually relevant while also strengthening the willingness and capability of residents to act. Research in the Philippines has shown that stronger forms of community engagement - characterized by active involvement, capacity-building, open information, and dialogue - are more effective than passive or consultative approaches in supporting local climate-change adaptation and DRRM (Baybay & Hindmarsh, 2019). Earlier Philippine work likewise demonstrated that locally grounded capacity-building can link disaster preparedness with broader climate adaptation and development concerns (Allen, 2006).

At the policy level, the Philippine Disaster Risk Reduction and Management Act of 2010 promotes a comprehensive, proactive, and community-based approach. It directs government to promote the involvement and participation of all sectors and stakeholders, especially local communities, and to create an enabling environment for substantial and sustainable participation by civil society organizations, private groups, volunteers, and communities (Republic Act No. 10121, 2010). The National Disaster Risk Reduction and Management Plan 2020-2030 organizes local and national work around prevention and mitigation, preparedness, response, and

rehabilitation and recovery, providing a useful cycle for examining the points at which participation may occur (National Disaster Risk Reduction and Management Council [NDRRMC], 2020).

However, participation is not a uniform practice. At its weakest, it may involve one-way dissemination of warnings, technical briefings, or attendance at meetings after key decisions have already been made. At its strongest, it may involve residents in risk assessment, plan formulation, budget prioritization, warning design, volunteer coordination, rapid needs assessment, monitoring, and recovery decisions. The difference matters. Scolobig et al. (2015) cautioned that people-centered disaster risk management can remain rhetorical when responsibility is transferred to citizens without corresponding influence, resources, or institutional support. Heijmans (2009) similarly argued that community-based disaster risk reduction (CBDRR) is shaped by political choices about whose risks are recognized, whose knowledge counts, and who has authority over priorities.

The evidence base is consequently dispersed across disaster studies, public administration, community resilience, early warning, volunteering, local governance, and recovery practice. Some studies focus on participatory planning, while others concentrate on evacuation drills, volunteerism, disaster-resilient villages, early warning systems, post-disaster needs assessment, or local recovery frameworks. A scoping review is appropriate for this fragmented field because it maps the breadth of approaches, clarifies how participation is operationalized across the DRRM cycle, identifies outcomes and implementation conditions, and reveals gaps without claiming to estimate a single pooled effect. This review therefore asked: What approaches are used to involve communities in local DRRM planning, preparedness, response, and recovery? It also examined the outcomes reported for these approaches and the barriers that continue to limit meaningful community participation.

2. METHODS

Design and Review Process

This study used a scoping review design. The review was conceptually anchored in the framework of Arksey and O'Malley (2005), refined by Levac et al. (2010), and aligned with the JBI guidance for scoping reviews and the PRISMA extension for scoping reviews (Peters et al., 2020; Tricco et al., 2018). A scoping review was selected because community participation in DRRM is a broad and interdisciplinary topic that spans local governance, public participation, community-based disaster risk reduction, disaster preparedness, emergency response, recovery, resilience, and inclusion. The purpose was to map strategies and recurring implementation patterns rather than to calculate pooled intervention effects or rank approaches by certainty of evidence.

The review followed a Population-Concept-Context (PCC) approach. The population included community members and local actors involved in DRRM, such as at-risk residents, barangay or village leaders, local DRRM personnel, community disaster volunteers, civil society organizations, informal networks, women, youth, older persons, persons with disabilities, Indigenous peoples, and other groups whose participation is discussed in the literature. The concept was community participation, including community-based DRR/M, citizen engagement, participatory risk assessment, participatory planning, community early warning, volunteerism, co-production, feedback mechanisms, and local recovery engagement. The context included local DRRM at neighborhood, barangay or village, municipal, city, coastal, rural, urban, and comparable community levels across planning, preparedness, response, and recovery.

A targeted web-accessible search was conducted on 21 June 2026. Search locations included Google Scholar, PubMed, SpringerLink, Jamba: Journal of Disaster Risk Studies, PreventionWeb, UNDRR, UNDP, Global Facility for Disaster Reduction and Recovery, OECD, and official Philippine government repositories. Search strings were combined in different ways, including "community participation" AND "disaster risk reduction," "community engagement" AND "local disaster management," "community-based disaster risk reduction" AND planning, "participatory disaster risk assessment," "community early warning system" AND participation, "community volunteers" AND disaster response, and "local actors" AND disaster recovery. Backward citation checking was used selectively to locate influential foundational works and practice guidance.

