WRECKED FUTURES

The Hidden Socio-Economic Burden of MSC ELSA 3 Disaster

A Case Study of Pulluvila
13/09/2025

WRECKED FUTURES

The Hidden Socio-Economic Burden of MSC ELSA 3 Disaster

A Case Study of Pulluvila

13/09/2025

Designed by
wobbly table
www.wobblytable.in

Acknowledgement

This report would not have been possible without the support, active participation, and contributions of the community members and the Coastal Students Cultural Forum (CSCF), who stood at the heart of the data collection, profiling, and mapping exercises. The community members of Pulluvila village not only volunteered to collect data but were also an active part of the study from the very beginning. This report wouldn't have taken the current shape without their active involvement and direction.

We would like to specially acknowledge the dedicated efforts of the following individuals from Pulluvila who played an instrumental role in this study, from carrying out the surveys to engaging and mobilising the community - **Lilly, Sandhya, Jaya, Rejani, Linitta, Vijin, Sherley, Manoj, Viji B., Nikitha, Liza, Swapna, and Preetha B.**

We would also like to thank **Aleena Bernard, Merin Varghese, Irene Kuttichira, Sofia Sylvius** and all others who supported and contributed throughout the study. Their involvement played an important role in the success of this study.

We are deeply grateful to the team of independent development consultants who undertook the field research and were responsible for the systematic collation and analysis of field data, as well as the calculation of losses and damages. Special acknowledgment for **Ms. Riby Rachel Mathew** who provided guidance in shaping the field findings into a structured case study report.

The initiative for this study was led by **Rethin Antony**, ward member Karimkulam Grampanchayat and president CSCF. His leadership and commitment were pivotal in mobilising the community and ensuring the success of this project.

The volunteers of the Coastal Students Cultural Forum played a crucial role in connecting with the community members, facilitating discussions, and ensuring active participation throughout the process. We sincerely thank everyone who contributed their time, effort, and expertise, making this report possible and supporting a deeper understanding of the issues at hand.

This is a community led study and is dedicated to the residents of Pulluvila village and all of those who contributed to make this study possible.

CONTENT

List of Maps

List of Figures

List of Tables

ABBREVIATIONS

DRR - Disaster Risk Reduction

GoK - Government of Kerala

ICZM - Integrated Coastal Zone Management

INR - Indian Rupee

IPCC - Intergovernmental Panel on Climate Change

KSDMA - Kerala State Disaster Management Authority

MGNREGA - Mahatma Gandhi National Rural Employment Guarantee Act

MLD - Million Litres per Day

MPAs - Marine Protected Areas

MSC - Mediterranean Shipping Company

MSC-ELSASITREP08 - MSC Elsa 3 Situation Report 08

OECMs - Other Effective area-based Conservation Measures

SHGs - Self-Help Groups

KEY HIGH

Income Loss & Livelihood Impact

Average income loss per family per day ranges from **Rs. 800 to Rs. 1,000**, considering fishing disruption from May 24 to June 24, 2025.

95.5% of families recorded a reduction in income, averaging **Rs. 29,000** over the month.

96% of families rely on fishing, with an average of **1.6 breadwinners per family**, often directly dependent on fishing activities.

82.5% of families have no savings or have exhausted savings to manage expenses due to the disaster, worsening their financial vulnerability.

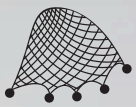
69% of families borrowed money ranging from **Rs. 50,000 to 3 lakhs,** expecting to repay once fishing resumes.

60.1% could not find alternative livelihoods or had to settle for lower-paying jobs. **Only 7.7% engaged in state-led programs (MGNREGA).**

HLIGHTS

Asset Loss & Economic Damage

Boat owners incurred average damage costs of **Rs. 65,000**, while recovery costs (boats, motors, nets) exceeded **Rs. 70,000**.



In Pulluvila, **51 surveyed households lost critical fishing assets**, with losses ranging from **Rs. 10,000 to 5.75 lakh**, averaging **Rs. 1.07 lakh per family**.

Cumulative asset loss for surveyed families amounts to over **Rs. 54 lakh**.

Socio-Economic Consequences

Depletion of savings, increased borrowing, and lack of alternative employment deepen distress.

Youth engagement in the trade is at risk due to lack of recovery support.

Families are trapped in cycles of debt while awaiting the next fishing season.

Recommendations for Sustainable Recovery and Resilience

Short-Term Priorities: Immediate Relief & Claim Mechanism

1. Develop clear, transparent, and accessible claim processes for affected households and communities.
2. Set up rapid loss and damage assessment protocols at household and community levels.
3. Ensure financial compensation and material support to replace lost assets (boats, motors, nets) and cover loss of income.
4. Mobilize public health interventions to mitigate environmental pollution risks (chemicals, plastic nurdles).
5. Implement legal frameworks to hold responsible actors accountable and guarantee timely restitution.

Mid-Term Strategies:: Institutional Strengthening & Adaptive Planning

1. Empower local governance bodies (panchayats, cooperatives, SHGs) to better respond to disasters and engage communities.
2. Establish community-based monitoring systems for marine pollution and coastal degradation.
3. Promote livelihood diversification via skill development and easier credit access—especially targeting women and youth.
4. Leverage Pulluvila's experience to guide district-wide resilience planning sensitive to local socio-economic and ecological contexts.

Long-Term Vision: Sustainability & Integrated Coastal Governance

1. Implement Integrated Coastal Zone Management (ICZM) balancing economic development (ports, seawalls) and ecosystem protection.
2. Ensure community participation in decision-making for environmental and coastal management.
3. Support community-led conservation initiatives like Marine Protected Areas (MPAs) and Other Effective Conservation Measures (OECMs).
4. Embed climate resilience in urban-rural planning, housing, and livelihood systems.
5. Align state and national policies with global frameworks for climate governance, disaster risk reduction, and just transitions.

Key Principles for Effective Response

- Approach must be context-specific, addressing local realities and socio-cultural needs.
- Emphasize participatory processes with fishing communities central in planning and implementation.
- Ensure inclusivity: Special focus on women, youth, and marginalized groups who face disproportionate risks.
- Promote flexible, place-based strategies that build local capacity while aligning with broader disaster risk reduction and sustainable development goals.

Pulluvila serves as a critical reference for Kerala's broader coastal vulnerability. Its case highlights systemic gaps in environmental governance, infrastructure, and socio-economic resilience. A comprehensive policy roadmap, from local governance reforms to national compensation frameworks, is essential to move towards sustainable recovery and long-term resilience.

1. INTRODUCTION

On 24 May 2025, the container vessel MSC Elsa 3 experienced a critical maritime emergency while en route from Vizhinjam Port to Kochi, marking one of Kerala's most significant recent shipping-related incidents. According to the Kerala State Disaster Management Authority (KSDMA), the Liberiaflagged vessel, carrying 643 containers—including hazardous cargo such as calcium carbide, hydrazine and hundreds of tonnes of diesel and furnace oil—developed a severe starboard list approximately 30 nautical miles southwest of Kochi Port. Within 24 hours, the ship capsized and sank at coordinates 09°18.75N 076°08.16E, 14.6 nautical miles from the coast, resulting in over 100 containers going adrift, with about 60 washing ashore along a 120 km coastal stretch spanning Alappuzha, Kollam, and Thiruvananthapuram districts (KSDMA, MSC-ELSASITREP08, 2025).

Image 1: Debris from the MSC-Elsa 3 Incident, including plastic nurdles and container parts on the coast of the Pulluvila fishing village.

Image 2: Aerial view of the coast of the Pulluvila fishing village.

The incident raised immediate concerns over environmental degradation and disrupted marine ecosystems, depleting nearshore fish stocks, and significantly interrupted fishing operations. For coastal fishing communities, particularly small-scale fisherfolk, the incident compounded existing socio-economic vulnerabilities by damaging equipment, reducing yields, and curtailing market access due to consumer fears of contamination.

This is a firsthand report on Pulluvila Fishing Village, located in Karumkulam Panchayat, in the southwestern coastal belt of Thiruvananthapuram district. Pulluvila is selected as a critical and representative case study due to its high dependency on marine resources, dense coastal settlement pattern, and limited alternative livelihood options. Its geographic proximity to affected waters and socio-economic profile make it an instructive example for understanding both the immediate and cascading impacts of such maritime accidents. Insights from Pulluvila are relevant to other fishing settlements along Kerala's coastline, offering comparative value for regional analysis. The purpose of this case study is threefold:

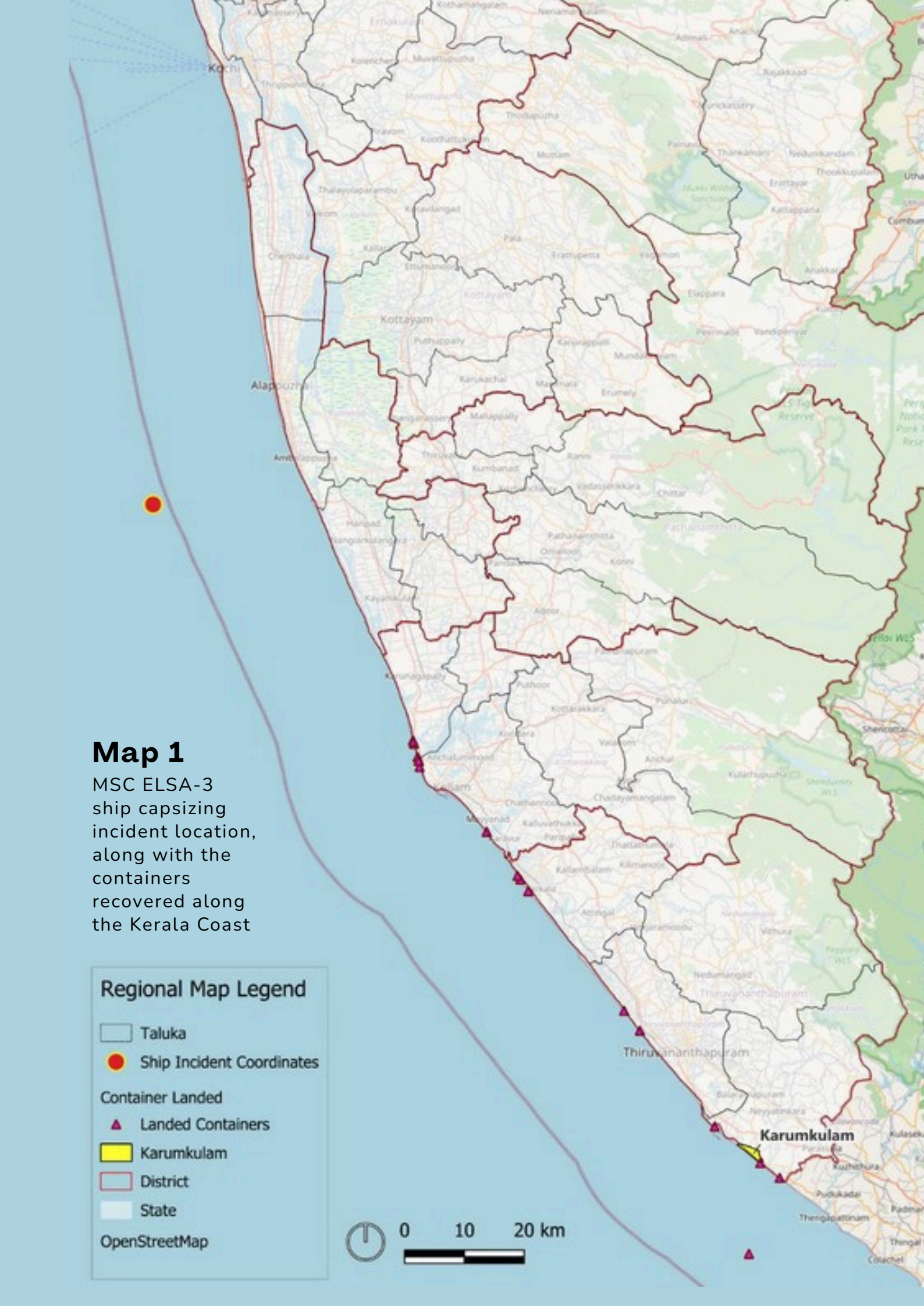
1. Document loss and damage—economic, environmental, and social suffered by the fishing community.
2. Analyse socio-economic impacts on households, including debt cycles, stress factors, and livelihood disruptions.
3. Examine community adaptation and resilience strategies in the wake of compounded hazards

Findings from this study hold wider relevance for informing policy interventions at multiple governance scales:

- **Local (Panchayat)**– Enhancing community-led disaster preparedness and support systems.
- **State (Kerala Government)-** Integrating marine risk management into fisheries and coastal development policies.
- **National (Central Maritime and Disaster Governance)**– Strengthening hazardous cargo regulation, ship routing policies, and institutional compensation mechanisms.
- **International** – Advancing global discussions on maritime safety, liability frameworks, and protection of vulnerable coastal communities.

