

# Community-Integrated Flood Resilience in Kerala: Assessing the Disaster Governance Framework

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## Abstract

Flood disasters pose a significant challenge globally, and Kerala is particularly vulnerable due to its unique geographical features, rapid urbanization, and changing climate. The devastating floods of 2018 and subsequent years underscored the urgency for robust, inclusive, and community-driven disaster governance. This study examines the concept of community resilience in disaster management. In the context of Kerala, the study critically analyses existing disaster management policies, including those of the Kerala State Disaster Management Authority (KSDMA), and evaluates the gaps and challenges in current frameworks. Emphasis is placed on the role of local self-government institutions (LSGIs) and initiatives like the Nammal Namukkayi campaign, which have shown promise in integrating community perspectives into disaster planning.

The findings reveal that Kerala's disaster governance framework has made strides in decentralization and public engagement but requires further enhancements in inclusivity, capacity building, and the adoption of innovative tools and community-based flood early warning systems (CBFEWS). Key barriers, including financial constraints, coordination issues, and resource limitations, also emerge as critical factors needing attention. Based on the analysis, the study proposes actionable recommendations to improve community resilience to floods in Kerala. The study also stresses the importance of continuous collaboration between government agencies, NGOs, and local communities to ensure that policies are effectively translated into practice. By focusing on community participation and inclusivity, the proposed recommendations seek to transform Kerala's flood disaster governance from a reactive to a proactive and sustainable system, ultimately building a resilient society capable of withstanding future flood challenges.

**Keywords:** Community Resilience, Flood, Disaster Risk Governance

## 1. Introduction

Flood is one of the most destructive natural disasters globally, with significant socio-economic impacts on affected communities. The Indian state of Kerala has seen a rise in the frequency and severity of floods in recent times, due to a combination of factors including urbanization, environmental degradation, and climate change. The devastating 2018 floods, which caused significant damage and fatalities, emphasized the urgent need for improved flood protection and control measures in the area.

Kerala is particularly vulnerable to floods because of a number of issues, including the state's dense population, unplanned development, poor drainage systems, and the encroachment of water bodies.

These vulnerabilities will probably get worse as urbanization accelerates, therefore proactive and integrated flood preparedness plans will need to replace reactive disaster management techniques.

The concept of community-integrated flood preparedness has gained popularity as a holistic approach that emphasizes active participation of local communities in disaster preparedness efforts. This approach recognizes that communities are not just passive victims of disasters but possess valuable local knowledge and resources that can be used to enhance resilience. There is great opportunity to further incorporate community-based initiatives into official flood preparedness methods in Kerala, where they have traditionally been crucial to disaster management.

## 2. Need for the Study

Kerala's intricate landscape and dense urban areas make it particularly vulnerable to regular flooding. The catastrophic floods of 2018 underscored the importance of adopting a more cohesive strategy for flood resilience that actively engages local communities. With climate change leading to more frequent and severe flooding, there is an urgent need for integrated solutions in disaster readiness. By focusing on community involvement, this study seeks to empower residents, ensuring they play a vital role in building their resilience against future flood challenges. This research is especially relevant given recent climate change forecasts, which suggest that extreme weather events, such as heavy rains and floods, are expected to increase in frequency and intensity. Additionally, the rapid urban growth in Kerala heightens the risk of flood-related disasters, making it essential to create robust systems. This study addresses the critical need to improve flood preparedness at a time when it is most necessary.

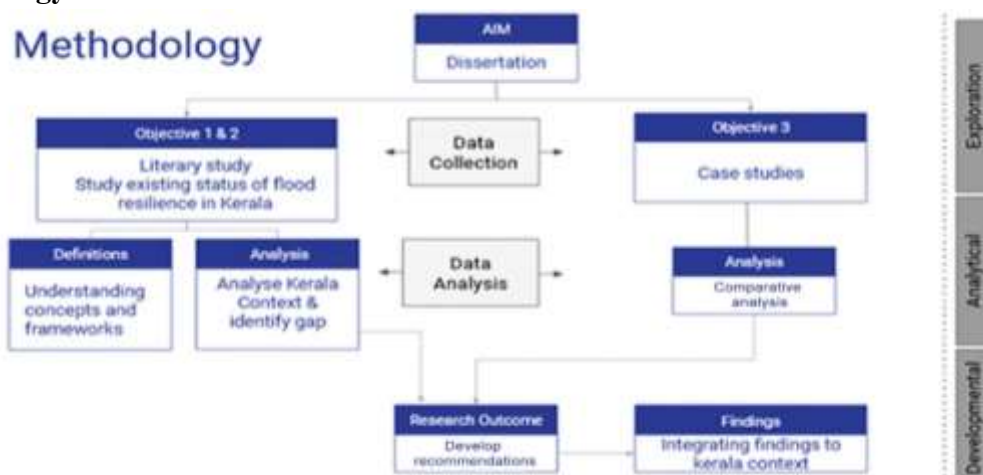
## 3. Aim

To suggest recommendations for enhancing community resilience to flood disasters in Kerala.

