Political Leadership And Governance On The Aftermath Of The 2018 Kerala Floods

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Abstract: The August 2018 floods that destroyed Kerala were among the worst in the state's history in nearly a century. The 2018 Kerala flood had a severe impact, leading to widespread displacement, loss of life, and extensive damage to homes, infrastructure, and agricultural land. The disaster disrupted daily life across the state, overwhelmed public services, and caused longterm economic and environmental consequences. This dissertation critically analyses the political role in managing this disaster in the post-disaster period, with a specific focus on the role of political leadership, institutional governance, and public participation in contributing to disaster response and recovery. Based on extensive reports of relief operations, intergovernmental relations, and engagement of diverse actors such as the state government, local self-governments, opposition parties, and civil society organizations, this research investigates the effectiveness and shortcomings of politically motivated disaster governance. The study highlights the critical leadership of Kerala's political leadership, especially the initiative of the Chief Minister and other major actors to mobilize resources, maintain open communication, and link decentralized governance structures for prompt response. It also assesses the relationship between the government and opposition, interaction with the civil society and volunteer networks, and the coordination with national agencies like the National Disaster Response Force (NDRF) and the central government. From this perspective, the research showcases the strengths and weaknesses of Kerala's political machinery in dealing with an unprecedented human crisis, providing insights into the wider implications of political agency for disaster resilience and recovery. The results underscore the significance of inclusive governance, inter-party collaboration, and decentralized administration in informing an effective post-disaster strategy.

CHAPTER 1
INTRODUCTION

POLITICAL LEADERSHIP AND GOVERNANCE ON THE AFTHERMATH OF THE 2018 KERALA FLOODS

. 1.1 Background

Kerala, known for its high Physical Quality of Life Index (PQLI), effective governance, social inclusiveness, and religious coexistence, faced an unprecedented disaster in August 2018 when severe floods struck the state. Meteorological experts identified it as the most severe in nearly a hundred years. The calamity caused extensive disruption to Kerala's ecosystems—both terrestrial and aquatic—resulting in a decline in biodiversity, damage to livelihoods, and loss of assets. The tragedy claimed at least 483 human lives, along with a large number of livestock. Infrastructure suffered heavily, with numerous roads, bridges, and homes either destroyed or severely damaged. Agricultural losses were substantial, endangering the incomes of many farmers, while the tourism sector also took a significant hit. International bodies such as the United Nations, Asian Development Bank (ADB), and the World Bank took note of the disaster. The overall financial loss was estimated to be around ₹40,000 crore. The flood's aftermath continued to affect lakhs of people in Kerala for years, potentially up to a decade. Despite the severity of the event, it presents an opportunity for the state to rebuild stronger and provide a better quality of life across its population (Siromony & Oommen, 2018).

Kerala's diverse geography makes it vulnerable to several natural disasters, including floods, droughts, landslides, coastal erosion, earthquakes, and lightning. Heavy and extended rainfall often causes flooding in low-lying areas and triggers landslides in the steep regions of the Western Ghats (Nair et al., 2020). Coastal erosion remains a serious and recurring issue, particularly in densely populated areas (Kerala State Disaster Management Authority, 2019). The state also experiences frequent mild earthquakes and one of the highest rates of lightningrelated fatalities in India. Following the 2004 earthquake, a tsunami hit Kerala, causing over a hundred deaths. Additionally, cyclones such as Ockhi and the major 2018 floods have severely impacted the state's economy. The 2018 flood, considered a rare and extreme event, highlighted the urgent need to reassess Kerala's development strategies. Current development practices often neglect the ecological sensitivity of the region and must be revised to withstand repeated natural disasters, especially in the context of climate change. Emphasis should be placed on protecting the Western Ghats which feed all 44 rivers in the state as well as the interconnected ecosystems of the lowlands, lakes, and coastal areas. Implementing localized, long-term disaster management strategies is essential to reduce the impacts of recurring disasters and enhance Kerala's resilience (Planning Commission, 2020).

1.2 Statement of the Problem

The floods of 2018 marked a turning point in Kerala's disaster history, revealing both the capacities and limitations of the state's political institutions in disaster response and management. While there was a rapid mobilization of resources, the post-disaster phase exposed significant challenges, including political inefficiencies, poor inter-agency coordination, and delays in the distribution of relief. These issues raised critical concerns about the role of politics in shaping the trajectory of disaster recovery and relief efforts. In

particular, questions persist regarding how the existing political framework influenced the efficiency, transparency, and overall effectiveness of post-flood management. To address these concerns, this research proposes a case study analysis of flood management in Kerala, with a focus on examining the political dynamics that influenced decision-making and implementation during the recovery process.

1.3 Review of Literature

A study conducted by Shankar Neeraj, Sandeeka Mannakkara and Suzanne Wilkinson in 2020 on the topic "Build back better concepts for resilient recovery: a case study of India's 2018 flood recovery". The paper aims to understand the recovery process after the 2018 floods in Kerala, India, and it determines whether the recovery efforts were aligned with Build Back Better (BBB) concepts. A qualitative approach was adopted to collect the data from the officials of the Government and NGOs involved in Kerala's recovery. The participants were interviewed on the challenges faced during the recovery process and the actions taken by them to overcome them. The study identified that the Kerala Government was proactive in making the community resilient from future disasters by encouraging owner-driven reconstruction among floodaffected households, supporting locals to rejuvenate their business, and by creating a locallevel recovery authority. Further, this paper identifies the areas which Kerala was lacking in terms of BBB and where resilience-based plans and actions are needed for the future.

A study conducted by Mohammed Irshad in 2023 on the topic "Civil Society, Community, Disaster and State Responses: A Critical Study on Ockhi Cyclone 2017, Floods in 2018 and 2019 in Kerala, India." Civil society is often defined as an umbrella term and an inclusive concept. Many civil society formations occur in the context of natural calamities. Natural calamities force people to question the established norms and practices, and are likely to be aligned with new collectives and movements. Such a new collective often acquires the character of a civil society movement and positions itself against the government and the dominant narrative of the causes of natural hazards. Recently, three natural hazards occurred in Kerala, a state of India, as the Ockhi Cyclone in 2017 and floods in 2018 and 2019, which led sizeable civil Society collectives to demand better relief and rescue and look at the root causes of flood disasters from a hazard perspective. On the other hand, the government and ruling political parties build counter movements to counter civil society resistance and opposition to take full ownership of risk management.

The paper's research design evolved out of continuous engagement with the community affected by the disasters from 2017 to 2019. Interviews with the flood-affected people in the study area, key informants who are involved in the relief and rehabilitation, newspaper reports on floods and cyclones, and other published sources such as the state disaster management authority's published documents, are used for this paper. Interaction with fishers, flood victims, journalists, bureaucrats, and civil society activists over the period helped frame the research method.

The state and ruling parties are not happy with civil society's articulation of the root causes of disasters, risks, and vulnerabilities. This civil society may not be able to challenge the state, and the state has the authority to overrule such articulations of risk and dictate the public perception of risks.

"Devising a Socioeconomic Vulnerability Assessment Framework and Ensuring Community Participation for Disaster Risk Reduction: A Case-Study Post Kerala Floods of 2018" by Fathimah Tayyiba

Rasheed in 2021. This study attempts to prove that, by developing and adapting an approach that understands, quantifies and maps vulnerability, we can help in curbing the adverse effects of disasters. The research is done in the context of the 2018 Kerala floods, in a case-study area specific to the coastal region of Ernakulam District. In August of 2018, the state experienced its worst-ever widespread calamity; floods, affecting more than 75% of the villages spread across its 14 districts and impacting the lives of around 5.4 million people.

This humanitarian crisis exposed an array of hidden, as well as obvious, vulnerabilities of the many coastal communities in the small state. Therefore, the aim is to develop an approach-based framework for decision-makers and physical planners to understand and reduce vulnerability to disasters and ensure community participation; we strive to make the existing disaster management process and disaster risk reduction measures much more effective. The research began as an attempt to explore the concept of disaster risk and vulnerability while examining the past trends and methods of flood vulnerability assessments, with a primary focus on the parameters/indicators that are used to quantify it. Subsequently, an approach was devised to assess vulnerabilities, and the analysis that follows traces this approach in the context of the floods, across the various levels of jurisdiction in the state, from the state to the community level. Finally, the study examines the multiple dimensions of vulnerability and disaster management across state policies and district plans in Kerala to identify gaps. In the context of those findings, an analysis is done of the missing link of socioeconomic vulnerability, from district to local self-government to community level (topdown approach), mapping its entire process. Later, an identification of the issues and their implications is done through community participation, and the findings are added to the skeleton of the proposed approach to complete a disaster (flood) vulnerability-reduction framework and prove its applicability.

A study conducted by Natasha Goyal in 2019 on "Disaster Governance and Community Resilience: The Law and the Role of SDMAs" Disasters have become more profound in intensity and frequent in occurrence due to climate change. The unpredictable and devastating consequences of rising global temperature has raised the alarm bells for 'rapid and farreaching' transitions in land, energy and urban governance. The recent devastation due to floods in Kerala in August 2018, has brought disaster governance to the mainstream in government accountability. Despite high performance on Human Development Indicators and social infrastructure, the failure of the state government in ensuring adequate preparedness and mitigation through capacity building has pushed back the development of the state by decades. Trust deficit in the face of administrative negligence and executive callousness hindered the translation of scientific information into understandable warnings for first-line responders. The havoc was significantly man made as the local administration failed to regulate blatant violations of Coastal Zone regulations, even after repeated warnings from the Western Ghats Ecology Expert Panel report. The focus of state policy on human development has ignored the crucial aspect of ensuring active citizen participation in the development process. This has resulted in citizens becoming passive recipients of state entitlements, rather than active agents in a democracy. This paper is a critical view on disaster policies in India, which continue to ignore the decentralized institutions as crucial institutions in disaster management. The laudable role of fishermen in rescue and relief in the aftermath of Kerala floods clearly emphasizes that communities can no longer be ignored in the framework of the disaster cycle. In a country which witnesses ubiquitous 'regime of noncompliance' to building bylaws, coastal zone regulations, land use plans and other safety laws, decentralized disaster management can help in building

community resilience and ensuring accountability and transparency of government institutions. The argument gets underscored in a scenario where institutions of Disaster Management continue to focus on post-disaster relief and rehabilitation, due to lack of enforcement powers of disaster management institutions.

A study conducted by Varghese, Ronniya, Lucas and Clementine in 2022 on "God's own country in trouble a comparative content analysis of health and disaster management policies on the 2018 floods in Kerala, India" In 2018, the Indian state of Kerala experienced devastating floods that killed 433 people and displaced 1.4 million. The floods has become more frequent since then due to climate change. This research compares international frameworks on health and disaster with national and state-level documents. It employs content analysis and applies Walt and Gilson's framework of health policy analysis to understand and evaluate the level of preparedness, the presence of a climate-resilient health system, and the integration between health and disaster departments at both national and state levels. The analysis, which focuses on the nexus between health, disasters, and resilience, reveals significant shortcomings in the translation of international recommendations. While several important recommendations are acknowledged in national and state policy documents, they have not been effectively adopted at the state level following the floods of 2018.