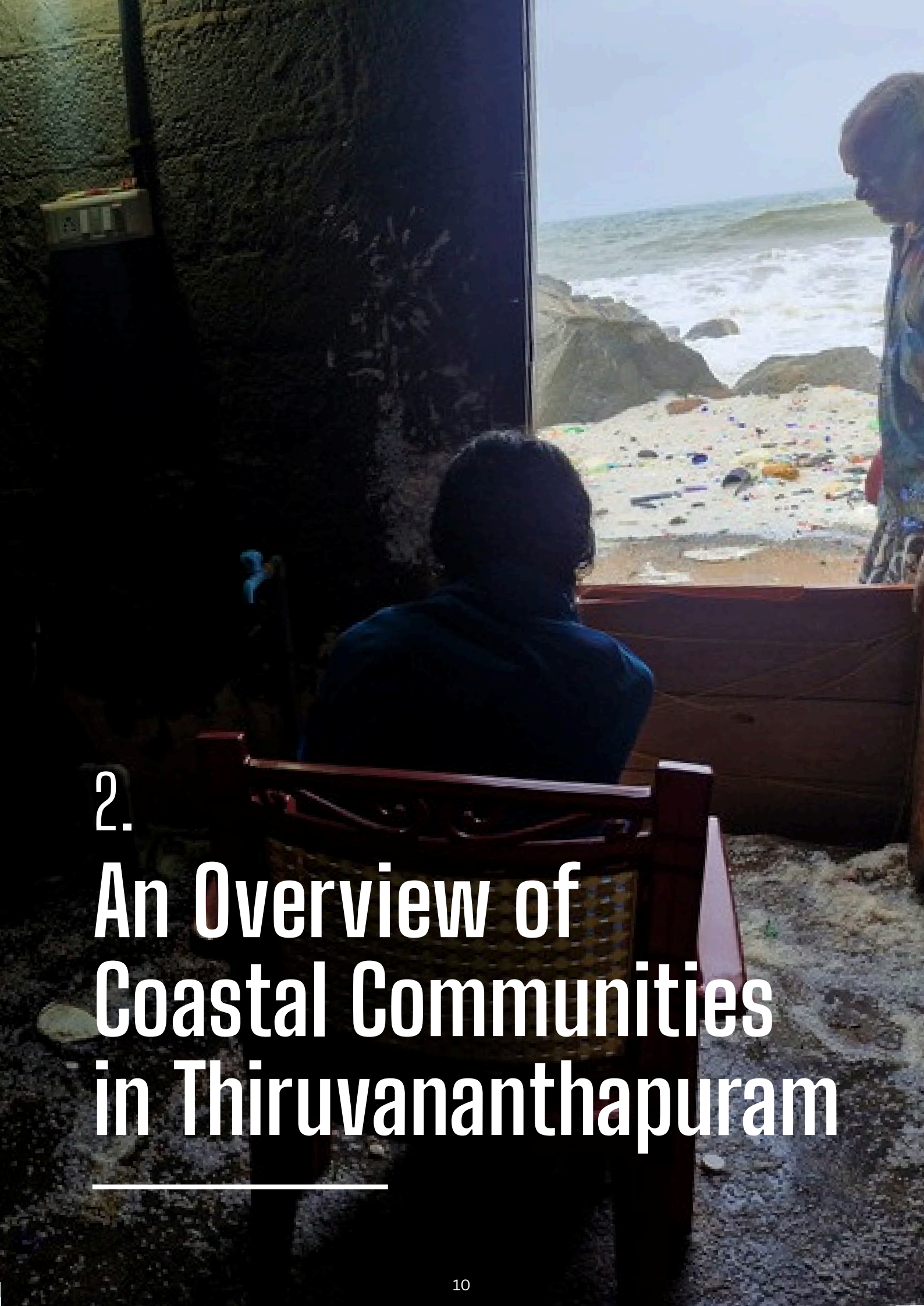
This incident underscores the urgent need for a standardised protocol for documenting damages and losses, enabling transparent claim-making processes, and ensuring timely and equitable compensation through accountable institutional mechanisms. By systematically profiling Pulluvila's experience, this report aims to contribute to the development of robust contingency frameworks that safeguard both marine ecosystems and the livelihood security of coastal populations.

Image 3: Aerial view, showing the proximity of the Pulluvila village to the Vizhinjam port and the stretch of several villages affected along the coastline



Map 1

MSC ELSA-3 ship capsizing incident location, along with the containers recovered along the Kerala Coast



2. An Overview of Coastal Communities in Thiruvananthapuram

Thiruvananthapuram district, located at the southwestern tip of Kerala, has a 75–78 km Arabian Sea coastline that is narrow, high-energy, and morphologically diverse, featuring steep beach faces, barrier beaches, spits, pocket beaches, and coastal cliffs. Its geography transitions from coastal plains to midlands and the Western Ghats, with five tidal inlets and a variety of coastal protection structures such as groynes, seawalls, and breakwaters near fishing harbours. The marine ecosystems along this coast are ecologically rich, supporting estuaries, rocky reefs, and sandy beaches that sustain one of the most important fishing zones in Kerala. The district has 42 marine fishing villages and over 33,000 fishing families, representing roughly 24% of Kerala's fisher population. Many belong to the 'Mukkuva community', culturally and economically tied to the sea through traditional small-scale fisheries, hook-andline reef fishing, and related trade (GoK,2018) . However, the socio-economic profile of these settlements is marked by dense populations, heavy dependence on marine resources, and limited access to healthcare, education, and diversified livelihoods—factors that heighten their vulnerability to environmental and economic shocks. These coastal communities face an overlapping set of environmental, climatic, and socio-economic stressors, including:

1. Climate Change and Extreme Weather

- Increased frequency and intensity of cyclones and extreme weather events, with accelerated coastal erosion—2.62 sq km lost between 2006–2020.
- Sea level rise projections (IPCC and others) suggest that much of the low-lying coast, including roads and beaches, could be submerged by 2050.

2. Sea Surges and Tidal Flooding

- High-energy wave conditions expose low-lying settlements to sea surges and tidal flooding, damaging housing, infrastructure, and community safety.
- Existing seawalls and groynes offer partial protection but disrupt sediment flows, sometimes worsening erosion elsewhere.

3. Socio-Economic Vulnerabilities

- Poverty, unstable fish stocks, high debt cycles, and reliance on seasonal fishing affect income security.
- Limited institutional support and marginalisation of fisherfolk constrain adaptation capacity.

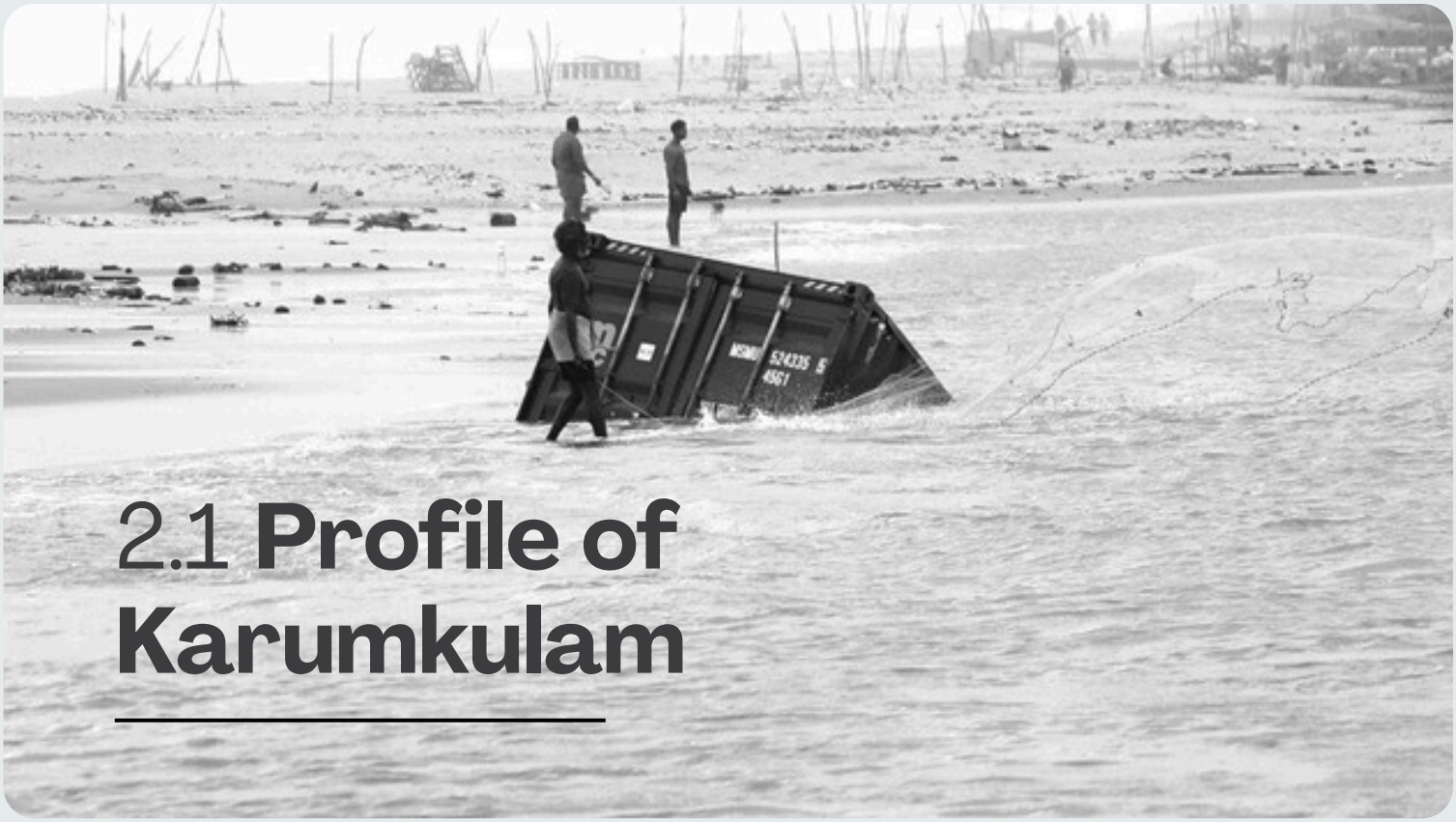
4. Environmental Impacts of the Vizhinjam Port Project

- Dredging and breakwater construction have damaged rocky reefs and mussel beds, disrupted fish habitats, and accelerated erosion.
- Local fishers report loss of traditional livelihoods, and environmental groups warn of long-term displacement risks.

5. Recent Ecological Disasters – MSC Elsa 3 Incident (2025)

- The MSC Elsa 3 sinking released oil, hazardous chemicals, and plastic nurdles into the marine environment, contaminating fishing grounds and causing market distrust in fish quality.
- Fishing bans and gear damage further exacerbated livelihood insecurity in affected panchayats.

