

# **A study on Climate-Resilient WASH in disasters: Addressing Gaps in Disaster Waste Management in Kerala**

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**Global South Academic Conclave on WASH and Climate 2025**

21st - 23rd February 2025, Ahmedabad

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# Introduction

- Kerala is significantly vulnerable to natural disasters and shifting climate patterns due to its coastal location and the steep terrain of the Western Ghats.
- Disaster waste refers to waste generated by the impact of a disaster, both from the direct effect of the disaster and from the post-disaster phase due to poor waste management (UNEP/OCHA, 2011).
- Following a disaster, significant amounts of waste are generated from sources other than the routine generation of waste from Municipal and industrial wastes.
- Efficient disaster waste management would enhance ‘safety life, emergency response and disaster recovery.’
- Effective disaster waste management can also help minimise economic losses.
- Improper waste disposal can result in the spread of diseases, contamination of water sources, and long-term environmental degradation.
- Effective waste management during disasters can help mitigate these risks.





## Purpose of the study

- The overall purpose of this study is to explore how existing systems perform under the pressures of climate-induced disasters and identify the gaps and challenges faced by Water, Sanitation, and Hygiene (WASH) services.
- The findings aim to inform the development of a climate-resilient protocol for disaster waste management, addressing both immediate and long-term needs in disaster-prone regions.



## Research objectives

- Assess how existing WASH systems perform under the pressures of climate-induced disasters.
- Identify governance related gaps and challenges for WASH services during climate-induced disasters.
- Develop a protocol for climate-resilient WASH systems that can adopt in a disaster waste management.

## Research Methodology

This study is in-depth qualitative research intended to assess how existing WASH systems perform under pressure climate-induced disasters and identify the systemic gaps and challenges for WASH services during such incidents.

The data was collected using interview guides from the multi-stakeholders including panchayat officials, district Suchitwa Mission officials, state Suchitwa Mission officials, officials of empanelled agencies and Haritha Karma Sena members.

The insights gained will contribute to the development of a protocol for climate-resilient WASH systems to be adopted during future disasters.

# Problem Statement

- With natural disasters becoming more frequent and severe, the effective management of disaster waste is crucial for reducing environmental and public health risks.
- The lack of standardised processes, protocols, and guidelines, makes the sorting, and segregation of large-scale waste in a disaster becomes a significant challenge (Aggarwal et al, 2023).
- Globally, current waste management practices often lack comprehensive approaches to consumption, resource extraction, and recycling.
- The literature highlights a pressing need for a disaster-specific waste management protocol in India, as existing Solid Waste Management guidelines are insufficient for handling the surge of waste following disasters.



# Problem Statement

- This study is driven by the urgent need to address these challenges through the development of a climate-resilient disaster waste management protocol.
- By examining existing systems, identifying governance gaps, and focusing on the role of Water, Sanitation, and Hygiene (WASH) services, the research aims to contribute actionable insights for improving disaster preparedness and resilience in waste management.



# Key Findings

- **Enabling environment**

1. Waste management is not given key priority at the time of disasters.
2. Lack of clarity on managing the debris and other C&D waste generated during disasters.
3. Lack of clarity regarding the roles and responsibilities of institutions responding to disaster waste management activities for assessment, procurement, deployment, capacity building, training, private sector engagement, community participation, monitoring, evaluation, and documentation.

- **Resources**

4. Insufficient funds for disaster waste management and the lack of a dedicated fund for it forced the Kainakary and Vanimel panchayats to operate with limited financial resources. The panchayat used its own funds and plans to submit a project later to recover the financial expenses incurred during the disaster.



# Key Findings

- **Infrastructure and Technology related**

5. Lack of sufficient storage facilities, such as MCF and RRF, will affect the day-to-day management of waste, worsening the situation for managing waste during disasters.
6. In Alappuzha, the camps were organised in schools, but the septic tanks' existing condition was insufficient to accommodate the number of people, resulting in their rapid filling. A major contributing factor was the elevated water table due to flooding, combined with the increased usage of toilets. Additionally, transporting a mobile treatment plant to reach some camps is also a challenge.
7. In Alappuzha district, all waste management activities that involve digging, such as preparing compost pits, normal sock pit become impossible during floods due to the high-water table.
8. The lack of sufficient FSTPs to cover the entire district is a challenge that will affect septage waste management during disasters. Existing no. of common STPs/FSTPs: 19 common STPs and 3 common FSTPs in the state (Kerala State Pollution Control Board, 2022).
9. The major gap is the lack of technology upgrades in preparation for future emergencies. Officials need to be made aware of the requirements for technological advancement.

## Key Findings

10. It is difficult for the Haritha Karma Sena members to continue the waste management services during extreme flood situations.
  11. The lack of a centralised treatment facility for non-biodegradable waste management is a significant gap during emergencies.
- **Managerial and Administrative**
12. If a flood alert is issued by the district administration, Suchitwa Mission informs the panchayats to remove waste immediately. However, the agencies will only remove the waste based on the demand from the linked agencies who would treat or reuse the waste.
  13. An institutional support and monitoring mechanism to ensure quality service delivery in disaster waste management was lacking. Institutions like the District Pollution Control Board could play a crucial role in addressing this by setting standards and monitoring it.
  14. The external consultant could not obtain a proper data base from panchayats regarding the relief camps and disaster waste management activities.

# Key Findings

15. There is no standardised system for assessment of the waste management needs at the time of disasters affecting the distribution of resources.
  16. If the regular collection of non-biodegradable waste occurs, there will be no issues. However, the agencies collect waste based on their own requirements, which affects the normal waste management activities at the panchayat and worsens the situation during disasters.
- **Capacity building**
17. No disaster-specific waste management training and capacity building was provided to the district Suchitwa Mission team or to panchayat.
- **Community participation and Social and Behaviour Change Communication (SBCC)**
18. Suitable Social and Behaviour Change Communication (SBCC) materials for emergency waste management were not readily available and had to be developed as needed.
- **Inclusion related**
19. The bio-toilets or the toilets in the camp were not inclusive, as they were not disabled/pregnant women/child-friendly.

# Discussion and Conclusion

- The study identifies critical challenges and offers practical recommendations to enhance WASH services in disaster waste management in Kerala.
- The key challenges include the lack of clear disaster waste management protocol, limited resources and infrastructure and inefficient capacity building and training, specific to disaster waste management among the stakeholders.
- These issues unaddressed, exacerbate the environmental and health risks associated with disaster waste.
- Strategic recommendations include strengthening existing waste management system, capacity building, promoting climate adaptive technology, enhancing interdepartmental coordination, promoting community-based waste management, and ensuring sufficient resources for disaster waste management activities.
- By institutionalising these practices and ensuring proper safety protocols, Kerala can improve its resilience to disasters, effectively manage disaster-generated waste, and promote sustainable environmental outcomes.



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# Thank You

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