A study conducted by Sreeja and K. Gireesan on "Strengthening the Capabilities of Panchayati Raj Institutions in Disaster Management: A Study of Flood-Prone Areas in Alappuzha District, Kerala" This research paper focuses on disaster management activities carried out by Panchayati Raj institutions (PRIs) in India, specifically emphasising disaster preparedness at the local level. Given India's vulnerability to natural disasters, this paper underscores the need for proactive approaches and citizen-centric as well as participatory strategies in disaster management. It draws on in-depth fieldwork conducted in four highly vulnerable and disaster-prone Gram Panchayats in Alappuzha district, Kerala. The study reiterates the importance of empowering PRIs, as they are the most significant political institutions to engage in the pre-disaster phase, and it emphasises the need to strengthen the capabilities of PRIs in disaster management, with a focus on disaster preparedness. Additionally, this paper explores the application of the principle of subsidiarity in disaster management, focusing on the delegation of tasks by mapping responsibilities to Gram Panchayats (GP), Block Panchayats (BP), and District Panchayats (DP).

A study conducted by Rajeev, M.M. (2019) on "Local self-governmental response towards disaster management: An investigation of the experience from the state of Kerala." Local self-government, because of its proximity to the crisis event and awareness of the social, cultural, and economic milieu of the impacted community, can play a major part in designing, coordinating, also guiding community-based catastrophe relief efforts. An effective local selfgovernmental response towards disaster response and recovery is critical as it assists the impacted region in recovering from the social, political, and economic impacts at a faster pace. However, the dramatic and tragic events that unfolded soon after the 2004 tsunami once again exposed the fragility of the local, state, and national disaster management system. Research (Comfort, Ko, & Zagorecki, 2004) indicates that inadequate resources, poor communication, and lack of coordination among governmental and non-governmental agencies are some of the most recurring problems for organizational performance in disaster relief efforts. Therefore, the objective of this study is to identify the various social, political, and economic barriers that hindered local self-government's optimal participation in the disaster relief operations, mainly related to Alappad Panchayat in Kerala, following the 2004 tsunami. Also, the study attempts to review

the post-disaster activities of the various stakeholders, especially PRTs, about the disastrous tidal wave that hit the states of Kerala, Tamil Nadu, and the Andaman Nicobar Islands. Specifically, the three major underlined research objectives of the study were to: (a) analyse the formal and informal institutional mechanisms that exist for disaster management in the state, (b) examine the problems and obstacles faced by local self-government in actively managing disaster response; and (c) explore possible ways through which local selfgovernment can be optimally involved in disaster response and recovery. The investigator used a purposive sampling method to recruit the required number of respondents for the study. An interview guide was prepared, which contained questions specifically intended to capture the problems encountered by local self-government in managing the crisis event. In-depth qualitative interviews were conducted with 10 participants. The qualitative analysis was presented in detail as major themes, and the paper concludes that local self-government can play a heightened role in providing and coordinating relief efforts, particularly in natural resource-based communities. Findings imply that, in disaster contexts, development professionals have the potential to assume a leadership role and help empower local communities to respond effectively to disasters.

A study conducted by Ali, s & George, A (2022) on "Fostering disaster mitigation through community participation of Kochi residents following the Kerala floods of 2018 and 2019." Community participation has grown in prominence in mitigating disasters globally. It involves the active involvement in search and rescue to reconstruction that people affected by disasters undertake unsolicited. Predictive power in disaster recovery has further increased its relevance. However, the quantitative analysis that community participation has on disaster mitigation measures is scant. The study analyses community participation on disaster mitigation measures following the Kochi flood of 2018 and 2019 in India. We use a Multivariate Probit Regression model with a sample size of 750 to analyse the relationship between disaster mitigation measures (namely, disaster event planning, previous experience, following disaster-related news closely, and neighbourhood relationship) and community participation. The results show participants who were active in community events were 23% more likely to adopt all the disaster mitigation measures than those who did not. In addition, households with special needs members were more likely to be prepared for an unanticipated event. The results also showed that higher education levels directly correlated to implementing more significant disaster mitigation measures. Implications for government policy formation include schemes to enhance community rehabilitation and promote social participation to mitigate future disaster events.

A study conducted by Singh, K., Nidha, F., Joseph, R., & Narayanan, N. C. (2022, September). On "Democratizing Disaster Risk Reduction: A Local Governance Approach to Contextual Knowledge Production for Flood Planning in Kuttanad, India." During the 2018 Kerala floods, the Kuttanad region was one of the worst-hit because of its peculiar topography. Large engineering structures for water control were built after the 1950s to facilitate rice cultivation, and later development interventions like roads altered the hydrology and seriously affected the system's ability to cope with flash floods. The local adaptation knowledge has been slowly replaced by knowledge borne out of top-down, managerial, and command-andcontrol-driven approaches to managing floods. With the help of an empirical study, the paper demonstrates the possibility of localizing scientific knowledge and integrating it with local knowledge through deliberative platforms for flood risk planning at the Panchayat level. Local and participatory exploration of perceptions about floods and vulnerability, integrated with scientific techniques of remote sensing, GIS, and flood zone mapping, was

undertaken. The bottom-up knowledge creation through community participation in the flood risk planning at the Panchayat level paves the way to integrate complex and contested realities of privileged and marginal epistemic groups and knowledge systems.

A study conducted by Mathew, M. (2018) on "Environmental Politics; An Evaluative Study About Degradation of Ecosystem of Wayanad on The Perspective of Flood Havoc in Kerala 2018" In August 2018, a severe flood affected the South Indian States, especially in Kerala, due to unusually high rainfall during the Monsoon. It was the worst flood in Kerala in nearly a century. A massive landslide and flood took place in all over Kerala, and the intensity of havoc was very severe in Wayanad, as one of the most sensitive biodiversity areas in Western Ghats. The Wayanad (a geographical area in Sahyadri Hills) is one of the sensitive zone in western Ghats and this is the largest biodiversity area in western Ghats with varied flora and fauna and landscapes. Western Ghats or Sahyadri have a predominant role on determining the climate pattern of peninsular India. Numerous previous studies have warned about any inhuman or unscientific intervention over these areas may badly affect the ecosystem of the Western Ghats. The recent studies of Sri Madhav Gadgil and Sri Kasturirangan underline once again to the importance of preserving the eco biodiversity of Wayanad and Western Ghats. But contradictory to the expert advice and warning a vertical infraction happened from top to bottom. A naked law breach occurred against preservation of environment. Land encroachment, deforestation, agriculture migration, unscientific constructions of dams, absence of drainage and canals, unlawfully constructed buildings and roads, tourism, erosion etc, are some of the reasons of degradation of our environment.

This study analyses the reasons for the degradation of the ecosystem of Wayanad and factors responsible for the massive environmental disaster which happened all over the Wayanad. The study focuses to the role of corporate interest that undermines the governmental and legal measures of environmental sustainability. This study tries to suggest some remedial measures for protecting the ecosystem of Wayanad based on the Gadgil Report.

A study conducted by Sebastian, S. (2019) on "Understanding the 2018 Kerala Floods." The state of Kerala is located towards the extreme south west of peninsular India. It witnessed a greater than normal South Western monsoon showers during June, July & August in 2018, which was estimated to be 42% over the average annual rainfall. In addition to this, about 37 dams across the state had to be opened up to release their excess water. This was followed by extensive flooding and landslides in all 14 districts of the state. As many as 433 lives were lost, while more than 5.4 million lives were affected. This disastrous event was widely referred to as the worst ever floods in the history of Kerala since the floods of 1924. The Indian government declared it to be a L3 level disaster, which means a calamity of severe nature. A rough estimate of the amount for recovery was put at 4.4 billion USD in a Post Disaster Needs Assessment (PDNA) report prepared for the state of Kerala by the United Nations. The central and state governments of the country, national and international non-profit and for-profit as well as religious organizations, celebrities and well-meaning individuals pitched in the rescue and relief efforts by donating money, facilitating fund & material collection as well as in their timely delivery. The Indian army, navy, air force, coastal forces and others, coupled with the mass voluntary support of 4537 fishermen and locals, contributed hugely to the rescue operations. It is necessary to study and evaluate the causative factors in the floods of Kerala as it holds a valuable lesson for

the future, in preparing for disaster risk management. Dams are often put to the test when a drought or flood situation arises in the state. To move away from the tendency of a seasonal blame game and develop a focused and planned approach in preparing for natural calamities is necessary, if we are to prevent such disasters in the future."

A study conducted by Kant, P., Machavarapu, P. K., & Natha, A. R. (2023). On "Evaluation of decision support system for disaster management using multi-criteria decision techniques: a case study of Alappuzha, Kerala." The monsoon pattern has shifted across Kerala. This, combined with significant deforestation and hill denuding, has resulted in catastrophic floods and landslides, particularly during the Southwest monsoon. Urgent relief services were to be delivered in a timely and accurate manner to sustain the lives of the impacted people. Even though resources were sent to several relief camps, they were either in excess or in short supply on multiple instances. The conditions that prevailed during the monsoon time, as well as concerns and challenges during disaster relief efforts, must first be investigated for the effective operation of these supply chain activities. This research aims to develop a disaster logistics hub location selection decision support system, based on the Fuzzy Analytic Hierarchy Process (FAHP) and Best Worst Method (BWM), to meet the needs of disaster victims and rescue teams in the event of flooding, and to implement the proposed systems in Kuttanad, Kerala. Initially, the criteria are determined and structured in the hierarchy, and the weightage for the criteria is determined via a questionnaire technique. Expert opinion on nine-point scale was gathered from a set of experts working at different levels of positions during disaster management. The weights obtained by the FAHP and BWM methods were statistically analysed and compared for the reliability of the two techniques. The suggested model and application results may throw light on future work, particularly in the realm of disaster logistics management.

According to the Rajiva Gandhi Institute of Development Studies, a report on "Kerala flood 2018, the disaster of the century "by Michael Vetha Siromony & Oommen V Oommen et al. They founded that in the area of disaster management plan by local bodies is the state and district administrations failed to take the warning seriously and the disaster management authority did not act alerted at the required speed for relocation confusing rescue and eviction and the general public is not aware of the different grades of alerts issued during such natural calamities and the government should take initiatives to create awareness programmed for the same. There are some governance issues that need for a strong Disaster Management Plan (DMP) at the district, block and more so at the panchayat level, since they are the first responders. As recommended by NDMA (National Disaster Management Authority), a Disaster Management Plan needs to be prepared at the Panchayat level. The plan has to be vibrant and should be known to the community and all the stakeholders. The Biodiversity Management Committee (BMC) constituted in all the local self-governments, including Panchayats, Municipalities and Corporations as per the Biodiversity Act 2002, Government of India and Kerala Biodiversity Rules 2008 is in vogue now. The Kerala government has issued an executive order authorizing the BMC to be the environmental protectors locally and the present disaster management plan should involve the BMC of the respective LSGs. The BMC may be requested to provide the necessary inputs for the local disaster management plans a segmented disaster.

According to a senior bureaucrat speaking to Newsclick on condition of anonymity said that this was the first time in his memory that such directions were given to IAS officers. The district collectors were of

course, overall, in charge of their districts, while superintendents of police (SPs) were given responsibility for rescue operations. Fire service personnel coordinated with them. One minister of the state government was deputed to each district to provide the necessary support, along with the district's other elected representatives like MPs and MLAs (Newsclick, 2018).