The following sections present a detailed settlement study, analysing incidents of compounding vulnerability with a focus on the Pulluvila settlements within Karumkulam Grama Panchayat.



2.1 Profile of Karumkulam

The Greenpeace team conducted a detailed ground-level study of fishing settlements within the Karumkulam Grama Panchayat, located on the southwestern edge of Thiruvananthapuram. The Panchayat, situated in Neyyattinkara Taluk and part of the Parassala Block Panchayat, covers an area of 417 hectares and has the distinction of possessing the longest contiguous coastal stretch in Kerala. This 8 | P a g e geographic feature provides significant fishing opportunities while also increasing exposure to climateand ocean-related hazards. Karumkulam exemplifies the intersection of environmental hazards, climatic stress, and socio-economic marginalization in Kerala's coastal belt. Its reliance on marine-based livelihoods and exposure to multiple stressors including climate-driven sea-level rise, port-related ecological changes, and maritime industrial accidents make it representative of the broader challenges facing fishing communities across the state.

Table 1: Demographic profile of Karumkulam Grama Panchayat

S.No.	CATEGORY	TOTAL	MALE	FEMALE
1	Total Population	27,481	13,506	13,975
2	Sex Ratio (Females/Male)	1.03	_	_
3.	Literacy Rate (%)	79.55%	80.10%	79.03%
4.	State Literacy Rate (Kerala)	94%	_	_
5.	Total Workers	11,576	7,181	4,395
6.	Main Workers	7,576	_	_
7.	Marginal Workers	4,000	_	_
8.	Work Participation (%)	100%	62%	38%

As per the 2011[1] census report the total population of the village was 27,481, with 13,506 males and 13,975 females, observing a sex ratio of 1.03.The village has a literacy rate of 79.55%, which reflects a significant deficit in comparison to the Kerala statewide literacy rate which stands at 94%. Fishing remains the primary livelihood, followed by wage labour and small-scale trade.. While male labour force participation (62%) is lower than the state average (~82.4%), female participation (38%) is comparable to Kerala's average (35.4%). The relatively high female participation despite lower literacy likely reflects economic compulsion and the prevalence of informal or marginal work. It is important to note, however, that these statistics are based on data that is over a decade old. Since 2011, the region has experienced an increased frequency of natural disasters and consequent environmental degradation, further disrupting the socio-economic landscape. Although up-to-date official data on the current demographic and socio-economic profile is unavailable, field-level surveys and an estimated annual population growth rate of 1.76% suggest that the population of Karumkulam Grama Panchayat in 2025 is approximately 38,000.

Pulluvila, one of the largest coastal settlements, is a critical site for examining cumulative environmental and socio-economic vulnerabilities. Studying the Pulluvila fishing settlement within the broader context of Karumkulam not only provides insights into current economic conditions and localised challenges but also offers a scalable reference point for developing Disaster Risk Reduction (DRR) strategies tailored to coastal fishing economies. Furthermore, by situating the analysis of the MSC Elsa 3 incident within this local profile, the report underscores the urgency of integrated coastal governance one that balances economic development, environmental protection, and the socio-cultural continuity of Kerala's fishing communities. The methodology adopted for this study is detailed in the following sections.

[1] *The Census provides the official demographic data, with the latest available report dating back to 2011*

3. Methodology of Field Study

Pulluvila, a major coastal settlement within Karumkulam Panchayat, spanning 12 of the Panchayat's 18 wards was selected for the field study. Pulluvila constitutes a substantial portion of Karumkulam's population and coastline. The settlement's deep reliance on marine-based livelihoods, coupled with its high population density, has made it particularly vulnerable to environmental disruptions such as coastal erosion, flooding, and climate-induced sea surges. The MSC Elsa 3 maritime accident compounded these pre-existing vulnerabilities, intensifying livelihood insecurity and economic stress. In recent years, development activities in the district have further strained local marine ecosystems, exacerbating risks for fishing-dependent households. The selection of Pulluvila is also informed by the active engagement of ward members, community organisations, and local leaders, which has ensured both access to data and community participation in the research process. As such, Pulluvila provides a representative and instructive case for examining the cumulative impacts of environmental, climatic, and industrial hazards on Kerala's coastal communities.

The Greenpeace India team, along with community surveyors, conducted a field study in the last week of June 2025, nearly a month after the MSC Elsa 3 incident. The study adopted a three-step mixed-methods design, combining qualitative and quantitative techniques to capture both the breadth and depth of impacts.

Step 1 – Community Engagement

- Initial group meetings were conducted with community members and Panchayat representatives to generate a broad overview of:
- Daily life in Pulluvila.
- Key reflections on the MSC Elsa 3 incident.
- Local health conditions, recent developments, and livelihood changes over the past five years.
- Subsequent ward-level discussions with volunteers and representatives from the 12 affected wards helped to compile broad settlement profiles, demographic estimates, and historical context for each ward.

Step 2– Ward-Level Contextualisation

Ward-specific reflections on the accident were gathered to refine the scope and structure of household-level surveys. This stage also identified coping strategies and variations in impact across wards, enabling a more tailored survey design.

Step 3 – Household Survey

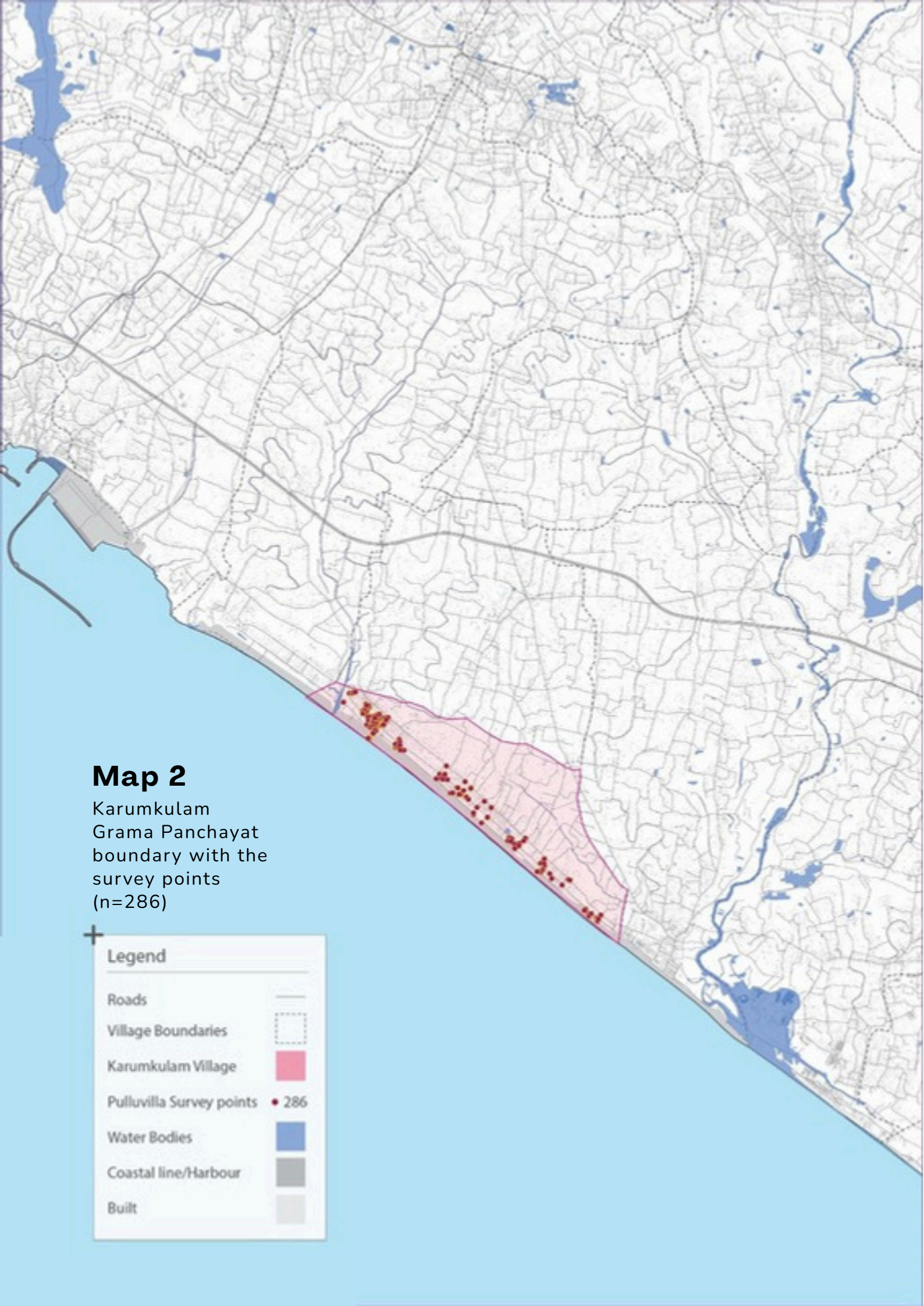
A structured survey was conducted with 286 households—approximately 6% of total dwellings in the 12 wards using a purposive sampling protocol to ensure an equitable distribution of families across the 12 surveyed wards. The sample ensured diversity in dwelling type, distance from the coast, and livelihood dependency.

Table 2: Sampling Overview

S. No.	CATEGORY	DATA
1	Total number of wards in Karumkulam	18
2	Number of wards surveyed	12
3	Estimated number of houses in surveyed wards	4,800
4	Estimated population	27,000
5	Number of houses surveyed	286 (6% of the total houses)
6	Total population covered in the survey	1,274

Surveys collected detailed profiles on household composition, livelihood patterns, economic and non-economic losses, income and yield reductions, asset damage, and coping mechanisms. Additionally, qualitative narratives captured the psychological and social dimensions of loss.

The analysis drew on both qualitative and quantitative data to develop a comprehensive understanding of the impacts experienced by the fishing community in Pulluvila. On the qualitative side, testimonies from affected individuals, focus group discussions, and detailed case studies were examined using inductive coding techniques. This process helped uncover recurring themes, patterns of vulnerability, and community-specific stressors often overlooked in purely statistical accounts. For the quantitative data, basic statistical tools were applied to assess the scale of the impact in measurable terms, including calculating the proportion of households affected and estimating the extent of income and yield loss. By combining these two approaches, the analysis not only captured the numerical extent of loss but also revealed the lived realities behind the data, allowing for a more grounded and human-centred understanding of the disaster's consequences. The following section builds on these findings by presenting ward-level profiles of Pulluvila and exploring the pivotal role the fishing trade plays in shaping both the economic resilience and environmental vulnerability of the community.



Map 2

Karumkulam Grama Panchayat boundary with the survey points (n=286)

4. Settlement of Pulluvila: Context and Characteristics

Pulluvila is a long-established coastal fishing settlement within Karumkulam Panchayat, where generations of families have relied on fishing, fish vending, and related marine activities as their primary source of income. The socio-economic fabric of the community is deeply tied to the sea, with fishing not only serving as a livelihood but also as a central cultural and social anchor.

Across the 12 surveyed wards, there are a total of approx. 4800 houses/dwelling units, and a population of 27,000 people. On an average, the family size is 5.6, with a range of 3.0 (Ward 14) to 8.0 (Ward 17). These suggest that there is variable dependency on fishing activities per family, and that income losses, given the single earner dependency can affect people differently. Specifically, larger families are likely to observe higher dependency rates and an increased vulnerability to shocks due to environmental, incidental and climatic hazards. The substantial time that families have had to consolidate their dwellings are reflected in the general state of living infrastructure, Houses are primarily built using permanent materials and families typically only incur maintenance and repair costs bi-annually. In sporadic cases, structures built on untenable land or in close proximity to the shoreline have been damaged during high tides and due to cyclonic winds, but such cases are rare and addressed immediately.