## 4. Objectives

- To study the concept of community resilience in disaster management.
- To study and assess existing policies and frameworks related to flood resilience in Kerala.
- To study best practices of community-based flood resilience models and identifies interventions that improve community participation.
- To develop recommendations for enhancing community resilience to flood disasters in Kerala.

## 5. Methodology



## 6. Scope

The research involves study and analysis of the current state of flood resilience in Kerala which includes evaluating existing flood preparedness and management practices, identifying gaps in the existing frameworks.

A comprehensive assessment of effective community-based flood resilience models from different areas will be carried out which focuses on identifying interventions that have effectively improved community participation in flood preparedness and management so that can be adapted to the context of Kerala.

The research will suggest recommendations for incorporating community involvement into the planning, implementation, and management of flood resilience in Kerala.

## 7. Limitations

The study is specifically focused on the disaster governance related to flood resilience, which is a component of institutional framework means that other components are not covered in detail. This narrowed focus may limit the comprehensiveness of the proposed recommendations, as flood resilience is a multifaceted process. Recommendations provided may face challenges in real-world application due to bureaucratic, financial, or socio-political constraints that are beyond the scope of the study to resolve.

## 8. Literature Review

### 8.1 Resilience

According to the United States Agency for International Development (USAID), “resilience is the ability of people, households, communities, countries, and systems to mitigate, adapt to, and recover from, shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth”. This definition is drawn from decades of experience of providing humanitarian and development assistance to disaster countries (USAID, 2012).

### 8.2 Community Resilience

“The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.” United Nations Office for Disaster Risk Reduction (UNDRR).

### 8.3 Community Flood Resilience

Community flood resilience is the ability of a community and all of its socio-ecological and socio-technical networks across temporal and spatial scales-to maintain or rapidly return to desired functions in the face of flood events, to adapt to change, and to transform systems that affect the current and future adaptive capacity.(Meerow, Newell, & Stults, 2016).

### Key indicators of Community flood Resilience:

- Social capital.
- Preparedness and Response Capacity.
- Access to Information.
- Infrastructure Resilience.
- Economic Resilience.
- Institutional Framework.

### 8.4 Community Based Disaster Risk Management (CBDRM)

CBDRM is defined as a process that places local communities at the forefront of disaster risk managem-

ent, enabling them to identify, assess, and mitigate risks associated with disasters. This approach fosters community ownership and empowerment, ensuring that strategies are culturally relevant and context-specific (Asian Disaster Preparedness Center, 2006).

According to Abarquez and Murshed (2004), CBDRM originated from a shift away from traditional top-down disaster management approaches towards more inclusive, community-driven strategies. This framework emphasizes the importance of community participation in decision-making processes related to disaster risk reduction.

### **8.5 Disaster Governance**

The United Nations Office for Disaster Risk Reduction (UNDRR) defines disaster risk governance as "the system of institutions, mechanisms, policy and legal frameworks and other arrangements to guide, coordinate and oversee disaster risk reduction (DRR) and related areas of policy" (UNDRR, 2020). According to the Annual Review of Environment and Resources, disaster governance consists of "the interrelated sets of norms, organizational and institutional actors, and practices that shape how societies prepare for, respond to, and recover from disasters" (Blaikie et al., 2011). Governance is described by the United Nations Development Programme (UNDP) as "the exercise of political, economic and administrative authority in the management of a country's affairs at all levels" (UNDP, 1997).

#### **Sendai Framework**

The approach to disaster management has changed from a stand-alone reactive measure (to cope with emergencies and provide relief) to a proactive, comprehensive approach to address all aspects of a disaster cycle that covers strategic issues like preparedness, resilience, risk reduction, mitigation, reconstruction, and recovery reactive issues like response and relief. The thrust on risk reduction (DRR) perhaps began with UN initiatives in 1987 when the UN general assembly announced to observe the 1990s as the International Decade for Natural Disaster Risk Reduction (IDNDR). Since then there have been three World Conferences on disaster risk reduction in 1994 (Yokohama), 2005 (Kobe), and 2015 (Sendai). The Yokohama Strategy and Plan of Action for a Safer World (1994), as the first major international framework for disaster risk reduction. Ever since, this close interrelation was continuously strengthened within the key global agreements, from MDGs to the Johannesburg Plan of Implementation (Johannesburg, September 2002), to the "Hyogo Framework for Action (2005-2015)" and to the "Future We Want" (Rio, June 2012), to the Sendai Framework for DRR (Sendai, March 2016) and the 2030 Agenda for Sustainable Development (New York, September 2015).

