Assessing and Managing Loss and Damage

Local-level evidence to inform global-level action in Gujarat, India



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PART I-B | Stakeholder Engagement Report

Partner:

UNEP - Copenhagen Climate Centre (CCC)

Report submitted by:

ICLEI South Asia in partnership with Transitions Research and GIDR

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Disclaimer

This document includes findings from the review of policies and plans at the National, State, and City level, largely based on the secondary background research conducted to arrive at the policy landscape that governs the loss and damage assessment in the cities of Ahmedabad and Surat, Gujarat, India and may require detailing as per the dedicated studies in the subsequent phases of the project.

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Introduction

Stakeholder Engagement Overview

The stakeholder engagement report is in continuation to the Assessing and Managing Loss and Damage (Deliverable 1), to validate and ground truthing of the findings from secondary studies and literature reviews comprising the Work package 1. The intent of this exercise is to gather community insights on climate change impacts in Ahmedabad and Surat through Household surveys (HH), Focus Group Discussions (FGDs), workshops with Community Based Organizations (CBOs), government departments and In-depth Interviews (IDIs) with government authorities and parastatals focusing on contextual risks, vulnerabilities, and specific community losses and damages.

The study has focused on 06 vulnerable areas in Ahmedabad and 07 areas including coastal communities Surat where communities are exposed to climate impacts. The areas in both cities have been selected based on their exposure to climate risks such as extreme heat, urban flooding and inadequate infrastructure, identifying them as high-risk zones, where the impacts of climate change have been most acutely felt by local communities.

The intent is to collect comprehensive contextual information regarding climate-related losses faced by the communities, and how the city manages the damage and loss. The study to dive deeper into case studies and nuanced understanding of the community, while the government officials to be able to give a more programmatic city-level gauge of how loss and damage is assessed and managed officially.

Collectively, the aim is to identify context-specific aspects of loss and damage within the city, assess their current management practices with city officials, and explore gaps and opportunities to develop a loss and damage (L&D) assessment framework at the city level.

Objectives:

- To comprehend community views on the effects of climate change.
- To validate city specific losses and damages through stakeholder consultations.
- To explore the complexities of non-economic losses and damages incurred by communities due to climate change within the cities.
- Identify the existing institutional gaps in assessing the ELD and NELD.
- Community and departmental insights to guide the city level loss and damage framework and aide in developing the methodology.

Methodology for Assessment

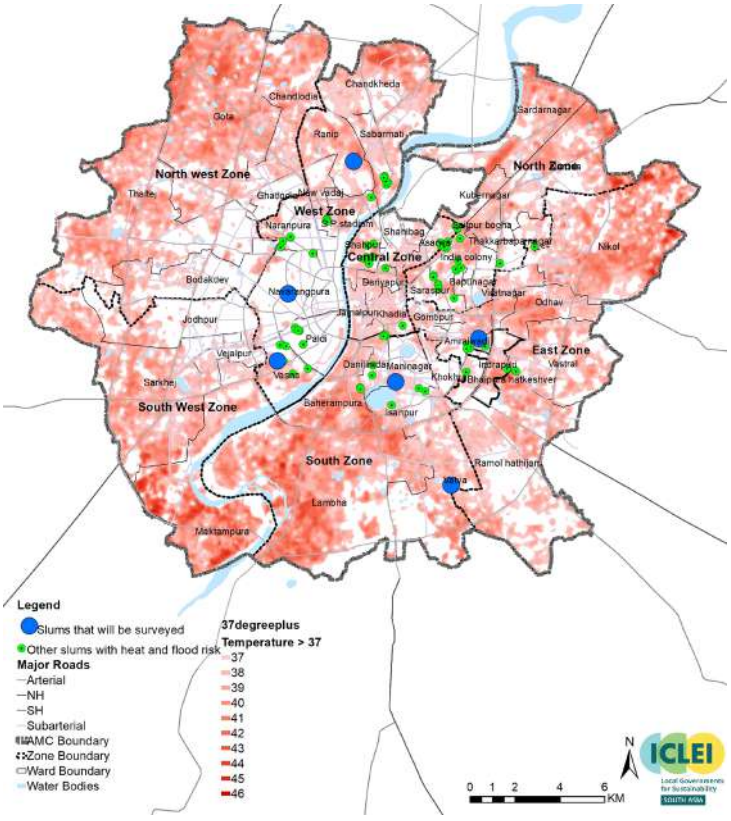
Representative Sampling Approach	**1. Climate Hotspots Identification:** Selection of areas prone to extreme heat, urban flooding, drought, creek flooding and sea-level rise.	Location Finalization: Locations short-listed and shared below.
	2. Geographical Diversity (Different Hotspot locations cover the MC wards and localities) to capture varied climate vulnerabilities.	Community Socio-Economic status/ location
	3. Socio- Economic representation (Migrant population, Different livelihoods practices, Cultural practices etc)	
Research Design	A Mixed Approach **1. Quantitative:** Household surveys; Secondary Data; IDIs with AMC/SMC and other departments' officials (i.e. Disaster, Fire, Health, ICDS etc); NGO and CBOs representatives	Household Survey Instrument is prepared FGD Questionnaire is prepared
	2. Qualitative: FGDs for comprehensive insights; Case stories etc	
Data Collection	Total Sample Size: 180-200 Households per city	Per Location: • At least 15 Households in Survey • 2 FGDs/ location with different gender/age/livelihood group • Total Coverage: (35-40 Households) Total Coverage: 180-200 per city
	• **Household Surveys:** Stratified random sampling to ensure representation of different household types (women-headed, migrant families, low-income workers, different livelihoods etc).	
	• **FGDs:** At least 2 FGDs per location (8-12 participants per FGD); Covering different gender and age groups (ensuring Youth, Elderly, Women participation)	
	• **Data Collection methods:** Instruments prepared (Manual+ Google form for Households); Notes, Audio Recordings of FGDs etc	
	IDIs with: • MC Departments/Units (Health, Education, Engineering,community, city planning, etc) • Govt. Departments (Fire, Disaster, IMD,Smart city, school board, etc) • NGOs/ CBOs (i.e. GujAid, MHT, Saath charitable trust, Paryavaran mitra, Nature Club, UHCRCE)	At least 3-5 IDIs/KIIs/ City
Ethical Consideration	• Informed consent from participants. • Anonymity and confidentiality maintained. • Avoid Culturally sensitive questioning and non-intrusive discussions.	

1.1 Ahmedabad Stakeholder Outreach

To assess the localized impacts of climate change and the adaptive capacities of vulnerable communities in Ahmedabad, a multi-tiered stakeholder engagement was conducted. The outreach focused on neighbourhoods exposed to urban flooding, heat stress, and capturing voices from informal settlements, daily wage workers, and marginalized populations across six wards in the East, South, New West, and West zones.

The process included household surveys, focus group discussions (FGDs), community storytelling, and participatory workshops with community based organizations and government representatives. The aim was to understand the lived experiences of climate stress, identify gaps in service delivery, that lead to economic and non-economic losses and damages.

The map and table below provide an overview of the surveyed locations, their socio-economic profiles, and key climate vulnerability indicators.



Map 1. Locations of the vulnerable communities in Ahmedabad with LST and flooding overlay.

S. No	Zone	Ward Name
1	East	Amaraiwadi
2	New West	Ranip
3	South	Vatva
4	South	Maninagar
5	West	Navrangpura
6	West	Vasana

Table 1. Profile of the surveyed locations in Ahmedabad

Stakeholder engagement outreach

- Identified vulnerable locations - **06**
- Household surveys - **57**
- Focus Group Discussions with Community - **138** (106 Female, 25 Men and 04 children)
- Workshop with CBOs/NGOs - **32 representatives** from **27 CBOs** in Ahmedabad
- Workshop with Government department stakeholders - **12 representatives** from 11 key departments of Ahmedabad Municipal Corporation
- Community Stories - **04**
- In-depth Interview - **01** (District Project Officer (DPO))

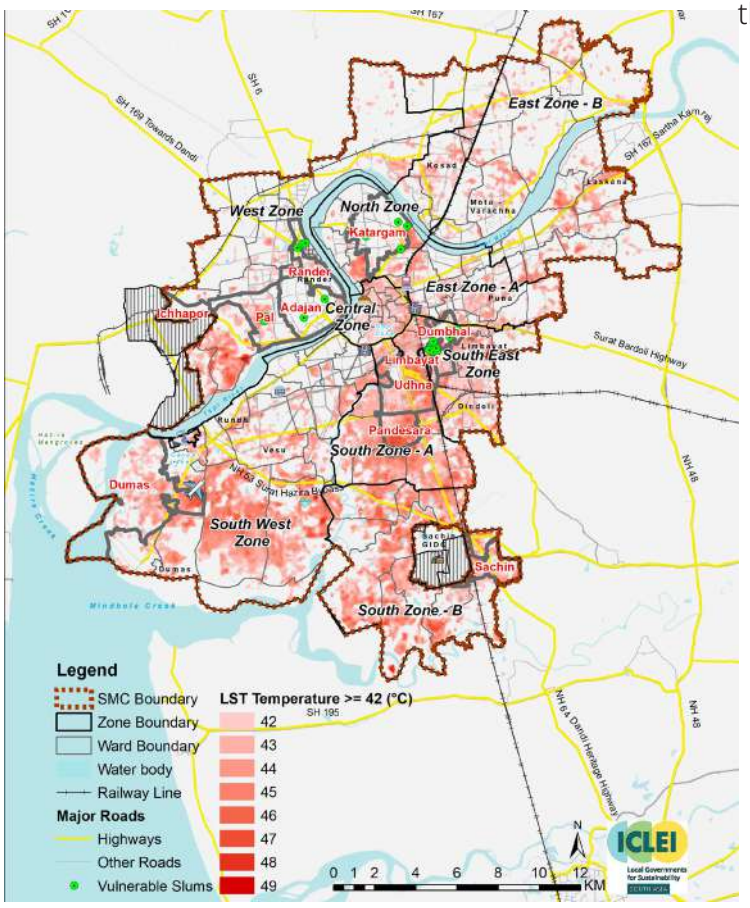
Location Name	Total Household	Total Population	Rationale	Socio- Economic Status/ Major Livelihood Status
Champa Ben Ni Chali	85	442	Vulnerable to urban flood and heat.	Daily wage workers, industrial workers
New Premnagar& Bakaramandi	1247	6484	Vulnerable to urban flood and heat, proximity to stream.	Vending activities, Scrap collection, daily wage workers
Navapura	55	286	Vulnerable to urban flood and heat, proximity to stream.	Industrial workers
Sindhi Camp	57	296	Vulnerable to urban flood and heat, proximity to stream.	Vending activities, casual labourers, construction workers
Gulbai tekra na chapra	2500	13000	Vulnerable to urban heat	Sculpture artists
Rabari wado	31	161	Vulnerable to urban flood and heat, proximity to stream.	Casual labourers, vending activities

1.2 Surat Stakeholder Outreach

To understand the climate vulnerabilities and lived experiences of communities for assessing loss and damage in Surat, a comprehensive stakeholder outreach was undertaken. This included engagement with diverse groups across seven vulnerable locations in six wards spanning North, West, South-A, and South-East zones of the city. These areas were selected based on their exposure to urban flooding and extreme heat.

The outreach focused on capturing local voices, identifying community-specific challenges, and gathering insights on coping mechanisms related to extreme weather events. The process included household surveys, focus group discussions with adolescents, students, dropouts, informal workers, and frontline staff, as well as workshops with community-based organizations (CBOs) and interactions with government officials.

The following table and map provide an overview of the surveyed locations, their socio-economic profiles, and the rationale behind their selection.



Map 2. Locations of the vulnerable communities in Surat with LST and flooding overlay.

S. No	Zone	Ward Name & No.
1	North	Katargam (42)
2	West	Rander (26)
3	West	Pal (67)
4	South-A	Udhna (56)
5	South East	Limbayat (51)
6	South East	Dumbhal (49)

Table 2. Profile of the surveyed locations in Surat

Stakeholder engagement outreach

- Identified vulnerable locations - **07** (in 6 wards)
- Household surveys - **63**
- Focus Group Discussions with Community - **267** (129 Female, 13 Men, 94 adolescents, 34 students, 60 drop outs and 31 frontline workers)
- Workshop with CBOs - **17 representatives** from **8 CBOs**
- Community Stories - **04**
- In-depth Interview Government department stakeholders- **05** (Chief Fire Officer (SMC), Deputy Fire Officer (SMC), Project Officer (GSDMA), District Project Officer (GSDMA), Deputy Mamlatdar (Disaster))

Location Name	Total Household	Total Population	Rationale	Socio- Economic Status/ Major Livelihood Status
Varigruh,Katargam (Pala Wali Jagya)	350	1750	Vulnerable to urban flood + heat, proximity to river, water body	Diamond workers, House help etc.
Golwad (Goyalawad) Near Hanuman TekriMora Bhagal	65	325	Vulnerable to urban flood + heat, proximity to river, water body	Daily wage, House helps, Street vendors etc.
Goya Faliyu, Jalaram Mandir, Pal Village	54	270	Vulnerable to urban flood + heat	Daily wage, House helps, Street vendors etc.
Indira Nagar Vasahat	572	2860	Vulnerable to urban flood + heat	Industrial Workers
Fulwadi,Imran Hotel Road	1200	6000	Vulnerable to urban flood + heat, proximity to river, water body	Textile Workers
Halpati Nagar,Parvat Patiya	200	1000	Vulnerable to urban flood + heat, proximity to river, water body	Industrial Workers

2. Community Engagement

2.1 Ahmedabad

2.1.1 Household Survey Analysis

The household survey was conducted to understand how climate change, specifically urban flooding and extreme heat, impacts vulnerable urban communities, aiming to identify community needs, vulnerabilities, and adaptive capacities to inform a city-level loss and damage methodological framework. In Ahmedabad, 57 households across six locations were surveyed, representing diverse socio-economic groups such as daily wage earners, textile workers, house helps, industrial workers, construction workers, vendors, Anganwadi and ASHA workers. These locations were strategically chosen based on the Ahmedabad Net-Zero Climate Resilient City Action Plan, which identified areas highly vulnerable to urban heat and flooding, particularly those near the river or low lying areas, thereby increasing their exposure to climate risks. The questionnaire gathered extensive data under five sections comprising demographic information, climate change awareness, economic and non-economic impacts (e.g., health, income loss, property damage, WASH, education), social disruptions, and existing coping mechanisms and support systems.

	HH Female	HH Male
Gulbai Tekra	6	2
Vasna	9	3
Ranip	4	3
Vatva	8	1
Maninagar	11	1
Ambraiwadi	6	3
NGO- Chetna/Others	0	1
TOTAL	**44**	**14**

Table 3. Gender-wise Distribution of Household Survey Respondents Across Locations in Ahmedabad

Household survey questionnaire categories

- Demographic Data
- Awareness and Perception of Climate Change/Economic Effects
- Non-Economic Effects (Health and nutrition, Safety, WASH and Education)
- Social and Cultural Impacts
- Coping Mechanisms and Support

Note: The detailed questionnaire format is provided in the Annexure I.

Demographic Profile

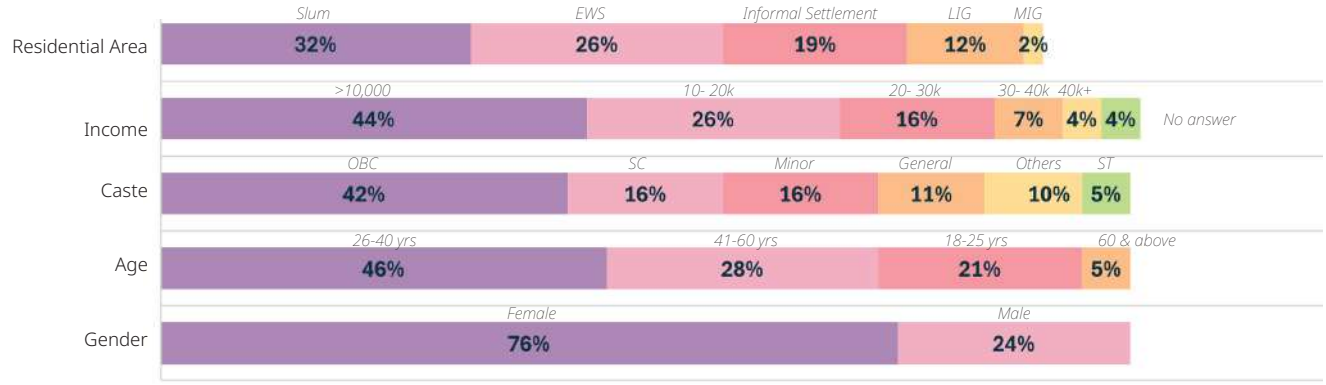


Fig 1. Demographic Distribution of Survey Respondents by Residential Area, Income, Caste, Age, and Gender in Ahmedabad

Climate Awareness and perceived impact on livelihood, income and expenses

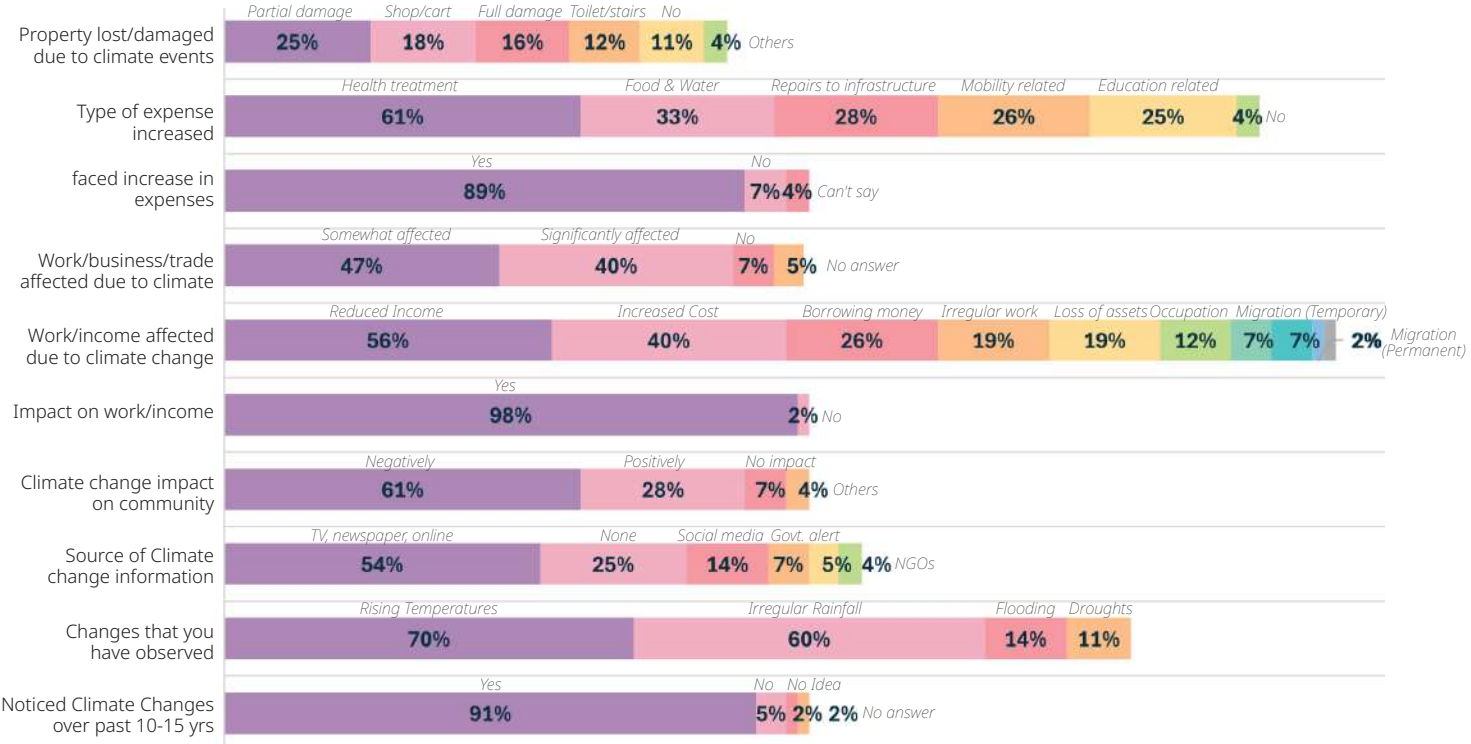


Fig 2. Community insights on climate awareness, observed changes, and effects on livelihoods and expenses in Ahmedabad

Economic Impacts

The respondents revealed a high degree of perception and lived experience of climate change, with 91% of respondents acknowledging shifts over the past 10 -15 years most notably rising temperatures (70%) and irregular rainfall (60%). Despite this awareness, 25% of the population lacks access to any climate-related information, underscoring a significant communication gap. Most of the information is received through traditional sources like TV and newspapers (54%), while social media, local alerts, and NGOs remain underutilized. The impacts of climate change are being acutely felt across communities, with 61% reporting negative effects and 98% experiencing disruptions in income or work. Reduced income (56%) and rising living costs (40%) have pushed many into financial distress, evidenced by coping mechanisms such as borrowing (26%), taking up irregular work (19%), and even migration (7%). Small businesses have also suffered, with 47% stating significant climate-related setbacks (fig-2).

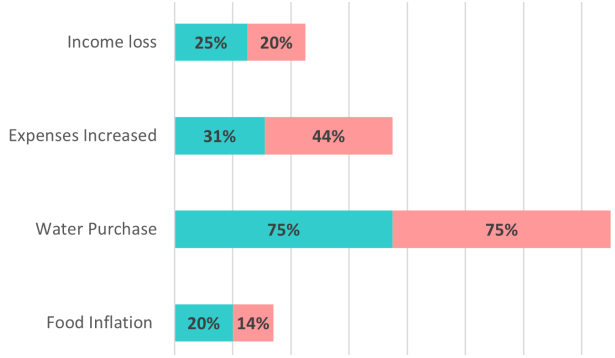


Fig 3. Climate change impacts on economic domains in Ahmedabad

Nearly nine in ten respondents reported increased expenses due to extreme weather, particularly in healthcare (61%), food and water (33%), and home repairs (28%). Property damage was also prevalent, with 25% reporting partially damaged homes and 18% affected vending spaces (fig-2). These findings point to the deepening socio-economic vulnerabilities of urban low-income populations due to climate stressors, highlighting an urgent need for robust adaptation planning and targeted awareness strategies to build resilience in high-risk communities.

This surveys provided insights which is represented through the horizontal stacked bar chart (fig-3) show the percentage impact of heat and flood conditions on four economic indicators: income loss, expense increase, food inflation, and house repair. The increased expenditure rise is compared for average household expenses during normal, heat, and flood months across three categories: electricity bills, health expenses, and food costs.

Among the categories, food inflation and

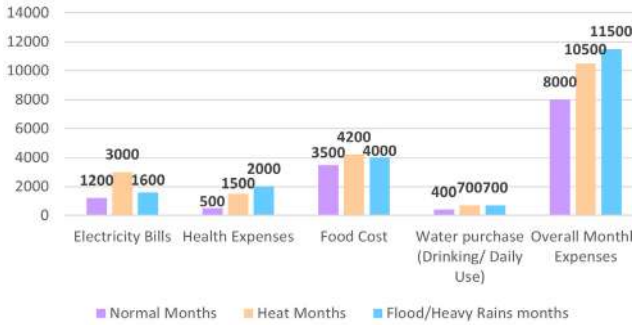


Fig 4. Monthly expenditure rise during heat and flood Household average (INR)

Note: The underlying data for figures 3&4 is available in Annexure VI.

Category	Ahmedabad Findings
Income Disruption	75%+ families reported lost workdays due to heat/flood.
Health- related expenses	Spikes in fever, dehydration, vector diseases, especially in children.
	Leads to 30–45% increase in monthly medical costs.
Electricity bills	Up to INR 3000/month due to use of coolers/fans even in winters.
Food Inflation	Supply chain disrupted during floods
	Spoilage due to heat
	Steep rise in fruit/vegetable costs.
Home Repairs	Dampness, sewage overflow, repainting due to floods
	Significant recurring expense.
Borrowing due to L&D	Many households borrowed at high interest to manage climate- related losses (repair, food, medical).
Income Loss – Vendors	Heat cuts afternoon street sales, spoilage of perishable goods.
Economic Loss to Women	Missed wages due to time spent on cleaning, caregiving, water management.
Migration- linked exclusion	Migrant workers don't receive full state benefits (PDS, cash transfers), worsening economic stress.

Table 4. Direct Impacts on Household Income & Expenditure in Ahmedabad

increased expenses emerged as the most reported consequences of both hazards (fig-4). Heat was associated with a slightly higher share of households reporting increased overall expenses, likely reflecting the rising electricity costs, healthcare, and other daily needs during extreme heat events. In contrast, floods were perceived to have a more significant effect on food prices, possibly due to disruptions in food supply chains, transport routes, and local market systems following flood events, resulting in temporary scarcity and inflated prices.

Income Impact	Heat	Flood
Monthly cost Increase	43%	29%
Income Disruption	73%	61%

Gaps Identified:

- Reliance on informal loans
- Minimal insurance coverage
- Migrants excluded from schemes
- Poor coverage of formal social protection
- High utility (Specially Electricity) and medical bills
- Vendor income loss, absenteeism

Non-economic Impacts

i) Health and Nutrition

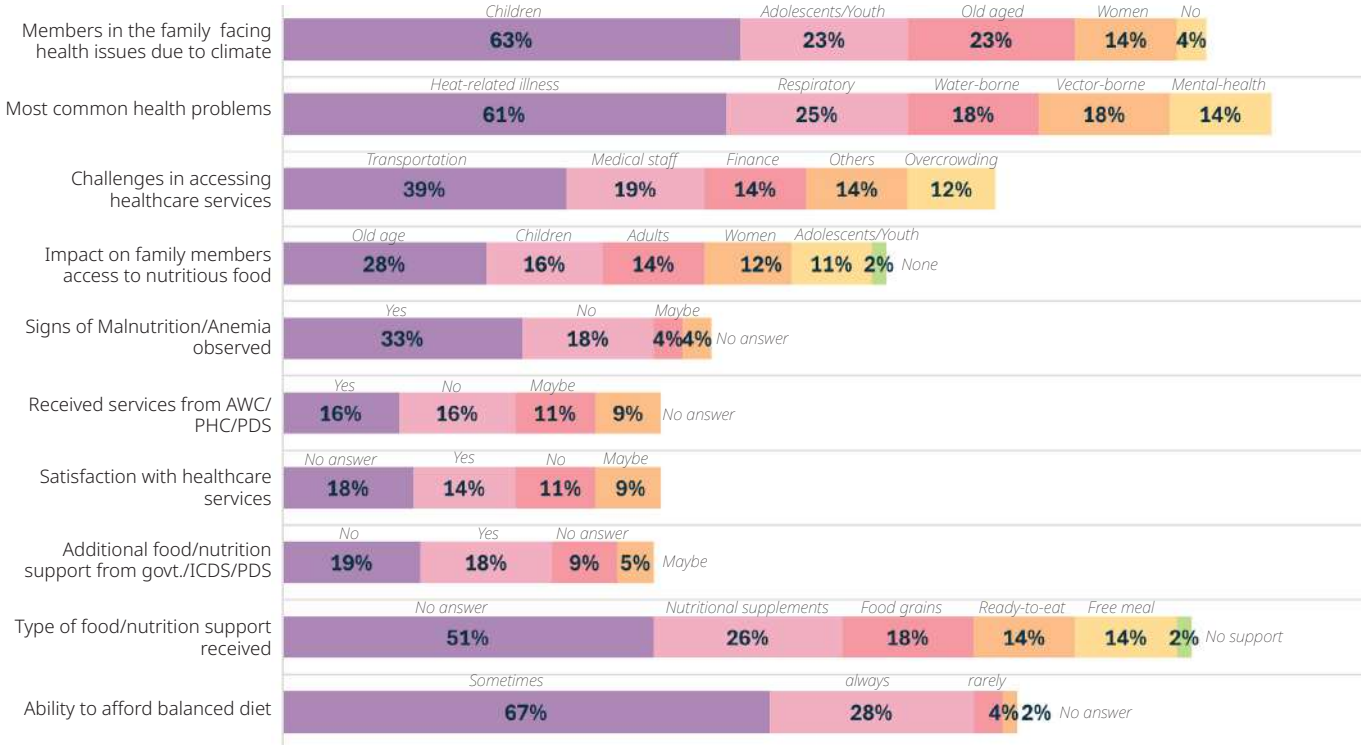


Fig 5. Health and Nutrition impacts on households in Ahmedabad

In the six surveyed communities of Ahmedabad, the compounded effects of urban flooding and extreme heat have intensified health-related vulnerabilities, especially among low-income groups. A striking 63% of respondents identified children and the elderly as the most affected by climate-health impacts. In comparison, 61% reported a higher prevalence of heat-related illnesses, as well as common health issues such as heat stress, waterborne diseases, and respiratory conditions. However, access to appropriate healthcare remains a challenge, 39% faced difficulties in reaching health facilities, with barriers including distance, cost, and service availability (fig-5).

Elderly population faces higher difficulty in access to nutritious food (28%). In the sample survey, 33% agreed exhibiting signs of malnutrition or anemia, particularly among children. Despite these challenges, service outreach remains limited, with only 16% of individuals receiving support from Anganwadi Centres (AWC), Primary Health Centres (PHC), or the Public Distribution System (PDS), and satisfaction with these services is similarly low at 18%. Food support coverage was sparse (19%), and among those who received it, over half (51%) received only basic rations, such as rice or wheat, indicating limited nutritional value (fig-5).