Table 3: Pulluvila demographic profile generated from the surveys

Sr. no.	Ward number	Dwelling units	Population	Household size average	Livelihoods (F)	Livelihoods (M)
1	1	502	2500	5	Fish trade (related activities)	Fishing
2	7	451	1660	3.7	Fish Trade, MGNREGA	Fishing, Daily wage labour
3	9	401	1620	4	Fish trade (related activities)	Fishing
4	10	456	2600	5.7	Fish Trade, MGNREGA, tailoring	Fishing
5	11	254	1850	7.3	Fish Trade, MGNREGA	Fishing
6	12	229	1366	6	Fish Trade, Tailoring, MGNREGA, Sales girl	Fishing, Driver, Painting
7	13	282	1631	5.8	MGNREGA, Fish Trade, Tailoring, Fish Drying, Sewa	Fishing (90%), Auto, Government (1%), Gulf (4%)

Sr. no.	Ward number	Dwelling units	Population	Household size average	Livelihoods (F)	Livelihoods (M)
8	14	400	1200	3	Fish Trade, Loading and Unloading work, MGNREGA, Daily wage labour, House Keeping	Fishing, Daily wage labour, Auto drivers, Working abroad
9	15	530	4300	8.1	Fish Trade	Fisherman, Fish Vending
10	16	550	2500	4.5	MGNREGA, Fish Trade, Tailoring, Sales girls, Self-employed	Fishing, daily wage labour
11	17	375	3000	8	Fish trade, Fish-drying, Self-business, MGNREGA	Fishing, daily wage labour, Working abroad
12	18	347	2750	7.9	Kudambashri, marketing, fish-drying, tailoring, (MGNREGA-not active),	Marine work, Auto and other work
		Approximate total no. of households	**Approximate total population**	**Average household size**		
		4777	**26977**	**5.6**		

Table 3. presents the ward-level demographic profile of the Pulluvila settlement, indicating approximately 4,800 dwelling units with a total population of around 27,000, averaging 5.6 members per household. Family size, however, varies significantly across wards, ranging from an average of 3 persons per household in Ward 14 to 8 persons per household in Ward 17, highlighting internal demographic diversity.

As shown in the table, fishing and fish trade are the predominant sources of livelihood across all wards. Approximately 96% of households rely on fishing as their primary occupation, with at least one member directly engaged in fishing activities. Most families depend on a single breadwinner, with an average of 1.6 earning members per household. In households where multiple members contribute to income, men are

are typically involved in fishing either as boat owners or workers while women participate in fish vending, tailoring, employment in private establishments, or under MGNREGA schemes, in that order of frequency.

This occupational pattern reflects varying levels of dependency on fishing-related income, indicating uneven economic vulnerability across the settlement. Notably, larger households tend to be more exposed to environmental and financial shocks due to their greater per capita reliance on limited income sources, compounding their socio-economic fragility.

The housing conditions in Pulluvila reflect both the community's long-standing presence and the structural limitations imposed by its socio-economic context. Most houses are constructed with permanent materials, and families generally incur maintenance or repair costs on a bi-annual basis. While sporadic cases of structural damage due to high tides or cyclonic winds have been reported—particularly in homes built on untenable land or too close to the shoreline these incidents are relatively rare and usually addressed through immediate repairs. In terms of Tenure, predominantly, most families have the 'Patta', a document that implies property rights to build their houses on earmarked plots of land, whilst others are in the process of securing the same. Few live on rent, but the exact number is unknown and subject to change.

Though many homes show signs of incremental consolidation over time, suggesting a sense of stability and permanence, the constraints of self-financed, gradual construction are evident. Households in Pulluvila experience limited access to drinking water, despite relatively better access to sanitation, health, education, and transportation infrastructure. However, recurring disasters, coastal degradation, and economic disruptions place Pulluvila in an increasingly precarious position.

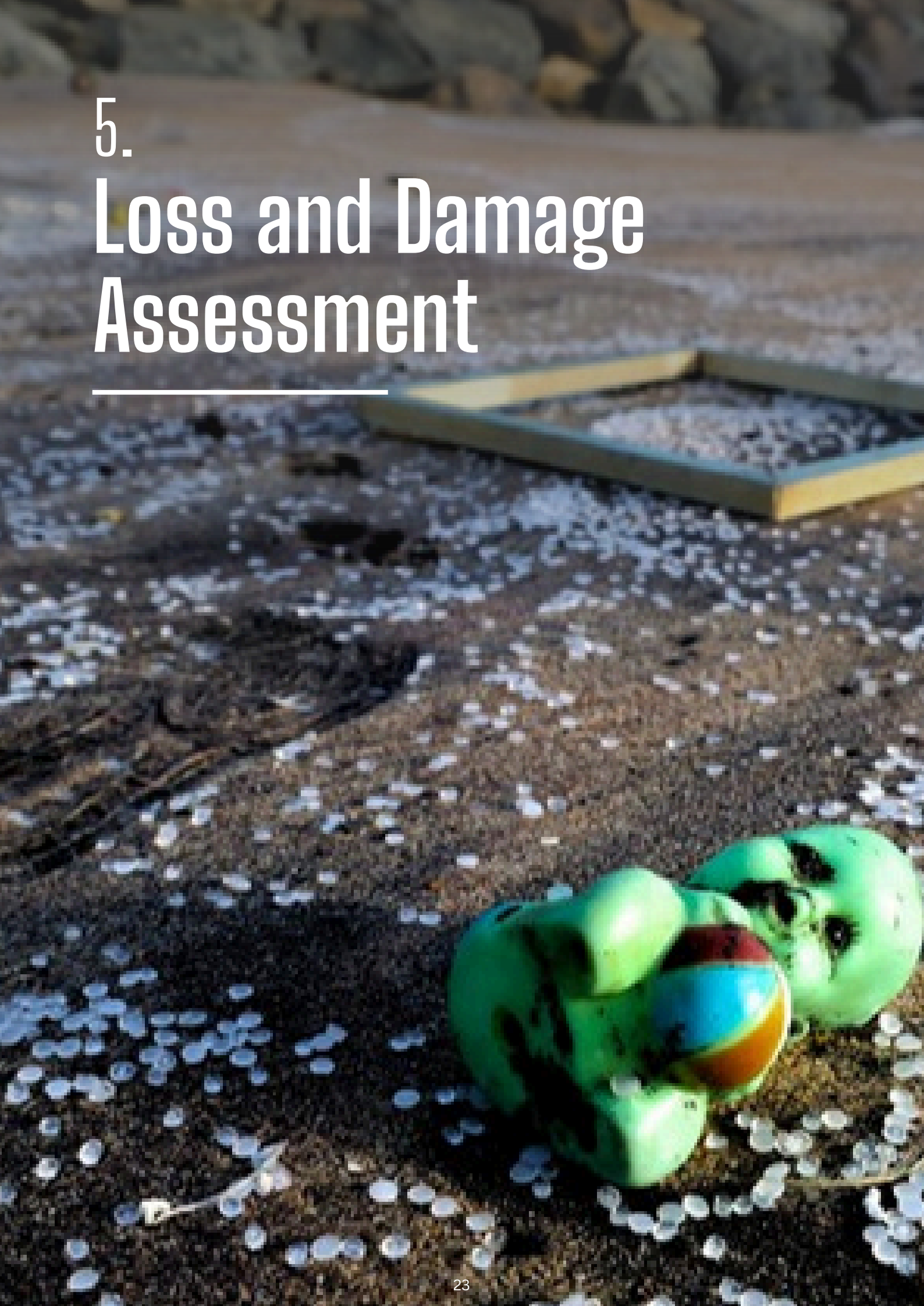
Field-level discussions reveal that the MSC ELSA 3 incident had a devastating impact across 12 wards of the settlement, with 9 wards experiencing significant non-economic losses and damage to household assets. The event caused both direct and indirect disruptions: plastic nurdles from the ship's cargo washed ashore, contaminating coastal waters and hampering fishing activities, while large fragments of shipping debris damaged nearshore ecosystems. As a result, many families faced increased recovery costs, including repairs to damaged boats and nets, alongside a sharp decline in income from disrupted fishing operations.

However, the impacts extended well beyond economic losses. The incident also fractured the tightly knit social fabric of Pulluvila. Altered fishing routines, declining catch volumes, and temporary restrictions on coastal access disrupted the community's daily rhythms and sense of stability. Simultaneously, the accumulation of waste and debris along the shoreline worsened already fragile sanitation conditions. These environmental stresses, compounded by long-standing gaps in waste management, elevated the risk of public health crises, particularly for children and the elderly.

Despite these adversities, the community displayed remarkable resilience. Residents swiftly mobilized to clear debris, adapt fishing practices, and seek alternative income sources. Yet, the scale, persistence, and compounding nature of the losses have begun to exceed local coping capacities, leaving many households vulnerable and without sufficient recovery support or institutional assistance.

The proximity of dwelling clusters to the coast further exposes the multi-layered vulnerabilities residents face a theme expanded upon in the Loss and Damage section. While coastal proximity supports traditional fishing livelihoods, it also magnifies exposure to environmental hazards. Past developments, including state-led infrastructure projects, untimely climatic events, and ecological degradation, have destabilized the local marine ecosystem and disrupted the fishing economy. For instance, Cyclone Ockhi intensified these risks, inflicting severe damage and psychological trauma. More recently, the construction of the Vizhinjam Port and the coastal seawall has constricted fishing zones, forcing fishermen to travel longer distances to find viable fishing grounds. This has led to a sharp rise in operational costs, particularly for boat maintenance, thereby reducing profit margins and weakening household financial stability. The MSC ELSA 3 incident further exposed how such events can rapidly erode livelihoods and destabilize communities like Pulluvila.

Taken together, recurring disasters, coastal degradation, and economic disruptions have placed not only Pulluvila but coastal fishing communities across Kerala in an increasingly precarious position. This situation highlights the urgent need for sustained attention, comprehensive policy interventions, and multi-level governance from local to national to ensure the continuity and efficiency of civic services and to safeguard the socio-economic resilience of Kerala’s most vulnerable coastal populations.



5. Loss and Damage Assessment

For the residents of the 12 surveyed wards in Pulluvila, the MSC Elsa 3 incident has affected their lives and livelihoods in multiple dimensions, adding layers of burdens, both economic and non-economic upon the residents. Since the incident, the average fishing household in Pulluvila has lost Rs.25,000–Rs.35,000 per month in a community where over 80% have little to no savings. The severity of this incident underscores the ways in which development activities, natural disasters and offshore incidents such as this intersect in ways that primarily affect poorer, marginalized communities who are reliant on a singular source of livelihood. Data points and testimonies presented here encapsulate this multi-dimensionality in three regards: Direct losses, which pertain to the detrimental effects of an incident which are directly experienced by people. Indirect impacts include the investments of both time and money which are incurred by the affected people and their families to reconstitute their daily lives. This includes the additional financial and time investments in their attempts to recoup and recover asset losses. Lastly, non-economic losses discuss the overarching mental and physical burdens that are placed on the affected families in several related dimensions, reconstituting livelihoods, and stresses associated with household expenses such as power, maintenance, and educational costs for families with children.

It is established that most settlements and villages along the Malabar coast observe fishing as a mainstay, and their intimate relationship with the coastline means that any development activity and incidents can have far reaching implications for their lives. Furthermore, natural disasters and climatic extremes only exacerbate this, affecting them to a significantly worse degree as compared to the those who live in cities towards the mainland. In the case of the MSC Elsa 3 incident, it is apparent from the surveyed sample, that Pulluvila observes a majority of families who are dependent on fishing activities. Out of 286 households sampled, 262 (96%) of the families have anywhere from 1-2 breadwinners, with at least one in each of the 262 families being involved in some aspect of the fishing industry: as boat owners and primary fishermen, as workers whose wages are paid from the net yield, or as fish sellers. In the case of boat owner households, post-fishing processes are shared in the families, with males being responsible for fish mongering while women travel to the Trivandrum main city to sell fish.