All local bodies' staff – from panchayats to municipal corporations – were asked to work in rescue and relief operations and, crucially, start using their funds as they deemed fit. Engineering wings of panchayats were also pressed into service. The local bodies, while given the freedom to act immediately in saving people and taking other measures like setting up relief camps, were instructed not to work in contradiction to the disaster management authorities' directions let there be confusion. The NDRF and the armed forces that were later deployed coordinated their work mainly through the district authorities mainly. The other equally important component of Kerala's response was how people from across the state, but especially in the affected areas, rose up to help. In this, there was an over-arching sense of collective solidarity and desire to support that was cutting across religious, political or class lines. It was humanity at its best (The Hindu, 2018).

This feeling was channelized by diverse political, social, cultural and religious groups or it expressed itself spontaneously in simple acts of bravery and selfless service. Several mass organizations like the DYFI SFI, AIDWA and other left leaning ones gave calls for participating in the rescue efforts at the local level. Such efforts dovetailed with the govt.'s own activities. Trade unions – including the now famous fisherfolk's unions – worked night and day to organize rescue and relief operations. An online portal KeralaRescue.in started by some non-resident Malayalis to not only collect donations (to be sent to the CM Disaster Relief Fund) but help enlist volunteers, record requests for help and other such needed services. It has been flooded with both donations and offers of volunteers whose names, addresses and phone numbers are listed. Reportedly, its visitor count is already over 10 million. Kerala has suffered immensely in this tragic natural disaster. But the people's response in tackling it and the collective spirit that emerged serves as an inspiring example. In the coming months, as the state rebuilds all that was lost, this spirit will surely continue to flourish and bloom (Sharma, 2018).

According to K.A. Shaji a news reporter. Could a poor response on the part of the Kerala government have caused the massive floods of 2018 in the state? A recent report by the Comptroller and Auditor General (CAG) has pointed out severe lapses on the part of the government in planning, capacity building, flood forecasting and dam management. The report made some startling observations about the way the floods of 2018 and 2019 had been handled by the state government. It stated that the floodplains of Kerala had not been identified and restricted so far. It noted that more than 14.52 per cent of the state's total area was flood-prone (Shaji, 2019).

Despite this, no large-scale flood hazard map was available in Kerala. The susceptibility map of the state developed by the Kerala Disaster Management Authority did not conform to Central Water Commission (CWC) criteria for flood-prone areas. The report said the Kerala State Water Policy 2008 was not updated under the National Water Policy. It lacked provisions for effective flood control and flood management. The report pointed out that the Disaster Management Plan of 2016 involved provisions for a State Emergency

Operations Centre. Such a center was to be equipped with an intelligent decision support system capable of predicting and issuing early warnings on significant hydro-meteorological hazards (CAG, 2019).

However, the system failed two years after its completion in 2019 to give an early warning about climate hazards. This was because its effective functioning was dependent on the receipt of externally sourced real-time data. The real-time data is yet to be made available. The report said the Kerala government had also not submitted the list of reservoirs or areas where the CWC had to establish inflow forecasting stations. "During the last five years, the state government failed to push forward any project to avail real-time data on rainfall and streamflow and it failed to deliver reliable data on a real-time basis," it further said. The CAG report was also highly critical of the continuing encroachments on river beds, which obstructed water flow during floods (CAG, 2019)

"Though 20 years have gone by since the establishment of the Cochin International Airport, it is witnessing repeated instances of extreme flooding. The issue remains unaddressed by the state government's irrigation, revenue and disaster management wings and the local self-government and Cochin International Airport Ltd," the report said. The airport authorities had even failed to construct a diversion canal adequate to carry the Chengalthodu waters during heavy floods into the Periyar river to avoid potential risks of riverine flooding to the resident population, the report noted. It pointed out that only six rain gauges against the requirement of 32 gauges were available for rainfall estimation in the Periyar basin (CAG, 2019).

This, according to the CAG, raised concerns as the basin had witnessed heavy floods every monsoon since 2018. Siltation in major dams was another matter of concern. "The government must depute an expert committee to suggest immediate measures to correct faults pointed out by the CAG," S Usha, environmentalist, told this reporter. No dam in Kerala had an EAP (Emergency Action Plan) despite the direction in this regard from the National Disaster Management Authority to have it by 2009, the report said (CAG, 2019).

The EAP is a written document prepared by each dam operator. It contains plans to prevent or lessen the impact of the dam's failure or apparent structural problems. The report said most of the significant reservoirs in Kerala were almost complete before the extreme rainfall in 2018. They could not accommodate the additional flow, compelling the authorities to release a substantial amount of water from reservoirs at the peak of the rainfall in a short period. The report pointed out that almost all dams released water only after the water level crossed the FRL (Full Reservoir Level) or reached the MWL (maximum water level). The dam managers should not have solely relied on the India Meteorological Department (IMD) prediction for dam management. Variation in IMD forecasts could not justify the delayed release of water from dams, the report said (CAG, 2019).

According to Walia, A. and Nusrat, N. (2020). On there repot they said about cause of flood in Kerala is poor resource management. Most of the area which got affected by the monsoons was classified as an ecologically sensitive zone (ESZs) by the expert panel on Western Ghats Ecology. It was also referred to as the Gadgil Committee. The report was delivered by a team that was headed by Madhav Gadgil, who was a renowned ecologist and also the founder member of the Centre for Ecological Sciences at the Indian Institute of Science, Bengaluru. According to environmentalists, the committee's recommendations were strong enough to protect the sensitive Western Ghat region. The recommendation of the committee was to categorize a

140,000 Km stretch of the Western Ghats in three zones. The committee recommended strong restrictions on mining and quarrying activities, using land for non-forest purposes and disallowing high rises in the concerned areas. The report was first submitted to the government in 2011. However, the recommendations of the committee were not adopted. Shri Gadgil maintained that quarrying was a major reason for the mudslides and landslides. Further, he added that Kerala floods were a man-made calamity where intense rainfall and human intervention had made it a serious disaster (First Post, 2018).

Lack of Awareness: Lack of awareness concerning disaster risks from urban floods are living testimony of the conflict between urban development and weather-related vulnerabilities. An example of this was the closure of Cochin International Airport for two weeks when flood waters from the swollen river breached the periphery walls and flooded the runway. Additionally, the world's first solar-powered airport lost approximately 20 percent of its solar panels owing to damage. In total, a loss of USD 35 million was incurred owing to damage to the airport and the ensuing closure. The airport is a mere 420 metres away from the Periyar River, located within the floodplains of the river. The Chengalthodu creek, which connects to the Periyar River, was completely realigned. Kochi's airport wasn't unique in this aspect. Airports in Mumbai and Chennai, which are also located close to rivers and have expanded their runways over river channels and floodplains and have also experienced extreme flooding and closure in 2005 and 2015 respectively (WRI INDIA, 2018).

Poor discharge capacities of water bodies: The embankments of rivers in Kerala are steep, stable to a degree. It seems the rivers are stable within their bed. Flooding occurs whenever the river discharges. People were used to limited flooding in the area but were not prepared for the extreme floods that occurred in 1924 and 2018. Regular flooding was a phenomenon which mostly occurred in the low areas around the backwaters and reaches of the lower part of river. The flood discharge inflow from rivers did cause flooding but it was aggravated by poor discharge capacities of the canals and blockage of discharge at the sea outlets (azhis and pozhis). Rising frequency of heavy rainfall and precipitation during monsoon led to an increase in the magnitude and frequency of river floods. It is projected that the sea level rise (SLR) along the coast will be somewhere around 100 mm–200 mm in the next 100 years. Needless to say, this would bring drastic uncomfortable changes in the large part of coastal communities living on sandy coasts. Backwater banks, paddy fields, filtration ponds are other sections of the coastal zone are susceptible to SLR. Although it is of not much significance for the next planning cycle, but it is particularly vital for the long-term scenario spanning over 50 years (UNDP, 2018).

The state-Led response: The fatigue and resource constraints hampered the ability of affected communities to respond to the disaster in the initial days of incessant rains and flooding. The primary role of rescue and relief was conducted by state and non-state service providers. Among these, the government disaster management teams, state government machineries and the local governments played an important role. The formal response received key information from the local administration and the State Disaster Management teams. However, realizing that the formal emergency services would not be adequate to provide such large-scale support, the state government had asked openly to the citizens for participation (RKDP, 2019). The Central Government along with many other states provided support to the state government's response and relief efforts. The Prime Minister, under the Pradhan Mantri Awas Yojana (PMAY), had declared financial assistance package of `600 crore for providing houses in villages which lost many houses to flood. The Ministry

of Rural Development sanctioned `1,800 corers under Mahatma Gandhi National Rural and Employment Guarantee Scheme (MGNREGA) for 2018-19. Clear directions were issued for insurance companies for the timely release of compensation to the affected families/beneficiaries under social security schemes. In addition to contributions in kind (medical and relief supplies) the Chief Minister's Disaster Relief Fund (CMDRF) had credited approximately `1,400 crores from millions of individuals and organizations across India and overseas (RKDP, 2019).

Community volunteers is other equally important component of Kerala's response was the manner in which people from across the state, and especially in the affected areas, rose up to help. In this, there was an over-arching sense of collective solidarity and desire to support that cutting across religious, political or class lines. This feeling was either channelized by diverse political, social, cultural and religious groups or it expressed itself spontaneously in simple acts of bravery and selfless service. Several mass organizations gave calls for participating in the rescue efforts at the local level. Trade unions – including the now famous fisher folk's unions – worked night and day to organize rescue and relief operations. As rains had eased and waters were receded, these organizations were worked to clean the villages from mud and debris that flood waters had left behind. Thousands of volunteers worked in relief camps including doctors and paramedical staff. They undertook a range of duties such as, cooking food, unloading supplies of relief material, looking after those who were elderly or sick, or taking care of children. Students, daily farm workers, carpenters, electricians and plumbers from across Kerala went from house to house, removing mud, restoring power and water connections, and repairing doors and windows (RKDP, 2019).

Nongovernment Organizations(NGO's) like Gospel for Asia (GFA),another NGO responded by mobilizing on-the-ground networks of workers who helped rescuing hundreds of people, provided immediate critical relief to stranded families and in relief camps, equipped victims with tools to help them rebuild long term, set up medical camps, and partnered with local churches and communities to bring aid where it counted the most (Missions Box, 2018) A renowned International NGO,- Rise Against Hunger India (RAHI) associated with many NGOs including Arshabharath, Hope Foundation and the Times Foundation to help the families living in the make-shift relief camps. Not only food, RAHI mobilized other important and essential items like hygiene kits, toiletry, soaps, water containers, utensils, bedsheets, blankets, clothing, water purifier and similar products, which could be utilized by survivors in relief camps. Save the Children India unit too helped the victims, especially children, in the flood- affected areas. It had set up child-friendly spaces, which provided children with important psycho-social well-being through learning and recreation facilities (Business Standard, 2018)

1.4 Research Objectives

- To evaluate the role of political leaders in coordinating disaster response efforts during and after the 2018 Kerala floods.
- To analyse the effectiveness of decision-making processes and resource allocation by the government.
- To investigate the existing governance frameworks and their impact on disaster management.
- To assess the level of community involvement in disaster recovery efforts.

1.5 Research Questions

• What role did politics play in poster-disaster management?

 • How has the political framework affected efficiency, transparency, and effectiveness regarding recovery and relief work?