Eligible sources included peer-reviewed empirical studies, systematic or critical reviews, scholarly conceptual works with direct implementation implications, and authoritative global, national, or professional guidance directly relevant to local community participation in DRRM. Sources were prioritized when they described participation strategies, governance arrangements, outcomes, barriers, inclusion, or local implementation across one or more phases of the DRRM cycle. Sources were excluded when they focused only on national-level coordination without a community participation component, on clinical or individual preparedness without local collective action, or on generic resilience discussions that did not provide direct implications for local DRRM practice. English-language sources published from 2004 to 21 June 2026 were prioritized, with older foundational works retained only when conceptually necessary.

After relevance screening, twenty-six substantive sources were charted, together with four methodological references. Data charting captured author and year, setting or population, DRRM phase, participation strategy, outcomes or contribution, and reported barriers or enabling conditions. The charted material was analyzed through an inductive-deductive thematic synthesis. Initial coding focused on approaches such as risk mapping, vulnerability and capacity assessment, community meetings, plan validation, committees, volunteerism, drills, early warning, local response coordination, feedback channels, post-disaster needs assessment, livelihood recovery, and reconstruction monitoring. Codes were then organized into themes that explain how participation is used

across the local DRRM cycle, what it is expected to achieve, and what conditions make it meaningful or merely symbolic. Consistent with the purpose of a scoping review, no formal risk-of-bias appraisal was undertaken; the synthesis should therefore be read as an evidence-informed map rather than a definitive estimate of effectiveness.

PCC Framework and Eligibility Criteria

Table 1. Population-Concept-Context Framework and Eligibility Criteria

Element	Description
Population	At-risk residents, local leaders, local DRRM personnel, community volunteers, civil society organizations, and groups whose participation or exclusion is directly discussed.
Concept	Community participation, community engagement, community-based DRR/M, participatory risk assessment, co-production, public participation, community early warning, volunteerism, feedback, response, and recovery engagement.
Context	Local or community-level DRRM in barangay, village, neighborhood, municipal, city, coastal, rural, urban, and comparable settings across planning, preparedness, response, and recovery.
Included sources	Peer-reviewed empirical studies, reviews, conceptual works with direct implementation implications, and authoritative policy or practice guidance relevant to local community participation in DRRM.
Excluded sources	Sources focused only on national coordination, individual household preparedness without collective participation, clinical emergency management, or general resilience without direct local DRRM participation implications.
Time coverage	2004 to 21 June 2026, with foundational sources retained when conceptually necessary.
Language	English.

3. RESULTS AND DISCUSSION

Theme 1: Participatory Risk Assessment and Co-Designed Local Plans Anchor Participation in the Planning Stage

Across the charted literature, the most direct way to involve communities in local DRRM planning is through participatory risk assessment. Approaches include community hazard mapping, vulnerability and capacity assessment, participatory transect walks, seasonal calendars, household and livelihood mapping, identification of evacuation routes and safe spaces, and community discussions that validate technical risk information. These processes make risk visible in the language and spatial knowledge of residents rather than presenting local people only with externally prepared maps or plans. Community members can identify who is exposed, where impacts concentrate, which groups need support, and how social, economic, environmental, and infrastructure conditions amplify risk. Allen (2006) found that local capacity-building in the Philippines is strengthened when disaster preparedness is integrated with community priorities and development concerns. Johnston et al. (2022) similarly argued that community engagement for natural-hazard preparedness should begin with a realistic understanding of local people, relationships, capacities, and hazard contexts rather than with a generic communication campaign.

Participation in planning becomes more meaningful when it continues beyond data gathering. The evidence points to community assemblies, local planning workshops, stakeholder dialogues, plan validation meetings, participatory modeling, and budget-prioritization discussions as mechanisms through which residents can influence the choice, sequencing, and acceptability of DRRM actions. In Philippine coastal communities, Baybay and Hindmarsh (2019) documented local engagement practices such as consultations, meetings, community assemblies, volunteer groups, and emergency teams, while also showing that communities preferred stronger engagement that combined capacity-building, open information, dialogue, and meaningful partnership. This distinction is important for public administration: a plan that reflects community priorities but has no community validation or feedback mechanism risks treating residents as informants rather than co-producers of local safety.