The Sendai conference identified four priority areas for action with a time frame of 2015-2030. These are: (i) Understanding disaster risk, (ii) Strengthening disaster risk governance to manage disaster risk, (iii) Investing in disaster risk reduction for resilience and (iv) Enhancing disaster preparedness for effective responses and 'build back better' in recovery, rehabilitation and reconstruction. There are also seven targets expected to be achieved by 2030 which are Substantial reduction in (i) disaster mortality by 2030, (ii) number of affected people, (iii) economic loss, (iv) infrastructure damage and increase or enhancement in (iv) DRR national or local strategies (v) international cooperation, (vi) EWS and DR information. The World Congress on Disaster management held in Mumbai (2019) reaffirmed the commitment to the Sendai framework and stressed on reducing risk and building resilience for disaster management.

The Sendai Framework plays a crucial role in shaping disaster governance by establishing guidelines and responsibilities for various stakeholders involved in disaster risk management:

- **Multi-Level Governance:** It promotes a multi-tiered approach that includes local governments, civil society organizations, and the private sector. This encourages collaboration across different levels of authority (UNDRR, 2020).
- **Shared Responsibility:** While states have primary responsibility for disaster risk reduction, the framework emphasizes that this responsibility must be shared with other stakeholders. This fosters accountability and encourages diverse participation in governance processes (UNDRR, 2020).
- **Integration with Sustainable Development Goals:** The Sendai Framework aligns closely with the Sustainable Development Goals (SDGs), ensuring that disaster risk management is considered within broader development agendas. For instance, it directly supports SDG 13 on climate action by promoting national disaster risk reduction strategies.
- **Enhanced Preparedness and Resilience:** By focusing on preparedness and recovery strategies, the framework encourages countries to build resilient systems that can effectively respond to disasters while also promoting recovery efforts that incorporate lessons learned from past events (UNDRR, 2020).

The Sendai Framework serves as a foundational document guiding global efforts in disaster risk reduction and governance. Its emphasis on understanding risks, strengthening governance structures, investing in resilience, and enhancing preparedness positions it as a pivotal instrument in shaping how communities worldwide approach disaster management.

### 8.6 Disaster Risk Reduction and Management in Kerala

Kerala's Disaster Risk Reduction and Management (DRRM) have evolved through a series of key legislation, regulations, and programs targeted at increasing the state's resilience to disasters. The following is an overview of major developments:

- **National Disaster Management Act, 2005:** This act established the framework for disaster management across India, leading to the formation of the Kerala State Disaster Management Authority (KSDMA). The act emphasized a structured approach to disaster risk reduction.
- **Kerala State Disaster Management Rules, 2007:** Formulated under the National Act, these rules provided a legal framework for disaster management at the state level, detailing roles and responsibilities for various stakeholders.
- **Kerala State Disaster Management Policy, 2010:** This policy outlined the state's approach to disaster risk reduction, focusing on preparedness, response, recovery, and mitigation strategies tailored to local vulnerabilities.
- **Amendments to Disaster Management Rules, 2013:** Updates were made to enhance the effectiveness of disaster management protocols based on lessons learned from previous disasters.
- **District Disaster Management Plans, 2015:** KSDMA approved district-level plans that align with the state's overall disaster management strategy, ensuring localized responses to disasters.
- **Kerala State Disaster Management Plan, 2016:** Approved on September 9, 2016, this plan aligns with national policies and the Sendai Framework for Disaster Risk Reduction (2015-2030). It includes guidelines for risk reduction, stakeholder responsibilities, and financial arrangements for disaster preparedness and response.
- **Response to Catastrophic Floods, 2018:** The devastating floods prompted immediate action and led to the launch of various recovery schemes. The government initiated the Prathyuthaanam Scheme, aimed at supporting families whose homes were damaged during the floods.