At the outset, based on conversations with the village residents, it is evident that their livelihoods have been disrupted in three primary regards; First, the presence of plastic nurdles from the shipping container have impacted fishing activities due to changes in the ecosystem, to which the fish colonies are highly sensitive. These changes disrupt common patterns of fishing activities and in some cases, make the trade unviable due to the increased distances and maintenance costs that have to be incurred by boat owners. On an average, it costs anywhere from Rs. 7000 – Rs. 10,000 to maintain a trawler for a single trip. During days of low yield, boat owners can run into unrecoverable losses. Second, low density plastic nurdles float on the surface, affecting the mechanical components and operations of motor boats. To put this in context, fishing groups invest Rs. 25,000 into a single net, around 2-3 times a year. Damage to crucial livelihood

assets such as this, result in recovery costs that exceed Rs. 1 lakhs. These losses can take up to a year to recover, given the average income levels, which suggest an average of Rs. 12,000. Lastly, the shipwreck has created apprehension among fish consumers across the state with perceptions that fish from Pulluvila and neighbouring coastal villages may be unsafe to eat. While official testing has not confirmed any contamination, these fears have affected local markets and livelihoods, adding another layer of challenge for fishing households already facing economic losses. Women in the village who are primarily engaged in the sale of fish suggest that they are unable to sell their daily yield in the city, and their incomes have depleted as a result.

‘We used to be able to make at least Rs. 3000 in net profit (per day) before the accident, at the very least, we could recoup the maintenance costs of our boat... Now, with the longer travel distances and damages to our nets, we are hardly able to do anything....”

Resident, Pulluvila

Public notices warning people to avoid contact with potentially hazardous substances may have reinforced these fears among prospective customers. Cumulatively, the loss of income and growing uncertainty about meeting future expenses have placed considerable strain on the mental health of residents. This strain is further compounded by loans and debts taken to cover essential household needs. For families with children in school or college, the additional burden of fees and lodging costs intensifies this stress, leaving many anxious about how they will sustain both livelihoods and education in the coming months.

The methodology employed for this assessment of loss and damage involved parallel comparisons of fishing yields and income levels for the month of June across the years 2024- 2025. In addition, the assessment considered the loss and recovery of livelihood assets such as boats and fishing nets. Given the high maintenance costs, these expenses constitute the largest share of the economic losses incurred. Furthermore, residents who participated in the surveys assessed changes in credit access patterns, including loans, borrowings, and other strategies used to manage household expenses. Case studies and reflections from residents on changes in their lives since 24 May have provided qualitative depth to complement the statistical data.

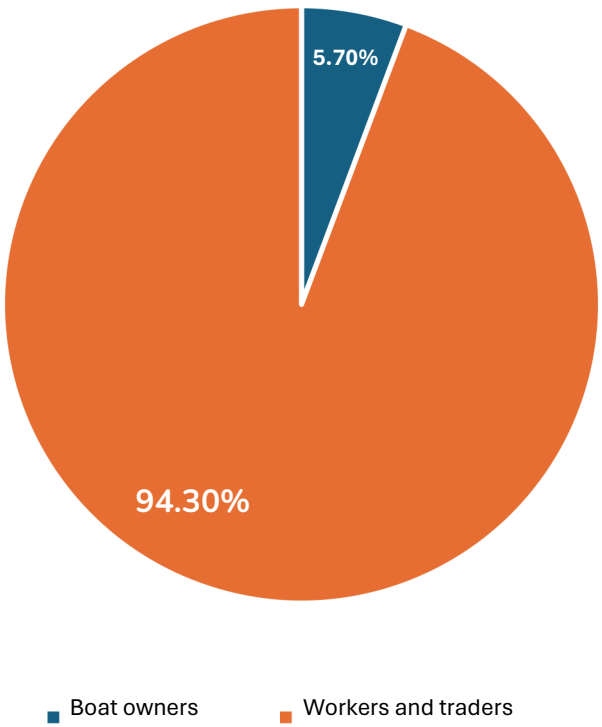
5.1 Nature of engagement in the fishing

Given the disproportionate impact on families dependent on fishing, it is essential to contextualize the extent to which residents have been affected. Based on a sample of 286 households, 96% of the families (n = 262) have 1–2 breadwinners (average 1.6) involved in one of three aspects of fish mongering: boat owners, workers, or fish sellers.

Table 4: Nature of engagement with the fishing trade

S. No.	Nature of engagement with the fishing trade	Percentage
1	Boat owners	15 (5.7%)
2	Workers and traders	247 (94.3%)

Figure 1 Nature of engagement in the fishing trade



The population of this sample is 1274 with a negative sex ratio at 0.96. The average family size is 4.45 people, with each family having at least 2 members who are dependents.

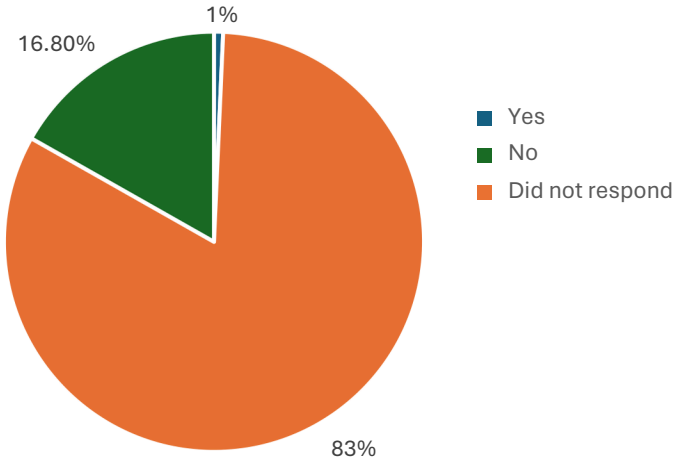
5.2 Reflections on savings

Among families dependent on fishing, 82.5% reported that their income is fully consumed by household expenditures, leaving them with negligible savings. Disruptions to fishing activities have therefore compelled them to seek alternative sources of income, in addition to borrowing money locally or through loans. Fishing is a seasonal activity, and people rely on six months of fish mongering to cover their expenses for the rest of the year. When the season is disrupted, or when unforeseen increases in equipment maintenance costs occur, savings are reduced, forcing households to pursue other avenues to manage their expenses.

Table 5: Savings

Sr. no.	Parameter	Percentage
1	Yes	2 (0.7%)
2	No	236 (82.5%)
3	Did not respond	48 (16.8%)

Fig. 2 Have you been able to save money from your income to take care of your expenses?



5.3 Losses: Yield and income

95.5% of the families representing all households reliant on fishing reported a significant reduction in their income during May and June following the MSC Elsa 3 incident. Respondents attributed this decline to reduced fish availability, which they linked to sudden and sporadic changes in ecosystem patterns. This, in turn, led to a drop in yield from 10 -15 baskets, depending on scale and crew size.

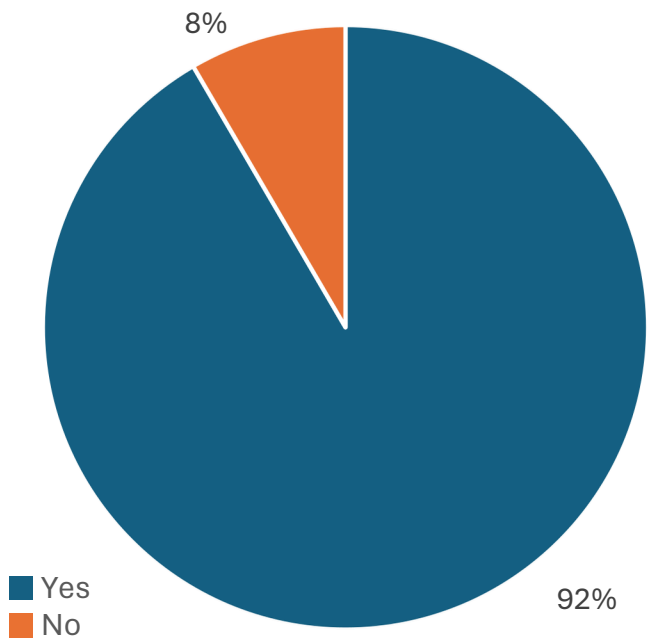
Furthermore, several respondents reported that fishing equipment had been damaged and that repairs required time, reducing their effective workdays from around 30 to fewer than 15 an approximate 50% reduction. The combination of fewer workdays, lower yields per trip and increased maintenance costs due to longer travel distances has resulted in substantial reductions in household income.

To put this in context, 69.1% of the respondents have mentioned a reduction in yield since the incident when compared to the same time period last year. One of the first few families which were interviewed mentioned that they used to catch around 15 baskets of a variety of fish a day. However, it has reduced to less than 5 baskets since the accident, with some days where they are unable to catch any fish. while the rest of the respondents have been unable to provide specifics for the same. Even with the reduced yield, attempts at vending fish have been unsuccessful, given the prevailing notions among consumers about the potential presence of toxic substances. Vendors described being turned away by regular customers, fearful that the fish may have been contaminated.

Table 6: Income reduction

Sr. no.	Impact: Has the shipping incident resulted in a reduction in income?	n=262	
1	Yes, our income has reduced since the Shipping incident	240	91.60%
2	No, our income has not reduced since the incident	22	8.40%

Fig. 3 Impact: Has the shipping incident resulted in a reduction in income?

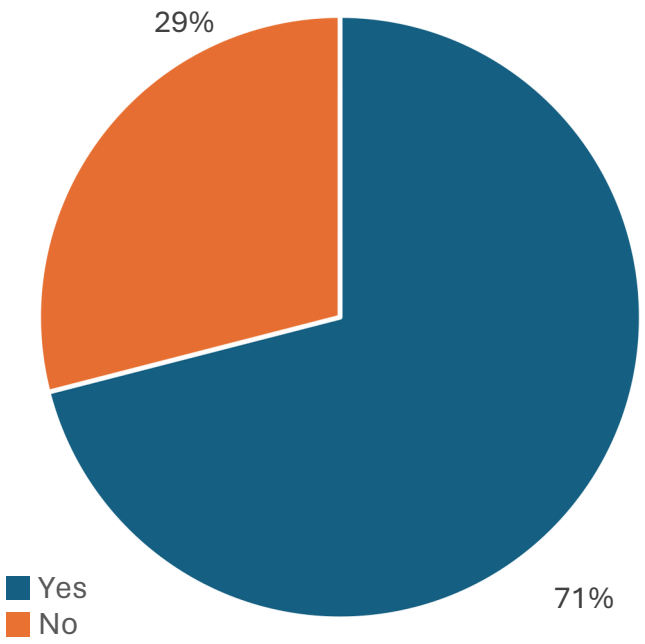


For 71 % of the families, the mode of fishing has changed since the incident, with areas normally associated with rich fish ecosystems have been disrupted, compelling fishing crews to seek out other spaces. As many testified during our conversations, debris from the containers and the nurdles have impacted their traditional fishing grounds , leading fishing communities to look out for areas of higher yield. The suddenness of the incident and its far-reaching changes left people with little time to prepare and adapt. Existing climate stresses and limitations on fishing placed by the Vizhinjam port have further layered these challenges.

Table 7: Changes to methods of fishing

Sr. no.	Impact on fishing methods: Have they changed since the accident?	n=262	
1	Yes	186	71%
2	No	76	29%

Fig. 4 Impact: Has the shipping incident changed your method of fishing?



5.4 Secondary losses: Debts and loans

The reduction in income, unexpected expenditures and exhausted savings have compelled people to access credit through other pathways. 69% of all the respondents reported borrowing money from various sources to recoup losses and manage their daily expenses.