The outcomes associated with planning-stage participation are not limited to the production of a document. Participatory processes can improve the contextual relevance of local plans, strengthen shared understanding of risk, surface local knowledge that

is absent from standard datasets, improve the legitimacy of priorities, and generate social ownership of agreed actions. Scolobig et al. (2015) emphasized that people-centered DRM requires attention to residents' perspectives and the institutional conditions that allow those perspectives to influence decisions. However, the same literature warns that risk assessment can become extractive when communities contribute knowledge but do not see how it changes priorities, budgets, or project design. Technical language, limited time for dialogue, absent feedback, and decisions made before consultation are recurrent barriers. Thus, participatory planning should include visible feedback loops explaining which community proposals were adopted, deferred, or rejected and why.

Theme 2: Community Committees, Volunteers, Drills, and Early Warning Systems Operationalize Preparedness

Preparedness is where participation commonly becomes operational. Local disaster committees, barangay or village DRRM groups, trained volunteers, neighborhood focal points, women's and youth groups, community health workers, and civil society partners can support warning dissemination, household preparedness, evacuation assistance, first aid, resource inventories, emergency communication, and drills. These arrangements translate plans into repeated collective practice. Que et al. (2022) found that participation in evacuation drills and self-help skills training was higher in model disaster-mitigation communities than in nonmodel communities, illustrating the value of organized preparedness structures. At the same time, the study found weaker participation in activities that invited public feedback, suggesting that communities may be mobilized more easily for implementation than for shared deliberation.

Community-centered early warning is another major preparedness approach. Rather than treating early warning as a one-way transmission of technical alerts, community-centered systems involve residents in interpreting risks, defining locally understandable warning messages, identifying trusted channels, maintaining communication links, and deciding what actions should follow a warning. Baudoin et al. (2016) described a shift from expert-driven to community-centric early warning systems in which vulnerable communities help drive the warning process. Sufri et al. (2020) similarly synthesized evidence on community engagement in disaster early warning systems and highlighted the importance of engagement across warning design, operation, communication, and response. Local participation is particularly valuable when warnings must reach people with limited access to formal information channels, different literacy levels, disabilities, language differences, or livelihoods that keep them away from home during critical periods.

Drills, simulations, and practical training are also central. They enable residents to rehearse evacuation routes, clarify roles, identify bottlenecks in transport and shelter management, and practice assisting children, older persons, persons with disabilities, and others who require support. These activities can build confidence and normalize collective action before a crisis. OECD (2025) notes that locally trained response volunteers can strengthen the installation, maintenance, interpretation, and credibility of early warning arrangements. Informal volunteers likewise often bring local knowledge, initiative, and rapid mobilization capacity during emergencies, although they need coordination and safety safeguards (Whittaker et al., 2015). The reported outcomes include stronger warning reach, better readiness to evacuate, improved self-help skills, and enhanced trust in local systems. Yet preparedness participation is difficult to sustain when training is repetitive, unpaid volunteer roles are unsupported, meetings conflict with livelihood demands, or equipment and transport are unavailable. Programs therefore need schedules, incentives, refresher training, accessible materials, and clear coordination with formal local DRRM structures.

Theme 3: Community Networks and Feedback Mechanisms Strengthen Local Response

During response, community participation shifts from preparation to immediate collective action. Local networks frequently assist with search and rescue support, evacuation, shelter coordination, household checks, distribution logistics, neighborhood-level information sharing, and identification of people who may be missed by formal response systems. Community members can provide rapid contextual information about blocked roads, isolated households, injury patterns, disrupted livelihoods, and emerging protection concerns. The Philippine DRRM Act recognizes the role of community disaster volunteers and emphasizes coordination and information sharing among provincial, city, municipal, and barangay DRRM structures (Republic Act No. 10121, 2010). Such arrangements provide a governance basis for connecting local action to municipal or city-level command and support systems.