- **Rebuild Kerala Development Program (RKDP), 2019:** Launched in July 2019 following extensive consultations, RKDP focuses on resilient recovery post-floods. It emphasizes inclusive development and climate sensitivity as core principles.
- **Nammal Namukkai Campaign:** Extensive campaign with active participation of the people to identify the required corrections and policy changes to ensure resilience. Preparation of Disaster Management Plan at every local self-government institutions.
- **Nava Keralam** is the government's vision of converting the crisis into an opportunity by more explicitly embedding the idea of building a green and resilient Kerala into the Approach Paper to the Thirteenth Five-Year Plan, the Disaster Management Policy, the State Water Policy, and the Gender Equity and Women's Empowerment Policies of Kerala. The recovery policy framework for building a Green Kerala committed to:

1. the Chief Minister's vision of a Nava Keralam (New Kerala), and
2. the concept of 'build back better and faster' rests on four pillars:

Pillar 1: Integrated water resources management (IWRM)

Pillar 2: Eco-sensitive and risk-informed approaches to land use and settlements

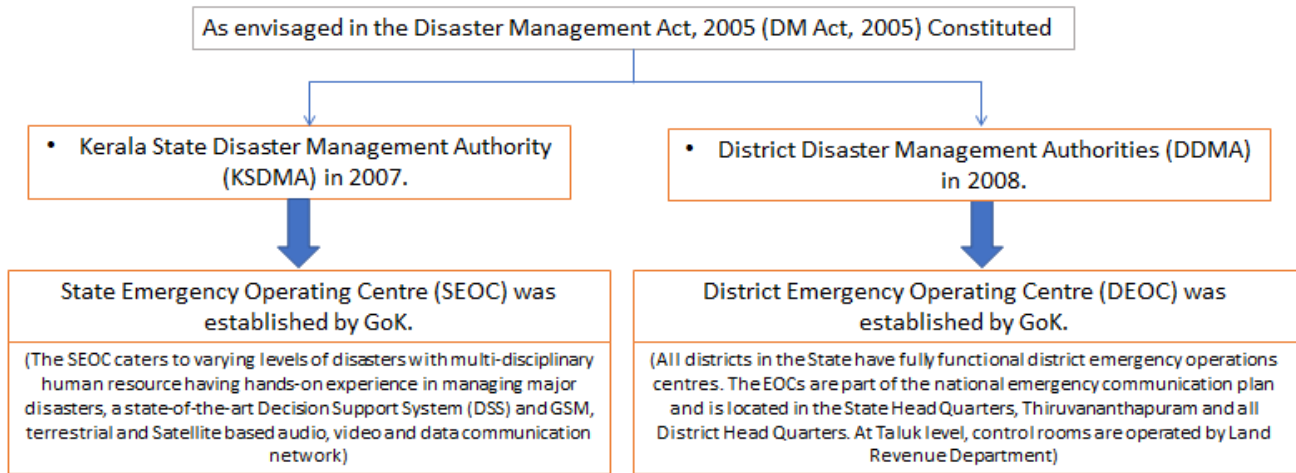
Pillar 3: Inclusive and people centered approach

Pillar 4: Knowledge, innovation, and technology

### **8.7 Kerala State Disaster Management Authority (KSDMA)**

The Kerala State Disaster Management Authority (KSDMA) was constituted in 2007 and District Disaster Management Authorities (DDMA) in 2008 as envisaged in the Disaster Management Act, 2005 (DM Act, 2005). The KSDMA has, as envisaged in the DM Act, 2005, constituted the State Executive Committee (SEC) chaired by its Chief Executive Officer (inter- alia Chief Secretary) and the executive management of the authority is vested with the Principal Secretary, Disaster Management (inter-alia State Relief Commissioner according to State DM Policy 2010). A well-coordinated and unified response of various departments of the State, its agencies, the Central Government, its departments and agencies appropriate to the demands of the district administration in the management of disasters will minimize loss of time wasted in response and improve the process of recovery. Recognizing the need for such a state-level a dedicated facility for disaster management, the Government of Kerala (GoK) has established the State Emergency Operating Centre (SEOC). The SEOC caters to varying levels of disasters with multi-disciplinary human resources having hands-on experience in managing major disasters, a state-of-the-art Decision Support System (DSS) and GSM, terrestrial and Satellite based audio, video and data communication network. All districts in the State have fully functional district emergency operations Centres. The EOCs are part of the national emergency communication plan and are located in the State Headquarters, Thiruvananthapuram and all District Head Quarters. At Taluk level, control rooms are operated by the Land Revenue Department.

**Figure 8.1 Disaster management in Kerala**



### State Emergency Operations Centre

- Conduct and regularly update the Hazard Vulnerability Risk Assessment (HVRA) of the state.
- Prepare the State and District DM Plans.
- Conceptualize and implement hazard early warning systems.
- Create and maintain the disaster database of the state
- Undertake research projects on topics relevant to disaster risk reduction
- Foster research collaboration with external agencies
- Emergency Coordination
- Preparation of calamity memoranda for submission to Government of India.