The roof our of our house was damaged during the rains, and we were in the process of repairing it...we have set that aside because our child is studying hotel management in Trivandrum...his college fees, the lodging...we have had to secure a loan for 3 lakh (INR) against all the gold we had... just to take care of our expenses...

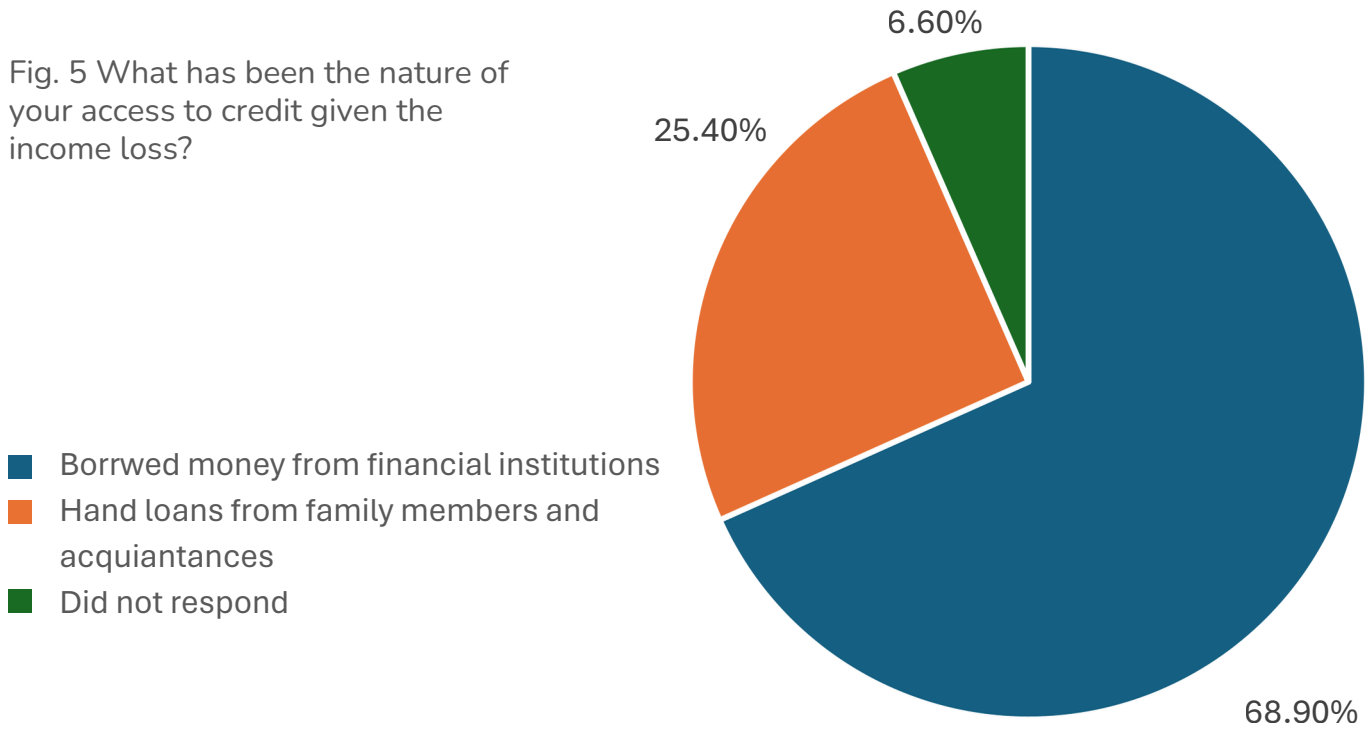
Resident, Pulluvila

Several families during the interviews mentioned accessing loans and credit from organisations NBFCs or larger banks against a gold mortgage. The rest rely on hand loans from nearby money lenders or microfinance institutions who do not make loans contingent on collateral. Furthermore, 24.5% of the respondents have mentioned that they have borrowed money from family members elsewhere to manage expenses. Loans taken extend from Rs.50,00 to Rs.3 lakhs.

Table 8: Alternative access to credit

Sr. no.	What has been the nature of your access to credit given the income loss?	n=286	
1	**Borrowed money from formal financial and microfinance institutions**	197	68.90%
2	**Hand loans from acquaintances, neighbours, or family members**	70	24.50%
	No comment	19	6.60%

Fig. 5 What has been the nature of your access to credit given the income loss?



The majority of those who mentioned having taken up loans suggested that they would await the forthcoming fishing season to repay their debts, significantly increasing the interest burden they are likely to face. In many cases, families who have pledged gold or other assets as collateral conveyed that they might forfeit these assets, as they do not anticipate earning enough income to repay their loans. This is an important indicator of projected expenses and the burden that insufficient savings present.

5.5 Stresses: Alternative access to income and credit

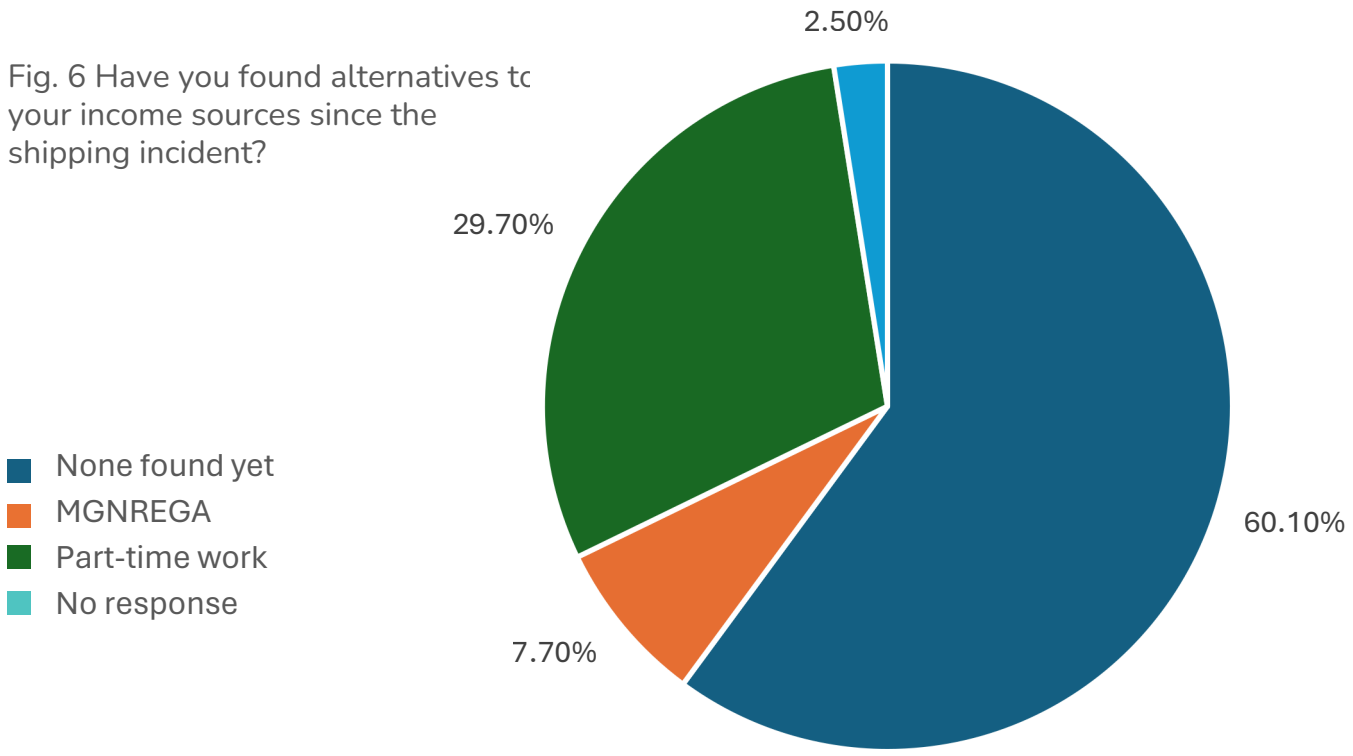
Given that loans are only a temporary response, people attempted to seek alternatives for their income during the period when fishing activities were disrupted. However, the outcomes were largely discouraging, pointing to the lack of viable livelihood options. About 60.1% of respondents were unable to find alternatives, while nearly 30% engaged in short-term, part-time work that proved insufficient to restore their income.

Men primarily sought employment as electricians, plumbers, or in other service-related jobs, while some had to resort to low-paid domestic work. In a few cases, individuals managed to remain connected to the fishing industry by engaging in the sale of dry fish. Women most of whom are fish vendors faced particular challenges in securing alternative sources of income. Only a small number of pursued options such as part-time home nursing or domestic help. Just 7.7% reported accessing state-led employment schemes such as MGNREGA, underscoring gaps in safety-net coverage. In occasional cases, respondents mentioned participating in Kudumbashree programmes such as the 100 Days initiative.

Table 9: Alternatives to livelihood

Sr. no.	Have you found alternatives to your income sources since the shipping incident?	n=286	
1	No, we have not been able to find other sources of income	172	60.10%
2	Yes, we are engaged in MGNREGA	22	7.70%
3	Yes, we are engaged in miscellaneous work, such as daily wage, part time work etc.	85	29.70%
4	No response	9	2.50%

Fig. 6 Have you found alternatives tc your income sources since the shipping incident?



5.6 Asset loss

The second dimension of economic loss and damage is asset loss, although the demographic group directly impacted is limited. Out of the 262 families dependent on fishing, 15 own assets such as boats. However small this percentage (6%) may appear, it is crucial to note that they anchor the micro-industry of fishing in the locality. In addition to owning primary infrastructure such as boats and fishing nets, they are also responsible for providing employment to the other 95% either through yield-sharing or per day wages. Plastic nurdle pollution and extended fishing ranges have not only increased maintenance costs in general but also caused damage to equipment, resulting in losses on two fronts: monetary damages to assets and recovery costs. On average, damages to boats and nets cumulatively cost a single owner Rs. 65,000. Recovery costs, which involve replacement and repair, amount to Rs. 77,000. Combined, this translates into up to Rs. 1.5 lakh in direct and indirect losses to equipment. On average, damages to boats and nets cumulatively cost a single owner Rs. 65,000. Recovery costs, which involve replacement and repair, amount to Rs. 77,000. Combined, this translates into up to Rs. 1.5 lakh in direct and indirect losses. It must be mentioned that this is an approximate range, which can vary depending on the size and nature of the boat.

5.7 Key summary of Loss and Damage

On average, income loss per family per day ranges from Rs. 800 to Rs. 1,000. Considering the disruption of fishing activities since 24th May until the 24th of June 2025.

- 95.5% of the families have recorded a reduction in income to an average of Rs. 29,000 during this time period.

- 96% of families are reliant on fishing. Families have an average of 1.6 breadwinners with at least one engaged in the fishing trade.

- 82.5% of families have no savings or have depleted savings to cover expenditures following the accident. The burden of expenditures during the off-season that are normally covered through in-season savings have been further aggravated by the incident.

- 69% of all the families have mentioned their savings were depleted and that they had borrowed money to manage household expenses and recover losses. A majority within this group are prepared for long term loans as they await the forthcoming fishing season to repay their debts. Loan amounts range from Rs.50,000 to INR 3 lakhs

- 60.1% of the people have not been able to find livelihood alternatives, or have reported to lower paying jobs, which is consistent with borrowing patterns in the settlement. 30% have found part-time occupations which underpay and do not suffice for household expenses. Only 7.7% are engaged in state-led programmes such as the MGNREGA.

- On an average, boat owners have sustained damage costs averaging Rs. 65,000, while recovery costs which include boats, motors and nets exceed Rs. 70,000.

- Based on a family average of earning members (1.6) and average income loss per capita per day (Rs. 800) and taking into consideration that fishing is the predominant source of income (91.6%) the average income loss per family per day stands at Rs. 1172. This translates to an average income loss of approximately Rs. 29,000 for a period of 30 days.