The literature also emphasizes two-way communication and accountability during response. Participation is not only the provision of labor; it includes the right of residents to receive understandable information, raise concerns, correct inaccurate beneficiary lists, and receive feedback about relief criteria, service availability, and recovery options. Wells et al. (2013) showed that community engagement in preparedness and recovery can strengthen the fit between services and the needs of affected populations when institutions build relationships before disasters occur. In local response, these relationships can make it easier to share information quickly and to distinguish urgent needs from assumptions made at a distance. Community feedback mechanisms, local focal persons, participatory needs assessment, and transparent grievance channels help reduce the risk that assistance is distributed through opaque or exclusionary processes.

However, response participation requires role clarity. The spontaneous arrival of informal volunteers may be valuable, but it can also produce duplication, congestion, safety risks, and unclear accountability when not integrated into incident management arrangements. Whittaker et al. (2015) found that informal volunteerism brings both opportunities and challenges, particularly regarding coordination, liability, communication, and the matching of skills to tasks. Response systems should therefore pre-identify

local volunteer roles, referral points, safety protocols, and reporting channels during preparedness rather than trying to construct them under crisis conditions. The desired outcome is not the replacement of formal responders by communities; it is a coordinated response in which community knowledge and initiative complement professional capacity.

Theme 4: Locally Led Needs Assessment, Recovery Planning, and Livelihood Support Enables More Accountable Recovery

Community participation remains necessary after immediate relief. Recovery choices - such as where and how to rebuild, which infrastructure is prioritized, how livelihood assistance is targeted, whether relocation is acceptable, and how recovery monitoring occurs - reshape local vulnerability for years. The Global Facility for Disaster Reduction and Recovery and its partners (2019) recommend engaging local actors in recovery frameworks through understanding local needs and institutional capacity, planning with communities and market actors, strengthening accountability, and linking recovery actions to resilient development. These mechanisms move community participation beyond consultation toward sustained influence over decisions that affect land, housing, livelihoods, services, and the use of recovery resources.

Participatory recovery approaches include community-led or jointly conducted post-disaster needs assessment, recovery planning workshops, local reconstruction committees, community monitoring of housing and infrastructure, livelihood-recovery groups, participatory beneficiary validation, and local feedback and grievance systems. The intended outcomes are more appropriate recovery priorities, better alignment with local livelihood systems, stronger accountability, and a greater chance that reconstruction reduces rather than reproduces pre-disaster risk. Ma et al. (2023) emphasized that community resilience initiatives are more credible when they are locally tailored and built on the specific resources, networks, and constraints of each community. This perspective is important because recovery cannot be reduced to replacing damaged assets; it must also restore social connections, services, information, and the capacities needed to manage future risks.

Recovery participation faces a particular risk of fatigue and unequal voice. Immediately after a disaster, households may be occupied with shelter, income, caregiving, repair, and trauma-related concerns, leaving limited time for meetings or monitoring. More powerful groups may dominate decisions about land, beneficiary selection, or reconstruction standards. External funding cycles may also encourage quick outputs rather than deliberative processes. For these reasons, locally led recovery must be resourced, facilitated, and connected to transparent decision rules. The UNDP (2025) guidance on community-based resilience-building underscores the need to work with local institutions, social cohesion, inclusion, and area-based approaches rather than treating communities as temporary project sites. Meaningful recovery participation requires time, accessible information, and continuing support long after the first phase of assistance has ended.

Theme 5: Meaningful Participation Depends on Power-Sharing, Inclusive Representation, Trust, Resources, and Institutional Follow-Through

The strongest cross-cutting theme is that participation is meaningful only when local actors have genuine opportunities to influence decisions and when institutions respond to what they contribute. The difference between attendance and influence is crucial. Baybay and Hindmarsh (2019) reported that weak engagement in Philippine coastal communities was linked to limited decision-making, top-down implementation, poor community information, constrained budgets, insufficient coordination, and local political dynamics. Nkombi and Wentink (2022) similarly found that participation in a South African township was undermined by reluctance to participate, unclear roles, and inadequate stakeholder buy-in. These studies indicate that participation fails when residents are invited to activities without being informed about their roles, the purpose of the activity, the decisions open to influence, or the resources available for implementation.