Notably, 67% of respondents stated that most of the times they could not afford a balanced diet, underscoring the financial strains. These findings reflect a deepening cycle of vulnerability, where climate stressors not only exacerbate health risks but also erode household resilience

Issue	Status
Transport to Health Centers	Costly during floods (INR 500–700); Hard for poor
Availability vs Affordability	Private hospitals preferred (good care) but unaffordable.
Medicines	Free medicines in Gujarat often not available. Respondents cite doctors prescribe expensive healthcare options and medicines.
Insurance	Only 5% have health insurance.
Anganwadi/School meal interruption	Heat/flood closes centers; nutrition cut off.
Access Bias Allegations	Some women allege bias in food distribution.
PDS Grain Quality	BPL respondents say wheat is low quality but no choice.
Rising prices	Heat & flood disturb supply Veg, pulses, eggs unaffordable

Table 6. Accessibility challenges related to healthcare, nutrition, and food availability during climate events

and well-being.

Mental health is also emerging as a growing concern across all respondent groups. About 14% reported symptoms related to anxiety, chronic stress, and psychological fatigue; often linked to displacement, economic uncertainty, caregiving burdens, and disruptions to daily routines (fig-5).

During extreme weather, these shortages are compounded by disrupted supply chains and mobility limitations, increasing the risk of infections, skin irritation, and poor menstrual hygiene management. These issues were especially pronounced among adolescent girls, elderly women, and individuals with special health needs.

These burdens are disproportionately carried by women and girls, who are typically responsible for managing household water needs. A stark 67% of respondents reported an increased caregiving burden towards children and elders due to climate impacts, primarily

Issue	Heat (%)	Flood (%)
Temperature related illness (fever, dizziness)	68%	20%
Dehydration / Diarrhea in children	52%	58%
Mosquito- borne diseases (Dengue/Malaria)	30%	65%
Food spoilage / insecurity	75%	60%
Reduced meal diversity	62%	55%
Anganwadi closures/loss of nutrition	48%	72%

Table 5. Comparative Impact of Heat and Flood on Health and Nutrition

falling on women and girls, reducing their time for education, rest, and income-generating activities.

Participants reported higher incidence of fever, dizziness (68%), food spoilage (75%), reduced availability of nutritional food (62%) due to extreme heat, and reported higher prevalence of vector-borne diseases like malaria and dengue (65%) during monsoon (table 5). These diseases at times increase the monthly expenses by 30% to 45% (table 4). During flood events, the cost of transport to health facilities can rise significantly, creating challenges for economically vulnerable populations. Although private hospitals are often sought for perceived quality of care, affordability remains a concern, and occasionally the unavailability of free medicines in government hospitals may result in prescriptions for higher-cost alternatives.

The survey also provided insights into the varied flood and heat related impacts on health and nutrition that are categorized in the table below.

Fever are common during heat, while diarrhea in children is slightly higher during floods. Vector-borne diseases like dengue and malaria spike during floods compared to heat. Food spoilage and insecurity concerns are more severe during heat. Anganwadi closures, during floods further disrupt access to child nutrition.

The community-reported systemic and access-related challenges faced during extreme climate events. These include access to healthcare becomes challenging, making it unaffordable for many. Communities often rely on private hospitals due to limited availability of free medicines. Heat and flood events also disrupt meal services at schools and Anganwadis. Food insecurity intensifies due to poor-quality PDS grains, rising prices, and perceived bias in distribution, particularly affecting women.

ii) Education

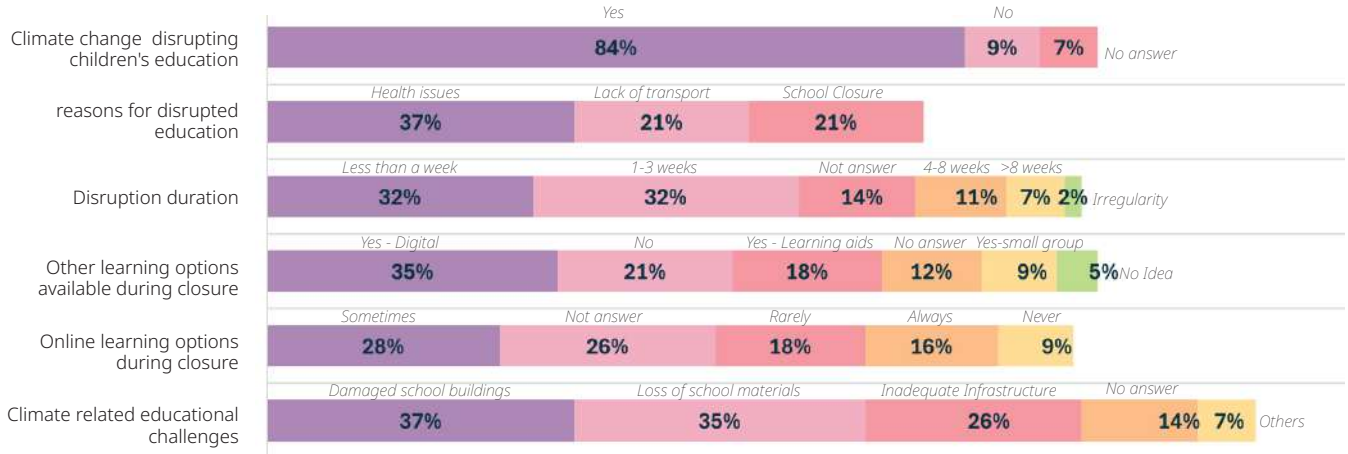


Fig 6. Climate Change impact on Education: Disruptions, duration, learning alternatives, and related challenges in Ahmedabad

In the six communities surveyed across Ahmedabad, the adverse impacts of urban flooding and extreme heat have significantly disrupted the educational continuity of children from vulnerable households. A staggering 84% of respondents reported that their children's education was affected by climate-related events. The primary reasons for this disruption included school closures due to flooding, unsafe travel conditions, and heat-related illnesses, with 37% attributing health reasons as the main reason for educational disruption (fig-6).

The duration of educational disruption varied, with 32% facing interruptions lasting less than a week and another 32% experiencing disruption of up to a few weeks. This prolonged instability severely hindered learning outcomes.

While some households attempted to bridge the gap through online learning, access remained uneven only 35% reported availability of any online options during closures whereas 21% could not access digital learning platforms. Barriers such as a lack of devices, internet connectivity, and digital literacy were common.

Issue	Status
School closures	1–3 weeks closure in extreme heat/flood.
No online backup	No digital learning after COVID.
Infrastructure	Poor ventilation, no cooling – affects classroom focus.
Distance & Safety	Anganwadis/schools far; heat and waterlogging restrict access.
Social Pressure on Girls	Teenage girls drop out due to early marriage or safety concerns.

Table 7. Access and usage related gaps in education during climate events.

Moreover, Moreover, challenges extended beyond access to education that include the relevance and effectiveness of education infrastructure itself. Nearly 37% of respondents highlighted difficulties in school learning, citing issues due to damage caused to the school premises due to extreme weather events and another 26% respondents cited inadequate infrastructure as the reason behind hindrance to learning (fig-6) .

Poor water, sanitation, and hygiene (WASH) conditions in schools remain a barrier to regular attendance and safety. Adolescent girls face specific challenges in maintaining educational continuity, particularly during menstruation.

About 16% of households reported lack of access to sanitary pads in schools, 7% reported lack of clean drinking water, while 32% cited poor sanitation infrastructure (fig-8). Absence of clean toilets during school hours discourages girls from attending, especially during menstrual cycles.



Fig 7. Focus Group Discussion (FGD) at Vasna (ICLEISA, 2025)

iii) WASH

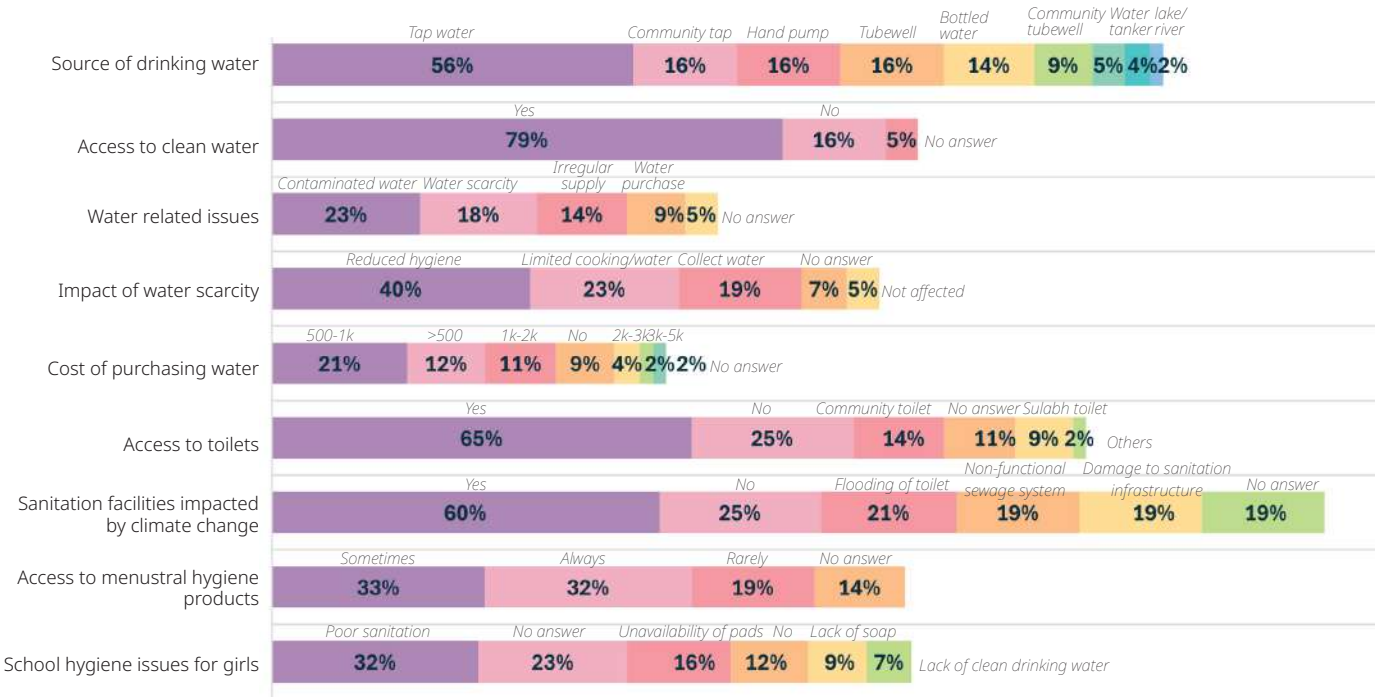


Fig 8. Water, Sanitation, and Hygiene (WASH) access issues and challenges in Ahmedabad

Urban flooding and extreme heat have significantly compromised water and sanitation infrastructure in the vulnerable settlements surveyed across Ahmedabad. The data highlights a sharp deterioration in access to safe drinking water and sanitation, with 16% attributing reduced access to clean water directly to climate impacts (fig-8). These stressors have intensified water-related issues and led to heightened perceptions of water scarcity for 18% of the respondents (fig-8).

Furthermore, 65% of households faced difficulties accessing toilets, while 60% observed that their sanitation systems were adversely affected by weather extremes, indicating poor basic infrastructure and sanitation facilities. The cascading effects are also evident in the increased cost burden of water purchase, reported by 21% of households, and the restricted availability of menstrual hygiene products (33%), which disproportionately affects women and adolescent girls. Nearly 32% of respondents also highlighted poor sanitation issues in schools, particularly for girls, due to inadequate facilities during extreme weather events.



Fig 9. Infrastructure services at Maninagar (ICLEISA, 2025)

iv) Safety and Protection

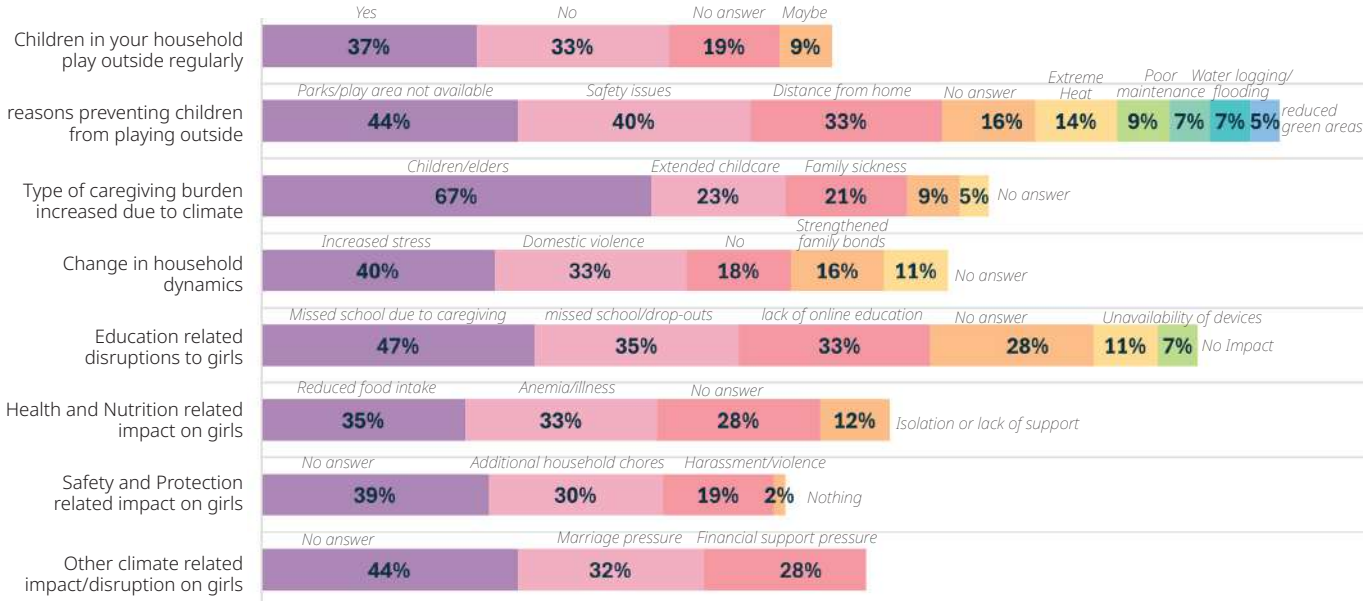


Fig 10. Safety, caregiving, and gendered impacts of climate change on children in Ahmedabad

Urban flooding and extreme heat are reshaping the social fabric, personal safety, and well-being of residents, especially women and children, as observed in the six surveyed locations.

A stark 67% of respondents reported an increased caregiving burden for children and elders due to climate impacts, primarily falling on women and girls, reducing their time for education, rest, and income-generating activities. Similarly, 40% noted disruptions in household dynamics, revealing how repeated climate events strain interpersonal relationships and family roles.

Children's well-being has also been affected as only 37% of households reported regular outdoor play, with 44% cited inaccessible play areas, and 21% attributed climate-related reasons, such as heat stress, waterlogging during monsoon (fig-10). These environmental constraints not only limit physical activity but also impact children's psychosocial development

Girls, in particular, face multidimensional vulnerabilities. 47% of respondents highlighted education setbacks due to caregiving responsibilities, 35% respondents noted dropping out of school or missing school days due to added responsibilities (fig-10). Additional adverse impacts include psychological stress, social restrictions, and diminished participation in community life.

These findings highlight that climate change is silently reshaping community life, amplifying gendered burdens, weakening social cohesion, and constraint children's development. These non-economic losses are being brought to the forefront through the urban informal settlements.

Social and Cultural Impacts

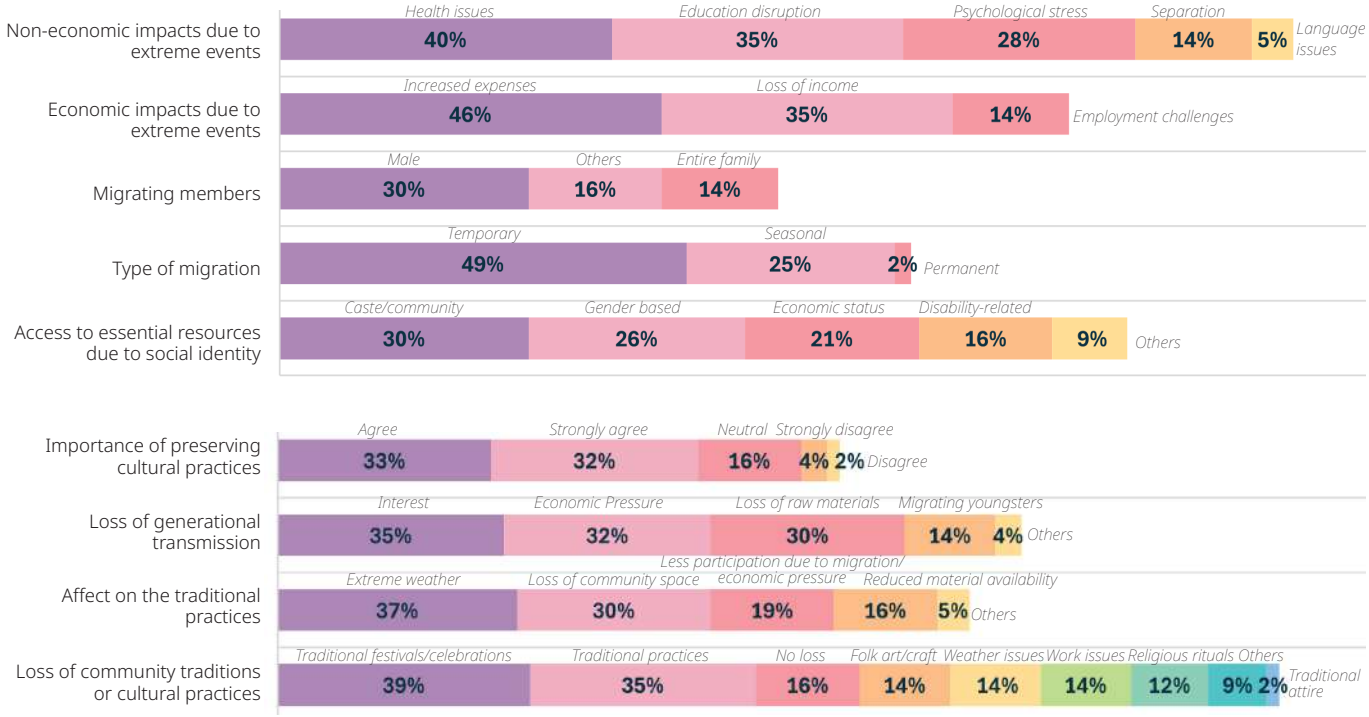


Fig 11. Social and Cultural impacts on community in Ahmedabad

Urban flooding and extreme heat are not only disrupting livelihoods and infrastructure in vulnerable communities of Ahmedabad but also silently eroding deep-rooted cultural and social identities. The findings reveals that 39% of respondents have experienced a loss of traditions or cultural practices due to climate change. In comparison, 37% observed that such disruptions were directly climate-induced, stemming from the cancellation of festivals, relocation, and changes in seasonal rhythms.

In addition to that, 35% reported a loss of interest in the generational transmission of cultural knowledge, indicating a break in how cultural wisdom, rituals, and customs are shared across age groups. This threatens to weaken intergenerational bonds and diminish community cohesion over time.

Despite these losses, the resilience of identity remains visible 33% of respondents emphasized the importance of preserving culture and tradition as vital to their sense of identity, underscoring a strong emotional and social need for cultural continuity.

These findings highlight that climate change is also a key factor for socio-cultural relationships of the communities, where the preservation of cultural heritage is crucial to ensure that social fabrics remain intact even as communities adapt to a changing environment.



Fig 12. Focus Group Discussion (FGD) at Maninagar (ICLEISA, 2025)

Coping mechanisms and support

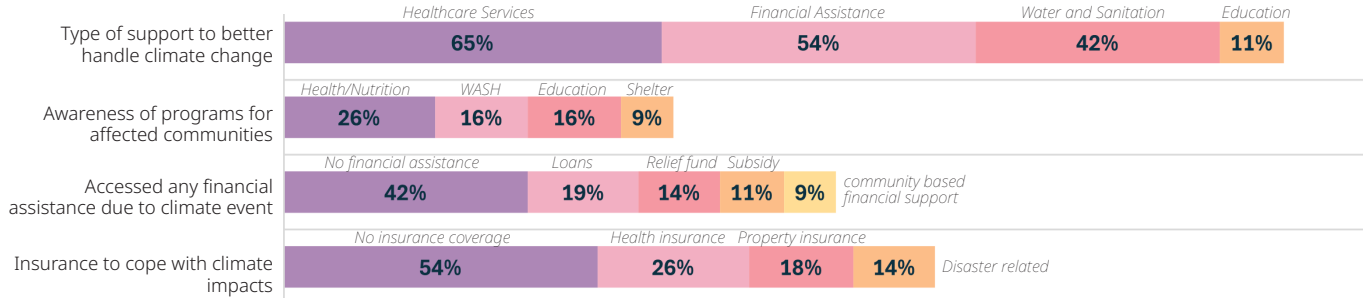


Fig 13. Community Access to Coping Mechanisms and Support Systems in Ahmedabad

The impacts of urban flooding and extreme heat have significantly strained the coping capacities of vulnerable communities in the six surveyed communities of Ahmedabad, exposing serious gaps in resilience support systems. A majority 54% of households lack any form of insurance coverage to mitigate climate-related losses, leaving them financially vulnerable during disasters.

Moreover, access to financial assistance remains limited, with 42% of respondents having not received any form of aid during climate events. Awareness of existing support mechanisms is equally low, just 26% of respondents are aware of government or NGO programs that assist health & nutrition services in climate-affected communities, highlighting a critical disconnect between vulnerable populations and institutional relief channels.

Despite this, there is a clear expression of need as 65% of the surveyed families indicated a strong demand for additional healthcare support to manage climate risks better. Additionally, they sought aid in financial assistance for livelihood upgradation (54%), WASH infrastructure improvements (42%), and education (11%).

Climate-induced events such as extreme heat and flooding have led to widespread economic disruptions, with 98% families reporting negative impact on work and income (fig-2). Health-related impacts, including increased cases of fever, dehydration, and vector-borne diseases particularly among children, have resulted in a 30–45% rise in monthly medical expenses. The use of cooling appliances, even during winter months, has pushed household electricity bills up to INR 3000-4000 per month. Food inflation is exacerbated by supply chain disruptions during floods and spoilage due to heat, causing steep increases in the prices of fruits and vegetables. Households also face recurring expenditures on home repairs, including repainting, managing sewage overflow, and addressing dampness.

To cope with these compounded losses and damages, many families resort to borrowing at high interest rates for essentials such as medical care, food, and home restoration. Street vendors experience reduced income as heat affects afternoon sales and spoils perishable goods, while women face economic setbacks due to missed wages from caregiving, cleaning, and water management duties. Migrant workers are further unfortunate, as they often lack access to state welfare benefits like PDS and cash transfers, intensifying their financial vulnerability.

The survey results highlight the need to strengthen localized coping mechanisms through inclusive insurance schemes, proactive financial support as vulnerable urban communities continue to face disproportionate risks with minimal resources to recover or adapt.

Note: The detailed questionnaire format is provided in the Annexure I.

2.1.2 Focus Group Discussions with Community

Overview

To build on the findings of the household survey and obtain richer qualitative perspectives, a focus group discussion (FGD) was conducted with community members who have experienced climate-related hardships. The debate aimed to explore their lived realities, coping mechanisms, and perspectives on the social, economic, non-economic, and cultural impacts of climate change. Participants represented a wide range of age groups, genders, and socio-economic statuses, providing a comprehensive view of community-level challenges and expectations.





Note: The detailed questionnaire format is provided in the Annexure II.

Community Outreach

Average Household Size:	05 to 06 members
Average Children:	01 to 02 (up to 15 Years)
Average breadwinner:	02

(Either Father and mother or Father and other male member)

Location Covered:	06
Total Women Participated:	106 *(20 to 65 years)*

(Including frontline workers)

Total Men Participated:	25 *(35 to 60 years)*
Total Children Participated:	04 *(12 to 16 years)*
TOTAL (in FGD):	**138**



Fig 14. Focus Group Discussion (FGD) at Ranip (fig-1&3) and Maninagar (fig-2) (ICLEISA, 2025)

FGDs with community | Economic Factors

1. Perceived Climate Changes and Their Impact on Daily Life, Work, and Travel (Past 10–15 Years)

- People unanimously agreed that Ahmedabad has become significantly hotter, with many now using fans even in December and January.
- The main reasons cited were reduced green cover, increased concrete surfaces, and limited access to green spaces.
- Rainfall has become more intense, overwhelming drainage systems and causing waterlogging, especially in Mani Nagar, Vasna, Vatva, and Ring Road. Gulbai Tekra residents said sudden downpours turn their area into muddy swamps.
- These changes have disrupted daily life, with poor and middle-class communities—especially daily wage workers—most affected by rising heat.
- The growing use of air conditioners in large homes was seen as worsening outdoor heat for others.
- Auto drivers, vendors, domestic workers, and labourers said recent years' extreme heat is unbearable, with more frequent heat-related illnesses.
- Women in Vasna noted poor drainage during sudden rains leads to dirty water flooding streets, increasing mosquito breeding and outbreaks of malaria and dengue.

2. Sources of Climate Information and Access to Early Warnings for Floods, Heatwaves, and Water Shortages

- Most respondents said there's no functional early warning system in the city, so they rely on newspapers and personal experience to prepare.
- Residents of Champaben ni Challi, Amraiwadi, noted that weather forecasts have become more accurate, prompting them to use plastic sheets to protect belongings in kutcha houses.
- Some also mentioned that social media influencers are helping raise awareness about changing weather, keeping communities informed.

	FGD-Female	FGD Male	FGD Children	With Service Providers
Gulbai Tekra	15	5	0	0
Vasna	15	5	2	0
Ranip	13	4	0	1
Vatva	20	0	0	0
Maninagar	24	5	1	1
Ambraiwadi	19	6	1	0
NGO	0	0	0	1
TOTAL	**106**	**25**	**4**	**3**

Table 8. Distribution of FGD respondents across locations in Ahmedabad

3. Impact of Climate Change on Livelihoods, Income, and Household Expenses Due to Extreme Weather Events

- Nearly all working respondents agreed that extreme weather has severely impacted their ability to work, citing heat-related fatigue, health issues, and caregiving burdens.
- Industrial area residents reported frequent work disruptions from heavy rains, worsened by unpaved, muddy roads.
- Over 75% said extreme weather strains their household budgets, especially due to rising transport and healthcare costs. Income losses from disrupted work, increased house repairs, medical bills, and electricity (averaging ₹3,000/month) added to the burden. Many households coped by borrowing money, cutting expenses, or shifting work hours.
- Respondents initially linked health issues to heat and mosquito-borne diseases but later acknowledged wider physical and mental health impacts. Overall, household expenses rose by 30–45% during extreme weather.
- Women said waterlogging escalates expenses, requiring 2–5 days to clean homes, often forcing them to miss work.
- Street vendors shared that extreme heat reduces afternoon sales and spoils produce, causing income loss. Vulnerable communities in Soni ni Khatra, Maninagar, reported that floods damage their ground-floor Zari textile workspaces.

4. Climate-Induced Migration and Its Effects on Family Income, Education, and Access to Services

- Most respondents had migrated to Ahmedabad in search of better employment opportunities. They stated that the city offers more job options, making them less likely to migrate again.
- For the majority of families, migration to Ahmedabad has taken place over the past one or two generations. As a result, there are no immediate, visible effects on children's education or health. However, since they come from different states, they experience significant challenges in adapting to the local language and culture.
- Respondents highlighted that the lack of a local identity card prevents them from accessing state government benefits such as free healthcare, free education, and schemes like "Direct Cash Transfer." This exclusion negatively impacts their overall quality of life.



Fig 15. Focus Group Discussion (FGD) at Vasna (ICLEISA, 2025)

5. Coping Strategies Adopted by Households to Deal with Extreme Weather Events

- Women from Maninagar, Gulbai Tekra, and Vasna shared that, with support from a local NGO, they painted tin roofs with white heat-resistant paint, slightly reducing indoor temperatures.
- Waterlogging forced some to relocate vulnerable family members or elevate furniture. Inadequate stormwater drainage led residents to open manholes, causing sewage backflow.
- Many women now start their day before sunrise to finish chores before work due to the heat.
- To prevent flooding, residents in Maninagar and Vatva have built 1–1.5-foot barriers at their doorways.
- Street vendors in Ranip continue working under extreme heat, covering their carts with plastic sheets for shade.
- A woman at a construction site shared concern about her child's suffering due to the heat and said no childcare was available, despite claims.
- Women in Champabai Ni Chali, Amraiwadi, save small amounts of money to use during extreme weather.
- Women in Maninagar said sudden waterlogging remains their biggest challenge, often forcing them to miss work.



Fig 16. Focus Group Discussion (FGD) at Vatva (ICLEISA, 2025)

6. Housing Damage from Extreme Weather Events and Coping Mechanisms Adopted by Households

- Respondents from Maninagar and Vasna reported that waterlogging leads to persistent dampness in their homes, damaging the paint and interior walls. Floodwater, often mixed with sewage, enters their homes, making everything dirty and unhygienic. As a result, families incur significant expenses on home repairs, damp treatment, repainting, and deep cleaning.
- The entire family is involved in the cleaning process, but this often forces them to take 2-3 days off from work, leading to financial burden on the earning member.

