



Implementation Case Study

Resilience Amidst Neglect: Analyzing Government Failures and Community Strengths in the Wayanad Crisis

Sandhya H.^{1*} and Bindi Varghese¹

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Abstract Disaster-prone areas are geographically, environmentally, or climatically vulnerable to natural disasters and require strong preparedness and adaptation. Collaboration, indigenous knowledge, and resource mobilization help communities recover and rebuild after crises, reducing vulnerability. This study investigates the catastrophic landslide in Wayanad, Kerala, in July 2024, to analyze governmental inadequacies in disaster preparedness and the notable resilience strategies exhibited by the local community. The landslide, intensified by unregulated development in ecologically vulnerable areas, underscores the failure to execute essential environmental recommendations, including those specified in the Madhav Gadgil and Kasturirangan reports. Notwithstanding these challenges, the community's swift response via local organization, resource mobilization, and local leadership was instrumental in alleviating additional losses and facilitating recovery. The research highlights the relationship among crisis management, community empowerment, and environmental sustainability in areas susceptible to disasters. This research analyzes the Wayanad disaster and proposes a model that integrates proactive policy measures with community-driven strategies to bolster resilience and diminish vulnerability in ecologically sensitive areas. The RESTORE Model Framework is a comprehensive methodology for disaster management, highlighting Resilience, Early Warning, Sustainability, and Strategic Collaboration as fundamental components. The results underscore the imperative for collaborative frameworks that incorporate government entities, local stakeholders, and environmental specialists to enhance disaster management systems.

Keywords: destination resilience, disaster management, crisis response, community empowerment, community resilience, environmental sustainability, ecologically sensitive areas, government inefficiencies

¹ Tourism Management, Christ University, India

* Corresponding author email: sandhya.h@christuniversity.in

1. INTRODUCTION

The Wayanad district in Kerala, India, became a focal point for analyzing the interplay between governmental interventions and community resilience during natural disasters. The region, defined by its hilly terrain and delicate ecosystems, has endured multiple natural disasters, with the latest crisis occurring during the monsoon season, which has resulted in unprecedented rainfall and landslides (Manandhar et al., 2023). In July 2024, Wayanad district in Kerala, India, suffered devastating landslides caused by intense monsoon rainfall. The catastrophe led to more than 400 deaths, with 152 individuals unaccounted for, and inflicted significant damage to property and infrastructure. The landslides annihilated entire villages, devastated homes, roads, and bridges, and resulted in considerable agricultural losses. The Kerala government assessed the financial repercussions to be around ₹1,200 crore (The Hindu, 2024). The disasters not only underscored Wayanad's physical susceptibility but also revealed the intricate complexities of disaster management and the responses activated when communities face environmental challenges (Benny, 2023).

The disaster's severity has been attributed to insufficient enforcement of environmental protections. The Western Ghats Ecology Expert Panel, chaired by Madhav Gadgil, previously advocated for the designation of extensive regions of the Western Ghats as Ecologically Sensitive Areas (ESAs) to curtail activities such as deforestation and unregulated construction (Figure 1). The Kasturirangan Committee proposed a balanced strategy, allocating designated zones for conservation while permitting sustainable development in other areas. But both reports encountered opposition from multiple stakeholders, resulting in restricted implementation of their recommendations.