Inclusion is also a governance requirement, not an optional addition. The people most exposed to risk may have the least time, mobility, formal status, or confidence to participate in standard meetings. Women, young people, older persons, persons with disabilities, Indigenous communities, migrants, informal settlers, and people with precarious livelihoods may face barriers to accessing information, reaching venues, speaking in public, or influencing local leadership structures. The Sendai Framework calls for inclusive, accessible, and non-discriminatory participation, while the midterm review of its implementation identified continuing gaps in the meaningful inclusion of diverse groups in DRR decision-making (UNDRR, 2015, 2023). Inclusive design may involve holding meetings at accessible times and locations, providing transport or child-care support, using local languages and nontechnical materials, ensuring disability-accessible communication, creating separate safe spaces where needed, and establishing representation rules that prevent elite capture.

Trust links all phases of participation. Residents are more likely to share knowledge, act on warnings, volunteer, accept evacuation advice, and cooperate with recovery decisions when they trust local institutions and perceive procedures as fair. Bonfanti et al. (2024) identified trust as central to DRR because it shapes risk communication, cooperation, and resilience across different phases of disaster management. Trust is strengthened when officials communicate uncertainty honestly, recognize local knowledge, follow through on commitments, disclose decision criteria, and make grievance procedures usable. It is weakened when participation occurs only after decisions are fixed, when aid allocation is opaque, or when community contributions disappear into plans that are never implemented.

Finally, local participation needs enabling resources. Arifin et al. (2021) illustrated how a disaster-resilient village program can remain inefficient when village apparatuses are treated as the main actors and residents are relegated to an afterthought. Heijmans (2009) warned that CBDRR can conceal politics and power if it is framed only as community mobilization. These insights point to a practical lesson for local governments: communities cannot be asked to carry disaster responsibility without access to training, facilities, warning tools, information, transport, inclusive governance arrangements, and adequate local DRRM funding. Participation is not a substitute for government duty; it is a way to make public action more responsive, legitimate, and effective.

Emergent Framework

The synthesis suggests that community participation in local DRRM can be understood as a cycle of shared governance rather than a single activity. The first layer of the framework is local context: hazards, exposure, livelihoods, local knowledge, social networks, cultural practices, and inequalities shape who can participate and what kinds of action are feasible. These conditions influence whether a standard program will be appropriate or whether the process must be adapted to local patterns of work, language, mobility, and decision-making.

The second layer is the system-enabling environment. Legal mandates, local leadership, resources, facilitation capacity, accessible information, trust, and clear institutional roles determine whether community participation has a pathway into formal planning and operations. Within this environment, participation is expressed through phase-specific mechanisms: participatory risk assessment and plan validation in planning; committees, volunteers, drills, and community early warning in preparedness; local coordination, feedback, and rapid needs assessment in response; and recovery planning, livelihood support, reconstruction monitoring, and accountability in recovery.

The third layer consists of core change mechanisms. When residents contribute knowledge, share decision authority, receive usable information, and work through trusted networks, participation can create shared ownership, collective capability, stronger risk awareness, and more legitimate local action. These mechanisms lead to expected outcomes: locally relevant DRRM plans, stronger warning reach, increased preparedness, more timely and coordinated response, equitable and accountable recovery, and longer-term resilience. Across every layer, safeguards are required to prevent tokenism, exclusion, and elite capture. Participation should be inclusive, accessible, transparent, and connected to visible feedback on how community input affects decisions.

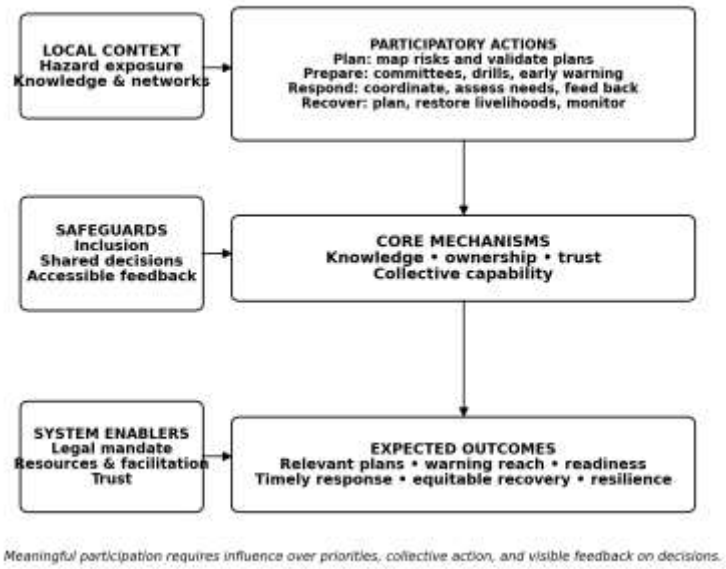

Figure 1. *Emergent Framework for Community Participation in Local Disaster Risk Reduction and Management*