1.6 Research Methodology

This study adopts a qualitative research method to explore and analyse the effectiveness of leadership and governance during floods in Kerala. It largely uses the secondary sources of data collected from open and publicly available sources, including: Government reports such as NDMA, SDMA, Kerala State Disaster Management Plan, NGOs and humanitarian organization reports, academic journals, research articles, newspaper articles etc. The study particularly uses the content analysis method to identify the specific challenges in leadership and governance. Also to evaluate the role of political parties, governance structures and community participation to develop more effective, inclusive and resilient strategies to ensure no community is deprived of receiving emergency response during disaster. Though, the research is completely based on secondary data, ethical considerations are taken into account where all sources are properly cited and acknowledged as well as adheres to academic integrity.

1.7 Scope of the Study

This study focuses on examining the role played by political actors and institutions in the postdisaster management of the Kerala floods of 2018. It seeks to understand how political leadership, government policies, party dynamics, and intergovernmental coordination influenced relief, rehabilitation, and reconstruction efforts in the aftermath of the disaster.

Political decision-making processes at the state and local levels during the immediate and long-term response to the flood. Coordination between state and central governments, including political challenges and support. Involvement of political parties, elected representatives, and local self-governments (Panchayats) in mobilizing resources and facilitating recovery. Policy formulation and implementation, especially the role of political will in infrastructure rebuilding, housing, and livelihood restoration. Public perception and media portrayal of political actions and their impact on trust and governance.

1.8 Limitations of the Study

The study may focus only on researcher articles and news, which could exclude other forms of communication (e.g., social media, poster, television broadcasts), potentially providing an incomplete picture of political involvement in disaster management. There is a gap in understanding whether political affiliation of affected regions or leaders influences the distribution of aid, compensation, or support from higher levels of government. Underrepresentation of Local Politics - Much of the focus is on national or state-level political actions, overlooking the crucial roles played by local leaders, panchayats, and municipalities. Exclusion of Non-Political Entities: The study might overlook the role of non-political actors (e.g., NGOs, civil society groups, and international organizations) in disaster management, focusing exclusively on political entities. Sample Bias: The articles selected for the study might not represent all the posters produced during the Kerala

flood. If the selection is limited or biased toward certain political parties or areas, the findings may not be generalizable.

CHAPTER 2
OVERVIEW OF 2018 KERALA FLOODS: LEADERSHIP ROLE AND DISASTER RESPONSE

2.1 Background

The 2018 Kerala floods were one of the most devastating natural disasters in India's recent history. Affecting millions, the floods in the southern Indian state of Kerala caused widespread damage, loss of life, and destruction of infrastructure. However, what stands out in the face of this calamity is the remarkable response of the local government bodies, NGOs, community volunteers, and the citizens themselves. This chapter explores the leadership and disaster response mechanisms during the Kerala floods, examining the role of local self-governments, community organizations, and the collaboration between different stakeholders in responding to the disaster.

2.2 Geographical Features of the State

Situated on the southwestern tip of the Indian subcontinent, Kerala spans a geographical area of 38,863 sq. km. With a population density of 819 individuals per sq. km (Census of India, 2011), it ranks among the most densely populated states in the country. According to the Resource Atlas of Kerala (1984), the state's terrain can be classified into five distinct zones from west to east: mountain peaks (above 1800 meters), highlands, midlands, lowlands, and coastal plains with lagoons. The mountain ranges, forming part of the Western Ghats, generally demarcate the state's boundary. The highland region, ranging from 600 to 1800 meters in elevation and covering roughly 20.35% of the state, is known for its rugged terrain, forest cover, plantations, and mixed agricultural use (Kerala State Planning Board, 1984).

This zone houses the majority of Kerala's hydroelectric dams, some of which include inter-state water diversions. The midland zone, located west of the highlands and characterized by hillocks and rocky outcrops, ranges between 300 to 600 meters in elevation and occupies about 8.44% of the state. Agricultural land here is primarily used for crops such as rubber, coconut, tapioca, and paddy. The lowland area, comprising about 54.17% of Kerala's total area, includes river valleys, floodplains, and sediment deposits, with elevation ranging from 10 to 300 meters. The coastal plains, which extend up to 16.4% of the total area, are marked by lagoons, estuaries, beach dunes, marshes, and alluvial formations, lying between sea level and 10 meters in elevation. Notably, Kerala's coastline is lined with interconnected water bodies such as backwaters and estuaries. The largest of these, the Ramsar-listed Vembanad Estuary, receives inflows from six major rivers (Kerala State Remote Sensing and Environment Centre, 2020).

2.3 Assessing the Impact of the 2018 Floods on Kerala

During the monsoon of 2018, Kerala experienced devastating floods and landslides, resulting from continuous and intense rainfall between August 8 and 18. Some districts like Idukki and Wayanad, instead of the usual 290 mm, received nearly 700 mm of rain, overwhelming the region (Government of Kerala, 2018).

The state's reservoirs were already holding excess water by July, and the deluge in August further filled them beyond capacity. Since the dams primarily serve power generation and not flood control, their management failed to consider downstream impacts. With little room left, shutters of all 34 reservoirs were opened simultaneously, exacerbating the situation for communities living downstream (Mishra & Nair, 2019).

A critical gap in communication made matters worse. Local authorities lacked timely and accurate data to inform the public about potential flooding. The absence of flood-risk maps meant no clear estimation of areas likely to be inundated, and thus no advance warnings or evacuation protocols were implemented (CAG, 2021). NASA's satellite images revealed the severity of the disaster, showing large parts of the state submerged.

The disaster drew reactions on multiple levels. The initial response was marked by spontaneous humanitarian aid pouring in from individuals and NGOs, both domestic and international. This uncoordinated but heartfelt response crossed regional and national lines. The second wave of response was more critical, with environmentalists and scientists questioning governmental policies and inaction despite previous warnings. Unlike the initial outpouring of emotion, this was grounded in scientific evidence and accountability. A third type of response attributed the catastrophe to divine will, reflecting deep-seated cultural and spiritual beliefs. In the face of this massive tragedy, Keralites displayed resilience, unity, and an unwavering spirit to overcome the adversity (Devika, 2018; EPW, 2018).

2.4 Map of affected areas

Figure 2.4.1: Map of Affected Areas

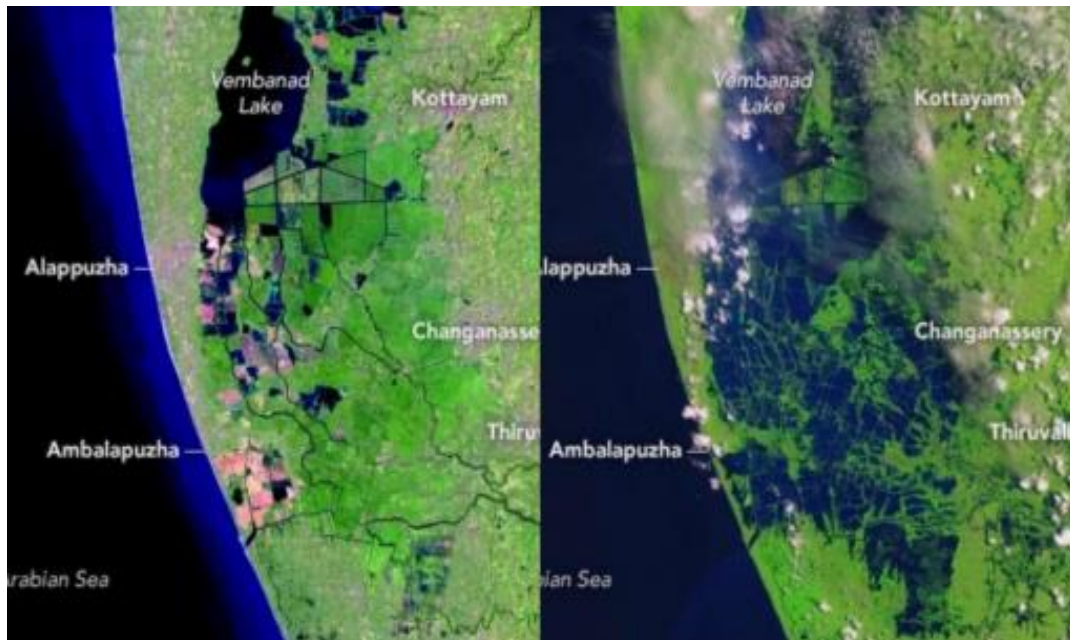Source: Rajiv Gandhi Institute of Development Studies,2018.

Figure 2.4.2: NASA's image before and after Kerala flood 2018

NASA had released satellite images of the Kerala flood that showed how the 'calamity of severe nature' had taken over the state.

The tragedy in Kerala gained public responses at three levels. At the first and basic level, it attained a spontaneous humanitarian response from several segments of society, which transcended regional and national boundaries. Responses at this level seemed to have been unmediated by any prior calculations or instrumental factors. The humanitarian aid that continued to flow into Kerala, both from within the country and abroad, particularly from nongovernmental organizations, was quite phenomenal. These acts transcended all the defined boundaries and demonstrated how our common humanity mattered more, leading to the mobilization of resources from various corners of the country and the world, evoked by human emotions. The response that occurred at the second level initiated with relentless criticism of the handling of the situation, this time focusing on the Kerala government that was caught in the vortex of the disaster (Devika, 2018)

The environmentalists sought to criticize the successive governments for failing to acknowledge the warnings that were given from time to time. The second level response, unlike the first, was not emotionally spontaneous and involved the force of scientific truth, and hence morally empowered the experts to fix the responsibility not on nature, but on human selfinterests and the public institutions that protected those interests. At the third level, the response understandably was a bit delayed, but was articulated neither on scientific nor instrumental grounds, but through causes mediated by a supernatural force. In the event of the devastating tragedy that gripped most parts of rural and urban Kerala, the people of Kerala rose over superficial boundaries, and demonstrated their tenacity, grit and, unity in spirit to tide them over a common tragedy that had inundated them (EPW, 2018).

2.5 Rainfall & Flood

The floods highlighted a number of structural constraints that left Kerala unprepared for major disasters caused by natural hazard or climate change shocks. This included inadequate policies and institutional frameworks to manage and monitor critical natural resources such as water and land, absence of risk-informed spatial and sectored planning policies and frameworks that led to extensive urban sprawl, unmanaged construction in hazard prone areas, exclusion of disaster risk preparedness in key socioeconomic sectors, weak capacity of institutions to anticipate and respond to extreme events, and limited fiscal resources as well as absence of ex ante financing modalities for risk pooling and sharing. Due to these systemic weaknesses, Kerala was at the mercy of the 2018 floods and landslides and suffered major socio-economic losses. (World Bank, 2018).

According to IMD data, Kerala received 2346.6 mm of rainfall starting from June 2018 to 19th August 2018. This was in contrast to an expected 1649.5 mm of rainfall. Further, the total rainfall received by Kerala in June, July, and the start of August to 19 of August was 15%, 18% and 164% respectively, which was above normal. The rains resulted in landslides in hilly areas after torrents of water loosened soils from hill slopes. These slurries of water, soil, rock, and vegetation overwhelmed villages, downed power lines, and cut some communities off from receiving immediate aid. About 341 landslides were reported from 10 districts. The worst hit district was Idukki, which was ravaged by 143 landslides. The natural cause of the landslides was the simple reality of steep terrain being bombarded with too much water. During the torrential rains, water percolated under the surface of the soil and tried to flow downhill.