7. Household Emergency Measures During Extreme Weather Events

- The women with the help of an organization, have painted their tin roofs with white heat-resistant paint to reduce indoor temperatures.
- To prevent water from entering their homes during heavy rains, they have constructed small protective walls at the entryways.
- Due to financial constraints, they avoid purchasing green vegetables and fruits, as these have become too expensive.
- To cope with extreme temperatures, they complete their kitchen chores early in the morning, as standing near the stove later in the day becomes unbearable.
- During heat waves, they avoid sending small children to school or Anganwadi centers to protect them from excessive heat exposure.
- During extreme heat days, as a result of poor housing infrastructure the participants reported changing their sleep cycle as per the surrounding temperature.

FGDs with community | Non-Economic Factors

1. Health Issues Experienced by Family Members During or After Climatic Events

- Most respondents highlighted health issues caused by dehydration, including diarrhea in children, weakness, dizziness, irregular menstruation, increased physical and mental discomfort during menstruation, insomnia, and stress. They noted that working women and children were the most affected.
- Post-waterlogging conditions were a major concern, with respondents stating that mosquito-related issues worsen every year in their neighborhoods (especially Gulbai Tekra, Vasna, Vatva, and Amraiwadi). As a result, cases of dengue, malaria, and skin infections are common, with young children being the most vulnerable.
- Rising cases of persistent fever in children emerged as a primary concern among women during discussions.
- Women from Maninagar specifically mentioned stomach-related illnesses, including indigestion and abdominal pain, caused by contaminated water.
- Furthermore, limited access to menstrual hygiene products forced some women to use unhygienic alternatives.
- Smita Ben Bajpai, former director of Chetna NGO, emphasized that extreme weather events severely impact maternal healthcare. She highlighted that frequent illness among pregnant and lactating women negatively affects both their unborn and breastfeeding children.

2. Accessibility of Healthcare Facilities During Climatic Events

- The biggest challenge for residents was transporting sick individuals to nearby health centers, as most rely on private autos or taxis. Transport costs range from ₹500 to ₹700, adding to their financial burden. During waterlogging, the situation worsens as they must find hospitals that are not overcrowded and can provide immediate emergency care.
- Migrant families noted that while free medicines are available in neighboring Rajasthan, in Gujarat the scheme exists only on paper, forcing them to buy medicines. Hospitalization costs add further strain. High medicine costs were a common concern, with over half reporting that doctors often prescribe expensive branded drugs. Many also noted that medicine prices have doubled or tripled with the rise in extreme weather events.
- Across all locations, respondents were generally satisfied with the availability of doctors, staff behavior, and health center facilities, with no major complaints.
- Nearly half of middle-class respondents preferred private hospitals, praising Ahmedabad's strong private healthcare network and doctor commitment. However, only 5% had health insurance, while 95% reported having no coverage.

3. Impact of Climate Change on Household Access to Nutritious Food

- Frontline Anganwadi workers reported that anemia and malnutrition are most common among families that migrate during extreme weather. They continue working in harsh conditions, with construction workers especially women being worst affected.
- Extreme weather linked to rising inflation, noting that heatwaves and floods disrupt supply chains, especially for vegetables, to higher prices and lower quality.
- Women from Amraiwadi raised concerns about unannounced school and Anganwadi closures during extreme weather, which halt free nutrition programs and affect children's diets. Some also reported bias in food distribution by local Anganwadi staff.
- Household nutrition has worsened, with staples like mustard oil, pulses, vegetables, fruits, eggs, and meat becoming unaffordable. Some shared that mutton, once a staple, is now eaten only once a week.
- The absence of refrigerators worsens food insecurity in summer. Cooked food spoils quickly, so families often skip evening meals or rely on simple items like roti with pickle, sev, onion, chutney, or buttermilk.
- Women also expressed concern over children increasingly eating packaged snacks like chips and Kurkure, reducing their intake of nutritious food.

4. Decline in Food Diversity and Coping Strategies for Food Unavailability or High Costs

- According to a health worker, people's diets now consist mostly of carbohydrates, while protein and fat are disappearing. This shift has led to increased malnutrition and weakness, especially among children.
- Women also shared that they can no longer afford to give milk to their children regularly and are forced to substitute it with tea.
- Women from the Below Poverty Line (BPL) category expressed dissatisfaction with government-provided wheat, saying it often has a foul smell and is of poor quality. However, they have no choice but to consume it.
- During periods of crisis, women, especially mothers, resorted to reducing meal portions or skipping meals to ensure that other family members were fed.



Fig 17. Focus Group Discussion (FGD) at Gulbai Tekra (ICLEISA, 2025)

5. Gendered Challenges in Managing Household Food Shortages

- Women reported that earlier, they used to store wheat for the entire year and grind it at the local nearby chakki (wheat flour grinder shops) as needed. However, due to the risk of sudden waterlogging, they no longer purchase wheat in bulk to prevent spoilage. As a result, they are now forced to buy readymade flour from the market or purchase wheat in smaller quantities every month, leading to a 20-25% increase in costs.
- Women said that food shortages are common in extreme weather. One woman explained that a family of 5-6 people typically needs at least 750 gm to 1 kg of vegetables for one meal. However, during summers and floods, when the supply is disrupted, vegetable prices surge. In such situations, the entire family manages with just 250 grams of vegetables. Even then, tomatoes and onions, staple ingredients are used sparingly as they become too expensive.
- Women shared that men in the family must be given a full meal as they work outside in all seasons. After that, food is prioritized for the elderly and children. If vegetables run out, women often eat chapati with masala, pickle, namkeen, or buttermilk. They acknowledged that this leads to weakness and increases the risk of illness, but they have no other choice.

6. Impact of Poor Diet on Malnutrition and Anemia Among Women and Children

- Women acknowledged experiencing physical weakness, with nearly half of them specifically mentioning anemia during the FGD. They attributed anemia primarily to menstruation. While they were aware of the need for better nutrition for women, they admitted that extreme weather conditions, coupled with their multiple responsibilities, prevent them from prioritizing their health.
- Regarding child malnutrition, most respondents (50-60%) did not directly associate it with extreme weather. They believed that parental work commitments and a mother's weak health contribute more significantly to malnutrition in children.
- Anganwadi workers and ASHAs recognized the link between extreme weather and malnutrition. According to them, factors such as poor hygiene during extreme weather, reduced household food budgets, and limited access to Anganwadi services contribute to malnutrition among children.
- More than 50% of respondents said they received benefits in the form of food assistance from government schemes (PDS, ICDS, Midday Meals), while the rest said they did not.
- Parents whose children attend schools or Anganwadi centers expressed satisfaction with the quality of the midday meal and hot cooked nutrition provided there.

7. Impact of Climate Change on Access to Clean Drinking Water and Water-Related Health Issues

- More than 90% of respondents have taps installed in their homes, with water supply available for 1 hour daily.
- The remaining 10% depend on community taps for their water needs.
- Respondents from Gulbai Tekra, Vasna, Maninagar, and Ambraiwadi reported occasional sewerage odor in their water supply. Women from Maninagar and Ambraiwadi also mentioned that muddy water sometimes flows at the beginning of the supply. Most women stated that in such cases, they do not collect the water for drinking; instead, they allow it to flow directly into the drain. They begin storing drinking water only once they feel the water is clean and free of any odor. However, in certain circumstances, they use the contaminated water for other household purposes.
- Some respondents noted that this occasionally leads to stomach issues in children, with diarrhea and digestive problems being the most common complaints among adults.
- Despite these concerns, the majority of respondents did not directly associate water quality with diseases. They generally considered the water supply to be normal and did not report any major health issues linked to it.

8. Disruption of Children's Education Due to Climate Events

- Most parents shared that schools and Anganwadi centres shut during extreme heat without notice, disrupting learning and making it hard for children to re-engage with studies afterward.
- Even when open, poor ventilation and lack of cooling make it difficult for children to concentrate. Frequent illness during extreme weather adds to the disruption.
- Parents also worried about reduced outdoor play during heatwaves or floods, leading to more screen time and less physical activity. Poor street lighting further limits evening play.
- Schools often remain closed for 1 to 3 weeks during extreme weather. Teachers noted closures are decided by the district collector, typically only if citywide flooding occurs.



Fig 18. Focus Group Discussion (FGD) at Navrangpura (ICLEISA, 2025)

9. School Absenteeism Among Children Due to Household Responsibilities

- Respondents noted that older children often miss school to care for sick siblings. Women expressed concern that children of working parents grow up too soon, taking on household duties over education.
- Teenagers who dropped out said financial stress worsens during extreme weather, pushing them to support their families. Many gave up academic dreams for practical skills with long-term benefits.
- Women from Vasna /Gulbai Tekra, originally from Madhya Pradesh, and tribal regions of Rajasthan, shared that extreme weather leads to school dropouts among girls. In such cases, early marriage is seen as the easiest solution. Some felt instilling responsibility early made girls "mature and capable."

10. Safety and Protection related

- Girls shared feeling pressured to excel in studies, fearing dropout or early marriage, but extreme weather affects their focus.
- Waterlogging hampers bringing children to Anganwadi centres, with many suffering insect bites.
- While most adolescent girls denied facing violence during such times, older women expressed concern about their safety, noting that reduced supervision during extreme weather increases risks of sexual violence and manipulation.

11. Access to Online Learning and Impact of Climate-Related School Disruptions on Children's Education

- During Covid-19, learning was via mobile phones, but now school closures due to extreme weather offer no online alternatives.
- Over 60% of respondents own smartphones, mainly used by women for their children's studies, but most agreed studying at home during extreme weather is difficult.
- Class 5 onwards, many children need private tuition as parents struggle to support them.
- Government school infrastructure is ill-equipped for extreme weather and private schools remain unaffordable.

12. School Measures for Climate Protection and Preventing Disruptions in Children's Education

- Parents reported no awareness of government school measures for protecting children during extreme weather and admitted they haven't raised the issue with school staff.
- Women from Vatva and Maninagar suggested building government upper primary schools and Anganwadi centres in every locality to avoid long walks, as private options are unaffordable.
- Residents also noted the decline in roadside greenery, making it harder for children to walk home in the summer heat.
- Teachers and Anganwadi workers said they educate children about health and safety during extreme heat and now schedule sports during cooler hours, though such activities have reduced due to rising temperatures.

13. Cultural Impacts of Climate Change

- Most migrant families said they've learned Gujarati while living in Ahmedabad, but no longer speak their native dialects, leading to a sense of lost belonging. Men noted that many migrants still can't read or write Gujarati, creating challenges.
- Women shared that their children have lost connection to their original culture and languages, speaking only Gujarati now.
- Some mentioned a decline in social programs and rising costs for organizing community gatherings.
- Due to inflation and extreme heat, migrants now visit their native villages less often, usually just once a year for harvest or religious events and often send only a few family members to cut costs.



Fig 19. Focus Group Discussion (FGD) at Amraiwadi (ICLEISA, 2025)

14. Coping Mechanisms & Support Systems

- Over half the respondents from Vatva, Gulbai Tekra, Amraiwadi, and Maninagar were aware of government schemes like scholarships and construction worker benefits, but few accessed them due to complex paperwork and ID verification issues, especially for migrants.
- Migrant families from tribal areas emphasized the need for service providers to be more sensitive to linguistic, religious, and cultural diversity, particularly during extreme weather.
- Women in Amraiwadi rely on small self-help groups for savings, serving as a key financial safety net during disasters.
- Most respondents were unaware of any government schemes or loans specifically addressing extreme weather impacts.
- Many slum residents are ineligible for bank loans due to lack of land documents, forcing them to borrow from private lenders at high interest after flood damage.
- Participants also highlighted the need for government and NGO support in improving school infrastructure, healthcare for pregnant and lactating women, menstrual hygiene support, and better access to micro-financing options like MUDRA loans and Sukanya Yojana through awareness initiatives.

2.1.3 Community Stories

Plight of a struggling mother

Location: Navapura, Vatva

Kokilaben (name changed), a mother of three living in the slums of Navapura, Vatva faces growing challenges due to rising temperatures. The extreme heat keeps her children confined indoors, limiting their play, social interaction, and cognitive development. She worries about their increasing dependency on mobile screens, which has led to behavioral issues and reduced physical activity. Frequent illnesses like fever, diarrhea, and malaria have become common, especially during heatwaves and heavy rains. With poor drainage and frequent flooding, She often stacks furniture to safe keep family members from waterlogging condition or relocates her children to other safer elevated spaces. High healthcare costs, lost workdays, and growing electricity bills strain her household budget. To cope, she borrows money and adjusts her daily routine, hoping for safer days for her family.

Battling the extreme heat

Location: Nearby Bakaramandi, Ranip

Kamal bhai (name changed), a fruit vendor in Ranip, struggles to protect his stock during Ahmedabad's extreme summer months. The intense heat causes his fruits to spoil quickly, leading to frequent losses and reduced daily earnings. With limited storage options and no access to cooling, he often sells at a loss or throws away unsold produce. Scorching conditions also make it hard for him to find safe drinking water and clean sanitation nearby. Working long hours under the blazing sun leaves him dehydrated and exhausted, affecting his health and income.

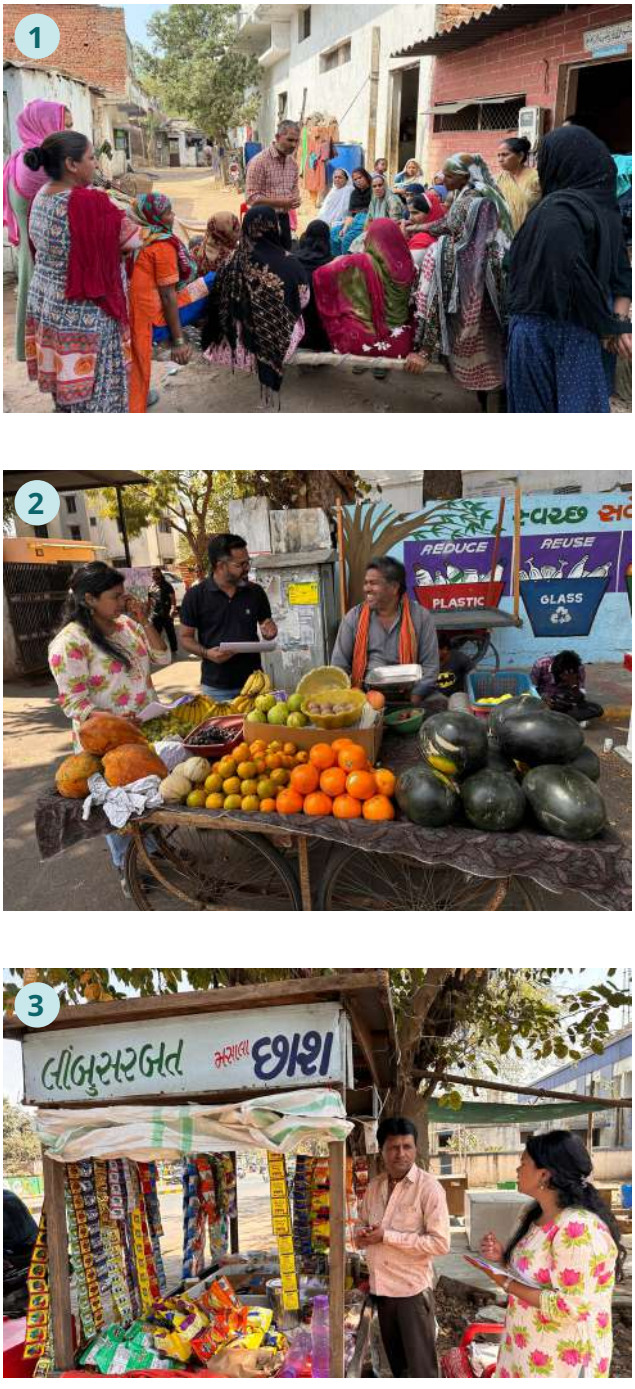


Fig 20. Focus Group Discussion (FGD) at Vatva (fig-1&2)and survey with street vendors at Ranip (fig-3) (ICLEISA, 2025)

Flooded income and hard work

Location: Maninagar

Sanjay bhai (name changed), a skilled Zari worker in Maninagar, works on the ground floor of a textile unit often hit by severe waterlogging. During heavy rains, floodwater enters the workshop, damaging intricate machinery, raw materials, and finished fabrics. Each flooding incident results in lost workdays and reduced working hours, directly affecting his income and job stability. Extended exposure to extreme heat and unavailability of cooling facilities at the workshop also affects his health and limits his work productivity, forcing him to cut back on working hours.

Protecting Children in Urban Climate Crisis

Location: Maninagar

Shloka (name changed), a mother of two, struggles to protect her children's health and nutrition amidst rising heat and frequent urban flooding. One of her children attends the local Anganwadi, but both have suffered from repeated illnesses like diarrhea, fever, and malaria. Due to soaring food prices and adulteration fears, she finds it difficult to provide nutritious meals, leading to signs of anemia and weakness. During crises, She often skips meals herself to ensure her children are fed, worsening her own health. Flooding regularly disrupts daily life, contaminates tap water, and forces her to rearrange their home to keep her children safe. Limited access to healthcare during such times delays treatment and adds financial burden through medical bills and home repairs. To manage, she has had to borrow money and cut back on essentials, hoping for stability that never seems to arrive.





Fig 21. Focus Group Discussion(FGD) at Maninagar(fig4&5) (ICLEISA, 2025)

2.2 Surat

2.2.1 Household Survey analysis

The household survey was conducted to gather insights to understand how climate change, particularly urban flooding and extreme heat, impacts families. The questionnaire was designed to capture a wide range of indicators, including demographic information; awareness and perception of climate change; economic impacts (e.g., income loss, property damage); non-economic effects (such as impacts on health, nutrition, safety, WASH, and education); social and cultural disruptions; and existing coping mechanisms and support systems.

The survey aims to provide a comprehensive understanding of the community's needs, vulnerabilities, and adaptive capacities in the face of climate risks. These insights will contribute to the development of a more comprehensive loss and damage methodological framework at the city level, enabling better-targeted interventions and planning.

In Surat, HH surveys were conducted across seven locations, as listed in Table, covering a total of 63 households. These households represent a diverse range of socio-economic groups, including daily wage earners, industrial workers, street vendors, construction workers, security guards, anganwadi workers, asha workers, textile workers and domestic helpers.

The locations were selected based on the City Resilient Climate Action Plan, which identified areas particularly vulnerable to both urban heat and urban flooding as shown in map 2 and listed in table 2. Additionally, these settlements are situated in close proximity to natural streams (khadis) or the river, further increasing their exposure to climate-related risks.

	HH Female	HH Male
Rander	8	2
Pal Village	5	7
Udhna	5	5
Limbayat	8	3
Bhimpore	0	0
Katargam	7	4
Dumbhal	5	4
ICCC	0	0
TOTAL	**38**	**25**

Table 9. Gender-wise distribution of household survey respondents across locations in Surat

Demographic Data

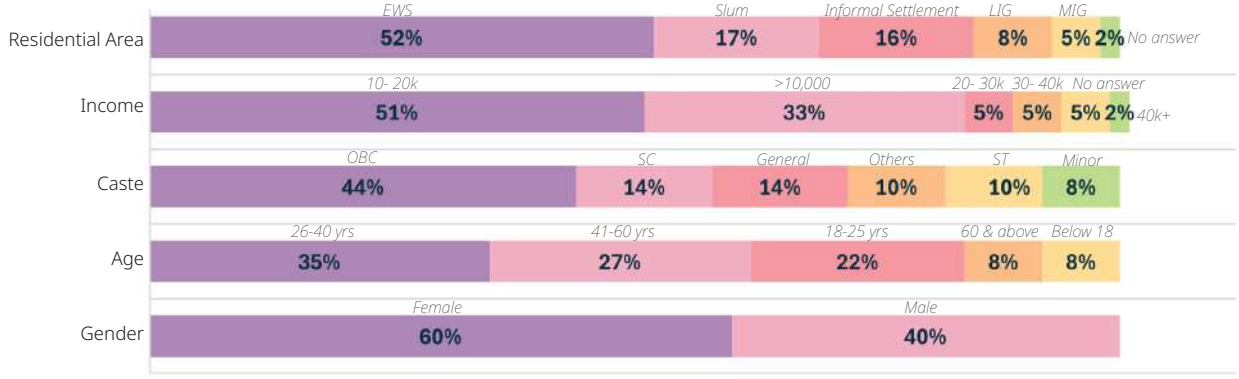


Fig 22. Demographic Distribution of Survey Respondents by Residential Area, Income, Caste, Age, and Gender in Surat

Climate Awareness and perceived impact on livelihood, income and expenses

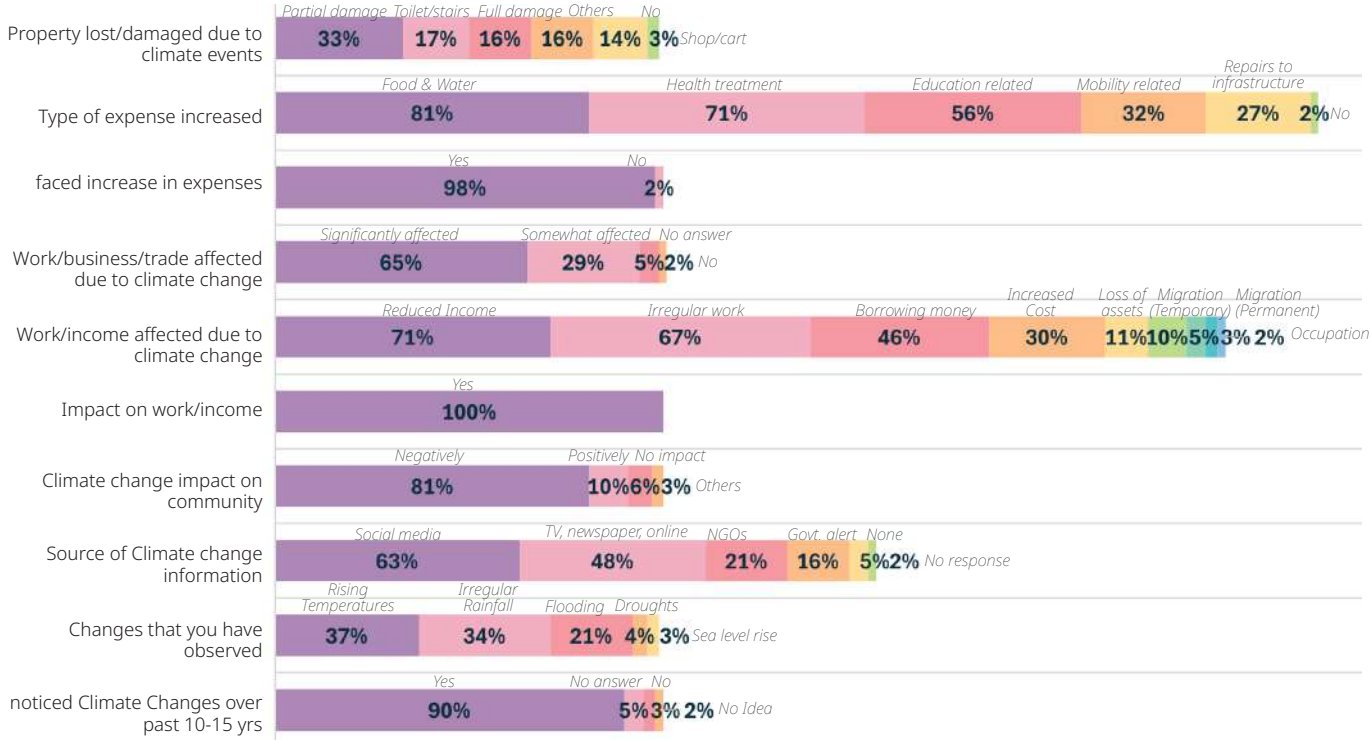


Fig 23. Community insights on climate awareness, observed changes, and effects on livelihoods and expenses in Surat

Most households surveyed in Surat (90%) reported observing noticeable climate changes over the past decade, particularly rising temperatures (37%), irregular rainfall (34%), and increased flooding (21%). Information about these events was primarily received through social media (63%), TV (48%), news outlets, community networks, and, to a lesser extent, from local authorities or NGOs (21%).

A significant majority perceived these changes as having a negative impact on their community particularly in terms of reduced income (71%) and irregular work opportunities (67%), especially among informal and daily wage workers.

Many respondents including daily wagers and informal workers highlighted that reduced or irregular income due to extreme heat or flooding have forced them to borrow money, change occupations, or migrate temporarily. Increased expenses were commonly reported for , food & water (81%), health (71%) and education (56%). Several families also experienced property damage ((house partially damaged (33%), house fully damaged(16%)), particularly to homes and vending spaces.

Note: The detailed questionnaire for each section is provided in the Annexure I.

Economic Impacts

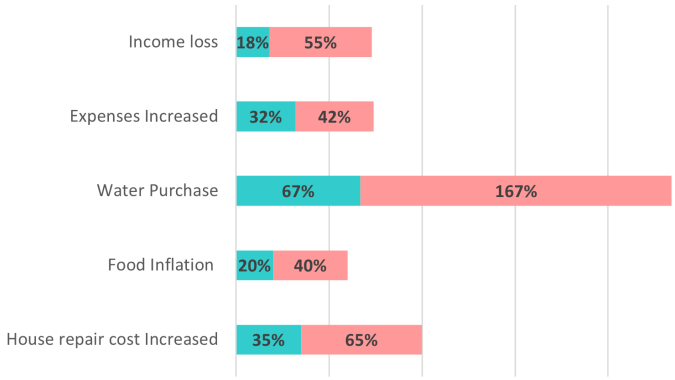


Fig 24. Climate change impacts on economic domains in Surat

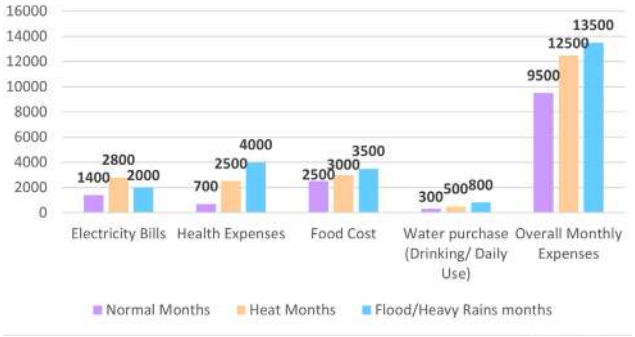


Fig 25. Monthly expenditure rise during heat and flood Household average (INR)

Note: The underlying data for figures 24 & 25 is available in Annexure VI.

The graph presents findings that assessed the socio-economic impacts of heat and flood events across four categories: income loss, increased expenses, food inflation, and house repair costs. The responses indicate that both climate-related hazards have had significant impacts on urban households, though the nature and extent of these impacts vary between heat and flood events.

Among the categories, food inflation and increased expenses emerged as the most reported consequences of both hazards. Notably, heat was associated with a slightly higher share of households reporting increased overall expenses, likely reflecting the rising electricity costs, healthcare, and other daily needs during extreme heat events. In contrast, floods were perceived to have a more significant effect on food prices, possibly due to disruptions in food supply chains, transport routes, and local market systems following flood events, resulting in temporary scarcity and inflated prices.

Income loss was also widely reported under both hazards. This suggests that both climate stressors have the potential to disrupt livelihoods whether due to reduced productivity during extreme heat or job interruptions caused by flood-related damages and mobility issues.

House repair costs, on the other hand, were primarily linked to floods. This reflects the direct physical damage floods can inflict on residential structures, in contrast to the more indirect financial pressures brought on by heat, which manifest through increased service-related and routine expenditures.

While heat primarily exacerbates ongoing living costs, floods tend to impose both immediate and longer-term financial burdens through structural damage and disrupted access to essential goods and services.