In Pulluvila, 51 surveyed households reported losing essential fishing assets from boats and nets to motorboat engines. Losses ranged from Rs. 10,000 to Rs. 5.75 lakh, averaging Rs. 1.07 lakh per family. In total, this amounts to over Rs. 54 lakh cumulatively for these families combined. Behind every number is a family whose work and dignity depend on these assets. Recovery support here will not just replace equipment, it will restore livelihoods, keep young people engaged in their trades, and strengthen the community's resilience against future shocks. Ensuring timely and adequate rehabilitation packages will help these households rebuild without falling deeper into debt or distress.

6. Conclusion: Towards Sustainable Recovery and Resilience

The case of Pulluvila highlights the multi-dimensional vulnerabilities faced by coastal fishing communities in Kerala. The MSC ELSA 3 incident is both a triggering event and a revealing lens, exposing systemic gaps in environmental governance, infrastructure planning and socio-economic resilience.

Short-Term Priorities: Immediate Relief and Claim Making

In the immediate aftermath of such marine disasters, there is a critical need to establish clear, transparent and accessible mechanisms for claim-making. This includes:

- Rapid loss and damage assessment protocols at the household and community levels.
- Provision of financial compensation and material support for lost income, assets (boats, nets, equipment) and environmental degradation.
- Public health responses to mitigate risks from environmental pollution, if any (e.g., chemicals, plastic nurdles).
- Legal frameworks to hold responsible actors accountable and ensure timely restitution.

Establishing a standardized claim and grievance redressal mechanism would empower affected communities and set a precedent for future incidents.

Mid-Term Strategies: Institutional Strengthening and Adaptive Planning

In the medium term, efforts may focus on:

- Strengthening local institutions (panchayats, cooperatives, SHGs) for better disaster response and community engagement.
- Developing community-based monitoring systems for marine pollution and coastal degradation.
- Promoting livelihood diversification through skills training and access to credit particularly for women and youth.

Pulluvila's experience can inform district-wide resilience planning that is sensitive to local socio-economic and ecological dynamics.

Long -Term Vision: Sustainability and Integrated Coastal Governance

Over the long term, the Pulluvila case emphasizes the necessity for integrated coastal zone management (ICZM) that:

- Balances economic infrastructure development (such as ports and seawalls) with ecosystem protection.

- Ensures the participation of coastal communities in environmental and coastal management decision making processes.
- Encourages community-led environmental initiatives such as Marine Protected Areas (MPAs) and Other Effective Conservation Measures (OECMs).
- Embeds climate resilience into urban and rural planning, housing and livelihood systems.
- Aligns with national and international frameworks for marine governance, disaster risk reduction, and just transition.

A state wide policy roadmap is essential one that spans from local governance reform to national disaster compensation frameworks and connects to global dialogues on loss and damage under climate agreements.

The strategies outlined here, ranging from short-term relief mechanisms to long term sustainability frameworks, are intended as suggestive pathways based on the specific case of Pulluvila within Karumkulam Panchayat. This case offers valuable insights into the complex intersections of disaster, livelihood and environmental vulnerability. Each coastal community faces unique socio-ecological conditions shaped by geography, livelihood patterns, cultural practices, climate change and levels of institutional support.

Therefore, any effective response must be:
- Context-specific, acknowledging local realities and needs.
- Participatory, involving the voices and agency of the fishing communities themselves in both planning and implementation; and
- Inclusive, ensuring the representation of women, youth, and marginalized groups who often bear disproportionate burdens in times of crisis.

Prevention and resilience strategies should adopt a flexible, place-based approach that builds on local capacities while aligning with broader frameworks for disaster risk reduction, biodiversity protection, climate adaptation and sustainable development. Thus, the Pulluvila case shall serve as a critical reference point a lens through which the wider vulnerabilities and opportunities of Kerala's coastal belt can be better understood, debated and addressed.

REFERENCES

Down to Earth. (n.d.). Vizhinjam was a mistake waiting to happen. Retrieved August 15, 2025, from https://www.downtoearth.org.in/environment/vizhinjam-was-a-mistake-waiting-to-happen

Express News Service. (2021, July 28). Vizhinjam port turning into an eco-disaster. The New Indian Express. https://www.newindianexpress.com/cities/thiruvananthapuram/2021/Jul/28/vizhinjam-port-turning-into-an-eco-disaster-2336336.html

Kerala State Disaster Management Authority. (2025, May 30). MSC ELSA-3 situation report 8, 1800 hrs, 30-05-2025. https://sdma.kerala.gov.in/wp-content/uploads/2025/06/MSC-ELSA3-SITREP-8-1800-hrs-30052025.pdf

Kerala State Disaster Management Authority. (2025, May 24). MSC ELSA-3 situation report 1, 24052025. https://sdma.kerala.gov.in/wp-content/uploads/2025/06/MSC-ELSA3-SITREP-1-24052025-1.pdf

Kerala State Disaster Management Authority. (2025, May 24). MSC ELSA-3 situation report 2, 2200 hrs, 24-05-2025. https://sdma.kerala.gov.in/wp-content/uploads/2025/06/MSC-ELSA3-SITREP-2-2200-hrs-24052025.pdf

Kerala State Disaster Management Authority. (2025, May 25). MSC ELSA-3 situation report 3, 1300 hrs, 25-05-2025. https://sdma.kerala.gov.in/wp-content/uploads/2025/06/MSC-ELSA3-SITREP-3-1300-hrs-25052025.pdf

Kerala State Disaster Management Authority. (2025, May 26). MSC ELSA-3 situation report 4, 1600 hrs, 26-05-2025. https://sdma.kerala.gov.in/wp-content/uploads/2025/06/MSC-ELSA3-SITREP-4-1600-hrs-26052025.pdf

Kerala State Disaster Management Authority. (2025, May 28). MSC ELSA-3 situation report 6, 2000 hrs, 28-05-2025. https://sdma.kerala.gov.in/wp-content/uploads/2025/06/MSC-ELSA3-SITREP-6-2000-hrs-on-28052025-1.pdf

The News Minute. (n.d.). Two maritime accidents, one coastal crisis: Why Kerala's fisherfolk are struggling. Retrieved August 15, 2025, from https://www.thenewsminute.com/kerala/two-maritime-accidents-one-coastal-crisis-why-keralas-fisherfolk-are-struggling

Hindustan Times. (n.d.). The environmental cost of back-to-back shipwrecks on Kerala shores. Retrieved August 15, 2025, from https://www.hindustantimes.com/india-news/the-environmental-cost-of-back-to-back-shipwrecks-on-kerala-shores-101751828801441.html

The Wire. (n.d.). MSC Elsa-3: Shipwreck waiting to happen. Retrieved August 15, 2025, from https://m.thewire.in/article/environment/msc-elsa-3-shipwreck-waiting-to-happen

Press Information Bureau. (2025, July 9). Kerala cargo ship arrested: MSC Akiteta, MSC Elsa environmental damage - High Court, Vizhinjam port, Admiralty Act. https://www.pib.gov.in/PressReleasePage.aspx?PRID=2146838

India Today. (2025, July 9). Kerala cargo ship arrested: MSC Akiteta, MSC Elsa environmental damage - High Court, Vizhinjam port, Admiralty Act. https://www.indiatoday.in/india/story/kerala-cargo-ship-arrested-msc-akiteta-msc-elsa-environmental-damage-high-court-vizhinjam-port-admiralty-act-2753135-2025-07-09

Registrar General & Census Commissioner of India. (2011). Census of India 2011. Government of India.

GLOSSARY OF TERMS

- Asset Loss - Damage or destruction of fishing boats, nets, engines and other productive equipment critical for livelihood.
- Breadwinner - The primary income earner(s) in a household, often engaged in fishing or fish vending in Pulluvila.
- Claim Making Mechanisms - Institutional processes through which affected communities seek compensation for losses and damages.
- Coastal Erosion - The wearing away of coastal land by wave action, tidal currents and sea level rise. A major hazard in Kerala's shoreline.
- Debts and Loans - Borrowed funds from banks, microfinance institutions or informal moneylenders, often against collateral such as gold, to cope with loss of income.
- Direct Losses - Immediate, measurable economic damages (income loss, asset damage) caused by the MSC Elsa 3 incident.
- Indirect Losses - Secondary impacts such as time, effort and additional expenses for recovery, or market distrust affecting fish sales.
- Kudumbashree - Kerala's state led poverty eradication and women's empowerment program, offering microfinance, self help groups and limited livelihood alternatives.
- Livelihood Diversification - Shifting to or combining non-fishing income sources (e.g., tailoring, construction work, MGNREGA) to reduce vulnerability.
- Loss and Damage (L&D) - A framework (drawn also from climate change discourse) that distinguishes direct, indirect and non-economic impacts of disasters.
- Marine Ecosystem Disruption - Ecological disturbance to fish colonies, reefs and nearshore habitats due to pollutants such as nurdles, oil and hazardous cargo.
- MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) - Indian social protection scheme guaranteeing 100 days of wage employment for rural households.
- Mukkuva Community - Traditional fishing caste/community dominant in Kerala's coastal villages.
- Nurdles - Small plastic pellets used as raw material in manufacturing; when spilled, they pollute oceans, damage nets and disrupt fish breeding grounds.
- Panchayat - Elected local self-government institution in rural India. Karumkulam Panchayat governs Pulluvila.
- Resilience - The community's ability to adapt, reorganize and recover in the face of shocks such as the MSC Elsa 3 disaster.
- Secondary Losses - Non direct but significant burdens such as debt accumulation, education disruption, and psychological stress.
- Trawler Maintenance Cost - The recurring expense (Rs.7,000 - Rs.10,000 per trip) of operating mechanized fishing boats which increases under disrupted fishing conditions.
- Vizhinjam Port Project - A major infrastructure development near Thiruvananthapuram causing ecological disruptions (erosion, loss of reefs) and impacting fisheries.

STAKEHOLDERS' LIST

1. **Local / Community Level**
    a. Fishing households of Pulluvila - Directly dependent on fishing and vending, primary communities affected of the MSC Elsa 3 incident.
    b. Boat owners - small group anchoring the local fishing economy, employing crew members.
    c. Fish vendors (women) - Key actors in marketing catch in Thiruvananthapuram city disproportionately affected by market distrust.
    d. Youth and Migrant Workers - Some employed abroad (Gulf) or in informal local trades.
    e. Karumkulam Panchayat - Local governance body coordinating with communities and higher authorities.
    f. Self Help Groups (Kudumbashree Units) - Women led collectives providing limited income alternatives and credit.
    g. Ward Representatives and Volunteers - Facilitated surveys, coordination and community engagement.
2. **State / Regional Level**
    a. Kerala State Disaster Management Authority (KSDMA) - Lead agency documenting incident and risks.
    b. Department of Fisheries, Government of Kerala - Oversees livelihood protection, fishing bans and compensation.
    c. Vizhinjam Port Authorities - Indirectly implicated through cumulative ecological disruptions.
    d. State-level Environmental Groups - Advocacy and monitoring of ecological impacts.
3. **National Level**
    a. Ministry of Shipping / Directorate General of Shipping - Regulatory authority for maritime traffic and cargo safety.
    b. National Disaster Management Authority (NDMA) - Responsible for large-scale disaster protocols.
    c. Financial Institutions (Banks, NBFCs) - Credit providers to indebted fishing families.
4. **International Level**
    a. MSC (Mediterranean Shipping Company) - Operator/owner of MSC Elsa 3 vessel, responsible for cargo and incident liabilities.
    b. International Maritime Organization (IMO) - Oversees global maritime safety, hazardous cargo protocols, liability frameworks.
    c. Insurance Companies / P&I Clubs - Cover ship and cargo liabilities, potential compensation.
5. **Civil Society & Research**
    a. Greenpeace Team - Conducted ground-level field research and surveys.
    b. Academic Researchers & Universities - Provide critical studies on marine ecology and socio-economic resilience.
    c. NGOs and Cooperatives - Local fisher cooperatives, welfare societies and advocacy groups engaged in relief and resilience.