According to the Indian Meteorological Department (IMD), from 1st June to 22 August 2018, the state received 2411.30 394.4 mm of rain compared to the normal 1770 mm (Table 1). In 2018, the southwest monsoon reached parts of the southeast Bay of Bengal, the south Andaman Sea and the Nicobar Islands on 25th May. It advanced over Kerala on 29th May, three days prior the normal date of 1st June and covered the entire southern peninsular India by 14th June. Normally, the state gets around 2039.6 mm rainfall from June to September in 120 days, but the rainfall during the southwest monsoon season 2018 (1st June to 28th August 2018) has been exceptionally high. Kerala so far received 2411.30 mm against the normal of 1770 mm (above normal by 36 per cent). The highest excess rainfall was recorded over Idukki District (84 per cent above normal) followed by Palakkad (66.80 per cent above normal). The rainfall over the state during June, July and August (1-19 August) has been 15, 18 and 164 per cent above normal, respectively. Eleven of the state's 14 districts were severely affected and the preliminary estimate of loss projected (not including loss of 483 lives and 55,439 ha (135,454 acres) of agricultural land) by the Government of Kerala is Rs 40000 crore (IMD,2018).

Sub Division/ Districts	Actual rain fall in mm	Normal rain fall in mm	Percentage/ Departure	Remarks
Kerala	2411.3	1770.0	36.2	Excess
Lakshadweep	461.4	816.0	(-) 43.5	Deficient
Alappuzha	1940.1	1418.7	36.7	Normal
Idukki	3559.4	1933.5	84.1	Large Excess
Kasargode	2349.4	2706.4	13.2	Normal
Kollam	1585.7	1094.5	44.9	Excess
Kottayam	2339.6	1602.0	46.0	Excess
Kozhikode	2941.7	2324.7	26.5	Excess
Malappuram	2652.9	1825.2	45.4	Excess
Palakkad	2293.7	1375.1	66.8	Large Excess
Pathanamthitta	1982.2	1424.6	39.1	Excess
Thiruvananthapurm	967.3	700.7	38.1	Excess
Thrissur	2079.1	1891.5	10.0	Normal
Wayanad	2906.9	2368.5	22.7	Excess

Figure 2.5.1: Table showing rainfall and its deviation from normal (1st June to 28th August 2018, Kerala)

Source: Indian Meteorological Department,2018

A fresh spell of active rainfall commenced on 8th August and continued till 18th August. Thereafter, there has been a gradual decrease in rainfall over the State. Heavy to extreme rainfall occurred across the state during 14th, 15th of August. The average rainfall on 15/16th August for the entire State was about 140 mm/day. The highest rainfall recorded during the 2018 southwest monsoon over the State was at Nilambur on 8th August (398 mm) and Peerumedu (Idukki catchment area) recorded 349 mm for a single day on 15th August. Peerumedu, located in the water divide of Periyar and Pamba River basin, has received 1615.7 mm of rain in a matter of 11 days, which is more than half of the average annual rainfall of Kerala (IMD, 2018).

The unprecedented flood after the heavy rainfall, which came along with several big and small landslips and landslides, was a natural calamity that struck the State after a century. However, the flood became a huge disaster, taking away 483 human lives and making thousands homeless, because of the lack of timely responsible human intervention. With more than 80 small and big dams, Kerala should not have had a flood as compared of the one in 1924, and it is paradoxical that state still experienced such a huge calamity.

The elevated tidal level corresponding to the new moon phase during Karkidakavavu, along with the wave setup, caused the stagnation of flood waters in the kayals and backwaters, more so in the Vembanad estuarine system. This has led to the accumulation of floodwaters reaching to greater heights, resulting in the flooding of adjacent lowlands (IMD, 2018).

2.6 Causes of Floods

Dr. E. Sreedharan, well-known technocrat (also known as Metro Man), opined that the lack of adequate data with dam authorities, correlating the rainfall precipitation at various points of the catchments and the rate of rise of water in the reservoir, with the time lag between precipitation and the rise of water level. Red alerts were therefore not taken seriously. Heavy silting of reservoirs resulted in a significant decrease in the storage capacities. Formation of artificial islands in the river beds in the absence of a healthy and controlled sand-mining policy resulted in thick jungle growth with huge trees in these islands, which led to severe blockage to the river cross section (This was particularly so in Bharathapuzha River, which resulted in the river overflowing its banks). The cause of the deluge that struck was a result of human omissions and commissions (Sreedharan, 2018).

All the dams in the state were opened simultaneously, which was a major contributing factor to the flood. Over the last 20 to 30 years, the land-use pattern in the state has completely 25 changed due to the reduction in forestland. Encroachments of land and unscientific constructions in the catchment areas of dams and high ranges increased the volume of damage. For example, back in 2005, the Government College in Idukki was destroyed in a landslide and the same was reconstructed again without conducting any environmental impact study. The landslide and similar activities (mass wasting) in the upper catchment areas, silt deposition and soil erosion have reduced the effective storage capacity (Maximum Drawdown Level) of the dams. Circular failures were noted in almost all the catchment areas. A research Study by IIT, Gandhinagar, has concluded that the flood in Kerala is a combined impact of extreme rainfall and reservoir storage and that reservoir operations need to be improved using skilful forecasts of extreme rainfall (Singh et al., 2018).

The total damages estimated by PDNA were around 10,557 crores and total losses were estimated to be around ` 16,163 crores, totaling to disaster effects of around ` 26,720 crores (USD 3.8 billion). This did not include the damage estimates as per the Joint Rapid Damage and Needs Assessment (JRDNA) carried out by the World Bank and the Asian Development Bank (ADB). The total estimated damage excludes damages done to private buildings and properties, losses incurred by private traders and business units, damage, and loss suffered by Kochi airport and road transport and waterways. The damage and loss, which was calculated at ` 26,720 crores in this report would be much higher if the review is done. The assessment across social, productive, infrastructure and cross-cutting sectors (public and private) indicates that complete recovery requires the sum of ` 31,000 crores (USD 4.4 billion). The share of estimated total disaster effects among the sectors of social and economic activity showed that the most affected sector was the infrastructure sector which accounted for 38% of the total disaster effects. This was followed by cross-cutting sectors (27%) followed by social sectors (18%), and finally the productivity sector (17%). The share of estimated recovery needs among the sectors of social and economic activity showed that the infrastructure sector had the highest recovery needs which accounted for 51% of the total recovery need. This was followed by the social sectors (20%), productive sectors (15%) and finally cross-cutting sectors (14%) (UNDP, 2018). The memorandum, which was submitted by the State Government to the Central Government, estimated the damages to be ` 5616

crores. The Joint Rapid Disaster Needs Assessment carried out by the World Bank estimated damages and losses to be 25,050 crores. The Post Disaster Needs Assessment carried out by UN led team estimated the damages and losses to be around 26,780 crores. However, after including the recovery needs, the cost put forward was ` 31,000 crores. A need was felt for convergence in the process of Damage and Loss Assessment to facilitate a holistic framework for responding to and recovering from any disaster (UNDP, 2019).

2.6.1 Overflow of Rivers and Blockage of Water Bodies

India is blessed with two rich biodiversity hotspots, the Western Ghats and the North Eastern Himalayan regions. Kerala is located on the South-West coast of India, embraced by 44 rivers, most of them originating from the Western Ghats. The Periyar, Bharathapuzha, Pamba, Manimala, Meenachil, Achenkovil, Chalakudy and Kabini overflowed in flood time and played an important role in causing the Kerala floods. Periyar is the longest river with the largest discharge potential in the State. Its sub-basin consists of about 50% of the cumulative live storage of Kerala. During the flood most affected cities by Periyar overflow were Kochi, Aluva, Ernakulum, Idukki, Neriamangalam, Kalady, Malayattor, Thrissur, etc. Bharathapuzha, the interstate river of Kerala and Tamil Nadu, flows into the Arabian Sea. This sub-basin has the neighboring Cauvery basin in the east and the Arabian Sea in the west. The route of the river to the district was affected. The four biggest west-flowing rivers, namely Achenkovil (128 km), Pamba (176 km), Manimala (90 km) and Meenachil (78 km) join the southern part of the Vembanad Lake, while a southern branch of Periyar drains into Cochin Kayal. It finally drains to the Arabian Sea through the Kochi outlet. Pathanamthitta, Kottayam and Alappuzha were the most affected districts by the flood of these rivers. Chalakudy River (130 km) is the fifth longest and the steepest river of Kerala. Thrissur was the most affected area by this river's overflow in this Monsoon season. River Kabini (240 km) is one of the major tributaries of the Cauvery River in southern India. The catchment area of Kabini is 1934.5 km. The outflow from the Kabini reservoir in H.D. Kote reached a record level of 80,000 cusecs, inundating lowlying areas in H.D. Kote, Nanjangud, Suttur, and other towns. This was caused by heavy rains in Wayanad, which is the upper catchment area of the Kabini (NDRF, 2018)

2.6.2 Poor Resource Management

Most of the area which got affected by the monsoons was classified as ecologically sensitive zones (ESZs) by the expert panel on Western Ghats Ecology. It was also referred to as the Gadgil Committee. The report was delivered by a team that was headed by Madhav Gadgil, who was a renowned ecologist and also the founder member of the Centre for Ecological Sciences at the Indian Institute of Science, Bengaluru. According to environmentalists, the committee's recommendations were strong enough to protect the sensitive Western Ghat region. The recommendation of the committee was to categorize a 140,000 Km stretch of the Western Ghats into three zones. The committee recommended strong restrictions on mining 27 and quarrying activities, using land for non-forest purposes and disallowing high rises in the concerned areas. The report was first submitted to the government in 2011. However, the recommendations of the committee were not adopted. Shri Gadgil maintained that quarrying was a major reason for the mudslides and landslides. Further,

he added that Kerala floods were a man-made calamity where intense rainfall and human intervention had made it a serious disaster (First Post, 2018).

2.6.3 Lack of Awareness Lack of awareness

concerning disaster risks from urban floods are living testimony of the conflict between urban development and weather-related vulnerabilities. An example of this was the closure of Cochin International Airport for two weeks when flood waters from the swollen river breached the periphery walls and flooded the runway. Additionally, the world's first solar-powered airport lost approximately 20 percent of its solar panels owing to damage. In total, a loss of USD 35 million was incurred owing to damage to the airport and the ensuing closure. The airport is a mere 420 metres away from the Periyar River, located within the floodplains of the river. The Chengalthodu creek, which connects to the Periyar River, was completely realigned. Kochi's airport wasn't unique in this aspect. Airports in Mumbai and Chennai, which are also located close to rivers and have expanded their runways over river channels and floodplains and have also experienced extreme flooding and closure in 2005 and 2015, respectively (WRI INDIA, 2018).

2.6.4 Poor Discharge Capacities of Water Bodies

The embankments of rivers in Kerala are steep, stable to a degree. It seems the rivers are stable within their bed. Flooding occurs whenever the river discharges. People were used to limited flooding in the area but were not prepared for the extreme floods that occurred in 1924 and 2018. Regular flooding was a phenomenon that mostly occurred in the low areas around the backwaters and reaches of the lower part of the river. The flood discharge inflow from rivers did cause flooding, but it was aggravated by poor discharge capacities of the canals and blockage of discharge at the sea outlets (azhis and pozhis). The rising frequency of heavy rainfall and precipitation during monsoon led to an increase in the magnitude and frequency of river floods. It is projected that the sea level rise (SLR) along the coast will be somewhere around 100 mm–200 mm in the next 100 years. Needless to say, this would bring drastic, uncomfortable changes in a large part of coastal communities living on sandy coasts. Backwater banks, paddy fields, and filtration ponds are other sections of the coastal zone that 28 are susceptible to SLR. Although it is of not much significance for the next planning cycle, it is particularly vital for the long-term scenario spanning over 50 years (UNDP, 2018).