Category	Surat Findings
Income Disruption	Families reported lost workdays due to heat/flood
	Fishing, Textile and Zari work halted during floods and high heat periods.
Health- related expenses	Illnesses from water contamination and mosquito-borne diseases pushed families to spend on branded medicines.
Electricity bills	Significant rise in summer bills.
	Reliance on coolers in poorly ventilated rental homes common in migrant areas.
Food Inflation	Similar trends with additional cost burden of bottled water (INR 20- 30/day) due to unsafe tap water in floods.
Home Repairs	Annual repair costs INR 10,000- 20,000 from creek flooding and seepage.
	Frequent replacement of damaged household goods.
Borrowing due to L&D	Borrowing from SHGs and moneylenders common.
	Many pawn valuables during repeated floods.
Income Loss – Vendors	Heat cuts afternoon street sales, spoilage of perishable goods; floods halt footfall entirely, damaging stock and increasing wastage costs for street vendors.
Economic Loss to Women	Women in textile work miss shifts due to flooded roads and childcare; home-based zari work halted during rains.
Migration- linked exclusion	Migrant workers don't receive full state benefits (PDS, cash transfers), worsening economic stress. Many migrants unable to access relief food or emergency aid due to documentation gaps

Table 10. Direct Impacts on Household Income & Expenditure in Surat

Income Impact	Heat	Flood
Monthly cost Increase	35%	47%
Income Disruption	64%	75%

Gaps Identified:

- INR 10k - 20,000 annual house repair, fishing losses
- Textile/zari work stoppage, women's wage loss
- Reliance on informal loans
- Minimal insurance coverage
- Migrants excluded from schemes
- Poor coverage of formal social protection

Non-economic Impacts

i) Health and Nutrition

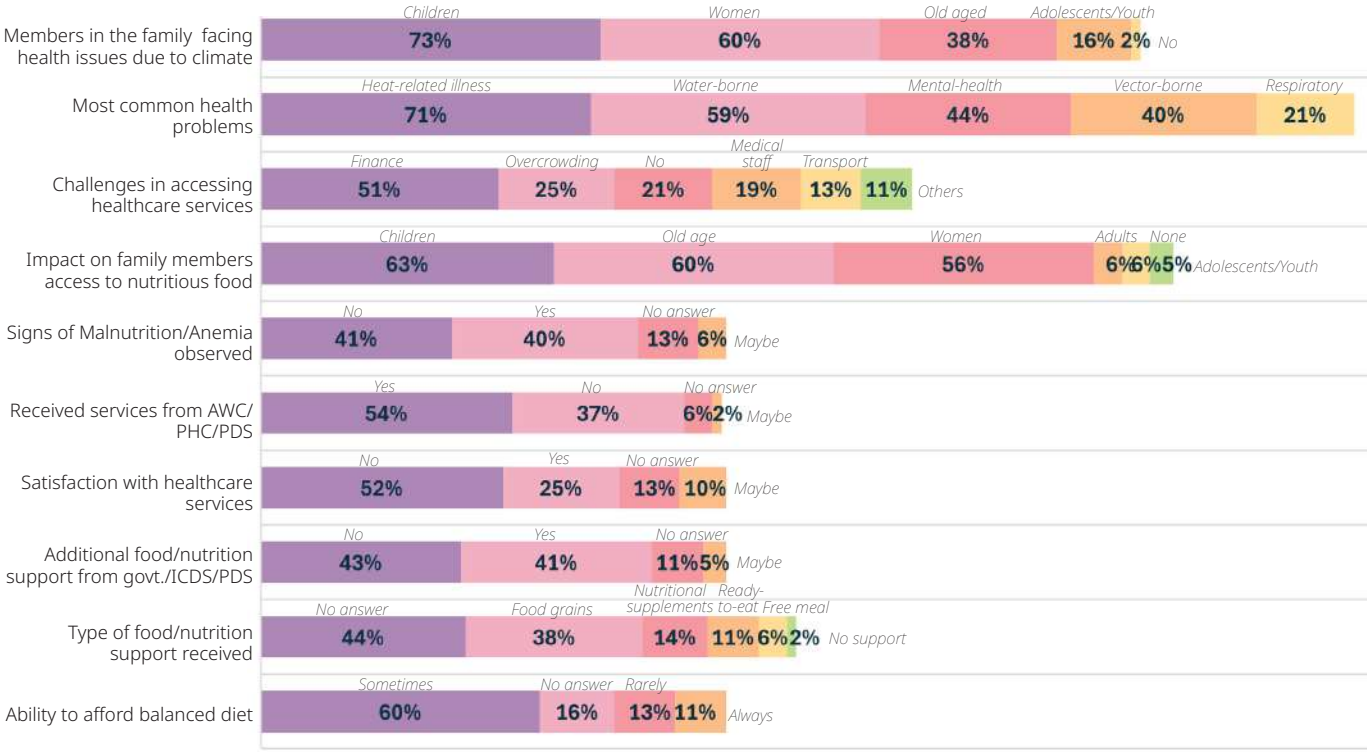


Fig 26. Health and Nutrition impacts on households in Surat

Climate change is worsening health problems in Surat, especially for vulnerable groups like children, women, and the elderly. Issues in water, sanitation, education, jobs, and transport are combining to cause serious physical and mental health risks.

Rising temperatures, irregular rainfall and frequent extreme weather events have led to a marked increase in heat-related illnesses (reported by 71% of households), as well as outbreaks of water-borne (59%) and vector-borne diseases (40%) such as diarrhea, dengue, and malaria. Specific symptoms such as fever and dizziness were reported by 60% of households during heat events and 25% during floods.Women, children and the elderly are more at risk because of weaker immunity and lower physical strength. In particular, households noted that children's health conditions often worsened following floods or periods of high heat, exacerbating pre-existing nutritional deficiencies and leading to school absenteeism due to illness. Diarrhea and dehydration in children were significantly reported during both hazards - 55% during heat and 60% during floods.

Mental health has emerged as a growing concern across all respondent groups. About 44% reported symptoms related to anxiety, chronic stress, and psychological fatigue; often linked to displacement, economic uncertainty, caregiving burdens, and disruptions to daily routines. These stressors were particularly acute among women, who are often responsible for managing health, food, and hygiene under increasingly strained conditions.

Food insecurity driven by climate-related income loss has a direct bearing on health,

Issue	Status
Transport to Health Centers	Health centers 3 to 4 km away; transport costs 500+ rupees during floods, unaffordable for low-income families.
Availability vs Affordability	Private hospitals preferred for better care but remain unaffordable for most migrant families.
Medicines	Branded medicines often prescribed.
Insurance	Families forced to purchase costly drugs due to lack of generic availability.
	Majority rely on out-of-pocket spending for medical needs.
Anganwadi/School meal interruption	Frequent closures during heat and creek floods disrupt meals and take-home ration supply.
Access Bias Allegations	Migrant families allege exclusion or delays in receiving food and health benefits during relief distribution.
PDS Grain Quality	Poor grain quality from PDS
	Complaints of small quantities (As per family size)
	Limited options force acceptance.
Rising prices	Vegetable, pulses and milk costs surge during heat and floods
	Bottled water purchase adds INR 20 to 30/day.

Table 12. Accessibility challenges related to healthcare, nutrition, and food availability during climate events

particularly among children and women. Many households reported reduced nutritious food and frequency of meals (63% responded that children are most affected), leading to signs of undernutrition and anemia; issues that disproportionately affect girls. Additionally, 70% of households reported food spoilage during heat events, and 60% during floods, significantly worsening food access. Reduced meal diversity was observed by 55% of respondents during heat and 65% during floods. Further, 50% of families reported anganwadi closures during heat periods, while 72% noted closures during creek floods —interrupting access to hot meals and take-home rations

While government schemes such as ICDS and AWS were accessed by some, many respondents noted that the support was insufficient to meet the nutritional needs of growing children. The long-term health implications of sustained undernutrition especially in young children and adolescent girls are significant, affecting immunity, cognitive development, and general well-being.

Access to safe drinking water has become increasingly unreliable in the face of changing climate patterns. Over a third of respondents

Issue	Heat (%)	Flood (%)
Fever, Dizziness	60%	25%
Dehydration / Diarrhea in children	55%	60%
Mosquito-borne diseases (Dengue/Malaria)	25%	70%
Food spoilage / insecurity	70%	60%
Reduced meal diversity	55%	65%
Anganwadi closures / loss of nutrition	50%	72%

Table 11. Comparative Impact of Heat and Flood on Health and Nutrition

(37%) reported worsening access due to contamination, irregular supply, or increased reliance on handpumps and water tankers. Reduced availability of water also limits the ability to maintain personal hygiene, with 16% of households specifically reporting this as a health concern. During flood periods, bottled water purchase adds INR 20–30/day for low-income families, straining already limited household budgets

These burdens are disproportionately carried by women and girls, who are typically responsible for managing household water needs. The physical strain of water collection, particularly during periods of scarcity, contributes to exhaustion, while also limiting time for rest or healthcare access. Additionally, elderly individuals and people with disabilities face heightened health risks due to poor water quality and lack of consistent supply.

Limited access to essential hygiene products such as sanitary pads and adult diapers has direct consequences for reproductive and geriatric health. Only 8% of households reported consistent access to such items, while the majority (51%) had only occasional availability, and 16% rarely had access. During extreme weather, these shortages are compounded by disrupted supply chains and mobility limitations, increasing the risk of infections, skin irritation, and poor menstrual hygiene management. These issues were especially pronounced among adolescent girls, elderly women, and individuals with special health needs.

Structural barriers continue to limit access to quality healthcare, particularly during and after climate events. Overcrowded health centres were flagged by 25% of respondents, Financial hardship remains the most significant barrier, with over half (51%) of respondents stating they had to borrow money to pay for treatment. In such cases, healthcare needs are often postponed or ignored, particularly for women and elderly family members. Health centres are often 3–4 km away, and transport costs during floods rise above INR 500 posing an additional burden for low-income and migrant families. Families often prefer private hospitals for better care but cannot afford them, especially migrant households This reinforces a cycle of health vulnerability, especially in households with multiple dependents or limited income sources.

ii) Education

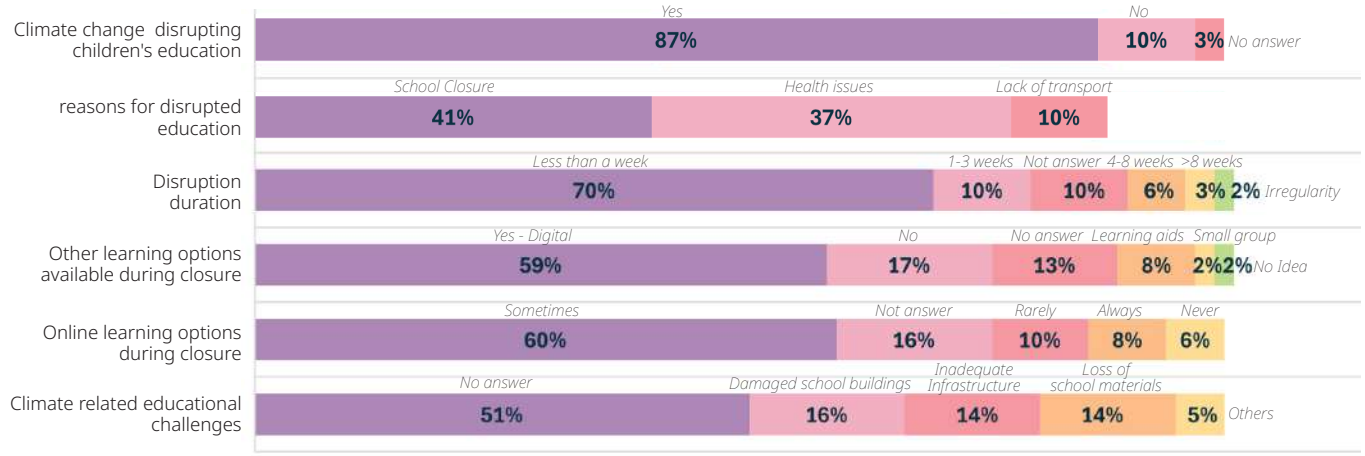


Fig 27. Climate Change impact on Education: Disruptions, duration, learning alternatives, and related challenges in Surat

Climate stress is deepening existing inequalities in Surat's education system beyond damaged infrastructure or heat-stressed classrooms. The climate-induced shocks and socio-economic pressures are driving reduced attendance, learning gaps, and gendered dropout risks, especially among already vulnerable groups such as children from low-income households, girls, and those in informal settlements.

The most frequently reported reasons for educational disruption included school closures due to extreme weather events (41%) and health issues preventing attendance (37%). In most cases, these absences were short-term (less than a week) but frequent. In Surat, these closures were often extended further as schools and Anganwadi Centres (AWCs) were used as flood shelters, leading to prolonged disruptions in education delivery.

During school closures, the majority (60%) reported accessing digital or remote learning only "sometimes," while 14% had rare or no access at all. Limited access to smartphones, lack of internet connectivity, and the cost of devices or data were cited during interviews as key challenges especially in lower-income households. This gap was more severe among migrant families, where device ownership is lower, and no structured digital alternatives exist disproportionately affecting girls' continuity in learning. This digital divide magnifies learning loss during climate events and adds to the educational gap between children from different socio-economic backgrounds.

Poor water, sanitation, and hygiene (WASH) conditions in schools remain a barrier to regular attendance and safety. Adolescent girls face specific challenges in maintaining educational continuity, particularly during menstruation. About 8% of households reported lack of access to sanitary pads in schools, 6% reported lack of clean drinking water, while 14% cited poor sanitation infrastructure. Absence of clean toilets during school hours discourages girls from attending, especially during menstrual cycles.

Climate-induced livelihood disruptions further exacerbate gender disparities in education. When household income falls, families often prioritize the education of boys over girls, who may be expected to take on caregiving, cooking, or water collection duties.

Issue	Status
School closures	1–3 weeks closure in extreme heat/flood.
	Schools and AWCs also used as flood shelters, halting education longer.
No online backup	No digital alternatives; Low device ownership in migrant families worsens continuity gaps. (Specially for girls)
Infrastructure	Overcrowded classrooms in flood-prone areas.
	Inadequate cooling and poor building conditions.
Distance & Safety	Unsafe commutes during floods; girls often stopped from attending due to harassment concerns.
Social Pressure on Girls	Dropout from flood displacement and cultural restrictions on mobility.

Table 13. Access and usage related gaps in education during climate events.

iii) WASH

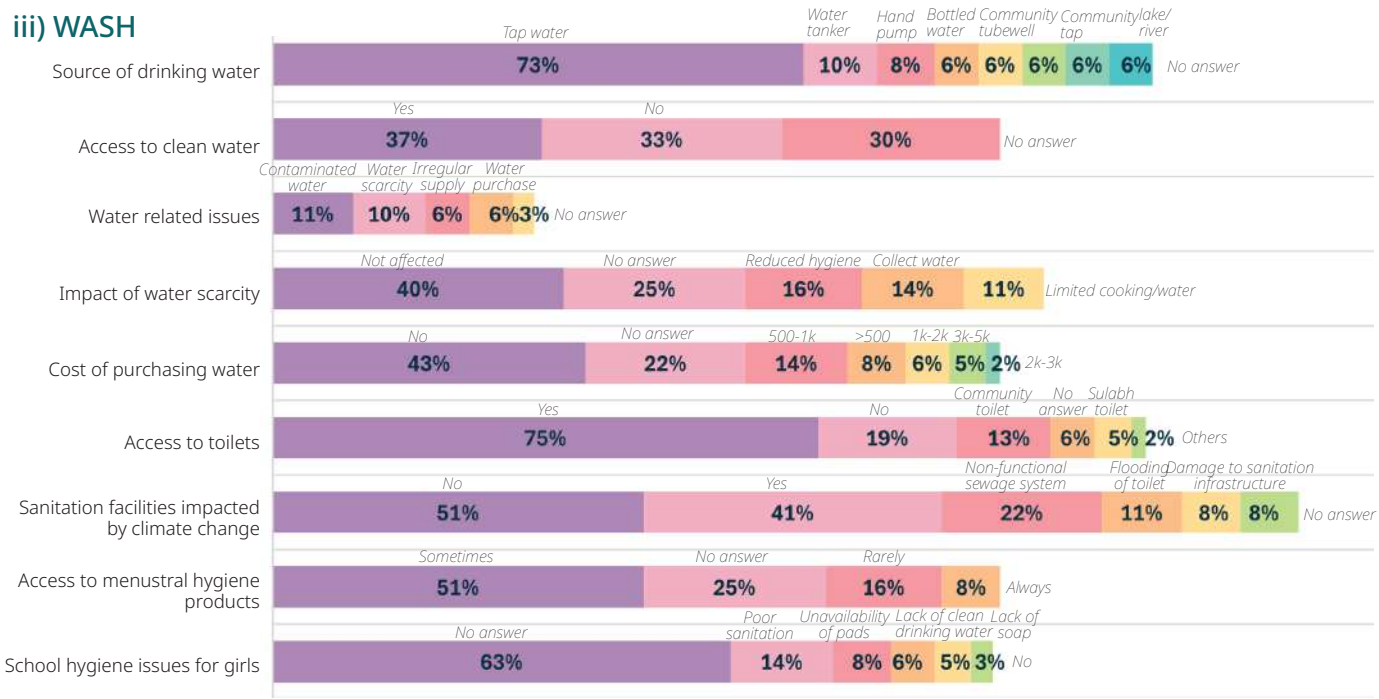


Fig 28. Water, Sanitation, and Hygiene (WASH) access issues and challenges in Surat

Access to clean and safe drinking water in Surat is increasingly strained under climate-related stress. While 73% of households primarily rely on tap water, a considerable portion depends on alternative sources such as handpumps (8%), private or community tubewells (12%), and government or private tanker supply (10%).

Despite infrastructural coverage, 37% of households reported rising difficulties in accessing clean water. The main causes include contamination (11%), irregular supply (6%), water scarcity (3%), and increased dependence on less reliable sources like handpumps or tankers (10%). These challenges are not only infrastructural but also behavioral (16% of households reported reduced personal hygiene practices, and 14% mentioned an increase in the time spent collecting water) indicating impacts on health and time-use patterns, especially for women and children.

Furthermore, in response to extreme weather events, such as heatwaves or water shortages, 35% of households reported having to purchase drinking water. Among these, 14% spent between ₹500 to ₹1000 per season highlighting the financial vulnerability and added economic pressure climate variability places on households, particularly among low-income communities.

These water challenges have had cross-sectoral impacts as seen in health and education sectors. Time lost in water collection or illness linked to poor water quality has an indirect impact on school attendance and workforce productivity.

iv) Safety and Protection

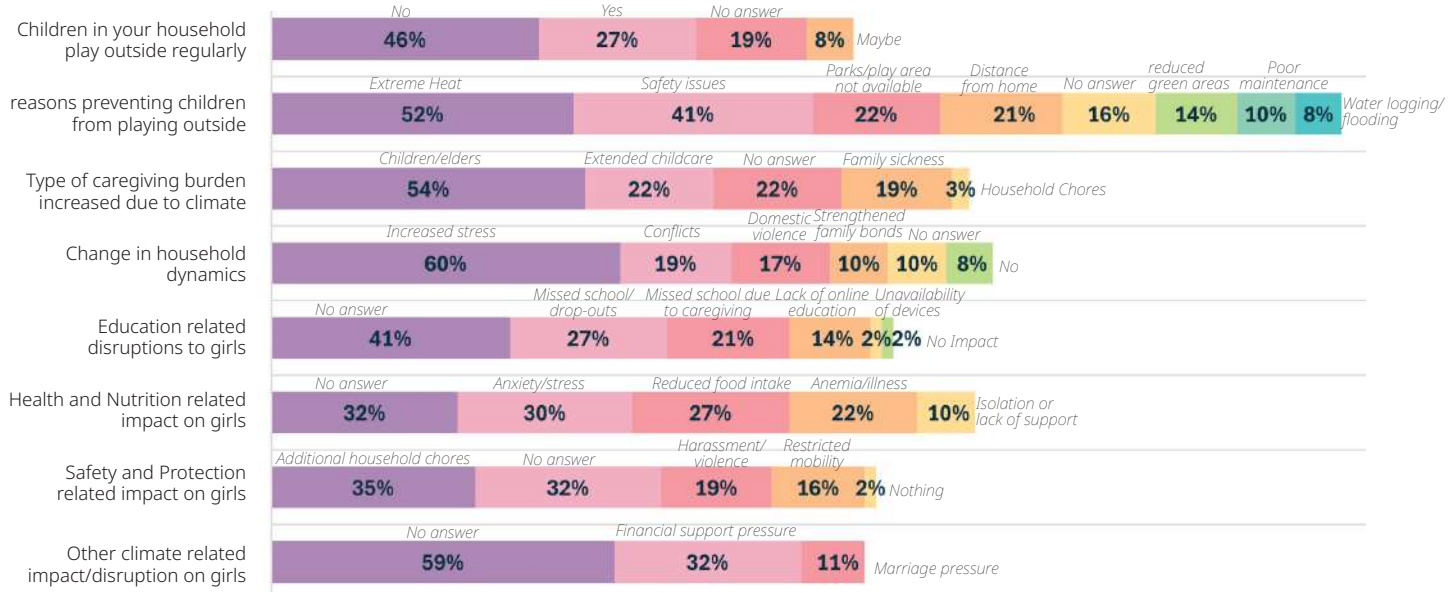


Fig 29. Safety, caregiving, and gendered impacts of climate change on children in Surat

In Surat, climate impacts are significantly affecting children's outdoor activities, caregiving responsibilities, and household well-being. Only 27% of households reported that children play outside regularly, while 46% do not—primarily due to extreme heat (52%) and safety concerns (41%).

Caregiving burdens have increased in 54% of households, particularly for managing the health of children and the elderly. This has contributed to heightened stress levels in 60% of families, with 19% reporting more conflicts and 17% experiencing domestic violence.

Girls are especially vulnerable. About 27% have missed school or dropped out, 21% have taken on caregiving duties, and 14% lack access to online education due to infrastructure issues. Health impacts include anxiety or trauma (30%), reduced food intake (27%), and illnesses like anemia (22%). Additionally, 35% of girls face increased household chores, 19% are exposed to harassment risks, 32% are under pressure to provide financial support, and 11% are facing pressure for early marriage.

These findings highlight how climate-related stressors are deepening gender and age-based vulnerabilities and straining urban family systems.

Social and Cultural Impacts

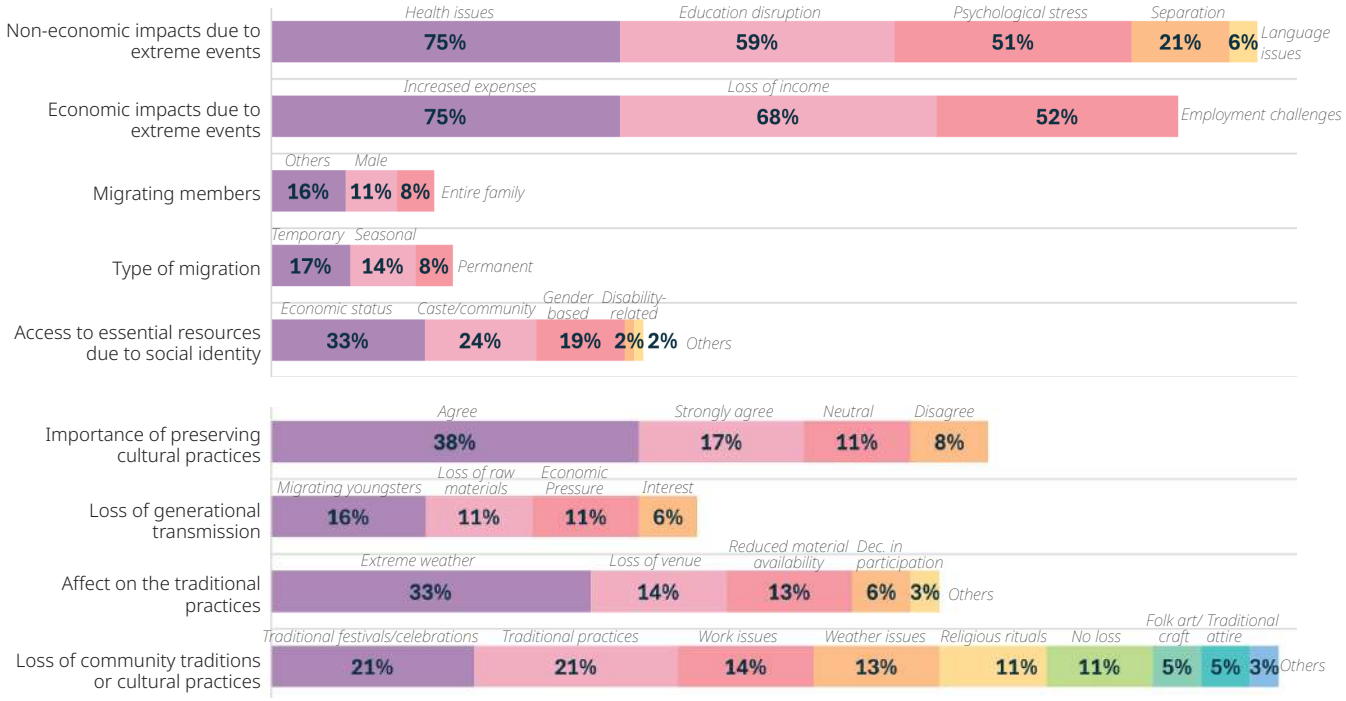


Fig 30. Social and Cultural impacts on community in Surat

A significant proportion of respondents reported facing challenges in accessing essential services such as water, food, and healthcare due to factors like economic status (33%), caste or community (24%), and gender (19%). Migration emerged as a key coping strategy, with 39% of respondents reporting some form of climate-induced relocation most commonly temporary or seasonal and often involving only male members, indicating gendered patterns of mobility.

Economic repercussions were widespread, with 75% of households experiencing increased expenses and 68% reporting income loss. Employment challenges affected over half the respondents(52%). These financial pressures were compounded by non-economic impacts: 75% reported health-related issues, 59% experienced social or psychological stress, and 51% noted disruptions in children's education. These stresses often led to the weakening of community ties, especially among those who migrated or were displaced.

Culturally, 21% of respondents observed a loss of traditional practices often due to extreme weather or work-related constraints. Generational transmission of traditional knowledge is also weakening, with migration of youth (16%) and economic pressures (11%) cited as major reasons. While 55% of respondents agreed that preserving cultural practices is essential for resilience, community-level efforts to revive these traditions remain limited or under-recognized.

Coping Mechanisms and Support

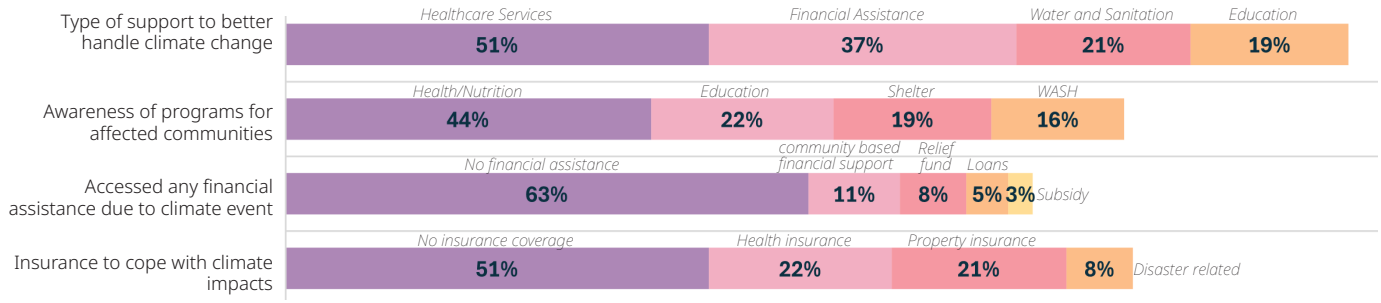


Fig 31. Community Access to Coping Mechanisms and Support Systems in Surat

The findings reveal that insurance coverage remains limited among climate-affected households in Surat. While 22% of respondents reported having health insurance and 21% had property insurance. A significant 51% reported having no insurance coverage at all, highlighting a major gap in financial risk protection, particularly in the face of increasing climate-related uncertainties.

Access to financial assistance following climate events has also been minimal. Only 3% of respondents received government grants or subsidies, 5% accessed loans from banks or private agencies, and 8% benefited from relief funds provided by government or NGOs. Community-based financial support was accessed by 11%, yet a striking 63% of households reported no access to any form of financial assistance, underlining the lack of safety nets and institutional support mechanisms during times of crisis.

When asked about awareness of support programs, 44% of respondents knew of health or nutrition schemes, while fewer were aware of initiatives related to education (22%), shelter (19%), or water, sanitation, and hygiene (WASH) services (16%). Most expressed a clear need for strengthened systems: 51% emphasized improved healthcare services, 37% called for greater financial assistance, and 21% identified the need for better water and sanitation infrastructure. Education and awareness programs were also mentioned by 19% of respondents as key to building community resilience. These responses reflect a strong demand for integrated and inclusive adaptation strategies that combine financial, health, and infrastructure support with public outreach.





Fig 32. Focus Group Discussion(FGD) at Limbayat(fig-1) and coastal community (fig-2), (ICLEISA, 2025)

2.2.2 Focus Group Discussions with Community

To complement the household survey findings and gain deeper qualitative insights, a focus group discussion (FGD) was conducted with community members affected by climate-related challenges. The FGD aimed to explore lived experiences, coping strategies, and perceptions around social, economic,non economic and cultural impacts of climate change. Participants included diverse groups representing different age, gender, and socio-economic backgrounds, ensuring a broad understanding of community-level concerns and aspirations.





Fig 33. Focus Group Discussion(FGD) at Rander(fig-1) and Limbayat (fig-2), (ICLEISA, 2025)

Average Family Size: 05 to 07 members

Average Children: 02 to 03 *(upto 17 Yrs)*

Average breadwinner: 02

(Either Father and mother or Father and other male member)

Location Covered: 06+01 *(coastal community)*

Creek Flood: 03

Urban Heat: 03

Total Women Participated: 129 (*23 to 65 Years)*

Total Men Participated: 13 (*25 to 60 Years)*

Total Adolescents Participated: 94

School Going (M+F): 34

Dropped out/Non-Schooling (M+F): 60 *(12-17yrs)*

Frontline Workers: 31

TOTAL: 267

	Female		Male		
Location	**Adult**	**School going adolescent**	**Adult**	**School going adolescent**	**Service Provider**
Rander	16		0		3
Pal Village	16		5		4
Udhna	33	20	0	14	4
Limbayat	30		0		12
Bhimpore	1		3		0
Katargam	18		5		1
Dumbhal	15		0		6
ICCC	0		0		1
TOTAL	**129**	**20**	**13**	**14**	**31**

Table 14. Distribution of FGD respondents across locations in Surat

FGDs with community | Economic Factors

1. Insights on climate changes over the past 10–15 years and their impact on daily life, work, or travel

- Nearly everyone agreed that the heat has intensified compared to earlier years.
- Creek floods, once quick to recede, now cause water to stagnate for hours or even days due to clogged drains, bringing dirty water into homes.
- Rainfall is now sudden and heavy, with little time to prepare. Earlier, unpaved surfaces allowed water to seep in, but concrete everywhere now leads to waterlogging and damage - issues not common in the past.
- Men said earning a living in such heat is tough. While professionals have cooling options, street vendors and daily wage earners suffer the most.
- Textile workers reported that machines on upper floors with tin roofs make working conditions unbearable. Heavy rains also risk damaging finished fabrics, as seen in the 2022 creek flood that caused major losses to mill owners.
- Women, especially domestic workers, struggle to walk long distances in the heat and often fall ill. School children shared that walking even short distances feels exhausting, with frequent thirst and fatigue.