This review has several limitations. First, it used a targeted web-accessible search rather than a full systematic database export with duplicate management and independent screening. Second, English-language sources were prioritized, which may have excluded relevant evidence published in local languages. Third, the literature is uneven across DRRM phases: preparedness and early warning are better represented than participatory response and recovery, while evidence on long-term outcomes remains less consistent. Fourth, the review did not undertake a formal methodological quality appraisal. The findings should therefore be interpreted as an evidence-informed conceptual map that can guide public-administration practice, local program design, and future empirical research rather than as a definitive ranking of participation models.

4. CONCLUSION

This scoping review shows that communities are involved in local DRRM through a broad set of strategies that extend across planning, preparedness, response, and recovery. Participatory risk assessment, local mapping, vulnerability and capacity assessment, plan validation, and budget discussions are used to bring community knowledge into local planning. Community committees, volunteers, drills, and community-centered early warning systems turn preparedness into repeated collective practice. During response, local networks, feedback channels, and participatory needs assessment can help formal systems identify urgent needs and reach people who may otherwise be overlooked. In recovery, local actors can contribute to needs assessment, recovery planning, livelihood support, reconstruction monitoring, and accountability.

The review also shows that participation is not automatically meaningful. The same label can describe simple attendance at a meeting or genuine influence over priorities and resources. The strongest outcomes are associated with approaches that are active, inclusive, adequately resourced, and connected to clear institutional follow-through. Where participation is limited to one-way information dissemination, where roles are unclear, or where residents have no visible influence over decisions, community engagement can become symbolic and may weaken trust. Local governments and DRRM councils therefore need to treat participation as an ongoing public-governance function with structures for shared decision-making, feedback, inclusion, and accountability.

For the Philippine context, the review reinforces the community-based intent of Republic Act No. 10121 and the NDRRMP 2020-2030. Community participation should not shift responsibility for disaster risk onto residents without support. Instead, it should connect community knowledge and collective action with the duty of local governments to provide resources, technical guidance, coordination, inclusive systems, and transparent decision processes. A local DRRM system becomes more resilient when communities are not merely recipients of warnings, relief, or projects, but recognized partners in defining risk and shaping collective action.

5. RECOMMENDATION

Local governments and local DRRM councils may institutionalize a participation cycle that is linked to the four DRRM thematic areas. Before disasters, they may conduct regular participatory risk and vulnerability assessments, publicly validate local DRRM plans and budgets, and document how community recommendations are addressed. Preparedness programs may combine neighborhood committees, trained volunteers, household-level risk communication, inclusive drills, and community-centered early warning protocols. These measures should be refreshed regularly rather than implemented only after a major event or during the preparation of a required plan.

Participation mechanisms should be deliberately inclusive. Local DRRM offices may establish representation and accessibility standards for women, youth, older persons, persons with disabilities, Indigenous peoples, geographically isolated households, and livelihood groups. Meetings and drills should be held at accessible times and locations, use local languages and nontechnical formats, and include practical arrangements for mobility, caregiving, communication, and feedback. Local leaders should also be trained to facilitate dialogue, manage conflict, disclose decision criteria, and prevent elite capture. Transparent feedback channels, grievance mechanisms, and public reporting on DRRM funds and project implementation can strengthen trust and demonstrate that community input has consequences.

Future research may examine which participation strategies produce sustained improvements in locally relevant outcomes, including warning comprehension, evacuation behavior, inclusion, response timeliness, beneficiary equity, livelihood recovery, and trust in local institutions. There is also a need for longitudinal and comparative studies in Philippine barangays and municipalities that examine how participation is affected by local political conditions, poverty, gender, disability, Indigenous knowledge, digital access, and repeated hazard exposure. Mixed-methods evaluations that combine administrative data, community narratives, and participatory monitoring would be especially useful for determining not only whether communities attend DRRM activities, but whether they gain meaningful influence over the decisions that shape their safety and recovery.

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