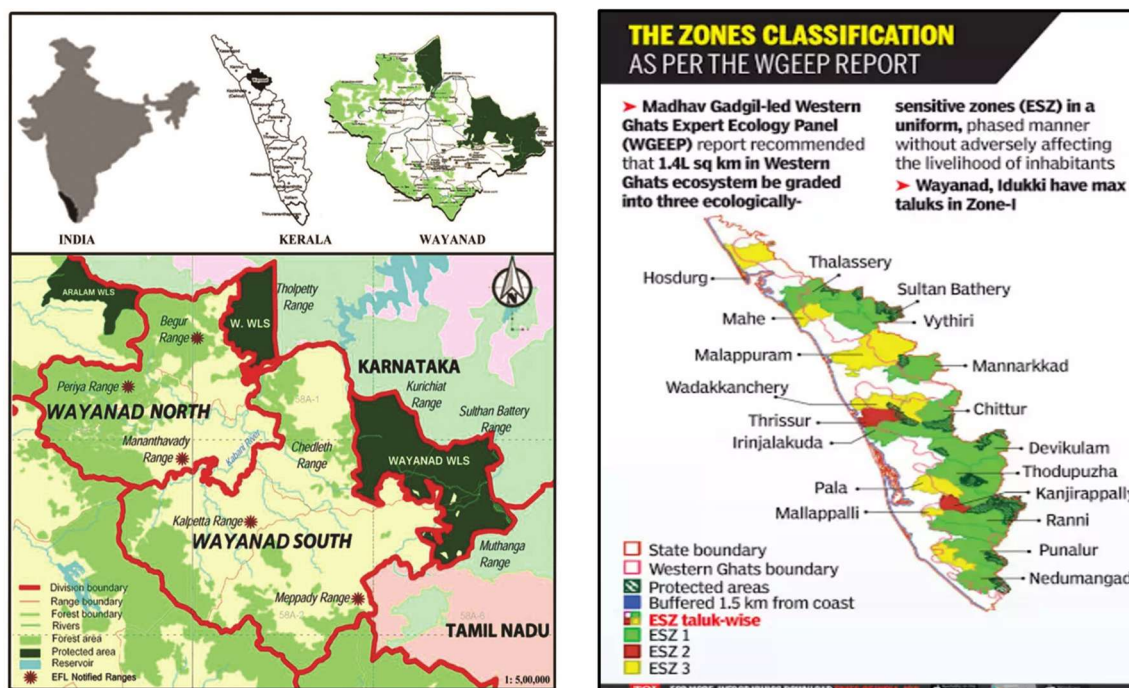


Figure 1. Map of Wayanad district with major ecological sites highlights (left), Ecologically Sensitive Zones (ESZ) classification according to Madhav Gadgil Report (right)
Source: Varkey et al. (2018) (left); The Times of India (2018) (right)

The significance of the Wayanad crisis within the context of disaster management in Kerala is complex. Kerala is often praised for its proactive disaster management strategies, which encompass sophisticated early warning systems and community engagement in preparedness planning. But, the Wayanad crisis has exposed significant deficiencies in these assessments, particularly concerning the coordination among different government agencies and the effective execution of rescue and recovery operations. Although a catastrophic management policy was in place, the implementation of these strategies was prolonged, resulting in delays and inefficiencies that intensified the disaster's overall impact on affected communities (Krishnan & George, 2023).

The socio-cultural context of Wayanad significantly influences the responses to crises. The Region is home to various indigenous and marginalized communities, whose traditional knowledge and practices are essential for survival during disasters. The ineffectiveness of government interventions frequently stems from a lack of comprehension and acknowledgment of local practices. In numerous instances, official responses have cultivated local perspectives, resulting in a disjunction between government agencies and the communities they intended to support. This disconnection was emphasized by insufficient communication strategies that failed to address the distinct linguistic and cultural requirements of the resident populations.

2. EARLY WARNINGS IGNORED

The earliest warnings relating to the fragile environmental conditions in the Western Ghats were proposed in the Madhav Gadgil and Kasturi Rangan reports. The Western Ghats Ecology Expert Panel (WGEEP), referred to as the Gadgil Committee, was constituted by the Ministry of Environment in 2010. The main aim was to examine the impacts of population density, climate change, and developmental activities on the Western Ghats. Despite submitting its report, the Gadgil panel never implemented it. All six states crossed by the Western Ghats opposed the report. As a result, the government appointed an additional panel, led by former ISRO chief K. Kasturiangan, to examine the issue. The report recommended categorizing the entire Western Ghats into three zones according to ecological sensitivity, imposing stringent restrictions on industrial, mining, and large-scale developmental activities in high-sensitivity zones. The Ecologically Sensitive Areas (ESA) promote environmentally sustainable practices, including organic farming and sustainable tourism, while restricting activities such as deforestation, unregulated construction, and polluting industries. The report advocated for the empowerment of local communities and Gram Panchayats to assume a pivotal role in governance and decision-making regarding natural resource management, while also proposing a prohibition on mining, large hydroelectric projects, and other high-impact activities in the most sensitive areas. Despite the reports emphasizing the ecological importance of the Western Ghats, they encountered opposition from stakeholders due to perceived threats to livelihoods and development (Krishnan & George, 2023).

Despite the warnings, developments continued to be made in and around Wayanad with the tourism sector serving as a principal source of income for the local communities. The region

experienced an increase in resorts, homestays, and other lodging alternatives to accommodate the influx of tourists to the destination. The tourism statistics for the state indicate 1.7 million annual tourists in Wayanad during 2023 (The Wire, 2024). Monsoon tourism was encouraged in these regions as numerous tourists visited the hilly areas to appreciate the pristine natural beauty (Manandhar et al., 2023). Over the past three years, the region experienced significantly elevated rainfall, culminating in a substantial precipitation of 572 mm from July 28th to 30th, which led to a catastrophic landslide (Dhanya & Geethalakshmi, 2023).

3. IMMEDIATE RESPONSE TO THE DISASTER BY THE GOVERNMENT

Given the substantial challenges encountered, it is clear that the government's initial response to Wayanad's crisis exhibited shortcomings in preparation, coordination, resource allocation, and communication. The failure of government agencies to manage the initial effects of disaster effectively underscored systemic deficiencies and highlighted the necessity for a thorough reevaluation of disaster preparedness frameworks (Koshy, 2024).

3.1 Shortcomings in the Initial Crisis Response by the Government

As the disaster hit, the government promptly implemented its disaster management protocols, established by the 2005 National Disaster Management Law. This involved the deployment of National Disaster Response Force (NDRF) units to the area for search and rescue operations (Figure 2). The purpose of establishing these specialized teams was to swiftly access remote communities and guarantee the safety of individuals potentially detained due to landslides or floods (Andharia et al., 2023). The government sought to alleviate the heightened risk of disaster by creating relief areas for displaced individuals and families, designed to function as temporary shelters with essential services (Vincent et al., 2023).