### 8.8 Attempts of decentralization in Disaster Management in Kerala; before 2018 flood.

#### Urban level Disaster Management Plans

- Thiruvananthapuram City Disaster Management Plan 2016.
- Thiruvananthapuram City Early Warning Systems Plan, 2016.
- Hazard and Vulnerability Assessment of Thiruvananthapuram City, 2015.
- Ward Level Disaster Management Plan (Sample).

#### Panchayat level Disaster Management Plans

- Village Disaster Management Plan, Peringara, Pathanamthitta , 2015.
- Village Disaster Management Plan, Munroethuruthu, Kollam, 2015.

#### Community Based Disaster Risk Management Programme - Munroethuruthu

Under the "Gol-UNDP Project on Enhancing Institutional and Community Resilience to Disasters and Climate Change" project, two revenue villages, namely *Munroethuruthu in Kollam and Peringara in Pathanamthitta districts* were selected to implement **Community Based Disaster Risk Management Programme (CBDRM)** with community participation and involvement. Foundation for Development Action (FDA), a Not for Profit Development Organisation based at Pathanamthitta provided technical support to execute the project in these villages.

#### Deliverables of the project:

- Community education and sensitization programme.

- Formation of Emergency Response Team's (ERT's).
- Training and capacity building programme for ERT's.
- Preparation of resource/social, hazard and evacuation maps adopting Participatory Capacity Vulnerability Assessment (PCVA) tool.
- Problem identification and prioritization of local issues through adopting Participatory Learning and Action (PLA) tool.
- Development of Village Disaster Management Plan (VDMP).

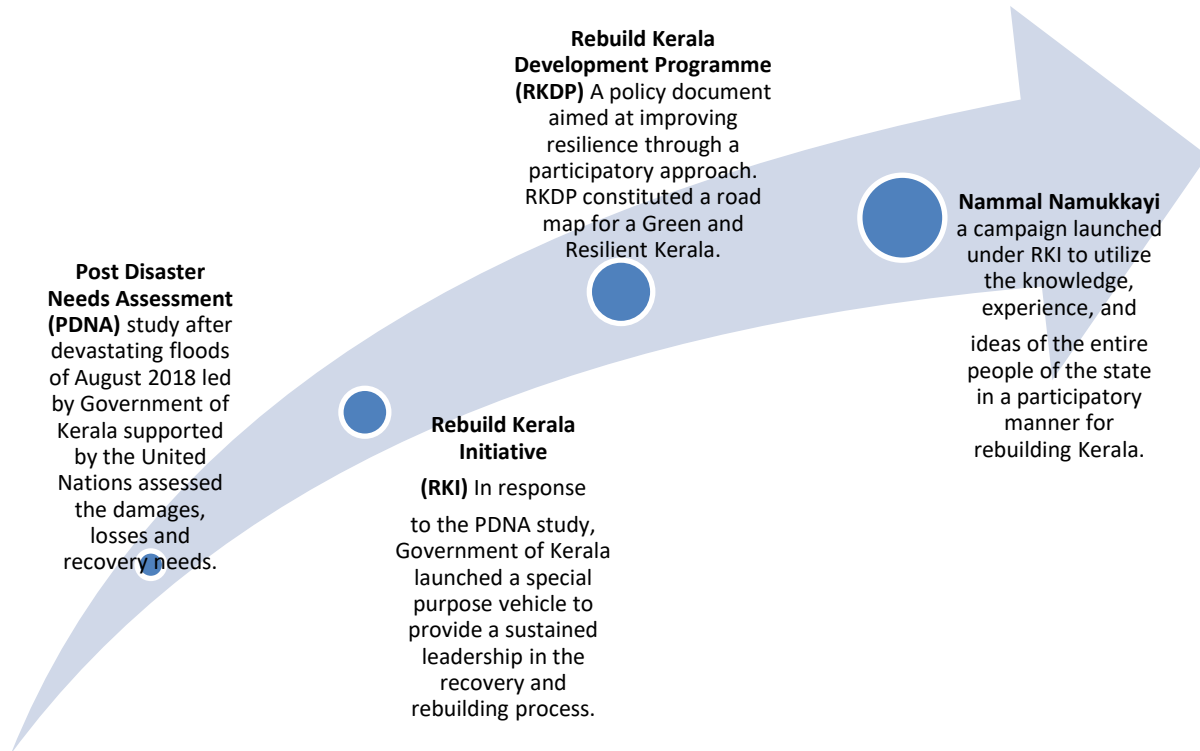
Village was divided into 3 zones each zone containing around 4 wards. Meetings were held for implementation of CBDRM. **Village Disaster Management Committee (VDMC)** consists of Chairperson – Gram Panchayat President Convenor – Village Officer & 20 members which includes Gram Panchayat Vice President, ward members, Secretary, Agriculture Officer, CDS Chairperson, Village Extension Officer, Medical Officer, Health Inspector PHC, Veterinary Surgeon, ICDS Supervisor.