2.7 Cause of the Landslide

Landslides are normally triggered by heavy rains, earthquakes, or a rise in groundwater and undercutting by rivers. In Kerala, landslides commonly occur in localised areas of the Western Ghats region, where the slope is steep and the soil is oversaturated as a result of prolonged rainfall. These events vary from those affecting a parcel of land to the larger ones with much causality. The State experienced unprecedented landslides in the year 2018, most of which occurred in the districts of Idukki and Wayanad. While Idukki experienced a total of 143 landslides, Wayanad was hit with almost 247 landslides, out of which 200 can be classified into road slips. Even though these road slips do not affect the catchment areas in Wayanad, these

cannot not to be taken lightly, as they happen mainly due to a lack of scientific designs in the construction of roads (Kerala State Disaster Management Authority, 2018).

The overall terrain setting in the highland of Kerala brings out two prominent plateaulike landforms commonly known as plantation surfaces. Peerumedu plateau, Wayanad region, which merges with Mysore plateau, Attappady, and Nelliampathy, are nearly flat land at about 600-800 m elevation. Similarly, a near-level landform is seen around Munnar, where the valleys are at about 1500 m elevation and the hills reach more than 2000m. These flat lands are flanked by steep to very steep slopes where the incidences of landslides are highest. Uncontrolled land use practices with cutting and levelling, drainage manipulation and promoting agriculture practices with frequent tilling in these slopes are some of the activities that have contributed to an increase in slope failures and landslides recently. These sloping regions are also the source points of many rivulets that feed majority of the rivers in Kerala, ensuring greater water availability. A common form of destabilising the steep slopes is by the toe disturbances. Indiscriminate construction of hilly roads and construction of houses by cutting and levelling the slopes are rampant in the highlands of the state. Soil piping or subsurface erosion leading to land subsidence is another active process during monsoons and in most places, it is triggered by human activities. The two major causes for recent landslides are given below: a) Nature of soil: The soil in the highland region like Idukki and Wayanad is slightly reddish, silty and the cohesive strength is less. Hence, when the soil is saturated, it tends to swell. By making an artificial cut of more than 2 to 3 meters, road structures come down, thereby inducing a possible landslide. This is what is happening frequently in 'Wayanad Churam'. This kind of landscaping for any purpose, such as agriculture or construction, 29 depending on the nature of the soil, must be regulated. b) Oversaturation of soil: Unscrupulous terracing and cultivation practices that promote infiltration, water retention that leads to the excess entry of water into the subsoil, are also one of the reasons behind the landslides (National Centre for Earth Science Studies, 2018).

The sudden flooding in the hilly areas moved downwards, due to the peculiar nature of the Kerala terrain, to the midland. In addition to the heavy rains in the midland, the entire lowlying and midland area got inundated, thus causing heavy damages like severe erosion, landslides, water logging, etc. It affected the lives and properties of people residing in these densely populated areas in the state. The poor management of water in the reservoirs, dams and other water-retaining structures belonging to the Power and Water Resource Departments worsened the situation of flooding. Due to the new moon on the 12th of August, the sea was very rough and during this time, the roaring waves deposited and took away the sand and mud in the coastal areas, resulting in the pozhi's getting closed with sand bars and water could not be discharged into the sea. The lack of coordination between the officers in timely communicating the alarming situation to the people residing in the flood-prone areas also increased the vulnerability of the situation. It is also to be noted in this aspect that in certain districts, the district administration was not aware of the openings of spillway shutters of dams resulting in huge damages, whereas in some other districts, the shutters of dams were kept opened well in advance (Neyyar, Peppara and Themmala) and with no adverse impact. The severely flood-affected areas can be classified into three regions: a) Region 1 (Wayanad, Malappuram, and Kozhikode Districts), b) Region 2 (Palakkad, Thrissur, Ernakulam, Kottayam and Idukki Districts), c) Region 3 (Pathanamthitta and Alapuzha Districts (Chengunnur and Kuttanad areas). In Region 1, two major dams, Karappuzha and

Kuttiyadi, and the canal system of Banasura Sagar Dam come under the control of the Irrigation Department, whereas the other three dams come under Kerala State Electricity Board Limited. Of these, the canal system of the Karapuzha Dam reservoir has not been made functional so far. Due to the unexpected rainfall in the Wayanad District, especially in Panamaram, Padinjarethara and Vythiri, heavy slippage and landslides occurred and the Kuttiady Dam reservoirs were flooded due to the heavy inflow of water, and the shutters were opened without considering the consequences and hardships. Moreover, no warning was given to the people living downstream of the dams. Wayanad District has had a relentless rainfall of 96.67mm on 16th August alone and continuous rain since 8th August 2018. The roaring flow of the flood water ate away the lives and property of the people living in the downstream until it reached the Arabian Sea. It may be noted that the changes made in the land-use pattern in the district had contributed substantially to the occurrence of landslides and slippages. Also, paddy cultivation has been almost completely wiped off from the Wayanad district.

The situations in region 2 were entirely different, where inundation occurred in the plain lands of Aluva town and its suburbs, North Paravur, Cherai, Chalakudy town and its periphery, and extended up to Edappally under the Kochi Corporation area. The water discharged from the Idukki reservoir through the Cheruthony Dam spillways (aggravated by the opening of all the 13 spillway shutters of the Mullapperiyar Dam), the outflow from the Dams in the Munnar region, Idamalayar reservoir and also from the Upper Sholayar, Peringalkuthu and Bhoothathankettu Dam induced such a severe situation in the basins of Periyar and Chalakudy Rivers. There was a huge lapse in communicating the flood situation that was increasing day by day, which resulted in heavy loss to the people and their valuable records, certificates, vehicles, livelihood, etc. The worst flood-hit area in the history of Kerala comes under this region. The third region, comprising places like Pathanamthitta, Ranni, Chengannur, etc., experienced severe damage, even though all these places lie in the central midland region. Almost all the dams in the upstream of Pampa River starting from Kochupampa belong to the Kerala State Electricity Board Limited, and only the barrage at Maniyar comes under the control of the State's Irrigation Department. The unprecedented rainfall, almost four times the normal, and the lack of communication about the opening of the spillway shutters, etc., contributed to the inundation of these regions. The Alappuzha District was experiencing a flood for one month before the disastrous second spell. The stagnation of water in the Kuttanad region increased the area of inundation in the upper midlands, making life miserable to the people there (Kerala State Planning Board, 2018).

The role of political leadership in disaster management is multifaceted, encompassing emergency response coordination, resource allocation, policy formulation, and community mobilization. Effective leadership is essential for timely and efficient disaster response and recovery, especially in a democratic context where accountability and transparency are paramount. In Kerala, the state government's response to the floods was subject to scrutiny, showcasing both successes and shortcomings in the political handling of the disaster (Thomas, 2019).

Following the 2018 floods, the Kerala government was under great pressure to react swiftly and forcefully. Coordinating immediate relief efforts—including the deployment of the 31 National Disaster Response Force (NDRF) and local volunteers, political leadership was crucial. Coordinating rescue operations, distributing relief, and attending to the immediate needs of impacted populations fell first to the

Chief Minister and state officials. Reducing the immediate human suffering the disaster brought about was mostly dependent on this proactive attitude (George, 2019). Still, the political scene both before and during the floods was convoluted. Strong political activity and community involvement in Kerala have a history that affected the disaster reaction. Different political parties and groups coordinated funds, volunteers, and support for flood victims.

2.8. Local Governance and Disaster Response

In Kerala In the aftermath of the 2018 floods, the role of local self-governments, particularly the Panchayati Raj Institutions (PRIs), was crucial. As the most proximate governance bodies to the communities, local self-governments such as panchayats, municipalities, and urban local bodies were pivotal in the immediate relief and recovery efforts. According to a study by Sreeja and Gireesan (2024), the Panchayati Raj system in India, particularly at the village, block, and district levels, is vital for disaster management. The proximity of these institutions to the community and their democratic nature makes them critical players in disaster management and response.

During the floods, the government of Kerala, led by the Chief Minister's office, coordinated with these local self-governments, mobilizing them to take an active part in rescue and relief operations. A senior bureaucrat highlighted that local bodies, ranging from panchayats to municipal corporations, were instructed to immediately begin rescue efforts and use their own funds to manage the disaster response. Engineering wings of the panchayats were also pressed into service to provide assistance in repairing damaged infrastructure and rescue operations.

The decentralization of power allowed these local bodies to act swiftly and efficiently, minimizing delays in providing assistance. For example, the local bodies were empowered to set up relief camps, provide shelter to the displaced, and offer immediate medical assistance. However, there was an important caveat: these local bodies were instructed to ensure their actions aligned with the broader disaster management strategies and not contradict the instructions of the central authorities (Neeraj et al., 2020).

This coordination between the local and state authorities helped prevent confusion and led to a streamlined response. The decentralized approach empowered local leaders to take quick action, but they remained aligned with the overall disaster management framework provided by the government and national disaster management agencies like the National Disaster Response Force (NDRF).

2.9 The Role of People's Participation: A Collective Effort

One of the most inspiring aspects of the Kerala floods response was the involvement of the people. As reported by various studies and media outlets, citizens from across the state, including those in the affected areas, rose to the occasion, demonstrating immense solidarity and selflessness in their efforts. The sense of collective responsibility was pervasive, cutting across political, religious, and social lines. This spirit of humanity manifested in a variety of forms, from spontaneous volunteerism to organized efforts by political and social groups (Ajay, 2019).

Several mass organizations, including left-leaning political organizations like the Democratic Youth Federation of India (DYFI) and the Students Federation of India (SFI), called on the public to participate in the rescue efforts. These organizations, in collaboration with the government, played a critical role in the local-level disaster response. Trade unions, particularly the fisherfolk unions, worked tirelessly, day and night, organizing relief operations and aiding in the evacuation and rescue missions (Thomas et al., 2020).

Moreover, an innovative and grassroots-driven online initiative, KeralaRescue.in, emerged during the disaster. This portal served as a platform for the public to donate funds, enlist volunteers, and request help. The platform garnered widespread participation, attracting millions of visitors, including non-resident Malayalis (NRIs) who contributed financially and through volunteering. This collaborative approach highlights the power of digital tools in enhancing disaster response and mobilizing the community (Ajay, 2019).

2.10 The Role of Non-Governmental Organizations (NGOs)

NGOs played an indispensable role in the Kerala flood response. Organizations such as Gospel for Asia (GFA), Rise Against Hunger India (RAHI), and Save the Children India provided onthe-ground support, supplementing the efforts of the government and local volunteers. GFA and other international NGOs worked closely with local communities, providing immediate relief in the form of food, shelter, and medical aid. They also partnered with local churches and communities to ensure that aid reached those most in need (Neeraj, Mannakara, & Wilkinson, 2020).

Rise Against Hunger India, in particular, worked with various local NGOs to provide not just food, but also essential items such as hygiene kits, clothing, water purification tablets, and bedsheets. Their efforts were vital in sustaining survivors in relief camps, where thousands of people took shelter after being displaced by the floods (Ajay, 2019).

Save the Children India set up child-friendly spaces in the affected areas, providing children with a safe environment where they could receive emotional and psychological support. These spaces allowed children to engage in learning and recreation, helping them cope with the trauma of the disaster. The collaborative efforts between these NGOs and the local government were essential in reaching vulnerable populations, particularly children, women, and the elderly (Neeraj, Mannakara, & Wilkinson, 2020).