Note: The detailed questionnaire format is provided in the Annexure II.

2. Sources of Climate-Related Information and access to Early Warnings for Floods, Heatwaves, or Water Shortages

- Residents along the banks of the Tapi River stated that when water is released from the dam, a loud alarm is sounded, prompting them to stay alert. In the past, people lived right on the riverbanks. However, after the devastating flood of 2006, which submerged 80% of Surat, significant changes occurred. Nevertheless, when water levels rise, residents still evacuate their homes, placing their belongings on higher ground.
- Men mentioned that they receive information about extreme heat conditions through newspapers and social media.
- During creek floods, officials from the Mahanagar Palika arrive on time to instruct residents to evacuate the colony.
- According to the fishing community, they receive news about changes in sea weather from the department from time to time.



Fig 34. Focus Group Discussion (FGD) at Rander, (ICLEISA, 2025)

3. Impact of Climate Change on Livelihoods, Income, and Household Expenses

- Diamond and textile workers said their shifts often extend into the evening to escape the heat and maintain productivity.
- Women shared that creek floods severely disrupt household budgets, takes 3–7 days restore homes, forcing them to miss work.
- Street vendors said they remain outside as moving carts is difficult without any business.
- Fruit and vegetable vendors noted that heat spoils produce quickly. Unable to buy in bulk, they pay more and face higher losses.
- In Katargam slums, flooding raises water levels up to 2–3 feet, making it hard to leave home or commute, with waterlogged streets and unreliable transport.
- Women in zari work reported a complete halt during rains, as wet fabric becomes unmanageable.
- The Municipal Corporation and donors provide food and water during floods, easing some burden. Some respondents shared that mosques offer shelter and meals through community support.
- Fisherfolk's first hand experienced shifting winds, rising temperatures, and erratic rainfall. Goldfish and hilsa have disappeared reducing income, while El Niño has worsened fish migration with just four months of monsoon work.
- Sudden temperature changes now cause frequent weakness, dizziness, and dehydration, making their work more difficult.
- Women from the fishing community said their traditional work - net making, drying, sorting, and selling seafood - has declined drastically, leaving them with little income.

4. Migration due to Climate-Related Issues and its impact on Family Income, Education, and Access to Services

- Most respondents said they faced delays in receiving aid during extreme weather, often due to language barriers and cultural differences. Migrants from Maharashtra, UP, and Rajasthan felt local residents were prioritized, with minor communities often served last. Women from Limbayat and Dumbhal reported similar challenges while collecting water.
- Fisherman community shared they prefer their children to avoid fishing and instead pursue education or work in textile mills.

5. Coping strategies adopted by families to deal with Extreme Weather Events

- Women reported that they adjust their household routines, starting their day before sunrise and heading to work early after completing kitchen and cleaning tasks. They rest during the day and resume work in the evening. However, the major drawback is their inability to dedicate sufficient time to their children. They remain unaware of their children's educational progress, health, and nutritional needs, which are usually managed by older siblings.
- Street vendors shared that they create makeshift shade using tarpaulin or plastic covers or seek refuge under trees. However, these measures offer no protection when flooding.
- Women mentioned that they settle their grocery bills either monthly or once every two months. Without this arrangement, managing other household expenses becomes extremely challenging.

- Women from the Udhna area expressed that their biggest challenge is sudden creek floods. With no viable solution in sight, they are often forced to take leave from work.
- Women from Udhna and Rander revealed that they frequently send their children to their parents' home or native village during summer vacations. The village's lower temperature compared to the city allows the children to live more comfortably.

6. Household Damage from Extreme Weather Events and Coping Mechanisms

- A sense of disappointment was common across creek-flooded areas. Residents said annual floods damage house foundations and bring in dirty and sewer water, forcing them to spend ₹10,000–20,000 yearly on repairs, painting, and cleaning.
- Entire families help with cleanup, but this means missing 2–3 days of work, causing income loss. Hiring mechanics adds to expenses.
- Both men and women stressed that borrowing is essential to manage weather-related losses. Most loans are interest-free or low-interest and go toward treating children's illnesses and elderly care.
- In heat-prone areas like Katargam and Pal, women said healthcare and nutrition are major costs. Emergency transport is expensive due to lack of government ambulances, forcing reliance on private hospitals.
- Only about 20% benefit from government schemes. While many know about them, most avoid applying due to complicated paperwork. Minority respondents said they're often denied benefits due to excessive documentation and needing guarantors from other communities.

7. Emergency Measures Taken During Extreme Weather Events

- Most respondents from Kachchi Bastis expressed fear that if they vacate the area, the government or others will not allow them to return. Therefore, they choose to stay, even during extreme conditions or floods.
- During summer, they are deprived of fresh green vegetables, so they prepare dry vegetables, especially those made with gram flour.
- Residents from Creek-flood areas mentioned that they place their belongings on higher floors or the first floor while staying on the roofs themselves.
- Residents of Udhna and Rander reported that they move to the upper floor of the Anganwadi Centre, where they receive free food, water, and shelter.
- A woman from Udhna recounted that during last year's evacuation, a young girl was accidentally left behind in the house while everyone else moved to the AW centre. Tragically, the girl drowned.

FGDs with community | Non-Economic factors

1. Health Issues experienced by Family Members during or after Climatic Events

- Most respondents reported heat-related illnesses like weakness, nausea, and loss of appetite, along with waterborne diseases such as diarrhea—especially among women, working men, and children.
- Children also suffered from fever, vector-borne diseases, and skin issues like rashes and itching during creek floods. These conditions weaken immunity and cause mental distress.
- While no one spoke directly about mental health, many described emotional impacts like anger, irritability, insomnia, social withdrawal, and frequent crying due to disrupted household routines.
- An Anganwadi worker from Pal Gaon shared a case of a caregiver overwhelmed by her husband's illness, childcare, and monsoon flooding. She expressed suicidal thoughts after struggling to feed her child. The worker offered emotional support and secured food aid through donors.



2. Accessibility of Healthcare Facilities during Climatic Events

- In four of the six surveyed locations in Surat, the nearest health center was 2–3 km away. Many preferred visiting distant civil hospitals or nearby private ones for better facilities and faster care. Transporting patients during extreme weather was a major challenge, with costs reaching ₹500.
- Respondents wanted primary health centers to stay open beyond noon for better access. Overall, they were satisfied with doctors, staff behavior, and facilities.
- The main concern was the high cost of medicines. Over half said doctors prescribe expensive brands, and rising extreme weather has pushed medicine costs up 2–3 times.
- A unique insight from Rander was that extreme heat and flood-related displacement have reduced intimacy among couples, contributing to a decline in childbirth rates.



3. Impact of Climate Change on Family's Access to Nutritious Food

- Most respondents linked extreme weather to rising inflation, explaining that heat and floods disrupt supply chains, especially for vegetables, driving up prices. Many also felt vegetables no longer taste as good.
- An ASHA worker noted that pesticide use and off-season farming, driven by changing weather, have reduced the quality of produce. She said farmers now rely heavily on fertilizers, disrupting natural balance.
- Anganwadi worker shared, malnourishment is under-reported actual cases far exceed official figures. Caregivers often neglect children's nutrition during extreme weather due to financial stress, and Anganwadi attendance drops in summer and floods.
- Muslim residents in Dumbhal said mutton, once a dietary staple, is now limited to once a week due to cost.
- Women voiced concern about children increasingly eating packaged snacks like chips and Kurkure, which reduces their appetite for nutritious food.



Fig 35. Focus Group Discussion (FGD) at Limbayat (fig-1), Pal (fig-2) and Katargam (fig-3), (ICLEISA, 2025)

4. Decline in Food Diversity and Coping Strategies When Food Is Unavailable or Expensive

- Most women agreed that the concept of a "nutritious thali" has faded. Previously, meals regularly included dal and green vegetables, but now they rely more on dry vegetables like mangodi, badi, and besan ki sabzi.
- According to a health worker, people's diets now consist mostly of carbohydrates, while protein and fat are disappearing. This shift has led to increased malnutrition and weakness, especially among children.
- Women also shared that they can no longer afford to give milk to their children regularly and are forced to substitute it with tea.
- Auto drivers reported that they often skip dinner. Due to the intense heat during the day, they struggle to find passengers, which forces them to work late into the night. Being away from home frequently leads to skipped meals. Additionally, because many buses and trains arrive in Surat early in the morning, they rush to work and often skip breakfast as well. Lack of proper rest forces them to take naps under trees during the day to compensate for lost sleep.
- Women from the Below Poverty Line (BPL) category expressed dissatisfaction with government-provided wheat, saying it often has a foul smell and is of poor quality. However, they have no choice but to consume it.

5. Gendered Challenges: Women's Role in Managing Household Food Shortages

- Women said food shortages are common during extreme weather. A family of 5–6 usually needs 750 gm to 1 kg of vegetables per meal, but during summers and floods, they manage with just 250 gm as prices surge. Staples like tomatoes and onions are used sparingly.
- Men, working outdoors, are served full meals first, followed by the elderly and children. If vegetables run out, women eat chapati with masala, pickle, namkeen, or buttermilk—despite the resulting weakness and health risks.
- Most men admitted they're unaware of how women manage kitchen budgets during such times.

8. Main source of drinking water

- More than 90% of respondents have taps installed in their homes, with water supply available for 1 hour daily.
- The remaining 10% depend on community taps for their water needs especially in Katargam area.
- 10-15% of households reported having RO filters, while another 10-15% buy 20 litres water cans daily from the market for drinking water, priced between INR 20-30 per can.

6. Impact of Poor Diet on Malnutrition and Anemia Among Women and Children

- Respondents -pregnant, lactating women, and the sick suffer most during extreme weather due to lack of budget for nutritious food like fruits or dry fruits. When nutritious meals aren't available, children are often given cheap snacks like chips or kurkure.
- Many women don't realize they are anemic, though over half likely are. Several appeared older than their age, though this was less common among Muslim women.
- Anganwadi workers noted that while extra nutrition is provided for pregnant women and malnourished children, its poor quality leads to low usage.
- ASHA workers said they conduct door-to-door ANC checkups and offer health advice, but many women don't follow it.

7. Access to Government Food Assistance Schemes (PDS, ICDS, Midday Meals)

- 50% of respondents said they received benefits, while the rest said they did not. Many women complained that Anganwadi workers prioritize their favorites when distributing benefits.
- In response, Anganwadi workers clarified that they can only provide supplementary nutrition to eligible beneficiary women, which often leads to dissatisfaction among others.
- Parents whose children attend schools or Anganwadi centres expressed satisfaction with the quality of the midday meal and hot cooked nutrition provided there.

9. Impact of Climate Change on Access to Clean Drinking Water and Related Health Issues

- During floods in areas like Udhna and Katargam, drinking water becomes a major issue. Government-supplied water often turns muddy or contaminated with sewage. Though residents are informed in advance and clean water is later restored, delays force many to rely on stored or bottled water, increasing expenses.
- In Udhna, summers bring irregular supply and low pressure, while floods cause grey, foul-smelling water. Residents either boil water or purchase bottled or tanker water.
- In heat-prone areas like Katargam, Dumas, Limbayat, and Dumbhal, water supply remains stable in summer, and disruptions are communicated in advance.
- Around 10–15% of respondents use RO filters, and a similar share buys 20-litre water cans daily, costing ₹20–30 each.
- Most didn't link water to illness, though some in Katargam reported fever, diarrhea, and mosquito-borne diseases like dengue and malaria during stagnant floodwater periods.



10. Disruption of Children's Education Due to Climate Events (Heatwaves, Floods, Droughts)

- Extreme weather significantly affects children's education, though impacts vary.
- Waterlogging and heat make commuting difficult. Schools up to Class 8 often close during heatwaves, while higher classes continue. Adolescents said regular schools lack cooling facilities, unlike model or Marathi schools, making it hard to concentrate.
- In flood-prone areas, learning materials get damaged, causing stress. Families cope by buying used books or seeking school support. Frequent illnesses further disrupt studies.
- Most male respondents were unaware of the educational impact. Teenagers shared that cycling 2–3 km to school leaves them soaked in sweat, forcing them to sit in wet clothes, affecting focus and causing skin issues.
- Some teens said this discomfort leads them to ask for scooters, despite being underage. They also noted that extreme weather limits outdoor play, leading to increased screen time indoors.



Fig 36. Focus Group Discussion (FGD) at Rander(fig-1) and Udhna (fig-2), (ICLEISA, 2025)

11. Increase in School Closures Due to Extreme Heat or Floods

- Schools remain closed for 1 to 3 weeks during extreme weather conditions.
- In creek flood-prone areas, schools are often converted into shelter homes, leading to class disruptions for 1 to 3 weeks.
- Teachers reported that school closures due to urban heat are decided by the district collector. However, schools close only if floods affect the entire city.

12. Availability of Online Learning and the Impact of Climate-Related School Disruptions on Children's Education

- During the pandemic, children studied on mobile phones, but now during extreme weather closures, parents are unsure if they're studying or watching reels.
- Over 75% of respondents have smartphones, mainly used by women for children's studies. Still, most agreed home study is difficult during extreme weather.
- From Class 5 onwards, children often need private tuition, as parents can't guide them. Government schools lack infrastructure to handle extreme weather, but private schools are unaffordable.
- While most students pass till Class 8, dropout risks rise sharply afterward.

13. School Absenteeism Among Children Due to Household Responsibilities

- Initially, respondents denied any impact, but later admitted that older children often miss school to care for sick siblings.
- In Rander, one adolescent shared that girls miss or leave school early during fixed water supply hours, as parents are away working. Flood cleanup also leads to 2–3 days of school absence.
- Dropout teens said extreme weather adds financial pressure, pushing them to earn. Those weak in academics, especially after Class 10 results, face greater pressure to leave school for jobs like zari work or car service centres.

14. School Measures Against Extreme Weather and Recommendations to Prevent Climate-Related Disruptions in Education

- Most community members are unaware of climate-related education efforts.
- Teachers and Anganwadi workers said they teach children about health, nutrition, and safety during extreme weather. Poster on heat safety is displayed at the Rander Anganwadi. However, students said they've never attended any related workshops or classes.
- Suggested solutions included improving infrastructure and ventilation in government schools, creating shaded pathways, integrating climate change into the curriculum, and conducting regular training and mock drills for teachers.

Note: The detailed questionnaire format is provided in the Annexure II.

16. Culture

- Women from Rander said their annual "Divaso" boat race stopped 3–4 years ago due to sudden Tapi River level rises and unpredictable dam releases.
- Udhna residents from Maharashtra struggle with Gujarati, despite Marathi being taught in schools. A Rajasthani woman in Pal shared that festivals feel lonely without a community to celebrate with.
- A woman in Udhna stopped Ganpati celebrations after floods damaged her home. North Indian migrants said Holi is now shorter due to March heat, with fewer visits and more online greetings.
- Many now visit native places less often due to financial stress and work, with only one family member attending major events.

15. Safety and Protection

- Girls said they feel pressured to excel in school, fearing poor grades could lead to dropout or early marriage. Extreme weather makes it harder to concentrate.
- Floods force girls in Udhna to take longer, unsafe routes. One girl recalled being molested but didn't report it out of fear.
- Anganwadi services are also disrupted, with waterlogging, open manholes, and insect bites. In 2023, a girl drowned during floods.
- Monsoon floods displace families for 3–4 days, causing income loss for women and school absences for girls, especially in summer when they stay home to fetch water.
- Girls said during rising heat and erratic rain they're burdened with chores while brothers play, and financial stress harms their health.

17. Coping Mechanisms and Support Systems

- In some areas, respondents are aware of government schemes like worker scholarships and construction benefits, but few can access them due to heavy paperwork and difficulties verifying migrant identities.
- Women in Pal Gaon shared that small self-help groups help them save and provide key support during disasters.
- Many live in slums or low-income areas are ineligible for bank loans due to lack of land documents. After flood damage, they often borrow from private lenders at high interest.
- Some blamed climate change on Surat's factories and ports, citing pollution of the Tapi River and rising heat due to emissions. They felt industries should take responsibility.
- Fisher families said the Coast Guard often supports them when fishing far at sea.
- Respondents urged the state to focus not just on industrial growth but also on environmental sustainability.
- Most were unaware of any schemes or loans directly addressing post-disaster financial support. The loan process is highly bureaucratic, especially without documents. Many stressed need for affordable, inclusive insurance.
- Anganwadi workers and ASHAs in Udhna said they're covered under the ₹2 lakh Pradhan Mantri Jeevan Jyoti Yojana but urged for broader schemes to cover work-related risks from heat and floods.

2.2.3 Community Stories

01. Flooded Hopes: A Festival Left Behind

(Story from Udhna, Surat)

For years, Sapna's (name changed) family eagerly awaited the Ganpati festival. It was a time of joy, devotion, and togetherness. But that changed when the monsoons began flooding their home every year.

"Our house fills with water, and so does Ganpati Bappa," she said with a heavy heart. "We used to bring him home with so much love, but now, he is washed away in the same floodwater that ruins our belongings."

The thought of their beloved deity being swept away in dirty water was too painful. So, they made a difficult decision, no more Ganpati celebrations at home. The festival that once brought happiness now only reminded them of their helplessness against the rising water.

02. Trapped in the Cycle: Manoj's Unfinished Dreams

(Story from Pal)

Manoj (name changed), a 20-year-old college student, dreams of pursuing higher education, but financial struggles have put her aspirations on hold. Living in a household of nine, with two younger cousins still in school, she watches as her family's limited income barely covers daily needs. She longs to study further but feels helpless, private institutions are too expensive, and there are no job opportunities to support her education.

With a heavy heart, she describes the vicious cycle she's caught in: "Because of less income, I have to leave my studies. But without education, how will I ever find a good job?" The weight of this reality lingers in her voice, as she wonders if she will ever break free from the hardships that define her life.

03. The Unintended Impact of Extreme Heat on Reproductive Health

(Story from an Asha Worker, Rander, Surat)

Extreme heat waves not only pose direct health risks like dehydration and heat strokes but also impact reproductive health and family dynamics. In Rander, a heat hotspot in Surat, ASHA workers have observed that rising temperatures are disrupting marital intimacy, contributing to a decline in childbirth rates.

During household visits and counseling sessions, ASHA workers observed that many couples experience discomfort and frustration due to prolonged exposure to high temperatures. The extreme heat diminishes physical closeness, leading to a decline in intimate interactions between partners. Families without access to air-conditioning or adequate ventilation face persistent discomfort, further discouraging intimacy.

Also, financial strain caused by reduced income opportunities during peak summer months exacerbates stress, negatively impacting mental well-being and marital relationships. To escape the indoor heat, many families resort



to sleeping on rooftops or in open spaces, significantly reducing privacy. Furthermore, altered sleep patterns, staying awake late at night and sleeping until late morning further limit opportunities for couples to spend time together.

This case study highlights that extreme heat influences not only physical health but also social behaviour and demographic trends. Addressing these effects is crucial for building climate-resilient communities that support both physical and reproductive well-being.





04. Impact of Receding Arabian Sea Water Levels on Fishing Communities and Gender Dynamics

Story from Fishermen family (Bhimpore, Surat)

Shrinking Arabian Sea water levels have severely affected fishing communities by increasing distances to fishing grounds and altering fish habitats. Key species like hilsa and katla have migrated toward the Tapti River, reducing both the quantity and quality of fish. This has driven up fuel and labour costs while decreasing demand and prices, weakening fishermen's income and bargaining power.

Small boat operators, who fish daily, have suffered greater losses than deep-sea vessels due to hot winds and rising sea temperatures. Falling incomes have lowered living standards and increased household stress. Men report rising aggression, alcohol use, and domestic violence, while women's traditional roles- net-weaving, fish sorting, and drying, have been disrupted, cutting their earnings and deepening household vulnerabilities.

The economic strain has worsened gender inequality. A teenage girl from one affected family fears dropping out of college as her education is de-prioritized in favour of her brother's, revealing how financial distress reinforces existing disparities.



Fig 37. Focus Group Discussion (FGD) at Udhna (fig-1), Pal(fig-2), and Bhimpore (fig-3&4), (ICLEISA, 2025)

3. Workshop with government stakeholders (FGDs and KIIs)

3.1 Ahmedabad Municipal Corporation (AMC)

The focused workshop engaged a wide range of participants, including 12 officials from 11 key departments of the Ahmedabad Municipal Corporation and one official from IMD. The 11 key departments from AMC include disaster management, health, engineering, water resource management (encompassing water, wastewater, and stormwater), urban community development, fire & emergency services, city planning, town development, heritage, smart city, and school board (Annexure III).

The discussions aimed to comprehensively assess the city's existing capacity to cope with the impacts of extreme climatic events, understand interdepartmental coordination before, after and during extreme climatic events, and identify existing gaps in data collection and resources required for L&D assessment. These insights provided a critical understanding of systemic challenges and opportunities for strengthening city-level loss and damage methodological approach.



Fig 38. 12 government representatives from Amedabad Municipal Corporation who attended the stakeholder engagement.

1. Departmental Insights on Climate Impacts and Vulnerable Communities

Interdepartmental discussions have highlighted how extreme weather events such as heatwaves, cold spells, urban flooding, heavy rainfall, and the surge in vector-borne diseases are exacerbating vulnerabilities among the most marginalised populations. These include residents of slums, migrants, daily wage earners, women, children, and persons with disabilities, especially those living in low-lying and poorly serviced areas. These communities are increasingly facing disruptions across health, education, infrastructure, livelihoods, and essential services. Damage to homes, food insecurity during crises, and interruptions in water and power supplies compound these vulnerabilities.

The health department representative highlighted the significant health risks confronting vulnerable slum communities, including dehydration caused by extreme heat, respiratory issues, and outbreaks of diseases during floods. During the monsoon season, water-borne illnesses such as cholera and typhoid, as well as vector-borne diseases like malaria and dengue, tend to increase in prevalence.

Key participants reported a broad spectrum of losses, including both economic and non-economic losses. Tangible impacts include reduced income for informal workers, damage to roads, schools, and homes, shrinking water

bodies, long-term livelihood insecurity, supply chain interruptions, and the displacement of vulnerable communities caused by urban flooding and infrastructural projects. Additionally, the often-overlooked intangible impacts, such as psychosocial stress and mental health burdens particularly among women and youth are emerging concerns.

Environmental impacts, including biodiversity loss and declines in animal species (notably the deaths of Indian Gir birds due to heat stress), were identified as critical issues with potential long-term, intergenerational effects. These ecological changes are poorly documented but profound.

In terms of early warning and response, parastatals like the India Meteorological Department (IMD), in collaboration with the Ahmedabad Municipal Corporation (AMC), provide weather alerts, including colour-coded warnings for heatwaves and heavy rainfall. The AMC prioritises maintaining and upgrading roads and drainage systems to mitigate urban flooding. Despite these efforts, significant gaps persist in delivering sustained and effective urban service delivery to vulnerable slum populations. This underscores the urgent need for comprehensive, inclusive, and adaptive resilience strategies to better safeguard our communities against the increasingly frequent and severe impacts of climate change.

2. Measuring L&D: Barriers, data gaps and opportunities for evidence based response

Departments shared challenges in recording and responding to L&D caused by climate impacts. There is a lack of a clear perception of the loss & damage framework, as well as standardized systems to capture the losses and damages at the city level. Most departments lack direct mechanisms for recording fire/ property damage due to extreme climatic events, heat-related illnesses, repair work on urban infrastructure such as roads and drainage lines, or disruptions in service delivery. Disaggregated information, such as fire calls, hospital cases, school attendance, and drainage line breakdowns, etc, is maintained at the city level and is not linked to climate-induced cause. This further obliterates the scope of health, livelihood, and infrastructure-related losses being recorded, especially in informal settlements.

To address the nutritional needs of children, the city government ensures that vulnerable children receive complete nourishment through the national PM POSHAN scheme, which provides cooked meals in government schools. However, gaps exist in assessing the current effectiveness of these initiatives in combating climate-induced malnutrition among children.

Barriers to data collection include a lack of awareness about loss & damage assessment among departments, the absence of clear mandates (such as policies or regulations that acknowledge loss and damage assessment),

The list of 12 government representatives, their department and designation who attended the workshop on 30th April 2025 is mentioned in the Annexure III.

and systemic silos between the city, district, and state levels of governance related to disasters like urban flooding and extreme heat. Informal settlements pose specific challenges due to the limited documentation of the population, urban service provision, and institutional reach. The migration status of the vulnerable population, lack of identification, and poor access to public services further hinder the capture of formal data. In addition, there is no compensation mechanism for vulnerable people displaced from their staying location or damage to property due to flooding and relief fund is only disbursed after declaration of a particular event as disaster.



Fig 39. Government Stakeholder Engagement with Amedabad Municipal Corporation held at GIDR, April 2025.

3. Coping, Recovery and Limits of Adaptation

Participants highlighted that while institutional responses to heatwaves and floods exist, they remain fragmented and under-resourced within the broader context of loss and damage assessment. In addressing heatwaves, measures such as heatwave early warning systems, school-level awareness campaigns, water sprinklers at key transit points, and the Ahmedabad Heat Action Plan (2019) have been implemented to enhance public awareness and improve departmental coordination.

Some studies indicate that these initiatives have effectively reduced heat-related morbidity and mortality from 35% in 2014 to just 4% in 2024, according to an official. When it comes to urban flooding, the city undertakes pre-monsoon activities, including cleaning catch pits, constructing and maintaining stormwater drainage machine holes, and cleaning lakes. A

dditionally, emergency response teams are deployed in each ward or zone to identify and address waterlogging hotspots. Municipal authorities also focus on monitoring machinery, repairing road potholes, and planning solid waste management ahead of and during the monsoon season. To address citizen concerns regarding urban service delivery, the city utilizes the CCRS (Comprehensive Complaint Redressal System) portal. During the pre-monsoon period, the health department conducts various preparatory measures, such as door-to-door fever surveys, pond cleaning, follow-ups for vector-borne diseases, and seasonal Indoor Residual Spraying (IRS) activities, alongside IEC campaigns to raise awareness.

To ensure effective response, the city also conducts 'Monsoon Mock Drills,' with city engineers reporting rainfall and waterlogging status to the Municipal Commissioner, facilitating

better assessment and action. Furthermore, stormwater pumps connected to the SCADA system discharge rainwater, which is monitored via CCTV in the 'Main Monsoon Control' room, ensuring real-time management of flood risks. The estate department issues notices to dangerous buildings, temporary structures before commencement of monsoon. The department also facilitates public awareness and notices to citizens for avoiding blockages of manholes or catchpits.

Officials from various departments shared a few innovative approaches 'Signal School' project for children from vulnerable communities and slum rehabilitation/resettlement under PMAY 2.0, urban shelters for the homeless population, and 'Cool Bus Stops' with mist cooling systems and curtains to combat the summer heat.

Despite these efforts, institutional constraints, such as limited budgets for L&D assessment, lack of resources for conducting surveys to collect data, and absence of standard operating procedures, especially for recording non-economic losses, hinder effective recovery measures and make it difficult to assess the adaptive capacity of various departments.

Disaggregated information on ELD components, combined with limited monitoring and assessment of the effectiveness of all initiatives undertaken by the city, further complicates the evaluation of adaptive capacities. NELD components like mental health care and psychosocial recovery are virtually absent in post-disaster assessment. From the perspective of vulnerable communities, when institutional aid is inaccessible, communities rely heavily on informal coping strategies, such as sheltering in schools, or depend on NGOs that provide ORS and food supplies.

4. Recommendations and Pathways for coordinated response: Institutionalizing Loss & Damage Response

The discussion on policy and institutional responses to Loss and Damage assessment underscored the necessity for structured, city-level mechanisms to effectively manage climate risks. The Ahmedabad Heat Action Plan (HAP) was recognised as an exemplary model, incorporating early warning systems, public awareness initiatives, and coordination among medical and civic agencies. Adjunct local models included flood control monitoring and educational initiatives such as the 'Signal School' project. Participants highlighted the importance of institutionalizing L&D management through comprehensive citywide risk and vulnerability assessments, integrating L&D into urban planning and governance frameworks, and utilising advanced technologies and artificial intelligence to address data deficiencies.

To guarantee a sustained and effective response, it was recommended to include both economic and non-economic losses in disaster reporting, allocate dedicated financial resources, and expand the mandate of NDMA to encompass heat-related events. Stakeholders emphasised the significance of cross-sectoral collaboration involving departments such as Women & Child Development, educational institutes, urban planners, mental health professionals, NGOs, ASHA, and Anganwadi workers (AWWs), for real-time monitoring. Ground-level assessments should document service gaps, displacement, contamination, access to food and nutrition, and the prevalence of non-communicable diseases. Data should be collected through diverse channels, including urban health centres (UHCs), microfinance institutions, health systems, and city-level risk and vulnerability assessments. Ultimately, integrating informal data sources—such as community narratives, secondary literature, and disaster histories—was deemed essential for a holistic understanding and more comprehensive L&D evaluation.

Note: The detailed questionnaire format is provided in the Annexure III.

Key Informant Interview (KII) with **Ms. Kinjal Pandya,** DPO (Ahmedabad)
District Emergency Operation Centre (DEOC) GSDMA

The meeting with the Ahmedabad District Project Officer from GSDMA provided detailed insights into the existing district-level framework for Loss and Damage (L&D) assessment and its coordination with city-level systems, where present.