Some of the major shortcomings in the government initiatives included a lack of proper coordination between local agencies and the national authority, leading to duplication in the rescue operations and equipment being conducted. The temporary relief camps opened during the crisis had very limited capacity and facilities to cater to the needs of the inhabitants (ETV Bharat, 2024). This resulted in a shortage of basic supplies like food, water, medication, and psychological support. Many hilly areas that were affected by the flood remained cut off and inaccessible for initiating rescue missions due to a lack of proper communication channels and infrastructure constraints. Another significant observation was the lack of adequate training of the local disaster management team, resulting in difficulties to handle large scale evacuations (The Indian Express, 2024). The absence of an early detection and warning systems by the meteorological department increased the severity of the event. The significant gaps were found in the resource planning and arrangement of logistics, such as rescue equipment, inflatable boats, and thermal sensors.



Figure 2. Efforts of the National Disaster Response Force (NDRF) units during the crisis

Source: The Times of India (2018, 20 Aug)

3.2 Long-Term Resilience and Recovery Challenges

Furthermore, the government has faced challenges in delivering financial assistance to individuals affected by losses resulting from damage to agricultural assets and destruction. The programs commenced the disbursement of emergency funds; however, bureaucratic delays frequently impede the efficiency of support delivery to impacted populations (Koshy & Smith, 2024). The funds were designated for the restoration of essential infrastructure, including roads, bridges, and other vital public amenities that were affected during the crisis (Deccan Herald, 2021). These interventions aim to promote immediate recovery and long-term stability, highlighting the necessity of reinstating normalcy in the lives of impacted residents.

Alongside these immediate interventions, the government aimed to establish a framework for sustainable development, incorporating proactive measures to enhance community resilience against potential disasters (Shaheed Khan et al., 2023). This aims to integrate vulnerability assessments and local knowledge and practices into disaster management strategies (The Federal, 2024). The implementation of these structures was frequently criticized for lacking sufficient engagement with local communities, thereby constraining their efficacy.

A crucial factor that impacted governmental disaster management initiatives was the community's preparedness prior to the crisis (South First, 2024). Despite national policies outlining comprehensive frameworks for disaster preparedness, the local execution of these strategies frequently proved insufficient (Koshy & Smith, 2024). The absence of infrastructure investment and inadequate training for community members in disaster risk reduction in rural Wayanad hindered response efforts. Insufficient communication channels, especially in the timely and relevant dissemination of information to residents, intensified the community's vulnerability during disasters.

4. LOCAL COMMUNITY RESILIENCE AND QUICK RECOVERY STRATEGIES

The community's resilience became apparent as local groups swiftly mobilized to address the deficiencies left by government inefficiencies. Fundamental organizations and informal networks have demonstrated significant adaptability by leveraging traditional practices and knowledge in their crisis responses. These community-based initiatives have frequently prioritized immediate needs such as food security, shelter, and psychological support, demonstrating the efficacy of local agencies in contexts where government efforts have been initiated. The response results emphasize the potential for incorporating local practices into formal disaster management strategies, highlighting the necessity for a collaborative approach that bridges the divide between governmental authority and community engagement (Board on Health Sciences Policy, 2015). Local networks demonstrated a notable capacity to mobilize resources and depend on one another in times of adversity. Multiple grassroots initiatives aimed to address the deficiencies resulting from governmental shortcomings, highlighting the strength of the community fostered by its members. This disparity prompts essential inquiries regarding the government's role in disaster management and the necessity for adaptive strategies that genuinely account for local dynamics and foster authentic collaboration with communities.

4.1 Emergence of Community-Led Response

In Wayanad, community responses emerged spontaneously as residents coordinated resources, knowledge, and networks, addressing the deficiencies in government oversight. This bolstered resilience, an element neglected by the authorities, undermining the potential efficacy of localized solutions compared to those dictated from above. The key factors affecting the efficacy of disaster management during the Wayanad crisis comprised the community's preparedness prior to the disaster, the accessibility of resources for prompt response, and the flexibility of governmental and non-governmental responses to evolving circumstances (Jayarajan & Gangadharan, 2022). The crisis demonstrated that although government interventions are essential for coordinating large-scale emergency responses, the resilience of communities frequently dictates the immediate outcomes and recovery trajectories following catastrophes. This dynamic highlights the necessity to reassess the paradigms for managing disasters in Kerala, advocating for a model that incorporates community involvement and strategies tailored to crisis response. A crucial factor that enhances the efficacy of these community responses is the fundamental knowledge of the local environment (Enayati et al., 2024). In contrast to governmental organizations that may function under rigid generic structures, local residents possessed a profound understanding of the geography and socioeconomic conditions of the Wayanad region (Few et al., 2023). This contextual awareness facilitated focused and appropriate interventions, including the provision of food and medical supplies via established local networks.