2.11 Financial Support and Government Assistance

In addition to the local-level responses, the state and central governments played significant roles in ensuring that the affected populations received financial and material support. The Chief Minister's Disaster Relief Fund (CMDRF) saw an outpouring of contributions from both individuals and organizations, amounting to over ₹1,400 crores. The fund was used for immediate relief and long-term recovery efforts, including the reconstruction of homes and infrastructure (Rajiv Gandhi Institute, 2019).

The central government also provided substantial assistance, including financial support under the Pradhan Mantri Awas Yojana (PMAY) for housing reconstruction and the Mahatma Gandhi National Rural

Employment Guarantee Scheme (MGNREGA), which allocated ₹1,800 crores for the 2018-19 fiscal year to rebuild Kerala's rural infrastructure. Furthermore, the central government directed insurance companies to release timely compensation to affected families under social security schemes, ensuring that financial aid reached those who needed it most. The prompt response from both state and central governments, coupled with the active participation of local bodies and NGOs, formed the backbone of Kerala's disaster response (Sreeja & Gireesan, 2020).

2.12 Challenges Faced During the Response

Despite the remarkable collective efforts, the Kerala flood response faced several challenges. One of the primary obstacles was the sheer scale of the disaster. With millions of people affected and vast areas inundated, coordinating relief efforts proved difficult, even with the involvement of local and national actors. The lack of resources, especially in the initial days, hampered the ability of both the government and volunteers to meet the overwhelming needs of the affected communities.

Another challenge was the fatigue and resource constraints faced by the affected communities themselves. As Walia and Nusrat (2020) point out, the exhaustion of local communities, combined with the heavy reliance on external support, made it difficult to maintain the momentum of relief operations in the early stages. The heavy rains and floods also caused severe damage to infrastructure, including roads, bridges, and communication networks, further complicating relief efforts.

Moreover, the lack of preparedness in some areas became evident, as local officials struggled to respond to the magnitude of the disaster. However, as the disaster response progressed, lessons were learned, and strategies were adapted to meet the evolving needs of the affected populations.

2.13 Conclusion: Key Lessons from Kerala's Disaster Response

The 2018 Kerala floods demonstrated the importance of local governance, community participation, and collaboration between various stakeholders in disaster management. The disaster response in Kerala was characterized by swift action, coordination, and the collective efforts of citizens, local bodies, NGOs, and the government (Walia & Nusrat, 2020).

Key lessons from Kerala's experience include the importance of decentralization and empowering local bodies to take immediate action. The ability of local leaders to respond quickly and use available resources effectively played a critical role in minimizing the impacts of the disaster. Additionally, the role of community volunteers, NGOs, and mass organizations in supporting the government's efforts was indispensable. Finally, the strong sense of solidarity and the willingness of people to help each other demonstrated the power of collective action in the face of adversity (Thomas, Varghese, & Benjamin, 2019).

Moving forward, it is clear that strengthening the capacity of local governments and enhancing disaster preparedness at the community level will be crucial in responding to future disasters. Kerala's experience serves as a model for how local governance, citizen participation, and collaboration between public

and private actors can lead to an effective and compassionate response to natural disasters (Neeraj, Mannakara, & Wilkinson, 2020).

CHAPTER 3

GOVERNANCE AND RESOURCE ALLOCATION CHALLENGES IN DISASTER MANAGEMENT AT STATE AND LOCAL LEVELS.

3.1 Introduction

The Kerala floods of 2018 revealed critical weaknesses in the disaster management systems at both state and local levels. Despite the immense damage caused by the floods, which led to the loss of 433 lives and the displacement of over 1.4 million people, the response was hampered by governance challenges, inadequate resource allocation, and delayed decision-making. This chapter examines the governance structure, resource management issues, and the failure to execute timely responses in Kerala's disaster management during the 2018 floods.

3.2 People's Response to Disaster and Community Involvement

The role of the community, particularly at the grassroots level, is critical during disasters. A study conducted on 2019 by Thomas P., Varghese SM, and Benjamin AI highlights how the local community in Kerala played a pivotal role in disaster relief, despite lacking proper institutional support. Over 93% of households were evacuated to relief camps, with significant assistance coming from neighbours. This reflects the importance of community resilience, as well as the gaps in institutional readiness. In a crisis, the local population becomes the first responder, and their preparedness and quick actions often prevent further loss of life.

Local communities had the knowledge and capacity to respond quickly. However, the lack of a decentralized disaster management system at the panchayat and block levels created bottlenecks when local authorities were forced to rely on the district administration for assistance. This reliance delayed the rescue and evacuation efforts, showing a significant weakness in Kerala's disaster management framework.

3.3 Governance Challenges in Disaster Management

While the Kerala State Disaster Management Authority (KSDMA) and District Disaster Management Authorities (DDMA) exist, the lack of a robust framework at the block or panchayat levels is a key oversight. This gap became evident during the 2018 floods, where Panchayat leaders were forced to call district-level authorities for help during the height of the disaster. The inability to deploy a well-coordinated and localized response system left the state and district authorities overwhelmed (Sreeja & Gireesan, 2020).

A comprehensive disaster management plan (DMP) is crucial at every level of governance. According to the National Disaster Management Authority (NDMA), disaster management plans should be prepared at the panchayat level. However, in Kerala, such plans were either non-existent or lacked proper implementation,

which led to delays in evacuation and relief operations. The governance model at the local level needs to be restructured, with an emphasis on making disaster management plans more vibrant and community-focused (National Disaster Management Authority [NDMA], 2019).

3.4 Challenges in Resource Allocation

One of the key failures identified during the floods was the inadequate allocation and management of resources. The Kerala government's response to the disaster was hampered by resource shortages, including boats for rescue operations, rescue teams, and relief materials. The resource allocation system was not prepared to handle a disaster of such magnitude, leading to delays in relief distribution.

Furthermore, the Comptroller and Auditor General (CAG) of India's report on the floods highlighted several governance shortcomings in resource management. The state government failed to develop a reliable flood hazard map, which would have been essential for resource deployment during emergencies. The CAG report also pointed to the lack of an effective decision support system for real-time flood forecasting and inadequate infrastructure for flood control.

The report further revealed that Kerala's disaster management system failed to integrate modern technology into its resource allocation processes. While international frameworks for disaster preparedness emphasize the use of technology for better forecasting and communication, Kerala's reliance on outdated systems exacerbated the problem. The real-time data required to make informed decisions during the disaster was not available, further delaying the response (Comptroller and Auditor General [CAG], 2019).

3.5 Inefficiency in Dam Management and Early Warning Systems

Another area where resource mismanagement was evident during the 2018 floods was in dam management. Kerala has numerous dams, but they failed to operate efficiently during the floods. Dams, such as the Idukki dam, were at full capacity before the heavy rains began, leading to the sudden release of water into already flooded areas. The failure of the authorities to pre-emptively manage the water levels and release water in a controlled manner contributed significantly to the scale of the flooding.

Moreover, the lack of effective early warning systems was a major governance failure. Despite having disaster management authorities in place, Kerala did not have a robust early warning system that could predict the severity of the floods. This is evident from the CAG report, which criticized the state's failure to develop a comprehensive flood hazard map, leaving the authorities unprepared when the floods struck.

The 2018 Kerala floods highlighted the critical need for regular dam assessments, early warning systems, and contingency plans. Establishing such systems and ensuring their proper functioning is essential to mitigate the impact of future disasters.

3.6 Lack of Awareness and Public Engagement

The public's awareness of the risks associated with floods and the various stages of flood alerts was another major shortcoming in Kerala's disaster management system. As noted in the reports, there was a significant lack of public awareness regarding the grades of alerts issued by the government, which hindered effective response. Additionally, local self-governments, which are crucial in disaster management, lacked the training and equipment to handle such a large-scale disaster.

The lack of a clear and effective communication strategy meant that citizens were unaware of evacuation procedures, relief camp locations, and safety protocols. This further delayed the relief efforts and created confusion during the crisis.

3.7 The Role of Technology in Disaster Response

In response to the Kerala floods, the role of technology emerged as a crucial tool in disaster management. Social media platforms, such as Facebook and Twitter, played a pivotal role in disseminating information about the disaster and coordinating relief efforts. Volunteers and affected individuals used these platforms to share information on their location, request help, and offer assistance.

The online portal KeralaRescue.in exemplifies the potential of technology in disaster management. It enabled citizens to donate funds, volunteer for rescue operations, and coordinate relief efforts. While government systems failed to respond quickly, community driven technology solutions showcased the importance of involving the public in disaster response.

However, as highlighted in the research, technology must be integrated into the official disaster management framework. The Kerala government should focus on developing robust digital platforms that can facilitate timely communication, resource allocation, and coordination during disasters (Ajay, 2019).

3.8 The Need for Reform in Disaster Management Governance

The 2018 Kerala floods serve as a wake-up call for the need to reform disaster management practices in the state. It is clear that Kerala's disaster management system, both in terms of governance and resource allocation, requires a comprehensive overhaul. Key recommendations include:

• Decentralized Disaster Management: Empowering local governance bodies such as Panchayats, Block Panchayats, and District Panchayats with disaster management plans, resources, and decision-making authority.

• Updated Disaster Management Plans: Regularly updating disaster management plans to incorporate modern technologies, such as early warning systems, GIS-based hazard mapping, and real-time data analytics.

• Community Engagement and Training: Providing citizens with the necessary training in disaster preparedness and involving them in the planning process to ensure better response during emergencies.

• Resource Management and Allocation: Ensuring that resources such as boats, first aid kits, and other emergency equipment are readily available at the local level, along with clear guidelines for their deployment

. • Public Awareness Programs: Launching extensive public awareness programs about disaster risks, alert systems, and safety protocols to improve citizen participation in disaster response efforts.

3.9 Conclusion

The 2018 Kerala floods exposed critical gaps in the governance and resource allocation frameworks for disaster management. The failure to decentralize decision-making, inadequate infrastructure, delayed response, and lack of public awareness all contributed to the severity of the disaster. The lessons learned from this catastrophe underline the need for stronger governance, better resource management, and more effective community engagement to mitigate the impact of future disasters. By focusing on comprehensive planning, the integration of modern technology, and enhancing local capacity, Kerala can improve its disaster preparedness and response systems, making it more resilient to future calamities

CHAPTER 4

COMMUNITY INVOLVEMENT IN DISASTER RECOVERY: EVALUATING, ENGAGEMENT, AND RESILIENCE

4.1 Introduction

The Kerala floods of 2018 presented a severe test for the state's disaster management systems and tested the resilience of its communities. In the face of unprecedented rainfall, rising floodwaters, and widespread landslides, community involvement became a pivotal factor in both immediate relief and long-term recovery. This chapter examines the community's role in disaster recovery, focusing on the various dimensions of engagement, the impact of their actions, and the resilience that emerged from this calamity. It also reflects on the role of political leadership, governmental coordination, and the innovative use of technology during and after the disaster.

Additionally, the floods provided a real-time case study on how communities respond under duress and how local systems can either support or hinder disaster mitigation. The lessons learned from Kerala offer valuable insights into the dynamics of community-centered disaster recovery—emphasizing the need for inclusive planning, empowerment of grassroots institutions, and integration of modern tools into traditional frameworks.