Disaster Data Systems (Rahat Portal & Reporting)

Currently, the Rahat Portal functions as the central disaster data system, maintaining records related to disasters and compensation. However, access to this portal is restricted only Taluka and Mamlatdar-level disaster officers are authorized to upload primary incident reports. While annual reports, such as those documenting monsoon-related impacts including human and cattle fatalities, are compiled, they are not publicly accessible. Data is transmitted hierarchically from the city Mamlatdar to the District Emergency Operations Centre (DEOC), then to the State Emergency Operations Centre (SEOC), and ultimately to the Relief Commissioner. District-level reports are consolidated from fifteen talukas and forwarded to the state headquarters in Gandhinagar.

Compensation Mechanism

The compensation mechanism is governed by Government Resolutions (GRs), which specify fixed payments ₹4 lakhs for human fatalities and ₹50,000 for cattle losses, and so on for various losses and damages. Nonetheless, compensation predominantly pertains to monsoon and urban flooding events. There exists no dedicated fund or relief grant for damages caused by heatwaves, representing a significant gap given the increasing frequency of such events. Damage to kutcha houses is appraised through a card-based system and is contingent upon whether evacuation occurred. In cases of structural damage, compensation is provided solely if a relief grant is officially declared. Valuations are undertaken by the Estate Department, based on predefined rates stipulated in GRs. Fire-related incidents are eligible for compensation, with protocols and drills established for emergency responses.

Reporting & Processes

The reporting process involves the city Mamlatdar preparing risk assessment reports for instance, concerning dangerous structures and communicating these risks. Nonetheless, coordination challenges persist, as relief officers and talukas operate under separate jurisdictions, with official contacts and responsibilities remaining fragmented. The State Monsoon Report aggregates data from all talukas concerning infrastructure damage and human losses, yet does not encompass city-specific L&D assessment mechanisms unless integrated through district channels.

Limitations & Issues

Several limitations have been identified within the current system. These include the lack of GRs or declared relief measures for numerous urban flooding and heatwave incidents, resulting in the absence of compensation. The reporting process often experiences delays and duplication, and valuation inconsistencies arise when estate officers fail to adhere to the Schedule of Rates (SOR). Overall, while the district maintains a structured mechanism for L&D reporting and compensation, deficiencies in beneficiary coverage, institutional coordination, and transparency between city governance and disaster management authorities particularly regarding heatwaves and urban-specific damages impede the comprehensiveness of loss and damage assessments.

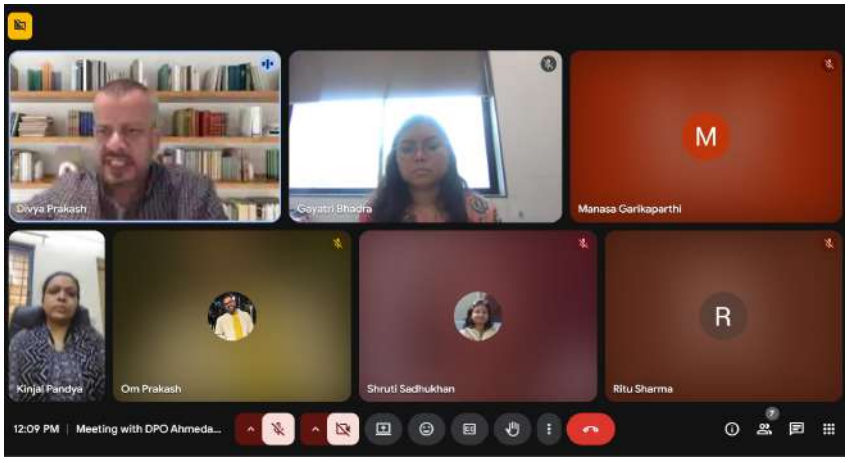


Fig 40. Virtual meeting with DPO, DEOC, GSDMA

3.2 Surat Municipal Corporation (SMC)

KIIs with Surat Municipal Corporation

A focused workshop was conducted with key government stakeholders to gather institutional perspectives on climate-related challenges, sectoral vulnerabilities, and current response mechanisms. Participants included representatives from relevant municipal departments, urban planning bodies, disaster management cells, and health, water, and sanitation divisions. The discussions aimed to assess existing capacities, inter-departmental coordination, and gaps in data, resources, and policy implementation. These insights provided a critical understanding of systemic challenges and opportunities for strengthening city-level loss and damage methodological approach

A detailed consultation was held with officials from the Gujarat State Disaster Management Authority (GSDMA) and the Surat Fire Department to discuss disaster-related data availability, institutional capacity, and cultural dimensions of loss and damage in Surat. The key points emerging from the discussion are outlined below:









Fig 41. Surat Stakeholder Engagement with Chief Fire Officer (CFO) and GSDMA officer

Meeting with Deputy Mamlatdar(Disaster) and District Project Officer (DPO-GSDMA)

1. Institutional Roles in Loss & Damage (L&D) Reporting and Relief Disbursement

The District Emergency Operation Centre(DEOC) plays a central role in loss and damage assessment across Surat district. It compiles a daily State Monsoon Report detailing damages to human lives, livestock, housing, slums, crops, electricity, water supply, roads, and education infrastructure. However, the focus remains skewed toward rural impacts, with urban assessments often under-represented. Urban loss assessments fall under the jurisdiction of the Tehsildar, who forms survey teams during disasters and rural assessments are handled by Class III officers and Panchayati Raj Institutions.

2. Relief Eligibility and Systemic Gaps

Only residents of notified slums are eligible for government relief and compensation. Those in illegal or non-notified settlements remain excluded, irrespective of the extent of damage. Access to compensation also requires linkage to Aadhaar and an active bank account; officials claim all slum dwellers have accounts, and those without can be supported to open zero-balance accounts post-disaster. Yet, ground realities point to difficulties in identifying genuine beneficiaries.

3. Limited Attention to Sea Level Rise

In Surat, sea level rise is currently not recognized as a significant climate impact. This is partly because the local fishing practices are largely concentrated in rivers rather than the open sea. While general monsoon-related warnings are in place, there is limited focus or preparedness concerning sea-level rise. It was suggested that further engagement with institutions such as the Institute of Seismological Research (ISR) and the Seismology Department could help assess this risk in future planning efforts.

Further, the DEOC highlighted several operational and policy-level gaps in addressing urban climate impacts. For instance , Although the Heat Action Plan (HAP) includes provisions such as increased minimum wages during extreme heat events, the mechanism for enforcing these measures remains unclear, underscoring the need for a stronger institutional mandate. Additionally, under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), labourers are entitled to full wages even during periods of extreme heat. To safeguard worker health during heatwaves, MGNREGA guidelines mandate a rest period between 1:00 PM and 4:00 PM without any wage deductions. This provision is aimed at minimizing heat-related health risks while ensuring income continuity for outdoor workers.

Challenges & Recommendations:

- Currently, there is no unified platform or portal to guide affected citizens on their eligibility for compensation or to streamline the claims process. This creates confusion, delays, and often excludes vulnerable groups from accessing their entitlements.
- Officials recommended strengthening political accountability by linking loss and damage (L&D) reporting mechanisms with elected representatives, such as Ward Councillors. This could help ensure that community-level losses are recognized and followed up effectively at the local governance level.
- Although the Surat Municipal Corporation maintains a GIS-based flood mapping system, it is not integrated with the State Disaster Response Force (SDRF) systems. This lack of inter-agency data sharing and coordination weakens the overall disaster response and preparedness framework.

4. Workshop with CBOs and NGOs

4.1 Background

As part of the broader initiative to support the development of practical, city-level approaches for assessing Loss and Damage (L&D), a three-day workshop was conducted with public sector stakeholders and representatives of community-based organizations (CBOs). The **workshops to engage with CBOs were held in Ahmedabad and Surat on May 1st, 2025 and May 3rd, 2025 respectively.**

To engage more deeply with the participating CBOs, a focused group discussion (FGD) method was employed to explore local experiences of climate-induced L&D and to identify gaps in existing assessment and response mechanisms. The FGD was intended as a qualitative session in a small group focusing on guided questions, revealing shared perceptions, points of dissent, and group dynamics that one-to-one interviews may not capture.

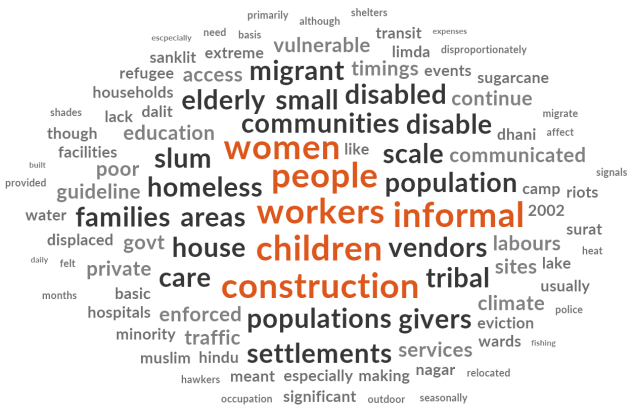
The structured discussions aimed to focus on and gather local data across eight thematic areas:

1. Post-disaster loss and damage (records and datasets)
2. Loss and damage assessment reports (rapid/detailed) at the district level
3. Capturing non-economic loss and damage
4. Health data with respect to climate events
5. Urban services disruption
6. Vulnerable communities and social impacts
7. Emergency response and institutional roles
8. Coping mechanisms, recovery efforts, and limits of adaptation

A total of **32 representatives from 27 CBOs in Ahmedabad** and **17 representatives from 8 CBOs in Surat** participated in the FGDs. Participants were divided into smaller groups four in Ahmedabad and three in Surat. Each group discussion was co-moderated by two facilitators using a structured questionnaire to guide the conversation. The FGDs lasted 3–4 hours, followed a five-section discussion format, and were recorded with prior consent from the participants.

This study applied thematic analysis to examine insights from the focus group discussions. It is is a qualitative method used to identify, analyze, and interpret patterns - referred to as themes- within qualitative data such as interview or FGD transcripts. It is particularly useful for making sense of complex and detailed narratives, allowing researchers to distill key insights in relation to the research question. Known for its flexibility, thematic analysis is well-suited for exploring participants' perspectives, knowledge, experiences, and values around a given topic.

Affected Groups in the cities



Note: The detailed questionnaire format is provided in the Annexure IV.

4.2 Thematic Synthesis

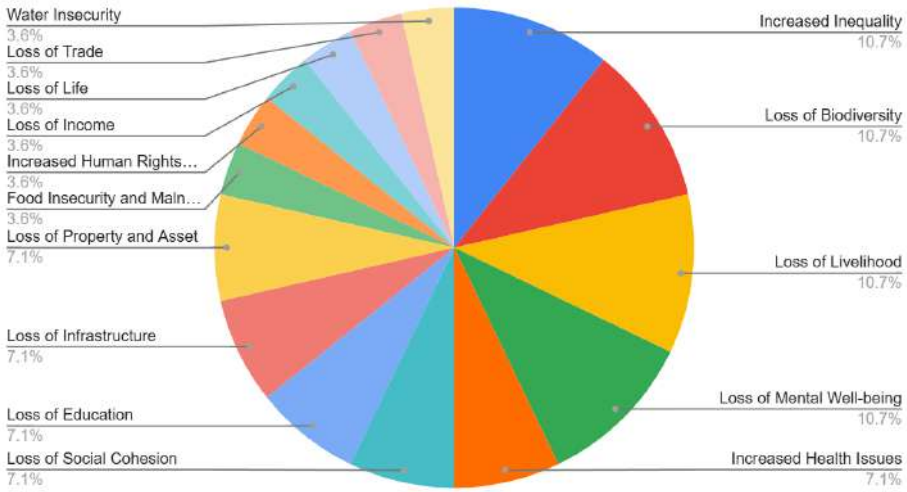


Fig 42. Most relevant L&D for Ahmedabad

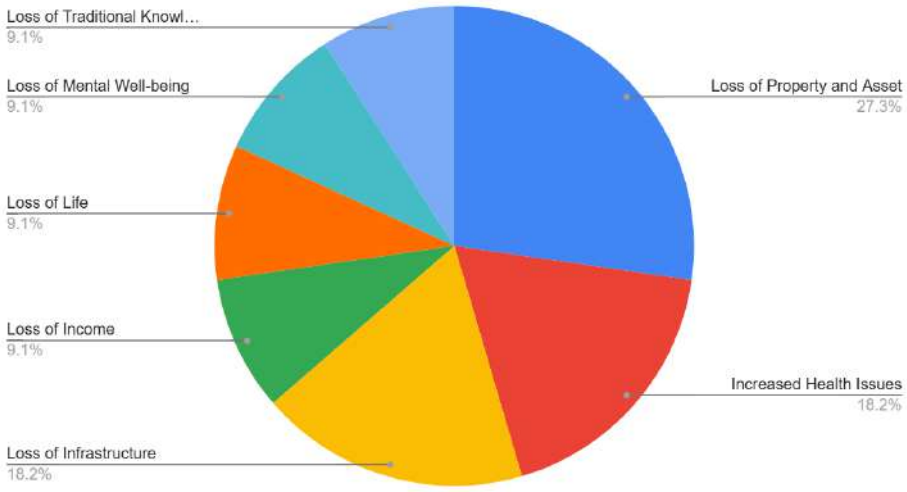


Fig 43. Most relevant L&D for Surat

Note: The deductive and inductive analytical approach, coding process, and reporting codebook is provided in the annexure V.

4.3 Key Insights from engagements with CBOs

The discussions reveal a range of climate-related impacts in the two cities such as heatwaves, urban flooding, and shifts in seasonal patterns and their cascading effects on health, livelihoods, and infrastructure. These interconnected impacts often intensify existing vulnerabilities, disproportionately affecting marginalized communities, outlining some of the key insights that emerged:-

1. Evolving Understanding of Urban Climate Impacts and L&D

Community reflections confirmed that the effects of heatwaves and floods are increasing economic and non-economic impacts on work, health, housing, and education remain undocumented and unaddressed. This reinforces insights from literature and policy reviews: the absence of localized assessment tools and institutional accountability means both tangible and intangible losses continue to fall through the cracks of urban governance.

2. Loss is deeply entangled with invisibility

Many affected populations gig workers, scattered informal settlers, displaced families are not recognized in official frameworks. This invisibility means no access to relief, no place in planning, and no way to claim damage or adaptation support.

3. Disproportionate Burdens of Loss and Damage

The burden of managing climate-induced loss and damage is falling disproportionately on individuals such as informal workers and women, particularly those with the least resources. In the absence of systemic support, people are forced to navigate difficult trade-offs - between income and health, safety and mobility, caregiving and paid work represent a silent accumulation of loss.

4. Gendered Dimensions of Climate Impact

Women experience layered climate-related burdens, including increased caregiving responsibilities and heightened health risks in their workplaces. These gendered impacts often go recognized, despite women's valuable knowledge of household and community-level adaptation strategies.

5. Addressing Learning Loss in a Changing Climate

Climate disruptions are affecting school attendance and increasing dropout rates particularly among girls, who often face added household pressures during crises. The discussions underscored a growing concern about loss of education and erosion of learning opportunities, alongside a range of other significant losses. This includes not just missed school days or academic delays, but also the long-term impacts on cognitive development, skill acquisition, and future prospects especially for children and youth in vulnerable communities.

4.4 Affected Groups in the cities

6. Ecological Urban Planning is Crucial

Conventional urban development has frequently disrupted natural systems such as drainage and ventilation worsening climate risks like flooding and heat islands. There is a growing push for planning approaches that integrate ecological knowledge to enhance urban resilience and sustainability.

7. Traditional Knowledge as a Resource for Addressing L&D

Cultural practices related to clothing, food, shelter, and resource use hold valuable insights for climate L&D.

8. Health Impacts Lead Climate Concerns, But Systems Lag Behind

Health impacts have emerged as a top concern, with rising cases of heat stress, respiratory issues, and disease outbreaks linked to climate change. Yet, health systems remain poorly equipped to monitor, attribute, and respond to these threats.

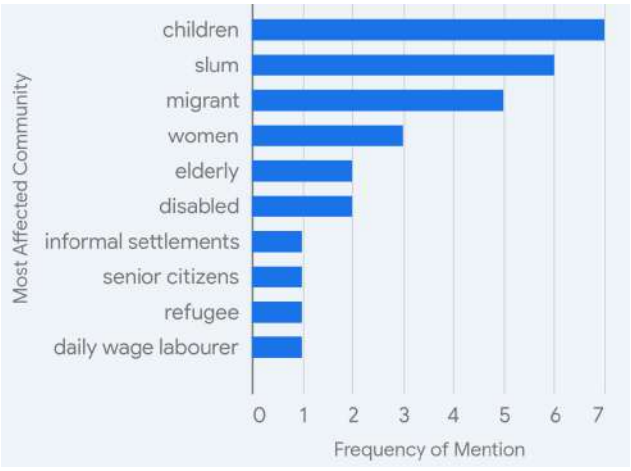


Fig 44. Top 10 Most affected communities mentioned in discussions

- **Children, Slum Dwellers, and Migrants** are highly vulnerable. The discussion highlighted that children, individuals living in slums, and migrant populations were most often mentioned as being particularly affected by climate events. This suggests that these groups face heightened vulnerability due to factors such as health sensitivities, inadequate housing and infrastructure, and potential lack of social support.
- **Vulnerability clusters around where people live, how they earn, and what care or dependency relationships they are embedded in**. It's not just exposure to climate hazards, but deep structural exclusions, living in resettlement colonies without services, working outdoors without protections, or caring for others without support that shape climate risks.
- **Climate risks are making existing urban inequalities more brittle**. For instance, already marginal livelihoods are further stressed by heatwaves, pushing families to pull children, especially girls out of school. Resettled communities lose social cohesion, which once functioned as informal safety nets. The "loss" here isn't just physical, but relational, educational, and psychological.
- **Urban development and climate adaptation are often in tension.** Evictions for beautification or infrastructure projects are justified in the name of progress but leave people more exposed to climate harm. The state's narrative of development masks the very real dispossession that underlies it.

4.5 Losses experienced by the communities

The analysis reveals multiple interconnected forms of economic loss and damage (ELD) driven by climate-related events such as heatwaves and flooding.

Economic Loss and Damage (ELD)

Most prominently, there is widespread **loss of income**, especially among informal workers, daily wage earners, home-based producers, and vendors. Their work is often disrupted by extreme weather, damage to tools and workspaces, or increased commuting difficulties. These losses remain largely invisible due to their exclusion from formal systems and compensation schemes. Women face additional income loss as caregiving responsibilities intensify during such events.

Closely tied to this is the **loss of infrastructure**, including damage to electricity lines, roads, and water systems, especially in informal settlements. Power outages during heatwaves and flooding impair economic activity and raise household expenses, while damaged roads hinder mobility and trade. These losses cascade into other sectors, affecting productivity in areas like textiles, powerlooms, and home-based work.

Loss of education is another critical concern, particularly during heatwaves that result in school closures or unsafe learning conditions. This reduces school attendance, disrupts learning continuity, and in some cases, leads to dropouts. Flooding further exacerbates the issue by damaging schools and educational materials.

Participants also reported **loss of property and assets**, from household goods and homes to small business inventories, especially among street vendors and informal producers. For many, these losses directly impact their ability to generate income and recover economically. Similarly, **loss of trade and business** manifests through market closures, disrupted supply chains, and reduced customer footfall, particularly for perishable goods or temperature-sensitive trades like dairy.

Livelihood disruptions are felt strongly in agriculture and informal sectors, with erratic rainfall, soil degradation, and heat affecting productivity. Attempts to shift to climate-resilient practices such as organic farming are constrained by resource shortages and lack of institutional support.

This contributes to **food insecurity**, as supply chain disruptions and crop failures push up food prices and reduce dietary diversity. These effects are compounded by **inflation**, with participants citing rising utility bills, food costs, and black-market activity during crises.

Health-related expenditures also rise sharply during extreme weather events. Without access to affordable public care, many rely on private services, incurring significant out-of-pocket costs especially for climate-induced illnesses like heatstroke or waterborne diseases.

Water-related disruptions, including contamination and drainage failures, further add to daily living costs and health burdens. Finally, seasonal economic slowdowns were noted, particularly in cities like Surat, where migrant workers return home during peak heat, disrupting local productivity.

Overall, the economic losses captured here are wide-ranging, overlapping, and deeply tied to social vulnerabilities. The most affected already on the margins are informal workers, women, and low-income communities whose losses are not only material but systemic and recurrent.



Fig 45. Workshop with CBOs held at GIDR, Ahmedabad (01st May, 2025)

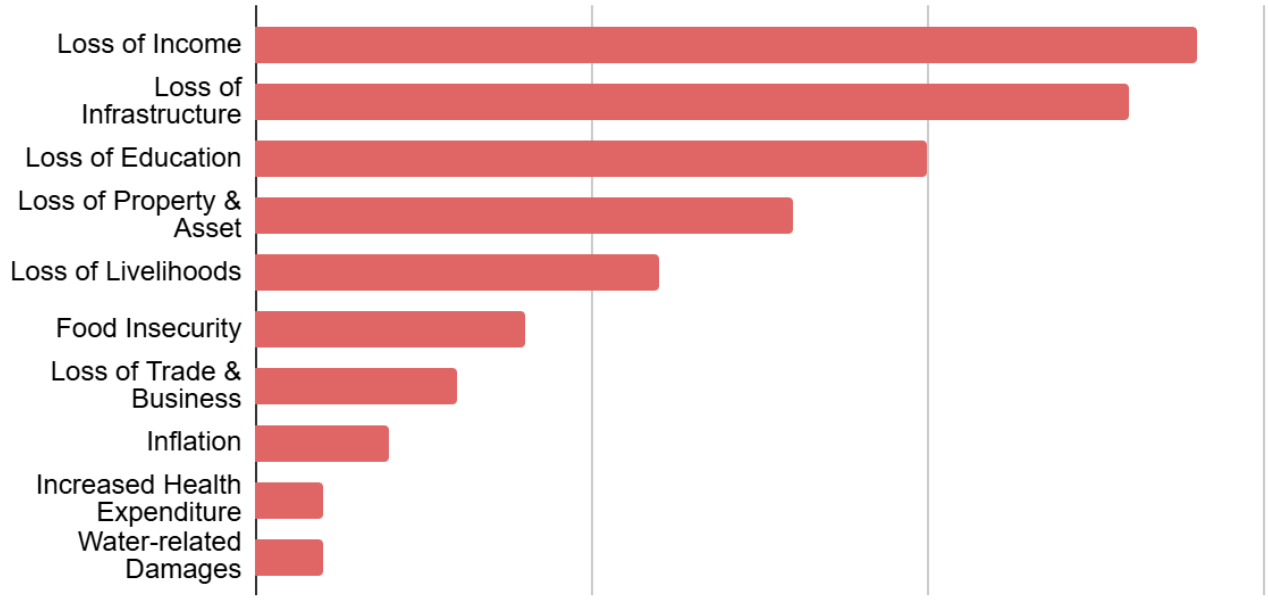


Fig 46. Most frequently cited or discussed ELDs by reference

Note: These represent the most frequently cited ELDs from the comprehensive list of ELDs and NELDs discussed during the workshop, as detailed in Annexure V

Non-Economic Loss and Damage (NELD)

The non-economic losses discussed including erosion of well-being, social cohesion, mental health, and access to vital resources offer crucial insights into the multifaceted and deeply human impacts of climate change in the cities that extend far beyond measurable economic damage.

The burden of climate change on physical health is mounting, evident in the **increased health burdens** facing vulnerable groups. Heat-related illness, field job hazards, and malnutrition are becoming common, particularly among low-income workers and children. In many households, illness is no longer an isolated event but a recurring state that strains already limited resources.

Among the most severe consequences is the growing **loss of life**, with deaths linked to climate-driven heat, disease, or unsafe living conditions. While some are direct and visible, like heatstroke fatalities, others, such as suicide in the face of cumulative stress remain hidden and unacknowledged, especially in informal urban settings.

Climate events are also deepening **socio-economic inequality,** disproportionately affecting already marginalized populations who remain excluded from critical public services and adaptation efforts. Inequities in access to water, healthcare, and education are growing, particularly for women and children who shoulder increasing caregiving burdens in worsening conditions. The inability to safely spend time outdoors, especially for unhoused populations, and the decline in everyday comfort quietly but significantly impact daily life. These layered vulnerabilities are intensified by gendered expectations and rising interpersonal violence, revealing how climate-driven insecurity entrenches inequality and spreads through the most routine aspects of life.

Ecological changes are contributing to the **loss of ecosystem services**, as communities report dwindling access to biodiversity, local water bodies, and green spaces. These losses not only threaten food and water security but also erode the everyday experiences and relationships people, especially children, once had with their environment.

Social ties are being strained, resulting in a gradual **loss of social cohesion.** As people relocate or shelter separately, opportunities for co-living, mutual care, and shared space shrink. Isolation grows, leaving some households particularly those with elderly or single members cut off from the networks they relied upon.

Alongside physical impacts, the **loss of mental well-being** is a growing concern. Emotional distress, anxiety, and seasonal disruptions are reported across age groups. Caregivers, youth, and displaced persons speak of fatigue and hopelessness, revealing the deep psychological toll of sustained environmental and economic stress.

Disasters and forced migration also bring about **displacement**, not only from homes but from relationships, institutions, and ways of life. Many displaced families face compounded challenges due to a lack of formal recognition, making it harder to access relief, rebuild community ties, or return to familiar livelihoods.

Often overlooked but critical is the **loss of documents,** where vital papers such as ID cards and educational certificates are lost during floods or evictions. These documents are more than paperwork, they are a gateway to services, protection, and continuity, particularly for children and those trying to re-establish their lives after a crisis.



Fig 48. Workshop with CBOs held at VNSGU, Surat (03rd May, 2025)

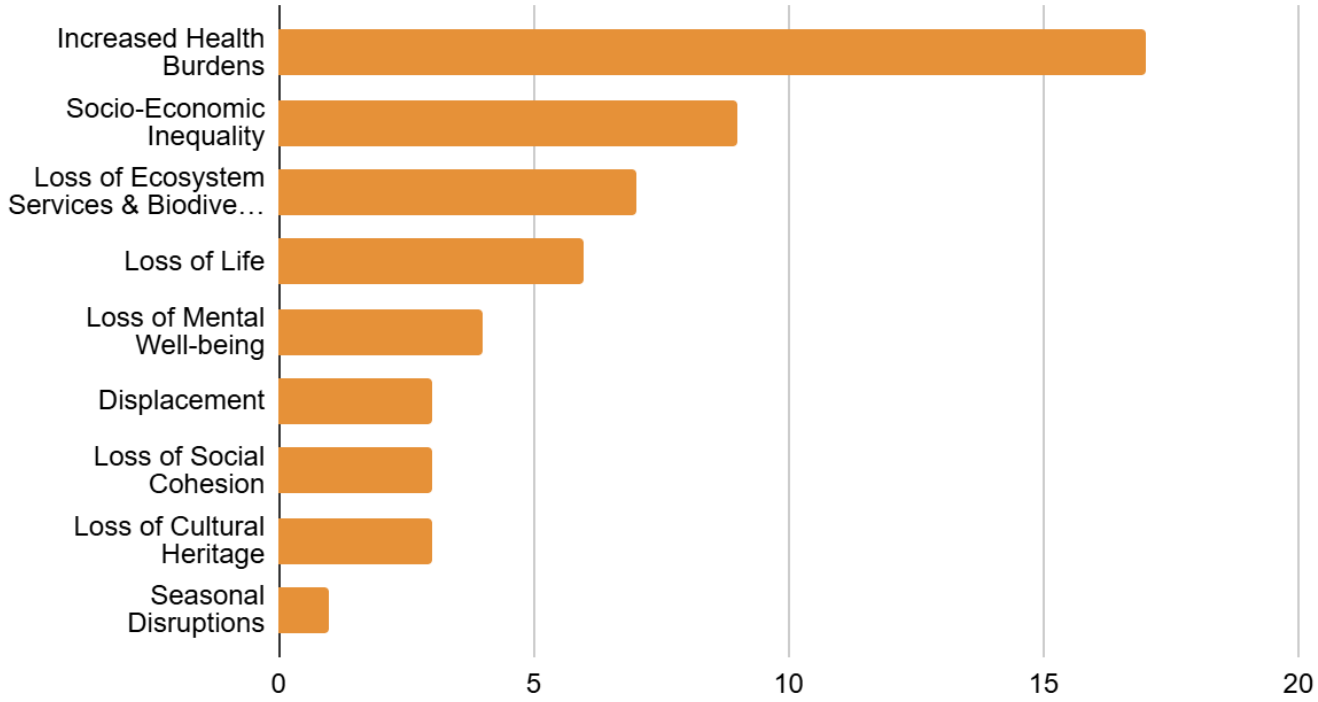


Fig 47. Most frequently cited or discussed NELDs by reference

Note: These represent the most frequently cited NELDs from the comprehensive list of ELDs and NELDs discussed during the workshop, as detailed in Annexure V

Measurement and Evidence of L&D

Institutional Sources and Potential Data

Recording of climate-related losses is generally limited and fragmented. Discussions revealed a few institutional sources including NGOs, government departments, and academic institutes that might be engaged in collecting data potentially helpful for Loss and Damage (L&D) assessment. For example, the Basera program conducts assessments on loss of identity and social welfare impacts, while the Blind Peoples' Association tracks disability and mental health losses. Health-focused data on heat-related illnesses is collected by institutions like IIPH and EMRI (ambulance services). Urban development departments such as UD&UHD and research centers like CEPT and AMC Research Wing are engaged in related studies.

Additional sources suggested include health surveys like NFHS, water-related research, and compensation data from bodies such as the State Disaster Management Authority (SDMA) and Revenue Department. Labour associations may document occupational health incidents and migration trends among seasonal workers, with groups like Sharad and Ajeevika recording fatalities and injuries in informal sectors. Population data from municipal corporations (e.g., SMC) also supports loss tracking.