4.2 Community Mobilization and Collective Strength

Local networks have fostered an innovative atmosphere in disaster response. Community members have frequently devised innovative solutions that were contextually relevant and timely, thereby enhancing response efforts (Figure 3). For instance, provisional shelters were constructed in educational institutions and community centers, utilizing readily accessible resources with efficiency (Hindustan Times, 2024). This adaptability sharply contrasted with governmental strategies, which frequently relied on established protocols that may not have accounted for the distinctive challenges posed by Wayanad's circumstances (Jayarajan & Gangadharan, 2022).



Figure 3. Efforts of the local community during the crisis
Source: Herald Goa (2024, Oct 22)

4.3 Role of Communication and Information Sharing

A pivotal factor was the tactical application of communication. Local voluntary organizations have utilized multiple channels, such as social media and community meetings, to disseminate information about available resources and coordinate support initiatives. This foundational approach facilitated a more prompt exchange of information and empowered community members to manage their own recovery processes. By doing so, they typically engaged individuals who might feel estranged from governmental frameworks, thereby enhancing participation and ownership during the recovery phase.

4.4 Role of Local Leadership

The interdependence within local volunteer networks and grassroots movements exemplified the significance of mutual aid. Community members collaborated to accumulate

resources and skills, fostering an environment of solidarity (McEntire, 2021). The initiatives encompassed collaborative educational workshops aimed at disaster preparedness and response strategies, incorporating diverse stakeholder perspectives, including women's groups and youth organizations. This collaborative strategy enhanced the immediate crisis response capability and fostered long-term resilience, cultivating a communal comprehension of disaster risk management (IPA News Pack, n.d).

A crucial element that enhances community resilience is the existence of local leadership (Figure 3). The community leaders, including officials, tribal chiefs, and prominent local activists, played essential roles in coordinating responses to the crisis. Their credibility and knowledge of local contexts facilitated the mobilization of both human and material resources, fostering a sense of responsibility. Leaders who had previously committed to disaster preparedness initiatives were observed to be more effective in coordinating response efforts. This experience enabled them to leverage their expertise to advocate for essential actions and prioritize immediate needs.

5. ESSENTIAL INSIGHTS FROM THE DISASTER

The Kerala State Disaster Management Authority (KSDMA) was responsible for formulating disaster response strategies, yet lacked the authority required to enforce collaboration among other departments (Mohan et al., 2024). This resulted in situations where attempts to deliver immediate assistance, including rescue operations and the allocation of relief supplies, have been obstructed by departmental disarray. The lack of a centralized command structure has exacerbated these challenges, resulting in confusion over the roles and responsibilities of frontline workers and volunteers (McEntire, 2021).

The Wayanad crisis illustrates that prioritizing financial assessments frequently delays the supply of food and water to those most in need, thereby prolonging human suffering and compromising the immediate goals of disaster response (Miles, 2021; Mohan et al., 2024). Additionally, outdated technological systems in governmental management, as emphasized by Krishnan and George (2023), exacerbate information bottlenecks, rendering timely data sharing and geospatial analysis ineffective. The lack of an integrated disaster management information system resulted in the frequent unavailability of real-time information, causing decisions to be made based on outdated or insufficient data (Cavallo, 2014). This technological inadequacy has aggravated the difficulties in efficiently managing the crisis and has postponed essential interventions during crucial periods (Sain & Nithya, 2023).

The bureaucratic framework governing disaster management in Wayanad impedes governmental interventions and shapes the character and intensity of community responses. The intrinsic delays in these bureaucratic processes underscore the critical necessity for reform and swift adaptation to enhance preparedness and resilience against future disasters (Sudheer et al., 2023). The Wayanad crisis, marked by severe floods and landslides, serves as a critical case study to comprehend the ramifications of insufficient coordination among various

government departments in disaster management (Jayarajan & Gangadharan, 2022). This lack of coordination can be attributed to several systemic issues, including bureaucratic silos, unclear responsibilities, and inadequate communication channels. The ramifications of these failures were apparent in the sluggish and ineffective response to the crisis, exacerbating the plight of the impacted communities (Imperiale & Vanclay, 2024).

The recovery efforts following the crisis also underscored the deficiencies in the government's strategy. Many affected regions were engaged in prolonged development initiatives that failed to sufficiently adjust to the immediate recovery requirements arising from the crisis (Taylor et al., 2023). Reconstruction initiatives that emphasized infrastructure development while neglecting the socioeconomic context of local communities frequently resulted in residents lacking access to essential services and livelihoods (Miles, 2021). This approach emphasized the disconnect between governmental planning and community realities, thereby widening the disparity between the intended goals of disaster management and the actual experiences of those most impacted (Irshad, 2024).