#### **Roles and responsibilities of VDMC:**

- Coordinate, supervise and monitor activities of DM Programme at village level.
- Assist supporting NGO: to form ERTs and coordinate training of ERT's; to prepare Village Disaster Management (DM) Plan.
- Presenting Village Disaster Management Plan in the Gram Panchayat council for approval & its yearly Updation.
- Evaluate the performance of ERT's & Conduct periodic meetings to review the activities of DRR programme.
- Integrating other development activity with VDMP to reduce vulnerability.
- Liaison with government departments like; health, revenue, police, fire force and other agencies for assistance before, during and after disaster.
- Ensure people submit relief application/request to government and ensure they get the benefits.
- Management of all other DRR activities in the village.

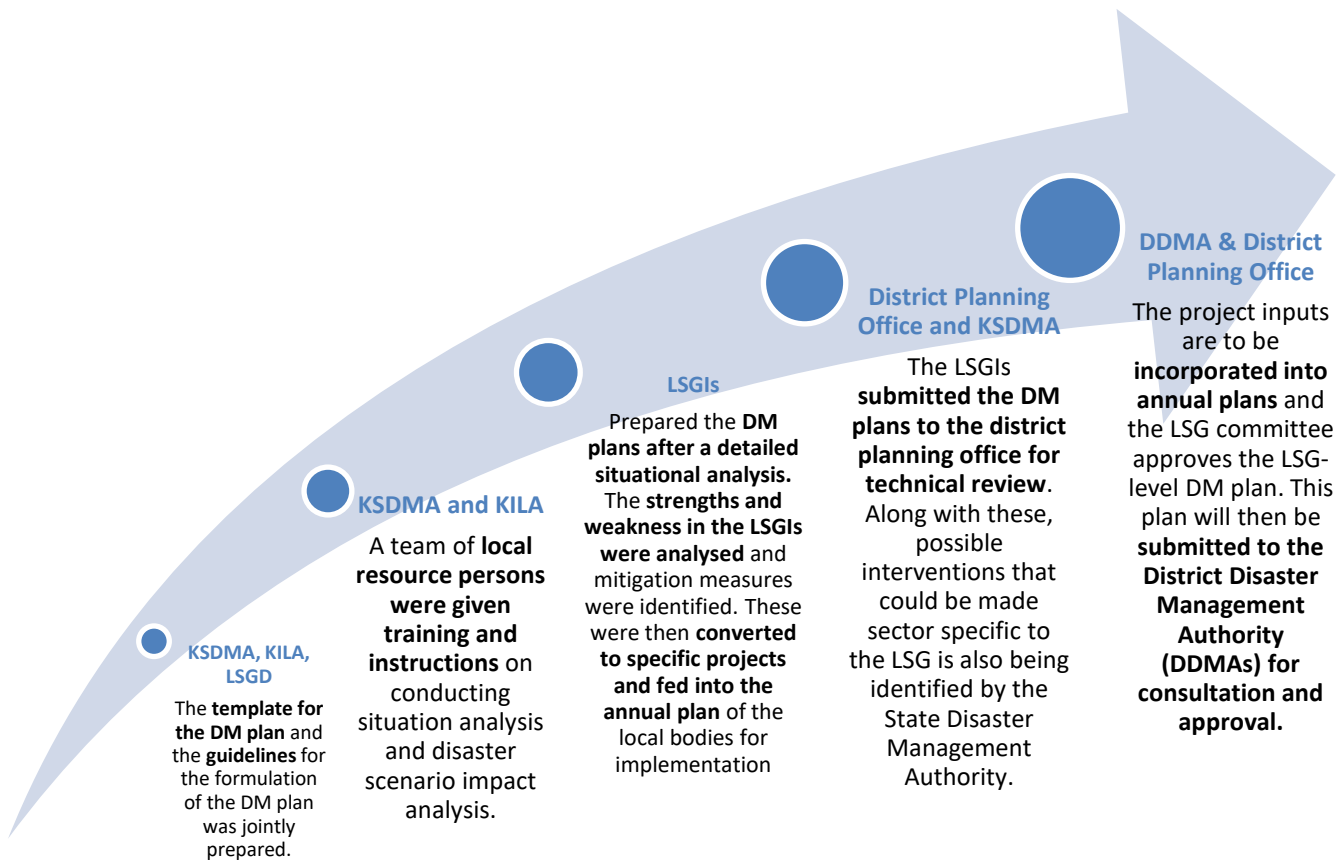
## 8.9 Post 2018 flood initiatives in decentralized disaster management in Kerala