ANNEXURE I:
SURVEY QUESTIONNAIRES

Section 1: General information about the Family (All data is confidential)

Survey intent and informed consent: The purpose of this questionnaire is to gather information about the losses and damages experienced by the residents of karinkulam village, pulluvilla since the recent incident involving a ship accident off the Malabar coast, to the north of the village. All the information here will belong solely to the residents, and no names or personal details will be shared with any external party.

Signature of the respondent (After informed consent): _____

Basic profile of the household

1.1	House no (coordinated with map)	
1.2	City	Trivandrum
1.3	Name of the settlement	
1.4	Tenure status of the house	
1.5	Duration of stay in house (Yrs)	
1.6	Duration of stay in settlement (Yrs)	
1.7	Location of selected house:	☐ Near a water body ☐ Near a railway track ☐ Near a road ☐ Near a bridge ☐ Near a community toilet ☐ Near a school ☐ Near a drain channel ☐ Others (Please specify) _____
1.8	Type of house	Kutcha / Semi-pucca/Pucca

1.9	Phone Number of respondents	

2.1		Family members name (Including respondent)	Relationship With Respondent	Gender	Age	Occupation (Workplace Name, location, and commuting time)	Gross Income (Per day/Per Month)
	Family members* (Relationship, Age, occupation) **Enter for family members currently living in the dwelling including the respondent*						
2.2	Identity proofs	Aadhar card / Election card / Ration card / Electricity Bill / Property tax bills / Land Patta Others (Please specify) _____					

3.1	Number of earning members in the family	
3.2	Gross family income average (Per Month)	
3.3	**Total expenditure per month**	

3.4	Are you able to save any money per month? If yes, how much are you able to save? (At present, since the shipping incident?)	
3.5	Do you own a boat?	
3.6	What is the cost of the boat?	
3.7	What is the maintenance cost of the boat per trip?	
3.8	What are the costs associated with fishing nets? How many times a year do you purchase nets?	

Loss and damage

Economic loss and damage

4.1	How many Kotta of yield per day last year? (Average during the season may-june-july)	
4.2	Has there been any change in the kotta of yield per day since the shipping incident? If yes, what is your present yield?	
4.3		
4.4	Do you have an estimate of your income before the accident? (Average during the season may-june-july)	
4.5	Has there been any change in your income since the shipping incident? If yes, What is your current income?	
4.6		
4.7	If you have experienced income loss, how are you meeting your expenses at this point?	
4.8	If you have taken up loans, how are you repaying them?	
4.9	How many workdays have been lost due to the accident? How has that affected your income (Estimate)?	
4.10	Have You found any alternatives for your income?	
4.11	Have you changed your method of fishing in due to the shipping incident?	
4.12	Do you feel that the shipping accident has seriously affected your livelihood?	
4.13	What is the source of income for women? Do they engage in any work apart from selling fish?	

Health and treatment

5.1	Where do you get your drinkable water from?	
5.2	What do you feel about the quality of water?	
5.3	Have there been health issues directly related to the shipping incident?	
5.4	If yes, could you describe it?	
5.5	Are there costs associated with treatment?	
5.6	What was the cost you incurred for treatment?	
5.7	Do you have access to healthcare centers?	Public/Private/both
5.8	How far are they from your house?	
5.9	Have you experienced any issues in your life due to the plastic nurdles?	

Asset Loss

6.1	Has there been damage to your fishing equipment, such as the boats and nets? (due to the shipping incident, the containers etc.)	
6.2	What is the approximate monetary value of these damages?	
6.3	How much money have you spent on repairs and maintenance for your fishing equipment?	
6.4	What has been the process of clearing the plastic nurdles that have washed ashore? Has any external agency/institution been involved?	

Non-economic loss and damage and other reflections

7.1	Has the accident affected the education of children in your house? In terms of fees, transport etc.	
7.2	For similar accidents, or environmental challenges (Tsunami and the cyclone Ockhi) that have been faced in the past what have the effects been? What stresses and anxieties, if any, have been experienced?	
7.3	How have people been able to cope with the same?	

1. Details of the interaction

1.1	Date and Time of the group discussion	
1.2	Facilitators name	
1.3	Facilitators contact information	
1.4	Number of people in the interaction (F)	
1.5	Number of people in the interaction (M)	
1.6	Number of people in the interaction (NB)	

2. Details of the settlement

2.1	Ward number	
2.2	Area	
2.3	City	
2.4	Coordinates of the settlement	
2.5	Location of the settlement	Near a canal
		Near a sea
		Near a waterbody (Lake/pond)
		Near a railway track
		Sinking soil
		Near an open drain
		Near an industry/industrial area
		On an inclined slope
		Others:
2.6	Nature of land ownership of the settlement (Private/government) *Mention institutions if applicable*	
2.7	Percentage of ownership	
2.8	Legal status of the settlement	
2.9	Area in hectares (HA)	
2.10	Age of the settlement (Years)	
2.11	A brief history of the settlement	

3. Disasters and threats

3.1	Has the ward experienced any natural disasters in the past?	
3.2	Mark if applicable	Cyclones
		Flooding
		Landslides
		Tsunamis
		Earthquakes
		Coastal erosion
		Heavy winds
		Thunderstorms
		Others:
3.3	If yes, please provide details of when and how the ward was affected?	

4. Population and demographics

4.1	Total population (Approximate)	
4.2	Livelihood and occupation (F)	
4.3	Livelihood and occupation (M)	
4.4	Communities living in the settlement	
4.5	Average household size	

5. Dwelling units and structures

5.1	Total number of dwelling units in the ward		
5.2	Predominant ownership status of the dwellings (%)		
5.3	Legal documents available to the residents		
5.4	Amenities, conveniences and facilities	Anganwadi	
		Primary health care centre	
		Community centre	
		Community toilet	
		School	
		Temple	
		Mosque	
		Commercial shops	
		Others:	

6. Basic services and infrastructure

6.1	Primary source of water in the ward	Municipal water connection
		Borewell
		Water tanks
		Others:
6.2	What is the general impression of the water quality? (Public taps)	
6.3	Is there a record of water-related illnesses in the community?	
6.4	Access to sanitation	
6.5	Percentage of houses with individual toilets	
6.6	Have there been any outbreaks of sanitation related diseases? (Diarrhoea, Cholera etc.)	
6.7	Electricity connections in the settlement	Yes/No
6.8	Other notes	

7. Dwelling materials and construction details

7.1	Materials generally used for the construction of roofs	
7.2	Materials generally used for the construction of floors	
7.3	Materials generally used for structures	
7.4	Materials generally used for the walls	

8. Community organisation

8.1	Are there community-based groups/organisations/federations active in the area?	
8.2	Overview of the activities undertaken	
8.3	Local NGOS working with the settlement (And their activities)	

9. Health, illness and access to healthcare

9.1	Disease occurrence in the community	
9.2	Perceptions of frequency of occurrence, which diseases are the most prevalent?	

9.3	In the view of the residents, what are the underlying environmental/climatic reasons for these ailments?	
9.4	Access to Public health centres	
9.5	Access to private clinics	
9.6	Access to hospitals	

WARD LEVEL REFLECTIONS ON THE SHIPPING INCIDENT, LOSS AND DAMAGE

ANNEXURE II:
TABLES ON SURVEY FINDINGS

a. Demographic and socio-economic profiles
b. Loss and Damage assessment

a: Demographic and Socio-economic profile

Table 1: Demographic & socio-economic Profile of Karumkulam Gram Panchayat

Sr. no.	Category	Total	Males	Females
1	Total Population	27,481	13,506	13,975
2	Sex Ratio (Females/Male)	1.03	-	-
3	Literacy Rate (%)	79.55%	80.10%	79.03%
4	State Literacy Rate (Kerala)	94%	-	-
5	Total Workers	11,576	7,181	4,395
6	Main Workers	7,576	-	-
7	Marginal Workers	4,000	-	-
8	Work Participation (%)	100%	62%	38%

Table 2: Demographic and socio-economic profile, Pulluvila Fishing village, Based on survey findings

Sr. no.	Ward number	Dwelling units	Population	Household size average	Livelihoods (F)	Livelihoods (M)
1	1	502	2500	5	Fish trade (related activities)	Fishing
2	7	451	1660	3.7	Fish Trade, MGNREGA	Fishing, Daily wage labour
3	9	401	1620	4	Fish trade (related activities)	Fishing
4	10	456	2600	5.7	Fish Trade, MGNREGA, tailoring	Fishing
5	11	254	1850	7.3	Fish Trade, MGNREGA	Fishing
6	12	229	1366	6	Fish Trade, Tailoring, MGNREGA, Sales girl	Fishing, Driver, Painting

Sr. no.	Ward number	Dwelling units	Population	Household size average	Livelihoods (F)	Livelihoods (M)
7	13	282	1631	5.8	MGNREGA, Fish Trade, Tailoring, Fish Drying, Sewa	Fishing (90%), Auto, Government (1%), Gulf (4%)
8	14	400	1200	3	Fish Trade, Loading and Unloading work, MGNREGA, Daily wage labour, House Keeping	Fishing, Daily wage labour, Auto drivers, Working abroad
9	15	530	4300	8.1	Fish Trade	Fisherman, Fish Vending
10	16	550	2500	4.5	MGNREGA, Fish Trade, Tailoring, Sales girls, Self-employed	Fishing, daily wage labour
11	17	375	3000	8	Fish trade, Fish-drying, Self-business, MGNREGA	Fishing, daily wage labour, Working abroad
12	18	347	2750	7.9	Kudambashri, marketing, fish-drying, tailoring, (MGNREGA-not active),	Marine work, Auto and other work
		Approximate total no. of households	**Approximate total population**	**Average household size**		
		4777	**26977**	**5.6**		

Table 3: Nature of engagement with the fishing trade

Sr. no.	Nature of engagement with the fishing trade	Percentage
1	**Boat owners**	15 (5.7%)
2	**Workers and traders**	247 (94.3%)

Table 4: Savings during the Fishing season, May-June 2025

Sr. no.	Parameter	Percentage
1	**Yes**	2 (0.7%)
2	**No**	236 (82.5%)
3	**Did not respond**	48 (16.8%)

a: Loss and damage assessment

Table 1: Impact of the shipping incident on Family income

Sr. no.	Impact: Has the shipping incident resulted in a reduction in income?	n=262	
1	Yes, our income has reduced since the Shipping incident	240	91.60%
2	No, our income has not reduced since the incident	22	8.40%

Table 2: Impact of the shipping incident on Family income

Sr. no.	Impact on fishing methods: Have they changed since the accident?	n=262	
1	Yes	186	71%
2	No	76	29%

Table 3: Access to credit to cope with the income loss

Sr. no.	What has been the nature of your access to credit given the income loss?	n=286	
1	Borrowed money from formal financial and microfinance institutions	197	68.90%
2	Hand loans from acquaintances, neighbours, or family members	70	24.50%
3	No comment	19	6.60%

Table 4: Alternatives to income sources given the impact to fishing activities

Sr. no.	Have you found alternatives to your income sources since the shipping incident?	n=286	
1	No, we have not been able to find other sources of income	172	60.10%
2	Yes, we are engaged in MGNREGA	22	7.70%
3	Yes, we are engaged in miscellaneous work, such as daily wage, part time work etc.	85	29.70%
4	No response	9	2.50%

GREENPEACE
ग्रीनपीस

Greenpeace India is an independent campaigning organization that acts to change attitudes and behaviour, to protect and conserve the environment and to promote peace.

Greenpeace India Society
#142 Ground floor , 2nd Main, 2nd Cross,
Domlur 2nd stage, Bangalore 560038

Supporter Services:
supporter.services.in@greenpeace.org

www.greenpeace.org/india