The analysis of community reactions during the Wayanad crisis uncovers essential insights into the intricacies of disaster management. The interplay of local knowledge, social capital, and established networks not only underscored the shortcomings of governmental interventions but also illuminated avenues for fostering effective community resilience (Imperiale & Vanclay, 2024). Andharia et al. (2023) emphasize the disarray of the government's initiatives following the Wayanad crisis, where multiple agencies functioned without cohesive strategies or collaboration. This fragmentation resulted in redundant efforts in specific areas, while overlooking the critical regions that necessitated immediate assistance. The insufficiency of the government's responses can be ascribed to the inflexible frameworks governing disaster management, which have failed to adequately address the distinct social dynamics and ecological factors intrinsic to Wayanad's geography (Jayarajan & Gangadharan, 2022).

Finally, technology emerged as a pivotal element in enhancing community resilience. The utilization of mobile communication devices and social media platforms enabled communities to organize, disseminate awareness, and coordinate more efficiently (Mohan et al., 2024). Real-time communication enabled the dissemination of information regarding available resources, security protocols, and refuge locations, proving essential in alleviating the effects of the crisis (McEntire, 2021). The incorporation of technology demonstrated that contemporary tools, when utilized effectively, can enhance conventional practices within crisis management frameworks (Rutherford et al., 2024).

The resilience exhibited by community responses during the Wayanad crisis can be ascribed to a confluence of social cohesion, effective local leadership, adaptability, access to knowledge and intrinsic resources, external support systems, and the strategic application of technology (Sain & Nithya, 2023). Each of these factors interacted synergistically, contributing to a robust framework of community-level disaster management that starkly contrasts with governmental interventions. In disaster management, comprehending the interplay between cultural practices and local knowledge is crucial for enhancing community resilience, particularly during crises (Miles, 2021). The crisis in Wayanad highlighted the crucial importance of indigenous

knowledge systems and cultural practices in enhancing community resilience in the face of insufficient government intervention. Gamliel and Kalluvalappil (2024) contend that these local characteristics not only influenced individuals' responses to natural disasters but also enabled the collective actions that alleviated the crisis's effects.

6. WAY FORWARD: SUGGESTIONS AND RECOMMENDATIONS

There is an imperative need for rigorous policies and strategies related to land use patterns, construction practices, enacting/revising regulations related to mining, quarrying, to mitigate disaster risks (Sain & Nithya, 2023). The concurrent progression of cutting-edge technologies and instruments, including Deep Learning (DL), data mining, Artificial Intelligence (AI), Machine Learning (ML), and the Internet of Things (IoT), is essential for developing dependable, field-validated models for multiple-hazard early warning, risk assessment, mitigation, and response, thereby potentially diminishing the impacts and frequency of future disasters (Paleri, 2023).

Landslide-induced disasters can yield catastrophic consequences, leading to fatalities, property destruction, environmental devastation, and harm to livelihoods. An integrated disaster risk strategy and the engagement of diverse stakeholders are essential for managing the threat of landslides (Ramesh et al., 2023a). This involves a comprehensive process aimed at predicting, alleviating, and permanently controlling the factors that heighten the risk of landslides, while striving for sustainable development for humanity, the economy, and the environment (Mohan et al., 2024).

Alongside hazard mitigation efforts, which encompass rehabilitation, structural remodeling, community education, emergency response training, and various disaster relief initiatives, additional measures must be implemented (Ramesh et al., 2023b). Afforestation is considered an effective strategy for mitigating landslides on steep inclines. It is evident that deficiencies persist in governance and financial protection despite advancements achieved over time. These deficiencies encompass insufficient financing for relief funds, social protection, incentives, insurance for public assets, insurance for new enterprises, and insurance for housing and startups. The execution and enforcement of public policies by a nation's institutional framework is essential for attaining sustainable development outcomes, which subsequently facilitates risk mitigation (Varghese & Natori, 2024). A governance framework that fosters open and transparent decision-making processes, involving all stakeholders affected by the outcomes, is essential to ensure enduring decisions for which decision-makers can be held accountable. Forming alliances, establishing priorities, and distributing resources are essential for mitigating and managing disaster risks (Nain et al., 2023).

7. RESTORE FRAMEWORK: RESILIENCE, EARLY WARNING, SUSTAINABILITY, AND STRATEGIC COLLABORATION IN DISASTER MANAGEMENT"

The RESTORE Framework is a comprehensive methodology for disaster management, highlighting Resilience, Early Warning, Sustainability, and Strategic Collaboration as fundamental components. This model incorporates advanced technologies for early detection and warning systems to reduce risks, facilitating prompt interventions and minimizing losses (Figure 4). Rooted in sustainability principles, it promotes environmentally conscious disaster preparedness and recovery strategies that emphasize ecological preservation. Community education and training are essential, providing local populations with the knowledge and skills necessary to adapt and respond effectively to crises. By cultivating strategic partnerships and collaborative initiatives among stakeholders—governments, private sectors, NGOs, and local communities—the framework guarantees a cohesive and resource-efficient response. Furthermore, it underscores the importance of comprehensive disaster relief strategies and expedited recovery initiatives to effectively restore impacted areas while bolstering long-term resilience. The RESTORE Framework embodies an innovative, all-encompassing strategy for protecting at-risk locations from escalating disaster-related threats.