Figure 8.2 Development stages



In response to the 2018 floods, the Government of Kerala initiated the Rebuild Kerala Development Programme (RKDP) under the Rebuild Kerala Initiative (RKI), which focuses on building a ‘Resilient Kerala’ by supporting key sectoral departments of the government align their development and planning process to a collective objective of building a more resilient state. Led by the Hon'ble Chief Minister, the Rebuild Kerala Initiative aims to involve every citizen in the State's rebuilding efforts. To support this goal, the Government of Kerala proudly introduces the "Nammal Namukkāyi" program, focusing on a citizen-centered approach to create a resilient Kerala. The "Nammal Namukkayi" programme is a three-phase process aimed towards making a shift in the policy paradigm of the State. The three phases of the programme were: Extensive Stakeholder Consultation, International Seminar, Policy Proposals for the Cabinet. Under the "Nammal Namukkayi" campaign, Kerala aimed to integrate disaster management planning at the local government level. **This initiative led to the development of disaster management plans (DM plans) by 1,034 Local Self Government Institutions (LSGIs), including grama panchayats, municipalities, and corporations across Kerala. These plans were tailored to the unique needs and vulnerabilities of each LSGI, incorporating hazard assessments, preparedness measures, and community-specific mitigation strategies.** The campaign was conducted with support from the Kerala Institute of Local Administration (KILA) and the Kerala State Disaster Management Authority (KSDMA).

Figure 8.3 Process flow – LSG DM Plan



The LSG level maps on different themes were prepared by KSDMA for better planning and decision making. A set of 31 different scaled-down maps for each LSGI, which specifically focus on various hazards, land use, susceptibility to disasters, infrastructure details, etc. The templates, maps, guidelines, and template were shared by Kerala Institute for Local Administration (KILA) through their portal.

## 9. Challenges and Gaps

### Resource Limitations:

Many local self-governance institutions face financial constraints that limit their ability to implement comprehensive disaster management strategies.

### Coordination Issues:

Effective collaboration among various governmental levels can be inconsistent, leading to delays in implementing effective disaster response measures.

### Need for Continuous Engagement:

While initial engagement through campaigns like Nammal Namukkayi has been successful, on-going participation from communities is necessary to sustain resilience efforts over time.

**Deficiency in Weather Observation Network:** Kerala still lacks the required density of weather stations according to BIS standards, which call for 256 stations. The current network falls short of this need.

## 10. Case Study Analysis

In Nepal, the implementation of the Nine Minimum Characteristics and the "Six Pillars" approach emph-

asizes technical innovations like Community-Based Early Warning Systems (CBFEWS), which provide critical lead time for evacuation. Similarly, the spontaneous formation of Community Disaster Risk Management Organizations (CDRMOs) in Thailand’s Nan Province illustrates the power of local self-reliance, where communities develop organic solutions such as localized zoning and self-funded mitigation independent of centralized government support. Bangladesh and Vietnam further demonstrate the necessity of inclusivity, leveraging gender-balanced action teams and Vulnerability and Capacity Assessments (VCA) to ensure that disaster strategies are both socially equitable and ecologically grounded. Collectively, these cases suggest that while institutional frameworks provide the necessary structure, the long-term sustainability of flood resilience depends on bridging the gap between national policy and grassroots execution through dedicated local capacity building and resource allocation.