4.2 Role of Government and NGOs in Community Recovery

The involvement of local authorities, NGOs, and community volunteers in disaster recovery operations is critical. In the case of Kerala, the government, alongside numerous NGOs, initiated various recovery processes, including relief distribution, rescue operations, and rebuilding efforts. The focus of these efforts was not only on providing immediate relief but also on fostering community resilience for future disasters.

A 2020 study by Shankar Neeraj, Sandeeka Mannakara, and Suzanne Wilkinson explored the recovery process post-floods in Kerala, aiming to assess the alignment of recovery efforts with "Build Back Better" (BBB) principles. These principles, which focus on creating safer and more resilient infrastructures and communities after disasters, were employed in Kerala to a large extent. The government encouraged owner-driven reconstruction for floodaffected households and supported local businesses, facilitating economic recovery. By 42 establishing local-level recovery authorities, Kerala promoted a sense of community ownership in the rebuilding process, empowering residents to take charge of their recovery (Neeraj et al., 2020).

Further analysis of the government's strategy reveals that integrating traditional community networks with formal institutional mechanisms played a key role in speeding up relief distribution and restoring public services. NGOs such as SEEDS India and Goonj coordinated with village councils to deliver aid tailored to local needs. Psychological support and trauma care were also prioritized in some districts, reflecting a more holistic approach to disaster recovery. These multifaceted interventions exemplified a people-centered recovery model where stakeholders at every level were mobilized.

However, the study also highlighted gaps in implementing resilience-based planning for future disasters. Some of these shortcomings were related to inadequate disaster risk management frameworks and insufficient emphasis on long-term environmental resilience. There is a need for sustained efforts in building capacity at the local level to ensure that communities are better prepared for future natural hazards.

4.3 Strengthening Local Governance: Empowering Panchayati Raj Institutions

The effectiveness of community involvement in disaster recovery can be substantially enhanced by strengthening local governance institutions. A study by Sreeja and K. Gireesan on the capabilities of Panchayati Raj Institutions (PRIs) in disaster management focuses on the Alappuzha district, one of the most vulnerable areas to floods in Kerala. The study emphasizes the importance of disaster preparedness at the grassroots level, advocating for a more proactive and participatory approach to disaster management.

In particular, the research stresses the need for empowering PRIs, as these institutions are closest to the people and play a critical role in pre-disaster preparedness. It was found that local-level institutions could significantly improve disaster management by integrating disaster risk reduction strategies into their development plans. Through their study, Sreeja and Gireesan pointed out that Panchayats need to be equipped with the necessary resources—such as boats for rescue operations, first aid kits, and communication systems like public announcement systems and powerful flashlights—to improve their responsiveness during emergencies.

In practice, empowering PRIs also means decentralizing decision-making powers and ensuring that local authorities have access to timely funding, technical knowledge, and emergency response training. For example, enabling gram panchayats to develop localized hazard maps and disaster response plans can facilitate quicker and more accurate action during emergencies. Institutionalizing these responsibilities within the Disaster Management Plans of each Panchayat can lead to more sustainable community preparedness.

Moreover, the concept of subsidiarity was highlighted as a key principle, ensuring that responsibilities for disaster management are appropriately delegated across local bodies, such as Gram Panchayats, Block Panchayats, and District Panchayats (Sreeja & Gireesan, 2020). This model ensures that disaster response is not delayed by bureaucratic bottlenecks and instead becomes a shared responsibility across levels of governance.

4.4 Technological Innovations in Disaster Response

In the digital age, technology plays an increasingly vital role in disaster management. In Kerala, the use of technology, particularly social media platforms, became a crucial tool for disaster response. Communities used Facebook, Twitter, and WhatsApp to share vital information quickly, enabling survivors to communicate their needs and request help. One notable example was the online portal KeralaRescue.in, which was set up to collect donations, enlist volunteers, and record emergency requests. This platform became a lifeline for people in distress, allowing them to connect with rescuers and relief organizations (Ajay, 2019).

Social media provided an invaluable real-time communication network for both survivors and responders, helping direct resources and assistance to the right locations. In addition to social media, technological tools such as GIS mapping and flood prediction systems are becoming essential in assessing risks and planning evacuation strategies.

Drones were also deployed for aerial surveys to assess damage and identify inaccessible locations, while mobile apps allowed rescue teams to navigate flooded areas with greater precision. Technological innovations not only helped streamline logistical operations but also fostered transparency and accountability. The digital volunteer network helped bridge information gaps between formal responders and isolated communities (Thomas & Prasad, 2020).

The use of technology in Kerala not only expedited immediate relief but also enhanced the coordination of recovery efforts, illustrating the potential for technological innovations to strengthen community resilience. This digital transformation of disaster response serves as a benchmark for future emergency management systems, especially in regions where terrain and population density pose logistical challenges (Ajay, 2019).

4.5 Challenges in Dam Operations and Flood Management

The Kerala floods of 2018 also brought into focus significant issues related to the management of water reservoirs and dams. A report by Walia and Nusrat (2020) noted that the role of dams in flood management was widely debated, particularly regarding the opening of floodgates during the crisis. It was revealed that the Idukki dam, which plays a crucial role in regulating water flow in Kerala's River systems, had been filled to near full capacity by the end of July, even before the peak of the monsoon season. When the rains intensified in August, the dam had no option but to release water into already flooded regions, exacerbating the flood damage.

Experts argue that effective flood management requires proactive measures, such as ensuring that dam reservoirs are at lower levels before the onset of the monsoon. Furthermore, inter-state dam management issues, such as the ongoing disputes between Kerala and Tamil Nadu regarding the Mullaperiyar Dam, have highlighted the need for better cooperation and coordination in managing water resources.

A lack of a unified water management policy and real-time data sharing between states contributed to reactive, rather than preventive, measures. Calls have been made for a central flood control authority that can integrate hydrological data, weather forecasts, and dam storage levels to issue timely alerts. Improved coordination among dam authorities, meteorological departments, and disaster management agencies is essential to avoid repeating such missteps. A more calculative and coordinated approach to managing these reservoirs could have mitigated some of the flood's impacts (Walia & Nusrat, 2020).

4.6 Community Resilience and Future Preparedness

The Kerala floods underscored the necessity for a resilient community capable of responding to disasters with speed and efficiency. As highlighted in a report by the Rajiv Gandhi Institute, building disaster resilience involves integrating disaster preparedness into local development plans. It is crucial that local communities, particularly in flood-prone areas, are trained in basic survival skills, such as swimming, first aid, and emergency evacuation procedures. In addition, local authorities must be equipped with the necessary tools and resources to manage emergency situations effectively (Rajiv Gandhi Institute for Contemporary Studies [RGICS], 2019).

The involvement of migrant workers and community volunteers also plays a significant role in strengthening disaster management systems. As noted in the report, a well-trained and equipped rescue team at the panchayat or ward level can significantly enhance the effectiveness of disaster response efforts. Periodic training and exposure to simulated disaster scenarios will ensure that these teams remain prepared to act swiftly and decisively in the event of a crisis (Rajiv Gandhi Institute for Contemporary Studies [RGICS], 2019).

Community resilience also depends on socioeconomic stability and public awareness. Therefore, integrating disaster risk education in school curricula, conducting community drills, and maintaining updated emergency contacts are crucial strategies. Ensuring inclusive participation—especially of women, the elderly, and people with disabilities—in planning and response efforts fosters a more comprehensive and equitable recovery framework.

4.7 Conclusion

The Kerala floods of 2018 revealed several critical gaps in disaster management, but it also showcased the tremendous potential of community involvement in the recovery process. The swift action of local volunteers, NGOs, and government officials helped reduce the immediate impact of the disaster. However, there is a pressing need for continued efforts to build longterm resilience through better disaster preparedness,

improved governance structures, and the innovative use of technology. Empowering local communities and institutions, along with enhancing the capacity of the state government to manage disaster risks effectively, will be essential in safeguarding Kerala's future against similar calamities.

In conclusion, Kerala's disaster recovery efforts have demonstrated the importance of community engagement in building resilience, but much work remains to be done in strengthening local capacities, improving communication, and ensuring that the lessons from the 2018 floods are applied to future disaster management strategies. The Kerala experience serves not only as a cautionary tale but also as a source of valuable insights into how integrated, community-based disaster recovery can form the foundation of a more secure and sustainable future.

CHAPTER-5

CONCLUSION AND SUGGESTIONS

5.1 CONCLUSION

The 2018 Kerala floods were a turning point in India's disaster management narrative, and the importance of people mobilization, decentralization, and technology integration for effective disaster revival. As this study unpacked across the different chapters, the floods exposed structural weaknesses like long-term dam actions, lack of inter-state coordination, and insufficiencies in readiness mechanisms along with exposing simultaneously the power of people's level mobilization. The initial response was marked by rapid mobilization of local volunteers, NGOs, and government agencies, showing the potential of locally driven action to counteract institutional lag and logistics hassles. Joint utilization of digital platforms like KeralaRescue.in and large-scale utilization of social media entirely revolutionized disaster response to the point of immediate coordination between the disaster-stricken population and rescue teams. The "Build Back Better" plan, pursued by the state administration, facilitated flood-affected households through owner-initiated rebuilding and community-driven recuperation activities with a sense of ownership and hardiness. Local governance instituted through Panchayati Raj Institutions (PRIs) was equally important because such institutions have also been at the forefront of preparatory activity involving the drawing of hazard maps, relief dispensations, and integrating disaster risk reduction in development planning. But the chapters also pointed out gaps particularly in environmental resilience, long-term infrastructure planning, and the need for robust local disaster management systems. In addition, the dam operation case, as with the Idukki and Mullaperiyar dams, raised alarm about the absence of a coordinated data-informed water management plan, and called for setting up a central flood control body to manage inter-state resources and give timely warnings. In the years to come, emphasis must be given to institutionalizing disaster preparedness in the form of education, training, and inclusive policies that consider the needs of vulnerable groups such as women, children, the elderly, and the disabled. Community resilience is less about surviving the next disaster and more about equipping communities to be knowledgeable, tool-enabled, and autonomous enough to respond well and sustainably. The Kerala model is a people-centred enabling model of community-based disaster management that unites traditional knowledge and new technology, local initiative and state intervention, relief action with prevention.

At a time of escalating climate-related disasters, their relevance grows daily. The future safe and resilient pathway is to centre on community, planning, readiness, and recovery.

5.2 Suggestions for Further Research

Comparative Analysis of Media Forms: Expand the research to include not just posters, but other forms of media like social media posts, TV advertisements, radio broadcasts, and print media. A comparative analysis could explore how political messages are conveyed across different platforms and their relative effectiveness.

• Long-Term Effects of Political Messaging: Research the long-term impact of political posters on public trust in political institutions and their role in disaster recovery. Did these messages help solidify support for political parties, or did they create skepticism about their commitment to disaster management?

• Cross-National Comparison: Expand the study to include a comparison between Kerala's political posters during the 2018 floods and those used in other major natural disasters globally. This could highlight universal trends in political messaging during crises as well as unique features specific to Kerala's socio-political environment

. • Influence of Cultural and Local Context: Further research could explore how cultural, linguistic, and local factors influence the way political posters were designed and received in different regions of Kerala. Understanding regional variations would provide insight into how local political contexts shape disaster communication strategies.

• Visual and Design Analysis: A deeper exploration of the visual and design elements of political posters, such as colour schemes, symbols, and typography—could reveal how these elements are used to evoke specific emotional responses and influence public opinion during a disaster.

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