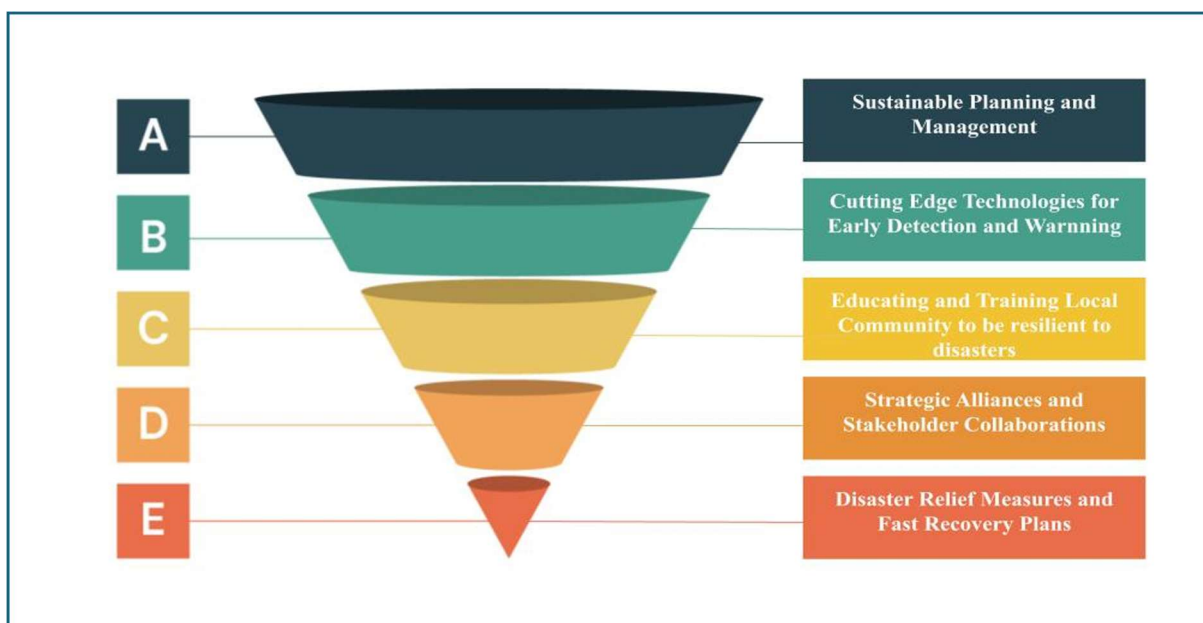


Figure 4. R.E.S.T.O.R.E. Framework: Resilience, Early Warning, Sustainability, and Strategic Collaboration in Disaster Management

8. CONCLUSION

The government's inaction regarding these environmental advisories has been condemned for intensifying the disaster's effects. Unregulated development, deforestation, and insufficient land-use planning in ecologically sensitive areas have heightened susceptibility to natural disasters. The Wayanad tragedy highlights the critical necessity for the proactive enforcement

of environmental regulations and the establishment of disaster preparedness strategies to reduce future hazards. The contrast between governmental shortcomings and community resilience presents essential insights regarding the necessity to reassess current strategies. Comprehending these dynamics is imperative.

As Kerala confronts the increasing frequency and severity of natural disasters, the insights gained from the Wayanad experience can guide future political strategies and practical disaster management approaches, fostering a more sustainable and inclusive framework moving forward. In the context of the Wayanad crisis, which was exacerbated by substantial landslides and flooding in the region, government interventions were primarily aimed at alleviating immediate human suffering, restoring public infrastructure, and ensuring long-term rehabilitation of affected communities. The primary aims of these interventions encompassed disaster response coordination, provision of emergency aid supplies, immediate medical assistance, and efficient communication strategies to convey information regarding safety protocols and recovery plans.

REFERENCES

- Andharia, J., Puri, A., & Namboothiripad, A. (2023). Transforming Post-disaster Recovery: Participatory Mechanisms for Community Feedback and Responding to Government's Real-time Data Needs with a Focus on Persons with Disability. *The International Journal of Community and Social Development*, 5(1), 47-70.
- Benny, N. M (2023). Navigating Climate-Induced Migration in Kerala: Challenges, Responses, and Adaptation Strategies. *STRATEGIES*, 5, 08.
- Board on Health Sciences Policy, Committee on Post-Disaster Recovery of a Community's Public Health, Medical, & Social Services. (2015). Healthy, resilient, and sustainable communities after disasters: strategies, opportunities, and planning for recovery.
- Cavallo, A. (2014). Integrating disaster preparedness and resilience: a complex approach using System of Systems. *Australian Journal of Emergency Management*, 29(3), 46-51.
- Dhanya, P., & Geethalakshmi, V. (2023). Reviewing the status of droughts, early warning systems and climate services in South India: Experiences learned. *Climate*, 11(3), 60.
- Enayati, M., Lukambagire, I., Manianga, A., Attah-Otu, B., Baudouin-van Os, A. C., SN, S., & Ramesh, M. V. (2024). Navigating sustainability and resilience: a collective case study of four indian communities. *Environment, Development and Sustainability*, 1-47.
- Few, R., Ranjit, N., Nalla, V., Jain, G., Tebboth, M. G., Singh, C., ... & Marsh, H. (2023). 'We are not in the same boat': Representations of disaster and recovery in India. *International journal of disaster risk reduction*, 92, 103709.
- Gamliel, O., & Kalluvalappil, S. A. (2024). Arabi-Malayalam disaster ballads: performative poetry and community resilience. *Nidān*, 8(2), 93-110.
- Imperiale, A. J., & Vanclay, F. (2024). Understanding the social dimensions of resilience: The role of the social sciences in disaster risk reduction, climate action, and sustainable development. *Sustainable Development*, 32(2), 1371-1375.