**Table 1 Case Study Assessment**

Parameter	Nepal	Thailand	Bangladesh	Vietnam (Mekong Delta)
Community Participation	Involves local institutions like VDC/ward task forces and vulnerability mapping; however, frameworks are often "loose guidelines" and not mandatory.	Focused on spontaneous Community Disaster Risk Management Organizations (CDRMOs) that emerge organically to reduce government dependence.	Strong emphasis on gender inclusivity, specifically recruiting at least two female members per community action team.	High engagement through Vulnerability and Capacity Assessments (VCAs) and Local Disaster Management Committees (LDMCs).
Key Frameworks	Sendai Framework, Nine Minimum Characteristics, and the DRRM Act 2017.	Sendai Framework and the development of Disaster Prevention & Mitigation Committees with specific urban zoning.	Community-Based Disaster Management (CBDM) program implemented by the Bangladesh Red Crescent Society (BDRCS).	National CBDRM program initiated in 2009 targeting 9,000 vulnerable communities.
Early Warning Systems	Low-cost CBFEWS using riverbank sensors (e.g., Ratu River) to provide 2–3 hours of lead time via sirens and SMS.	Uses staff gauges to monitor water levels alongside community-led communication through neighborhood units.	Integrated early warning systems as part of the Red Crescent model, though often hindered by financial resource constraints.	Early warning systems are deeply integrated with local governance structures and school awareness programs.
Resilience Strategies	Uses the "Six Pillars" approach:	Emphasizes self-reliant structures,	Focuses on economic resilience	Focuses on long-term sustainability

	EWS, CBDRR institutions, resilient infrastructure, safety nets, livelihoods, and public-private support.	including community-specific emergency centers and localized disaster funds from donations.	via seed banks for post-flood recovery and tree planting for erosion control.	through education and integrating disaster risk reduction into school curricula.
Capacity Building	Focused on technical backstopping and multi-stakeholder consultation across three tiers of government.	Grassroots training in risk assessment and collaborative data collection with academic institutions (e.g., Chulalongkorn University).	Training focused on volunteer empowerment and leadership roles for women in disaster committees.	Utilizes the "Train of Trainers" (ToT) model to empower selected members to educate the broader community.

### 10.1 Inferences

- **Inclusivity Enhances Resilience:**
- Gender inclusivity and the involvement of vulnerable groups significantly improve community participation and disaster response. Bangladesh’s focus on recruiting women into leadership roles and Vietnam’s empowerment of women in disaster management demonstrate how inclusivity can strengthen community resilience.
- **Early Warning Systems as a Game-Changer:**
- Early warning systems tailored to community needs, such as Nepal’s CBFEWS, have proven effective in minimizing loss of life and property. These systems, coupled with timely communication and local training, are essential for proactive disaster management.
- **Resource Constraints Hinder Implementation:**
- Despite innovative frameworks, limited financial resources and technical capacity remain a common barrier in all case studies. For instance, Bangladesh and Nepal face challenges in mobilizing funds and technical expertise to implement DRR measures effectively.
- **Coordination among Stakeholders is Crucial:**
- Poor coordination among government agencies, NGOs, and communities weakens disaster governance, as seen in Thailand. Vietnam’s success in fostering collaboration highlights the importance of multi-stakeholder engagement for effective disaster response.
- **Implications for Kerala:**
- Kerala can benefit from adopting decentralized, community-driven models, as seen in Thailand and Vietnam.
- Implementing inclusive policies to involve women and marginalized groups, similar to Bangladesh, can enhance community cohesion and resilience.
- Localized early warning systems and participatory risk assessments, as in Nepal and Vietnam, can strengthen Kerala’s preparedness mechanisms.

- Addressing resource and coordination challenges is essential to ensure the effective implementation of these strategies.

## 11. Recommendations

### • Strengthen Early Warning Systems

- Expand the density of Automated Weather Stations (AWS) and improve data-sharing networks.
- Train local volunteers in data interpretation and dissemination to enhance local response.

### • Enhance Resilient Infrastructure and Flood-Resistant Livelihoods

- Improve flood-resilient infrastructure such as embankments, raised shelters, and sustainable drainage systems.
- Encourage local participation in designing resilient infrastructure and promote flood-resistant agricultural practices.

### • Integrate Public-Private Support Systems and Safety Nets

- Create financial safety nets like insurance schemes and micro-savings for vulnerable households.
- Involve communities in setting up and maintaining these safety nets, with assistance from NGOs and government bodies.

### • Improve Collaboration among Stakeholders

- Strengthen coordination between local governments, NGOs, private sectors, and communities.

### • Conduct Continuous Training and Education

- Develop training modules for household preparedness, first aid, and evacuation drills.
- Engage families, schools, and local organizations in regular training, mock drills, and disaster education programs.

## 12. Conclusion

The community participation is a cornerstone for effective flood resilience. Kerala has made commendable strides in disaster governance, especially post-2018 floods. However, gaps remain in coordination, inclusivity, and the implementation of localized solutions. Drawing from global best practices, the proposed recommendations emphasize decentralization, inclusivity, and the integration of technology and local knowledge. By adopting these measures, Kerala can transition from reactive disaster management to a proactive, community-driven resilience framework, ensuring long-term sustainability and equity in addressing future flood challenges.

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