Despite these pockets of data, no unified system exists, highlighting a significant gap in comprehensive institutional recording and monitoring. Discussions highlighted that urban loss and damage measurement is hampered by fragmented data, ambiguous attribution, and limited baselines. While formal systems are lacking, NGOs, media, and research organizations offer valuable informal data to fill gaps. Informal sources like Basera's demographic data, SEWA's women's well-being records, Red Cross need assessments, and women-focused community radio provide valuable insights that, combined with community training and decentralized collection, could improve loss and damage tracking.

Participants emphasized community training and decentralized data collection as vital for better tracking and accountability.

On Undocumented Losses and Damages

According to respondents, none of the climate-related losses they discussed are currently being systematically documented, either by government or non-government stakeholders. This widespread lack of documentation spans both economic and non-economic losses, and reflects the absence of institutional mechanisms and coordinated efforts to track and record the diverse impacts communities face.

However, several categories of loss emerged as especially unreported and in urgent need of attention:

- **Displacement and Housing Insecurity:** Climate-linked evictions and displacement, especially during heatwaves or flood-prone periods, are not systematically tracked. Migrant communities and informal settlements face repeated relocations without any official recording or compensation mechanisms.
- **Livelihood Losses in Informal Economies:** Climate events disrupt the livelihoods of informal workers such as street vendors, daily wage labourers, and waste pickers but these losses are not accounted for in either urban planning or disaster response. Losses due to resource degradation (e.g., declining water availability or ecosystem loss) that affect occupations like fishing or urban farming are also undocumented.

- **Health-Related Losses:** Physical health impacts from climate stressors like extreme heat, poor air quality, or flooding such as heatstroke or water-borne illnesses are not attributed to climate- events in formal health records. Similarly, mental health impacts, including rising climate anxiety among urban youth, are entirely absent from data systems.
- **Cultural and Nutritional Losses:** Climate change is driving a loss of traditional food practices and diets, undermining nutritional security and adaptive behaviours (e.g., dressing for heat). These cultural losses, which have health and identity implications, are not documented in any structured way.
- **Social, Gendered and Inter-sectional Impacts:** Gender-specific losses such as disproportionate exposure to heat, increased caregiving burdens during crises, or loss of livelihoods for women in informal work are not captured due to a lack of gender-sensitive frameworks in climate documentation.
- **Loss of Public Infrastructure and Services:** Some respondents noted gaps in tracking damage to critical infrastructure, such as communication networks and access to clean water, especially following urban floods or heat-related power outages.

Despite the wide range of losses experienced, there is no publicly accessible data capturing these impacts, leaving major gaps in understanding and addressing urban vulnerabilities. The responses strongly indicate that most losses remain undocumented, particularly those affecting marginalized populations and non-economic domains. This absence not only obscures the scale of harm but also limits the effectiveness of recovery, planning, and policy interventions.

Challenges Anticipated in Recording Loss and Damage

1. Governance Gaps and Lack of Institutional Mandate

A major barrier to recording climate-related losses in urban areas is that extreme events like urban flooding and extreme heat are not officially classified as disasters. This lack of formal recognition prevents local governments and institutions from developing structured assessment frameworks, leading to the absence of mandates, accountability, and coordinated action. Without this institutional backing, data on such events is inconsistently recorded or not recorded at all, and responsibilities remain unclear.

2. Challenges in Attribution and Measurement

Assessing urban L&D is complicated by the difficulty of attributing specific outcomes—such as mortality during heatwaves or economic disruptions from floods—to climatic events. Unlike immediate physical destruction, many losses unfold slowly or are influenced by multiple factors, making it hard to isolate climate as a cause. Additionally, there are no standardized tools or metrics for measuring many types of loss, especially non-economic ones like mental health impacts or loss of identity. This creates inconsistencies in what is counted and how.

3. Invisible Populations: Informal Sector and Migrant Workers

The informal sector and migrant communities are often the most vulnerable to climate impacts but remain underrepresented in data systems. These populations typically lack formal identification, fixed addresses, or institutional touchpoints, making systematic documentation extremely difficult. Migrant workers, in particular, are transient and may avoid engagement due to fear or mistrust, while informal workers often fall outside regulatory and welfare systems. This leads to large data gaps in understanding the full scope of urban L&D.

4. Community Participation and Trust Barriers

Effective L&D data collection requires community engagement, yet several challenges hamper this. People often experience fatigue from repeated post-disaster surveys, especially when data collection does not lead to tangible change. In urban settings, trust between communities and institutions is frequently low, with concerns about misuse of information or lack of follow-up. These issues reduce willingness to participate in assessments and weaken the quality of data collected from those most affected.

5. Limited Capacity in Local Institutions

Many frontline organizations and community-based institutions lack the technical expertise, human resources, and tools required for rigorous data collection and analysis. They may be well-placed geographically and socially to capture local impacts but are often under-trained in systematic assessment methods. This capacity deficit reduces their ability to produce credible and comparable L&D data, limiting their contributions to formal reporting or influencing policy.

6. Chronic Resource and Funding Constraints

Community-based organizations (CBOs) and NGOs, despite their proximity to affected populations and informal networks of knowledge, often face severe constraints in terms of funding and operational support. These limitations restrict their ability to conduct ongoing, detailed assessments, maintain data systems, or scale their work. As a result, valuable local knowledge often remains undocumented or is lost over time.

7. Low Institutional Investment in Research and Long-Term Documentation

There is limited emphasis within city or state-level governance on systematic research, archiving, and longitudinal tracking of climate-related losses. The absence of dedicated research arms or partnerships with academic institutions reduces the availability of credible, long-term data. This undermines learning from past events, impedes planning for future risk reduction, and weakens the case for financial and policy investments in climate resilience.

Key Losses and Overlooked Dimensions

However, several critical dimensions were noted as missing or under-recognized in existing loss and damage lists that were brought to the discussions based on previous secondary research. These included **increased drudgery** - particularly the physical and emotional strain on women performing essential tasks under climate stress, **loss of cultural heritage** such as traditional pottery-making, **stagnation of daily activities and loss of time,** and impacts related to sea level rise. Participants emphasized the importance of integrating these less visible but profound losses to better capture the full scope of climate impacts on urban communities.

Community based coping strategies

Coping Strategies to Climate Impacts in Ahmedabad

- **Built Environment Adaptations:** Practical architectural adjustments include moving sensitive hospital units to cooler locations, widespread use of cool roofs and terracotta tiles, and designing window-to-wall ratios to optimize indoor cooling. The innovative cool roof bus stop is a notable example of urban climate adaptation.
- **Community Engagement and Preparedness:** Community Action Groups led by organizations like MHT empower locals through training, regular meetings, and coordinated responses. Community leaders and volunteers play key roles in flood relief and climate event preparedness.
- **Revival of Traditional Water Management:** Reviving traditional well systems and interlinking lakes represent place-based strategies to manage water resources and reduce flood risks.
- **Urban Heat Management and Limitations:** Measures like green shade nets at traffic signals and extended city park hours offer relief during heatwaves, though attempts at vertical greening have not been successful, showing challenges in urban greening initiatives.

Coping Strategies to Climate Impacts in Surat

- **Place-based and Traditional Knowledge:** Residents show strong local awareness by avoiding flood-prone areas and adopting informal but effective adaptations such as building homes one storey higher. There's also a clear call to revive traditional practices related to clothing, food habits, and architecture that historically helped cope with heat and disasters.
- **Community Solidarity and Mutual Aid:** During floods, communities rely heavily on internal support networks, assisting each other before any external help arrives. This mutual aid is a critical first response strategy.
- **Institutional Environmental Efforts and Limitations:** Surat Municipal Corporation's large-scale tree planting aims to combat severe air pollution and environmental degradation affecting health and economy. However, the growing environmental stress and untreated drainage highlight the need for more integrated interventions.
- **Vulnerabilities and Inequities:** Early warning systems benefit some groups like fishing communities, but marginalized populations, such as migrant and informal workers, often lack timely alerts, pointing to gaps in inclusive climate communication.

5. Conclusion

5.1 Analysis

This chapter synthesizes the multiple layers of stakeholder engagement conducted across Ahmedabad and Surat. The stakeholder engagement and workshops in Ahmedabad and Surat brought together diverse voices, from urban poor communities, vulnerable groups, frontline workers, civil society, and government departments highlighting how climate events are reshaping lives, services, and institutional responses.

Drawing from household surveys, focus group discussions (FGDs), community narratives, and structured interactions with municipal authorities, NGOs, and community-based organizations (CBOs), the analysis presents a comprehensive picture of how climate risks are experienced and perceived at various levels. The integrated approach captures the economic, non-economic losses and damages, and institutional and governance mechanisms that collectively shape urban vulnerability and influence adaptive capacity.

Domain	Heat Impact
Economic	
Income, expense and productivity	Street vendor income loss, rising electricity; food & medical costs, Productivity loss
City Specific	Surat Specific: Textile and fishing sector losses, women lose income
Non-Economic	
Health and Nutrition	Dehydration, anemia, heat exhaustion, increased illness, rising medical costs, Food spoilage, low appetite, heatstroke, Weakness, expensive branded medicines
Education	Heat fatigue, poor classroom focus, school closures, low attention span
WASH	Increased water demand during heat leading to scarcity; Poor hygiene from reduced water usage; Reduced personal hygiene; Increased skin rashes and infections
	Ahmedabad Specific: Unhygienic public toilets with no running water; Odor and muddy water supply during monsoon
	Surat Specific: Migrant areas lack proper toilet cleaning or water availability, forcing open defecation in some pockets
Culture	Holi shortened, fewer gatherings due to extreme heat
Safety and Protection	Girls' mobility restricted, emotional distress in heat

Flood Impact	Access Issues	Coping Measures
Job/work loss, home repair costs	No insurance, dependence on informal borrowing	SHG support, loans, relief food
Ahmedabad Specific: Absenteeism	Surat Specific: Migrants face delays accessing schemes	Ahmedabad Specific: White Thermal coating of tin roofs
Surat Specific: Zari work disruption, fisherfolk net loss, house repair expenses INR 10k- 20k/year		Surat Specific: Adjusting work hours, selling in shade, mosque/ NGO help
Waterborne diseases, mosquito rise, skin rashes, Home dampness, dengue/malaria surge, Sewer overflow, diarrhea, skin infections	Long distance to health centers, transport unaffordable, poor PDS quality, Free meds unavailable, Branded medicines unaffordable	Skipping meals, SHG borrowing, bottled water use
		Ahmedabad Specific: Early morning schedule, home-based heat coping
		Surat Specific: Informal loans, reduced portions, water purchase
1–3 week closures, disrupted study time	Far schools, poor ventilation, Screen time increase	Ahmedabad Specific: Routine shifts, early learning
Surat Specific: Materials get wet, schools; AWCs used as shelters during creek flood	Surat Specific: No digital learning, girls face safety risks during waterlogging	Surat Specific: Sending kids to villages, second-hand books, adjusted schedules
Sewer overflow contaminates water; Foul odor and grey water supply in low-lying areas; Mosquito breeding;	Limited daily water supply (less than 1 hr/day); Poor drainage and sanitation infrastructure	Storing water for hygiene purposes; Shared public toilets and taps in slums.
	Ahmedabad Specific: Long queues at community taps.	Ahmedabad Specific: Reduced use of soap and hygiene products to save costs; Skipping menstrual hygiene materials
Surat Specific: Increased purchase of bottled water due to unsafe supply; Sewer-mixed water floods homes; Increased cases of diarrheal outbreaks	Surat Specific: Migrant colonies underserved by cleaning staff, worsening post-flood hygiene	Surat Specific: Families clean flooded homes manually; informal community efforts for drain cleaning.
Surat Specific: Ganpati festival & Divaso (Boat race in Tapti river) discontinued, fishing festivals declined due to climate shocks		
Unsafe roads, open drains, accidents during floods, Family displacements	Poor child protection systems	

5.2 Synthesis

Economic Losses and Damages

- **Income:** Climate stress is imposing significant economic burdens on low-income households. Heatwaves lead to loss of income, particularly for street vendors and daily wage workers, as productivity drops and medical and utility expenses rise. In Surat, sector-specific impacts were pronounced in textile and fishing workers, especially women, facing loss of income due to damage to raw materials, disrupted operations, and reduced demand. Flooding further compounded income losses through damage to homes and assets, increasing repair costs (₹(INR 10,000–₹–INR 20,000 annually), and temporary displacement.
- At the same time, household expenses are rising, especially for electricity, food, and medical needs, forcing families to shift towards cheaply available food and neglecting nutritious requirements. The lack of insurance or formal financial safety nets pushes many to depend on informal borrowing, SHGs, or temporary relief from NGOs and religious institutions.
- **Livelihood Disruptions:** Across Ahmedabad and Surat, climate extremes particularly prolonged heatwaves and recurrent floods are exerting severe pressure on urban livelihoods, especially among informal and low-income groups. Daily wage earners, street vendors, and home-based workers in both cities have experienced disruptions in their regular income streams, either due to physical fatigue during heat events or infrastructural damages caused by flooding. Migrants also face unique livelihood challenges, with delays in accessing welfare schemes due to lack of documentation or temporary housing.
- Surat presents a more sectorally concentrated impact, where specific industries such as fishing and zari work faced compounded stress. Fishing communities reported significant losses from damaged nets and reduced catch due to flood events, while zari workers many of whom are women faced loss of income due to disrupted production and market access. In contrast, Ahmedabad's disruptions were more commonly associated with heat-induced absenteeism, adjusting work hours, or temporarily withdrawing from economic activities, all of which reduce long-term livelihood resilience.
- **Productivity:** Heat stress has led to a visible decline in worker productivity. Respondents across both cities reported fatigue, weakness, and frequent illness, all of which reduce the number of working hours per day and overall output. High temperatures affect concentration and physical stamina, particularly for outdoor and manual laborers. In some cases, as reported in Ahmedabad,

residents have tried white thermal coating on tin roofs or shifted to early morning work routines to minimize heat exposure, but such adaptations are limited in scale and impact.

Overall, both heat and flooding are placing a triple burden on economically vulnerable households eroding incomes, disrupting livelihoods, and reducing productivity, while formal financial and institutional support remains insufficient or inaccessible.

Non-economic

- **Health and Nutrition:** Heatwaves and flooding events are intensifying health vulnerabilities in both Ahmedabad and Surat, particularly among women, children, and the elderly. Residents commonly reported cases of dehydration, anemia, heat exhaustion, low appetite, and general fatigue during extreme heat periods. These issues are compounded by rising medical costs and poor access to affordable healthcare. Branded medicines are commonly prescribed, with limited awareness of cheaper generic alternatives, families are forced to spend more out-of-pocket. During floods, families faced a surge in waterborne illnesses such as diarrhea, dengue, and skin infections due to damp housing conditions, open drains, and sewer overflow. waterborne illnesses such as diarrhea, dengue, and skin infections due to damp housing conditions, open drains, and sewer overflow. Long distances to health centers and unaffordable transport further limit access to care. In Ahmedabad, some residents have adapted by modifying daily routines to avoid peak heat, whereas in Surat, coping mechanisms included reducing meal portions, borrowing informally, and relying on bottled water for safety.
- **Education:** Climate-induced disruptions are threatening children's access to consistent and equitable education. Heat stress has been linked to fatigue, lower classroom attention spans, and temporary school closures. Flooding further exacerbates these challenges through infrastructure damage and the repurposing of schools and Anganwadi Centres as emergency shelters. The increase in digital screen time is observed during school closures. In Surat, wet learning materials, lack of digital access, and safety concerns during waterlogging were reported as major barriers, particularly for girls. Families often adjusted schedules or sent children to rural relatives to reduce exposure to hazards. In Ahmedabad, minor adaptations such as early-morning classes and revised routines were observed, but these remain stopgap solutions. The compounded effect of poor infrastructure, gendered safety concerns, and learning disruptions is widening the education gap for vulnerable children.

- **Water and Sanitation:** Water and sanitation access emerged as a major concern across both cities, reporting issues such as water contamination, irregular supply, and scarcity. These challenges have direct implications for health, hygiene, and dignity especially for women and girls who often bear the burden of water collection. Standing water during floods contributes to mosquito breeding and the spread of diseases, while poor sanitation infrastructure results in overflowing sewers and increased exposure to pathogens.
- **Socio-cultural aspects:** Culturally, communities are experiencing a gradual erosion of tradition. In Ahmedabad, extreme heat has led to shortened Holi celebrations, while in Surat, fishing festivals and traditional events like Ganpati and Divaso have been discontinued. This loss of cultural expression, tied closely to community identity, reflects the deeper social costs of climate change.
- Women and girls face disproportionate impacts across all sectors. The burden of adaptationwhether collecting water, caregiving during illness, or sacrificing food and education falls heavily on them. During floods, girls' schooling is often interrupted due to safety concerns, and women's income-generating activities are disrupted due to both physical damage and increased domestic responsibilities. In Surat, women engaged in zari work or informal vending faced significant income loss. Social protection systems do not adequately account for the needs of single mothers, female-headed households, or migrant women, who often lack documentation to access relief. Coping measures such as reducing food intake or skipping health appointments reflect the unequal toll of climate stress on women and other marginalized groups.
- **Environment:** In flood-prone areas of Surat, poor drainage and lack of green infrastructure have intensified waterlogging, while rising temperatures across both cities are worsening the urban heat island effect. Households attempt to cope through localized measures such as planting trees or using reflective coatings, but these are limited in scale and impact. Solid waste mismanagement, especially during floods, clogs drain worsens public health outcomes. Environmental stress is also altering local biodiversity and reducing access to natural spaces, which communities previously relied on for recreation, livelihoods, or cultural activities.

Further, access to essential services remains a persistent barrier. Health centers, schools and AWCs are often far, poorly ventilated & structurally inadequate. During floods, emergency services in Surat are often unreachable for migrant families, forcing them to rely on temporary relocation to Anganwadi or school buildings. In the absence of structured relief, communities rely on their own coping mechanisms adjusted work hours, early routines, informal loans, shared water resources, second-hand materials and support from SHGs and NGOs. These localized solutions reflect both resilience and the urgent need for integrated, climate-responsive systems that prioritise service access, social protection, and child-sensitive urban planning.

Governance and Institutional

Based on the key insights gathered from interviews and worshop with officials of the Ahmedabad Municipal Corporation (AMC), and Interviews in Surat Municipal Corporation (SMC), and district- and state-level authorities, the following synthesis outlines institutional

perspectives and practices on governance and institutional arrangements related to climate-related loss and damage. The analysis highlights the state of data systems, compensation mechanisms, coordination gaps, and adaptive governance in both Ahmedabad and Surat.

In both cities, early warning systems for extreme heat have been developed, in collaboration with the India Meteorological Department (IMD). Ahmedabad's Heat Action Plan (HAP) is frequently cited as a best practice model, incorporating early alerts, public awareness campaigns, and inter-agency coordination. Surat has also initiated flood-mapping and monsoon preparedness measures, including mock drills, SCADA-connected pumping systems, and ward-level emergency teams. However, these efforts do not adequately cover non-economic aspects of loss and damages. Coping efforts led by civic bodies such as road repairs, compensation for house damages, and community awareness campaigns are often limited due lack of standardized post-event evaluations which considers more economic loss and damages.

Data Collection, Monitoring, and Loss & Damage Documentation:

- Current system of data collection and reporting is particularly constrained. The District Emergency Operation Centre serves as the central coordinating body for loss and damage assessments across both cities. It compiles a comprehensive daily State Monsoon Report that documents damages across multiple sectors, including human casualties, livestock losses, housing and slum conditions, crop failures, electricity and water supply disruptions, road damages. This data feeds into state-level decision-making and relief allocation. Urban loss and damage assessments fall under the jurisdiction of the Tehsildar, who is responsible for forming survey teams during disaster events. These teams assess sectoral damages and feed into official records. The same data is also feed onlie through Rahat Portal in Gujarat. While the District Emergency Operations Centre (DEOC) and platforms like the Rahat Portal in Gujarat serve as official repositories of disaster data, access remains restricted to specific administrative levels, and urban climate impacts are underrepresented. Reporting mechanisms are also inconsistent; for example, the valuation of damages relies on GR-mandated estimates and SORs, which are applied unevenly. Relief data flows upward through district channels but is not always integrated into urban planning or city-level adaptive governance.
- Departments often lack clarity on their specific mandates around L&D, particularly concerning non-economic losses like mental health, displacement-related stress, and loss of cultural identity.

Compensation Mechanisms and Relief Systems:

- When it comes to compensation mechanisms, both cities face similar limitations. Relief is only provided when an event is formally declared a disaster, and eligibility is confined to residents of notified slums, excluding those in informal or non-notified settlements. Compensation is also linked to Aadhaar and bank account verification, creating exclusionary barriers for many urban poor. Moreover, while Surat and Ahmedabad maintain structured processes for flood relief, there is currently no dedicated compensation framework for heatwave-related losses, despite growing recognition of their health and livelihood impacts.
- Compensation frameworks are largely governed by state-level Government Resolutions (GRs), which provide standardized payouts (e.g., ₹4 lakhs for human death, ₹50,000 for livestock) for monsoon-related events. However, there is no relief provision for heatwave-related damages, despite their rising frequency and associated fatalities. Damage to kutcha housing is eligible for compensation only under specific declarations, and even then, depends on valuations done by estate departments using fixed schedules of rates. Importantly, urban losses particularly for renters, migrants, and non-notified slum dwellers often go unrecognized. For example, in Surat, only residents of officially notified slums qualify for relief, excluding many of the most at-risk populations. In both cities, there is no single portal or grievance mechanism to guide citizens on eligibility, report damages, or file compensation claims. This lack of accessibility and transparency leads to delays, duplications, and often exclusion of genuine beneficiaries.

Institutional Gaps

Currently there is a lack of comprehensive loss or damage assessment at the city level. There is no existing reporting mechanism in place or a organizational sturcture to assess non-economic losses.

Economic

Economic losses from direct income disruption to productivity setbacks and repair costs are experienced at a household, community level.

1. **Inadequate Assessment of Informal Sector Losses:** Sectors like textiles, zari work, and fishing, relies heavily on informal labor, yet climate-induced work stoppages and income losses are rarely captured in official records. Daily-wage workers and home-based women workers remain invisible in economic assessments. Residents of non-notified or informal settlements are ineligible for relief, despite being highly vulnerable
2. **Poor Inclusion of Migrants in Relief Schemes:** A significant proportion of population consists of seasonal or circular migrants, who are often excluded from compensation schemes, health coverage,

and livelihood support mechanisms due to lack of documentation or permanent residence.

3. **Relief Disbursement Systems:** There is a mismatch between the real cost of losses suffered and compensation provided, e.g., tailor loses their sewing machine due to a flood or fire, there's no proper system to compensate for that loss, even though it affects their ability to earn.
4. **Event-Triggered Relief Only:** Compensation is provided only when an event is officially declared a disaster, excluding many localised or slow-onset events (e.g., heatwaves,
5. **No Compensation for Heatwaves:** There is no formal compensation mechanism for heat-related injuries, deaths, or productivity loss, despite the growing frequency and impact of heatwaves.

Non-Economic Losses

Non-economic losses such as disruption in education, psychosocial health, reduced access to services, and safety risks are currently under-recognized.

1. **Lack of Standard Indicators and Methodologies:** There is no standardized methodology or set of indicators to assess non-economic losses such as mental well-being, learning loss, gendered burdens, or water insecurity. This leads to weak institutional acknowledgment and poor integration into planning.
2. **Limited or No Data Collection on Non-economic Losses:** Existing municipal and state systems focus on asset-based loss (houses, utilities, crops), while non-economic data (e.g., girl child dropout due to heat, increase in domestic burden on women during flooding) remains undocumented.
3. **Relief and Compensation Systems Focused Solely on Tangible Losses:** Government compensation frameworks do not account for mental health needs, informal sector learning gaps, or loss of cultural practices. The invisibility of these losses weakens long-term community resilience.
4. **Departmental Silos and Lack of Mandate to Address Intangible Impacts:** Cross-sectoral issues such as adolescent health risks during flooding or water scarcity-related school absenteeism are not addressed collaboratively by health, education, or disaster departments
5. **No Mandated Process for Tracking or Reporting Non-Economic Losses:** post-disaster assessments by DEOC and state departments do not include social or psychological impacts, leading to significant under-reporting in disaster documentation and risk planning.

Opportunities

Several opportunities for institutional strengthening were identified.

- Officials emphasized the need to strengthen political accountability by closely linking loss and damage reporting with local elected representatives. Embedding these processes within governance structures would ensure that assessment and response become part of routine administrative functioning, rather than reactive efforts during crises.
- Integrating technological tools such as GIS-based flood and heat vulnerability mapping with emergency response systems like the State Disaster Response Force (SDRF) can enable real-time monitoring and better coordination during climate-induced events. This would support timely interventions and improve accuracy in identifying affected populations and infrastructure.
- Cross-sectoral collaboration was also seen as a key opportunity. Actors such as ASHA workers, Anganwadi staff, NGOs, and microfinance institutions play a vital role in community outreach and service delivery. Strengthening their involvement in data collection, early warning communication, and needs assessment could bridge existing gaps, especially in informal settlements and among socially marginalized groups. Their participation can also help address non-material aspects of loss, such as mental health impacts, disruption to caregiving roles, or breakdown of community networks.
- Innovative local solutions such as the 'Signal School' initiative for displaced children, 'Cool Bus Stops' to mitigate heat exposure, and urban shelters show the potential of targeted, inclusive approaches when supported by political will and adequate resources.

However, for these initiatives to scale and endure, institutional mandates must evolve to embed loss and damage assessment into governance, with adequate financial allocation.

5.3 Next Steps

The diverse group of stakeholder engagements with communities in Ahmedabad and Surat have revealed both the profound challenges of climate impacts and the resilience of those facing them daily. These dialogues have highlighted valuable opportunities to strengthen how cities understand and respond to climate-related loss and damage.

Several important insights emerged from these exchanges:

- Communities possess a very nuanced understanding of climate impacts that could greatly enrich formal systems of documentation and response
- Many residents are already developing innovative, locally-grounded solutions to climate stresses
- There is particular wisdom in how vulnerable groups, informal workers to homemakers perceive and manage climate risks

These insights from both cities will support in developing the city-level L&D Assessment framework that:

- Aligns with the Disaster Management (Amendment) Act 2025 which proposes setting up of Urban Disaster Management Authority at the city level.
- Integrate community-driven data, especially from informal settlements, to capture non-economic dimensions.
- Create a standardized, interoperable reporting mechanism across departments for heat, flood, and multi-hazard events.
- Enable financial earmarking and compensation triggers for currently under-represented losses like education interruption and mental health impacts.
- Foster institutional partnerships between Municipal Corporations, State DMAs, and civil society for co-producing L&D data and methodology for assessment.

This stakeholder-informed base lays the foundation for piloting a robust equitable city-level L&D assessment methodology that will be undertaken in the subsequent report.

The perspectives shared will strengthen in developing a more holistic, people-centered approach to addressing loss and damage approaches that are more grounded, recognize adaptation limits, and benefit from sustained dialogue and collaboration among all stakeholders.

6. Annexures

6.1 Annexure I: Household Survey Questionnaire

Consent Form

Purpose of the Survey:

Hello, my name is .....and I am working with ICLEI South Asia. We are conducting a Household Survey to understand how climate change, particularly urban flooding and extreme heat, impacts families. Your responses will contribute to improving community support systems.

Why You Are Invited: You are invited to share your experiences and challenges related to climate change. Participation in this survey is entirely voluntary. Your decision to participate or not will not affect you or your family in any way.

Procedures: The survey will take approximately 30 minutes to complete. You are free to skip any question that makes you uncomfortable. Please feel free to ask questions or request clarification at any time during the survey.

Risks and Confidentiality: There are no physical risks associated with participating in this survey. All your responses will remain strictly confidential and securely stored. Only the study team will have access to your information.

Benefits: While there is no direct benefit or payment for participating in the survey, your input will help inform efforts to improve services and support systems in your community.

Contact Information: If you have any questions or require further information about this survey, please contact: ..... (Surveyor name, contact details)

Confirmation: I have read (or been read) the consent form in full, and I agree to participate in the survey.

Participant Name: Signature/Thumb Impression:

Investigator Name: Signature of Investigator:

Date:

(Note: The investigator must provide a signed copy of the consent form to the participant and keep another signed copy for the study records.)