- Irshad, S. M. (2024). Civil Society, Community, Disaster and State Responses: A Critical Study on Ockhi Cyclone 2017, Floods in 2018 and 2019 in Kerala, India. *IDRiM Journal*, 14(2).
- Jayarajan, A., & Gangadharan, N. (2022). We Don't Sleep on Rainy Nights. *Contemporary Voice of Dalit*, 2455328X221135312.
- Koshy, M., & Smith, D. (2024). Community resilience implications for institutional response under uncertainty: Cases of the floods in Wayanad, India and the earthquake in Port-au-Prince, Haiti. *Sustainable Development*, 32(2), 1412-1427.
- Koshy, M. (2024). Running Towards the Fire: Navigating Compounded Uncertainty through Contextualised Contingency Planning during Unprecedented Flooding in Wayanad, Kerala. [Doctoral thesis, NTNU]. The Norwegian Research Information Repository.
- Krishnan, J., & George, A. (2023). LIVING WITH FLOODS: COPING WITH LIVELIHOOD UNCERTAINTIES IN POST-FLOOD KERALA. *Living with the Weather: Climate Change, Ecology and Displacement in South Asia*, 147.
- Manandhar, B., Cui, S., Wang, L., & Shrestha, S. (2023). Urban flood hazard assessment and management practices in south asia: a review. *Land*, 12(3), 627.
- McEntire, D. A. (2021). *Disaster response and recovery: strategies and tactics for resilience*. John Wiley & Sons.
- Miles, S. B. (2021). Foundations of community disaster resilience: Well-being, identity, services, and capitals. In D. J. Parker & E. C. Penning-Rowsell (Eds.), *Environmental hazards and resilience: Theory and evidence* (pp. 32–50). Routledge.
- Mohan, C., Unni, D., Hiranyadha, N., Shekdar, A. A., Shrivastava, S., & Ankita, G. (2024). Psychological impact of natural disasters and mental health response in landslide hit place of Wayanad & Puthumala, Kerala. *Journal of Emerging Technologies and Innovative Research (JETIR)*, 11(10), 238–246. <https://www.researchgate.net/publication/385230447>
- Nain, A., Jain, D., Gupta, S., & Kumar, A. (2023). Improving first Responders' effectiveness in post-disaster scenarios through a hybrid framework for damage assessment and prioritization. *Global Journal of Flexible Systems Management*, 24(3), 409-437.
- Paleri, D. (2023). Crisis as Opportunity: The Politics of 'Seva' and the Hindu Nationalist Response to the COVID-19 Pandemic in Kerala, South India. *Religions*, 14(6), 799.
- Ramesh, M. V., Thirugnanam, H., Mohanan, N. K., Singh, B., Ekkirala, H. C., & Guntha, R. (2023a). Community Scale Landslide Resilience: A Citizen-Science Approach. In *Progress in Landslide Research and Technology*, Volume 2 Issue 2, 2023 (pp. 183-196). Cham: *Springer Nature Switzerland*.
- Ramesh, M. V., Thirugnanam, H., Singh, B., Nitin Kumar, M., & Pullarkatt, D. (2023b). Landslide early warning systems: requirements and solutions for disaster risk reduction—India. In *Progress in Landslide Research and Technology*, Volume 1 Issue 2, 2022 (pp. 259-286). Cham: *Springer International Publishing*.
- Rutherford, G., Kirkpatrick, J., Davison, A., & Prahalad, V. (2024). Can a relational cross-scalar approach to management improve environmental disaster responses? A case study of an unprecedented flood in New South Wales, Australia. *Australasian Journal of Environmental Management*, 31(4), 431–447. <https://doi.org/10.1080/14486563.2024.2378214>

- Sain, F., & Nithya, N. R. (2023). The Future-Oriented anticipatory Disaster Risk Management—A Case Study in Munnar Gap Road Region: A Case Study in Munnar Gap Road Region. *Journal of Polity and Society*, 15(2).
- Shaheed Khan, F. M. S. M., Kumar, E. A., & Panda, A. K (2023). Tourism, Risk Management, Sustainability options, the India Story. *International Journal of Engineering Technology and Management Sciences*, 1 (7). DOI:10.46647/ijetms.2023.v07i01.055
- Sudheer, K. P., Thomas, J., Jainet, P. J., Nizar, S., Beegum, S., Sebastian, D. E., & Pai, D. S. (2023). From science to policy—Toward an approach linking extreme rainfall events to climate resilience and policy development: A case study from Kerala, India. *Developments in Environmental Science*, 14, 143-172.
- Taylor, S., Booth, D., & Irudayarajan, R. (2023). Diasporic engagement and the climate crisis in Kerala: inclusive disaster relief and reconstruction?. *South Asian Diaspora*, 15(2), 217-231.
- Varghese, P., & Natori, Y. (2024). The socio-ecological impacts of tourism development in the Western Ghats: the case of Wayanad, India. *Frontiers in Sustainable Tourism*, 3, 1384962.
- Varkey, J. K., Gopakumar, S., Vidyasagaran, K., Mathew, J., & Santhosh Kumar, A. V. (2018). *Forest laws, for whom, by whom? A concept mapping study of the Ecologically Fragile Lands Act, 2003 in Wayanad, Kerala, India*. *Current Science*, 115(8), 1459–1469.
- Vincent, A. M., Parthasarathy, K. S. S., & Jidesh, P. (2023). Flood susceptibility mapping using AutoML and a deep learning framework with evolutionary algorithms for hyperparameter optimization. *Applied Soft Computing*, 148, 110846.

NEWSPAPER ARTICLES AND WEBSITES

- Deccan Herald. (2021, Feb 09). *Illicit tourism extracts its cost from nature*. Retrieved from <https://www.deccanherald.com/india/illicit-tourism-extracts-its-cost-from-nature-948459.html>
- ETV Bharat. (2024, Jul 24). *Kerala: Wayanad landslides live updates - Death toll rises*. Retrieved from <https://www.etvbharat.com/en/bharat/kerala-wayanad-landslides-live-updates-death-toll-enn24073101574>
- Herald Goa. (2024, Oct 22). *Shattered community united in grief and resilience*. Retrieved from <https://www.heraldgoa.in/review/shattered-community-united-in-grief-and-resilience/414460>
- Hindustan Times. (2024, Aug 01) *In Wayanad, a community emerges to help with relief*. Retrieved from <https://www.hindustantimes.com/india-news/in-wayanad-a-community-emerges-to-help-with-relief-101722533893525.html>
- IPA News Pack. (n.d.). *Wayanad landslides claim 143 lives; Rescue efforts hampered*. Retrieved from <https://ipanewspack.com/wayanad-landslides-claim-143-lives-rescue-efforts-hampered/>
- South First. (2024, Jul 30). *Wayanad landslides: Mosques, churches turn into makeshift hospitals; social media and political parties lend a hand*. Retrieved from <https://thesouthfirst.com/kerala/wayanad-landslides-mosques-churches-turn-into-make-shift-hospitals-social-media-political-parties-help/>

- The Federal. (2024, Jul 24). *Wayanad landslides live: Rescue ops continue on second day; Toll rises to 166*. Retrieved from <https://thefederal.com/category/live/wayanad-landslides-live-rescue-ops-continue-on-second-day-toll-166-136259>
- The Hindu. (2024, Aug 02). *Volunteers in action to bring relief to those displaced by landslides in Wayanad district*. Retrieved from <https://www.thehindu.com/life-and-style/volunteers-in-action-to-bring-relief-to-those-displaced-by-landslides-in-wayanad-district/article68471983.ece>
- The Hindu. (2024, Aug 02) *Volunteers in action to bring relief to those displaced by landslides in Wayanad district*. Retrieved from <https://www.thehindu.com/life-and-style/volunteers-in-action-to-bring-relief-to-those-displaced-by-landslides-in-wayanad-district/article68471983.ece>
- The Hindu. (2024, Aug 12). *Selfless service by volunteers of civil groups in relief operations in landslide-hit Wayanad*. Retrieved from <https://www.thehindu.com/news/national/kerala/selfless-service-by-volunteers-of-civil-groups-in-relief-operations-in-landslide-hit-wayanad/article68516427.ece>
- The Indian Express. (2024, Aug 03). *Wayanad landslide live updates: Rahul Gandhi visits affected areas in Kerala rains*. Retrieved from <https://indianexpress.com/article/india/wayanad-landslide-live-updates-rahul-gandhi-kerala-rains-9487968/>
- The Times of India. (2018, August 20). *Crisis arose due to destruction of ecologically-sensitive zones in Western Ghats. The Times of India*. <https://timesofindia.indiatimes.com/city/kozhikode/crisis-arose-due-to-destruction-of-ecologically-sensitive-zones-in-w-ghats/articleshow/65371244.cms>
- The Wire. (2024, Aug 04). *Nightmare in Wayanad: Torrential rains triggered landslides, but climate change may not be the sole culprit*. Retrieved from <https://m.thewire.in/article/environment/nightmare-in-wayanad-torrential-rains-triggered-landslides-but-climate-change-may-not-be-the-sole-culprit/amp>