Household Survey Form

Section 01: Demographic Information

1.1	Name			Location		
1.2	Age	Below 18	18-25	26-40	41-60	60 above
1.3	Gender	M		F		O
1.4	Total Family Members	Children (0-6) M/F	Children (7-14) M/F	Young (15-21) M/F	Adult (21-60) M/F	Elderly (60+) M/F
1.5	Caste	Gen	OBC	SC	ST	Minor
1.6	Type of work/ Occupation	Street Vendor	Construction Worker	House Help	Student	Retired/ NA
		Shopkeeper	Helper	Driver	Scrap collection	Security Guard
		Carpenter	Ironing/ Dhobi	Tailoring	Fishermen	
		Painter	Private job	Other business-		
1.7	Monthly Income	>10000	10-20K	20-30K	30-40K	40K<
1.8	Residential Area	Slum	Informal Settlement	EWS	LIG	Other-

Section 02: Awareness and Perception of Climate Change/Economic Effects

2.1	Have you noticed any changes in the climate over the past few years? (10-15 Yrs)			Yes	No	No Idea
2.2	If yes, what changes have you observed?	Rising temperatures	Irregular rainfall	Flooding	Droughts	Other-
2.3	How do you usually receive information about climate-related changes or events?	TV, newspapers, or online news	following climate-related content on social media platforms	NGO/ community organizations shared information	When received alerts or information from govt. sources, local authorities or weather agencies	Others
2.4	How do you think these changes have affected your community?	Positively		Negatively		No impact
2.5	Has climate change impacted your source of income or work?			Yes	No	Sometimes
2.6	If yes, how has it affected you?	Reduced income	Irregular work opportunities	Borrowing money	Increased costs (healthcare, utilities)	Loss of assets (home, livestock)
		Migration to safer areas- Temp/ Seasonal	Migration- Permanent	Changing occupation	Back to Village/ Cropping	Other-
2.7	Has your work/ business/trade been affected by climate-related events?	significantly affected	somewhat affected	No	I have no business	
2.8	Has your family faced increased expenses due to extreme weather events?			Yes	No	Can't say
2.9	If yes, which expenses have increased?	Health treatments	Repairs to home/ infrastructure	Food and water	Education related	Others-
2.10	Have you lost/ damage any property due to climate-related events?	House- Partially	House- Complete damage	Toilet/ Stairs/ Water tank etc	Shop/ Wending	Others-
2.11	Have climate-related events increased household expenses?	Health/ Hygiene related	Nutrition related	Infra related	Mobility related	Education related

Section 03: Non-economic Effects (Health, Nutrition, Safety, WASH and Education)

3.1	Has anyone in your household faced health issues due to climate change in past few years?			Yes	No	Not Remembered
3.2	If yes, who has been affected the most?	Children	Women	Adolescents/ Youth	Adults	Old age
3.3	What health problems have been most common?	Heat-related illnesses (heatstroke, dehydration, Weakness, Tiredness)		Respiratory issues (asthma, allergies)		Waterborne diseases (cholera, diarrhea)
		Vector-borne diseases (malaria, dengue)		Mental health problems (anxiety, depression)		Other-
3.4	Have you faced difficulties accessing healthcare services during extreme weather events?			Yes	No	Sometimes
3.5	If yes, what were the challenges?	Transportation issues	Overcrowding at health centers	Non-availability of medical staff	Financial constraints	Other-
3.6	Has climate change affected your family's access to nutritious food?			Yes	No	Sometimes
3.7	If yes, which groups in your family are most affected?	Children	Women	Adolescents/ Youth	Adults	Old age
3.8	Have you observed any signs of malnutrition/Anemia in your family members?			Yes	No	No Idea
3.9	If yes, have you received services from AWC/ PHC/PDS?			Yes	No	No Idea
3.10	If yes, are you satisfied/sufficient with that?			Yes	No	No Idea
3.11	During extreme weather events, do you receive any additional food/nutrition support from the govt./ICDS/ PDS or NGOs?			Yes (Describe)-	No	Not Remembered
3.12	If yes, what type of support?		Food grains	Ready-to-eat meals	Nutritional supplements	Other-
3.13	Are you able to afford a balanced diet (including milk, fruits, vegetables etc)?			Always	Sometimes	Rarely
3.14	Tap water at home Community tap Handpump Own tubewell/ Well Community tubewell/ Well	Tap water at home	Community tap	Handpump	Own tubewell/ Well	Community tubewell/ Well
		Water tanker Supply (Govt/ Private)		Bottled water	Direct from River/ lake	Others-
3.15	If outside, has access to clean drinking water become more difficult due to climate change?				Yes	No

3.16	If yes, what are the primary issues?	Water scarcity	Contaminated water	Irregular water supply	Based on handpump/ Govt. Tankers	Water purchase (Private tanker/ For drinking)
3.17	How has water scarcity affected your family's daily life?		Reduced personal hygiene practices	Limited cooking and drinking water	Increased time spent collecting water	Other-
3.18	Do you purchase Drinking water in extreme climate situations?			Yes	No	Sometimes
3.19	If yes, Basic Cost of the water? (In one season)	>500	500-1000	1000-2000	2000-5000	5000 or more
3.20	Do you have access to functional toilets in your household?				Yes	No
3.21	If no, where does your family go for sanitation needs?		Open defeca-tion	Sulabh toilets	Community owned toilets	Others-
3.22	Have extreme weather events caused issues with sanitation facilities?		Flooding of toi-lets	Non-functional sew-age systems	Damage to sanitation infra-structure	Others-
3.23	Are menstrual hygiene (Pads)/ Diapers (Children or elderly) products accessible in your family?		Always	Sometimes	Rarely	No
3.24	Do children/Girls in your house-hold face any hygiene-related challenges at school?	Lack of clean drinking water	Poor sanitation facilities	Lack of soap or handwashing stations	Pad distribution/ Unavailability of diapers	Other-
3.25	Have climate change events disrupted children's education?			Yes	No	Sometimes
3.26	If yes, what types of disruptions have occurred?		School closures due to flooding or ex-treme heat	Lack of transporta-tion to school	Health issues preventing attendance	Other-
3.27	If yes, How long did these disruptions last?		Less than a week	1-3 weeks	4-8 weeks	More than 8 weeks or oth-ers-

3.28	Have online learning options been available during school closures?		Yes- Digital/ Learning aids/	No	No Idea
3.29	If yes, were you able to access these options?	Always	Sometimes	Rarely	Never
3.30	What challenges do children in your household face regarding education due to climate change?	Inadequate school infra-structure (no cooling dur-ing heatwaves)	Damaged school buildings from floods	Lack/loss of study materials due to financial constraints	Other
3.31	Do children in your household play outside regularly?		Yes	No	Sometimes
3.32	If not, what are the reasons preventing children from playing outdoors, and have parks or playgrounds been impacted by climate change?	Parks/ Play area not available	Distance from home	Safety issues	Poor mainte-nance or unsafe conditions	Reduction in greenery or shaded areas
		Extreme heat	Waterlogging/ flooding		Lack of lighting or se-curity	Others-
3.33	Has the caregiving burden in your household increased due to climate impacts?	Managing chil-dren's/ Old age's health	Increased need for childcare due to school or day-care disruptions	Providing care for elderly or sick family members affected by climate condi-tions	Additional time spent on house-hold chores like fetching water or maintaining safety	Others-
3.34	Have you noticed any changes in household dynamics due to climate-related pressures?	Increased stress among family members	More frequent conflicts or ar-guments	Experiences of domestic violence or abuse	Strengthened family bonds or cooperation dur-ing crises	Others-
3.35	What specific impacts have these disruptions had on girls in the household?		Education related	Health and Nutrition	Safety and Protection	Others

Section 04: Social and Cultural Impacts

4.1	Have you faced any challenges in accessing essential resources (water, food, healthcare) due to your social identity during climate-related events? If Yes, what kind of-	Caste/ Community	Gender based	economic status	age or disability-related challenges	No/ Others-
4.2	Has your family experienced migration due to extreme climate events? If Yes, please specify:	Type of Migration - Seasonal - Temporary - Permanent	Migrating Members - Entire family - Only male members - Other	Economic Impacts - Loss of income - Increased expenses - Employment challenges	Non-Economic - Disruption of children's education - Health issues - Social or psychological stress - Separation from community/ support networks - Language issues	
4.3	Have you noticed any loss of community traditions or cultural practices due to climate change?			Yes	No	Sometimes
4.4	If yes, which of the following have been impacted? (Select all that apply	Traditional festivals/ events/ Celebrations	traditional practices	Participation related issues due to weather	Participation issue due to work	
		Religious rituals or practices	Folk art and craft production	Traditional attire or materials	Others	
4.5	How has climate change affected these practices?	Reduced availability of materials (natural dyes, bamboo, clay)	Inability to hold events due to extreme weather	Loss of venues or spaces for community gatherings	Decrease in participation due to migration or economic pressures	Other
4.6	Any Traditional sustainable practices, which affected? if yes, please describe-					
4.7	Have local folk practices (music, dance, Satsang) declined due to climate-induced changes?			Yes (Specify)-	No	No Idea
4.8	Are there specific festivals or rituals that affected recently due to extreme weather events?			Yes (Specify)-	No	No Idea

4.9	Has climate change affected any generational transmission of cultural knowledge or skills (traditional craft-making, storytelling etc)?				Yes	No
4.10	If yes, what are the reasons for this loss?	Migration of younger generations	Loss of raw materials	Economic pressures forcing individuals into other livelihoods	Interest	Other-
4.11	Do you believe it is important to preserve cultural practices and traditional knowledge to maintain your community's identity and resilience for future generations?	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
4.12	Are there any initiatives in your community to revive or protect cultural practices affected by climate change?			Yes (Specify)-	No	No Idea

Section 05: Coping Mechanisms and Support

5.1	Do you or your family have any form of insurance coverage to cope with climate-related impacts?	Health Insurance	Property Insurance	Disaster related	No insurance coverage	Others-
5.2	Have you accessed any financial assistance due to climate-related events?	Government grants or subsidies	Loans from banks or Sahukar/ Private Agency	Relief funds from the govt or NGOs	Community-based financial support	No financial assistance accessed
5.3	Are you aware of any govt. or NGO programs supporting climate-affected communities?				Yes	No
5.4	If yes, what kind of benefit you got?	Health/ Nutrition related	WASH related	Education related	Shelter/ Cloths	Other-
5.5	What support would help community better handle the effects of climate change?	Improved healthcare services	Better water and sanitation facilities	Financial assistance	Education and awareness programs	Others
5.6	Do you have any additional comments or suggestions?					

6.2 Annexure II: Focus Group Discussion Questionnaire (community)

Consent Form

Purpose of the Survey:

Hello, my name is .....and I am working with ICLEI South Asia. We are conducting a Focus Group Discussion to understand how climate change, particularly urban flooding and extreme heat, impacts families. Your responses will contribute to improving community support systems.

Why You Are Invited:

You are invited to share your experiences and challenges related to climate change. Participation in this survey is entirely voluntary. Your decision to participate or not will not affect you or your family in any way.

Procedures:

The survey will take approximately 30 minutes to complete. You are free to skip any question that makes you uncomfortable. Please feel free to ask questions or request clarification at any time during the survey.

Risks and Confidentiality:

There are no physical risks associated with participating in this survey. All your responses will remain strictly confidential and securely stored. Only the study team will have access to your information.

Benefits:

While there is no direct benefit or payment for participating in the survey, your input will help inform efforts to improve services and support systems in your community.

Contact Information: If you have any questions or require further information about this survey, please contact: Om Prakash (9772333391; om.prakash@iclei.org

Confirmation

I have read (or been read) the consent form in full, and I agree to participate in the survey.

Participant Name: Signature/Thumb Impression:

Investigator Name: Signature of Investigator:

Date:

(Note: The investigator must provide a signed copy of the consent form to the participant and keep another signed copy for the study records.)

1. Economic

	Query/Questions	Supporting Problems *(for facilitator only)*	Notes
1.1	Have you noticed any changes in the climate over the past 10-15 years? - Have summers become hotter? Are winters shorter? - Have rainfall patterns changed? More or less frequent? - Has there been an increase in flooding or water scarcity?		
1.2	Are these changes affecting daily life, work, or travel?		
1.3	How do you receive information about climate-related changes or warnings?	- TV/News - Radio - Social Media (WhatsApp, Facebook, YouTube) - Word of Mouth - Government SMS Alerts - NGO/Community Meetings - Weather Apps - Local Leaders/Panchayat - No Information	
1.4	Do you receive early warnings for floods, heatwaves, or water shortages?	- Yes, SMS Alerts - Yes, Community Meetings - Yes, TV/News - Sometimes - No Warnings - Don't Know	
1.5	Has climate change affected your work or income in any way?	- Reduced Work Opportunities - Lower Daily Wages - Irregular Employment - Lost Livelihood/Job - Increased Workload - No Impact	
1.6	Has your household's monthly expenses increased due to extreme weather events? If yes, on what?	- House Repairs - Rent a property - Water (Drinking, Storage, Tankers) - Health Treatment - Food & Nutrition - Tution Fees & Education Costs - Electricity Bills (Cooling, Fans, ACs, Heaters) - Transportation Costs - No Increase	

	Query/Questions	Supporting Problems *(for facilitator only)*	Notes
1.7	Have you or your family members migrated due to climate-related problems?	- Seasonal Migration - Temporary Migration - Permanent Migration - Men Only Migrated - Entire Family Migrated - No Migration	
1.8	Has migration affected family income, children's education, or access to services?	- Reduced Household Income - Interrupted Children's Education - Lost Access to Government Services (Ration, Health, ICDS) - Increased Cost of Living in New Area - Loss of Community Support - No Major Impact	
1.9	What steps have you or your family taken to cope with extreme weather events?	- Changed Work Timings - Built Temporary Shelters - Stored More Water & Food - Borrowed Money for Repairs - Reduced Daily Expenses - Sent Family Members to Safer Areas - No Coping Strategies	
1.10	Has your house been damaged due to extreme weather events?	- Yes, due to riverine, creek floods - Yes, due to storms surge events - No major damage	
1.11	If yes, How have you coped with housing damage?	- Self-repair with personal funds - Borrowed money for repairs - Received government aid for reconstruction - No repair measures taken	
1.12	What emergency measures do you take during extreme weather events?	- Evacuate to safer locations - Stockpile food and water - Rely on community/government assistance - No specific measures taken	

2. Non-Economic

	Query/Questions	Supporting Problems *(for facilitator only)*	Notes
2.1	Have you noticed specific health problems in family during or after such climatic events?	Physical: fever, diarrhea, skin infections, respiratory issues, heat exhaustion, dehydration etc. Mental Health related: Irritation/ Anger/ Disturbed	
2.2	How accessible are healthcare facilities during such climatic events?	- Distance between House- PHC - Timing related issues (Open/Close) - Availability of Staff/ Doctor - Medicines related - Health checkup/ Pathology tests - Others-	
2.3	Has climate change affected your family's access to nutritious food?	- Vegetables are costly - Milk & pulses are unaffordable - Meat & eggs have become expensive - Everything is expensive - No significant change	
2.4	Has there been a decline in food diversity (eating fewer food groups)?	- Less vegetables & fruits - Less dairy & protein-rich foods - Yes, eating more rice/wheat but fewer nutrients - Relying more on packaged/low-quality food - No change in diet	
2.5	What steps do you take when food is not available or too expensive?	- Reduce meal portions - Skip meals (adults eat less so children can eat) - Buy cheaper or low-quality food - Depend on borrowed money or credit at local shops - Rely on government ration (PDS, Anganwadi, Midday Meals) - No coping mechanism, we just struggle	
2.6	Do women face more challenges in managing food shortages at home?	- women eat less - pregnant/lactating don't get enough nutrition - Women have to work extra to afford food - Mothers worry about their children's health - No gender-specific impact	
2.7	Do women and children suffer from malnutrition or anemia due to poor diet?	- Yes, children are underweight - Yes, women suffer from weakness/anemia - Yes, pregnant women face nutrition issues - Yes, lack of protein leads to tiredness - No noticeable health issues	

	Query/Questions	Supporting Problems *(for facilitator only)*	Notes
2.8	Do you receive food assistance from government schemes (PDS, ICDS, Midday Meals)?	- Yes, but quantity is insufficient - Yes, but quality is poor - Yes, but not regularly available - No, we don't receive any help - Not aware of any scheme	
2.9	Has the burden on women increased due to food shortages and climate events?	- Yes, women have to spend more time finding food & water - Yes, they do extra work to earn money for food - Yes, they take care of sick children due to poor diet - Yes, they walk long distances to collect water - No major impact on workload	
2.10	What is your main source of drinking water?	- Municipal tap water - Community borewell/handpump - Private water tankers - Packaged bottled water - River/lake water	
2.11	Has access to clean drinking water become more difficult due to climate change?	- Yes, water is scarce in summer - Yes, floods contaminate drinking water - Yes, we have to buy water - Yes, waterborne diseases have increased - No major impact on water availability	
2.12	Have government water supplies (taps, tankers) become irregular?	- Yes, water supply is unpredictable - Yes, tankers come late or sometimes don't come at all - Yes, pipeline water pressure is too low - Yes, only certain areas get proper water supply - No, water supply is stable	
2.13	Has water quality worsened, leading to diarrhea or stomach issues?	- Yes, water looks dirty/smells bad - Yes, children often fall sick with stomach infections - Yes, we boil water before drinking - Yes, more people suffer from diarrhea & typhoid - No, water quality is fine	
2.14	What solutions do you think can improve water availability and quality in your area?	- More regular water supply from government - Better water filtration & treatment - More borewells or handpumps - Stronger rules against water wastage - Community rainwater harvesting - Others	

	Query/Questions	Supporting Problems *(for facilitator only)*	Notes
2.15	Have climate events (heatwaves, floods, droughts) disrupted your children's education?	- Yes, schools close frequently - Yes, extreme heat makes studying difficult - Yes, floods make it unsafe to go to school - Yes, children fall sick more often and miss school - No, education is not affected	
2.16	Have school closures increased due to extreme heat or floods?	- Yes, schools remain closed during peak summer - Yes, roads and streets flood, making it difficult to reach school - Yes, schools remain closed due to poor infrastructure (roof leaks, flooding, no drinking water) - Yes, government announces school holidays due to heat or floods - No, schools function normally	
2.17	Has study material (books, notebooks, school bags) been damaged due to flooding?	- Yes, books and notebooks got wet in the flood - Yes, school bags and uniforms were lost/ damaged - Yes, we cannot afford to replace damaged study materials - Yes, children cannot study at home due to lack of dry space - No, study materials were not affected	
2.18	Do children miss school to help with household tasks (fetching water, looking after younger siblings)?	- Yes, girls miss school to fetch water - Yes, older children take care of younger siblings when parents work - Yes, children help in earning extra income for the family - Yes, household chores increase when families struggle with water or food shortages - No, children continue to go to school regularly	
2.19	Has online learning been an option during school closures?	- Yes, but we don't have smartphones/ internet - Yes, but children find it hard to study online - Yes, but electricity/power cuts make it difficult - No, we don't have access to online education - No, teachers/schools don't provide online learning materials	

	Query/Questions	Supporting Problems *(for facilitator only)*	Notes
2.20	How has climate-related school disruption affected children's learning?	- Children forget lessons due to missed school days - Lack of proper school environment affects concentration - Extra tuition is unaffordable - Children perform poorly in exams due to learning gaps - No major effect on learning	
2.21	Have schools taken steps to protect children from extreme heat or floods?	- Yes, fans or cooling areas have been installed - Yes, some schools provide clean drinking water - No, schools do not have proper cooling in summer - No, schools flood during rains and are unsafe - No, school toilets are non-functional during floods	
2.22	What can be done to prevent climate-related disruptions in children's education?	- Better school infrastructure (roof repairs, cooling systems, drainage systems) - Free school supplies for children who lose books due to floods - Flexible school hours during extreme weather - Access to affordable online education - More government support for children's education in climate-affected areas	

3. Culture

	Query/Questions	Supporting Problems *(for facilitator only)*	Notes
3.1	How have extreme weather events (floods, heatwaves, etc.) impacted the scheduling or organization of traditional festivals?	- either canceled or delayed - Some events took place, but with adjustments such as shorter durations or indoor locations. - No significant impact	
3.2	Has the frequency or scale of community gatherings been reduced due to climate change?	- Yes/ No - Some gatherings are held virtually to avoid the impacts of extreme weather	
3.3	Have local festivals or religious ceremonies been modified in response to extreme weather conditions?	- Yes, certain rituals or practices have been modified - No - outdoor activities were limited - but indoor events continued	
3.4	How has migration (due to climate events or economic reasons) affected participation in traditional cultural or religious events?		
3.5	Have climate-related events led to an increase in family stress or emotional tension?		
3.6	Has there been an increase in family conflict related to the challenges posed by climate change (e.g., loss of livelihood, displacement)?		
3.7	How have caregiving responsibilities changed in families during extreme weather events?	- With kids/ Elderly members/ Pregnant/ Lactating	

4. Coping mechanisms and support systems

	Query/Questions	Supporting Problems *(for facilitator only)*	Notes
4.1	Have local authorities or government programs provided support for coping with extreme weather?	- Financial aid- - Limited support- - Proactive programs-	
4.2	Have your community members made changes in their homes or lifestyles to reduce the impact of floods or heat?	- Elevated homes - Tree planting - Water storage - Insulation	
4.3	Have any specific programs or initiatives from NGOs been helpful in addressing the impacts of extreme weather on your community?	- Resilience training - Awareness campaigns - Minimal efforts	
4.4	Have you received any government or NGO support during extreme weather events?	- Ration supplies, emergency relief, or financial aid - Have ICDS/PDS systems helped with nutrition or food security?	

Before we conclude, is there anything else you would like to share about your experiences with climate change?

Other Notes/Case story-

6.3 Annexure III: Workshop with government departments and parastatals

FGD Questionnaire - Understanding and Responding to Loss and Damage (Govt. Stakeholders)

Session 1:

Introduction

[Context setting presentation]

- Introduction and rationale for the FGD
- Icebreaker exercise (to be finalised)

Section A: Observations on Impacts of Extreme-Climatic Events and Social Vulnerabilities

1. What are the key climate-related impacts your department is responding to?
2. Which areas or population groups within the city do you see being most affected by these impacts?
3. From your observations or department records, what kinds of losses have communities experienced (e.g. disruption of services, informal sector income loss, damage to public infrastructure, health burdens)?

Section B: Types of Loss & Damage

[Use matrix sheet as a visual aid: Tangible vs Intangible, Economic vs Non-Economic]

1. Based on your department's engagement, which of the following categories of loss and damage have you encountered in communities?
   - Economic and tangible:
   - Economic and intangible:
   - Non-economic and tangible:
   - Non-economic and intangible:
2. Are there any kinds of losses your department witnesses that are missing from this list?

Section C: Measurement and Evidence of L&D

1. Are any of these losses & damages reported within city systems? Which of these are more frequently reported in your department?
2. What barriers exist in capturing certain kinds of L&D data (e.g of conditions that pose barriers - from informal settlements, health effects, non economic losses)? (if barriers are specific, moderator to match barrier to type of L&D + condition)
3. In the absence of formal data, what kinds of data—quantitative or qualitative—would strengthen institutional responses?
4. With focus on non-economic L&D, what types of data could be collected at the grassroots level by non-government stakeholders & what type of data could be collected at the institutional level?
5. Are there informal data sources (community reports, field staff inputs, etc.) currently being collected by non-government stakeholders that could be better integrated in institutional response? (Prompt for any examples)

Session 2: (Post Lunch)

Section D: Coping, Recovery and Limits of Adaptation

[Recap key insights from morning session on types of loss and affected communities]

1. What institutional responses have been implemented to support coping with or recovery from recent events like heat waves or floods?
2. Are there any institutional constraints that hinder recovery from these events? (e.g budget constraints, human resource etc).
3. Could you share an example of a successful adaptation strategy and what were the factors or conditions that enabled it? (emphasise mapping out specific conditions/factors)
4. Have you encountered limits to existing strategies—where they were no longer sufficient or responsive? Can you share examples? (if hard limit response is given, probe soft limit — follow up on limits to Infrastructure & NbS strategies)
5. When limits have been reached, what has been provided to communities for the process of recovery?

Section E: Recommendations & Next Steps

1. Are there policy mechanisms or institutional examples you consider good practice for addressing L&D—either locally or from other cities/states?
2. What is your recommendation for institutionalising L&D assessment & management at the city level?
3. Are there other departments, agencies, or community partners you think should be engaged in this process to better understand the full picture?
4. Would you be open to being contacted for follow-up discussions or validation of findings?

Government departments and parastatals who attended the Ahmedabad Workshop on 30th April 2025

S.No.	Department/Organization	Name	Designation/Position
1	Disaster Management, AMC	Dhumit Gandhi	Deputy Chief Fire Officer
2	Health Department, AMC	Milan Nayak	Deputy Health Officer
3	Engineering Department	Amit Patel	Asst. City Engineer, Road
		Bhavesh Vyas	Asst. City Engineer, WRM
4	Urban Community Development Department	Jagdish Prajapati	Project Officer In Charge
5	Fire and Emergency Services Department	Pankaj Rawal	DV. Fire Officer
6	City Planning Department	Jitesh Kacha	Assistant Estate Officer/TDO
7	TDO Central Office	Akshay Patel	Assistant Estate Officer/TDO
8	Smart City	Apoorva Solanki	Assistant Manager
9	School Board	Dinesh Desai	Assistant Governor
10	Gujarat Industrial Development Corporation (GIDC)	Kruti J Maniyar	Superintending Engineer, Ahmedabad
12	IMD - Met Centre Ahmedabad	Pradeep Sharma	Scientist-D
13	UNICEF Regional Office	Abhishek F	DRR& CCES Consultant

6.4 Annexure IV: Workshop with Community Based Organizations (CBOs)

FGD Questionnaire - Understanding and Responding to Loss and Damage

Session 1:

Section A: Observations on Impacts of Extreme-Climatic Events and Social Vulnerabilities

1. What are the key climate-related impacts faced by communities in city?
2. Which communities in the city have you observed to be more affected than others? (e.g factors of gender, age, caste, income etc.)
3. What kinds of losses have communities experienced due to these events/risks? (e.g. income loss, displacement, health issues etc.)

Section B: Types of Loss & Damages

Use matrix sheet as visual aid: Tangible vs Intangible, Economic vs Non-Economic (to be explained)

1. From your work, which of the following types of L&Ds have you observed impact in the communities?
    - Economic and tangible:
    - Economic and intangible:
    - Non-economic and tangible:
    - Non-economic and tangible:
2. Are there any kinds of loss you see in your work that are missing from this list?
3. Which types of L&Ds are most relevant or recurring for the communities you work with?

Section C: Measurement and Evidence of L&D

1. Is your organisation or anyone you know recording any of these losses?
2. Are any of these losses currently not being documented at all either by government or non-government stakeholders?
3. How would you recommend recording these losses? Or what challenges do you foresee in recording these?
4. With focus on non-economic L&D, what types of data could be collected at the grassroots level by non-government stakeholders & what type of data could be collected at institutional level?
5. Are there informal data sources (community reports, field staff inputs, etc.) currently being collected by non-government stakeholders that could be better integrated in institutional response? (Prompt for any specific examples)

Session 2: (Post Lunch)

Section D: Coping mechanisms, Recovery Efforts and Limits of Adaptation

[Context setting: Reflect on insights shared from impacts of heat & flood in previous session]

1. What are some coping or recovery strategies communities have used to deal with these impacts of heat/flood?
2. Have you noticed points where these strategies no longer work or reach their limits? Can you give examples?

Section E: Recommendations & Next Steps

1. Are there policy mechanisms or community-driven action you consider good practices in addressing L&D—either locally or from other cities?
2. If you could recommend one change to how L&D is currently approached, what would it be? – is defined in the matrix or definition by UN/IPCC to discuss with Prerna, I think the latter might be futile
3. In your experience, how do communities understand 'loss and damage'? Are there any local terms/ concepts that capture these perceptions of L&D?
4. Can you suggest any other CBOs/civil society representatives we could further consult with to better capture local understanding of L&D?
5. Can we contact you for follow-up questions in the future as the research progresses?

Community Based Organizations (CBOs) who attended the Ahmedabad and Surat Workshop on 01st May 2025 and 03rd May 2025 respectively.

Organizations who attended in Ahmedabad-

- Basera
- Shelter Square Foundation
- Aajeevika Bureau
- SPIESR
- SPARC
- SAFAR
- GujAid – Disaster and First Aid Foundation
- Sanchetana Community Health and Research Centre
- Cohesion Foundation Trust
- Centre for Integrated Development
- IITRAM
- Paryavaran Mitra
- CEE Ahmedabad
- The Urban Lab Foundation
- SAATH
- UNNATI
- Action Aid
- VIKSAT
- Utthan Trust
- Mahila Housing Trust
- BMS
- CLRA
- GIDM
- SEEDS

Organizations who attended in Surat-

- Veer Narmad South Gujarat University
- UHCRCE
- Sardar Vallabhbhai National Institute of Technology (SVNIT) Surat
- Centre for Labour Research and Action (CLRA)
- Ajeevika Bureau
- PP Savani University
- Child Online Protection Foundation of India
- Falak Charitable Trust
- Community medicine Department, Government Medical College, Surat
- Retired Deputy Engineer (Weir cum Causeway, SMC)

6.5 Annexure V: Analysis approach for FGD with CBOs

This study applied thematic analysis to examine insights from the focus group discussions. Thematic analysis is a qualitative method used to identify, analyze, and interpret patterns—referred to as themes—within qualitative data such as interview or FGD transcripts. It is particularly useful for making sense of complex and detailed narratives, allowing researchers to distill key insights in relation to the research question. Known for its flexibility, thematic analysis is well-suited for exploring participants' perspectives, knowledge, experiences, and values around a given topic.

The most widely referenced approach to thematic analysis was developed by Braun and Clarke (2006). Their method involves a process that includes the following steps:

1. Familiarization with the data
2. Coding
3. Generating themes
4. Reviewing themes
5. Defining and naming themes, and
6. Reporting

This structured yet adaptable approach helps ensure rigour and clarity in qualitative analysis, supporting the development of findings that are both grounded in participants' voices and analytically robust.

Building on the approach outlined above, the analytical steps followed in this study are detailed in the section that follows.

Data Familiarization

Initially, the focus group transcripts were organized and cleaned using Google Sheets, followed by a thorough review to ensure familiarity with the data. Preliminary observations were documented in the form of notes, allowing key ideas and areas of interest to emerge ahead of formal coding.

Coding

For the coding process, NVivo software was used to organize and analyze the data systematically. Two complementary analytical approaches guided the coding process: deductive and inductive.

- A **deductive approach** was applied first, using a set of predefined themes drawn from the guiding questions and existing literature on L&D specific to the cities of the study. This ensured coherence with the study objectives while maintaining consistency across transcripts. To capture unanticipated insights, data that did not align with the initial coding framework were also noted.
- An **inductive approach** allowed new themes to emerge directly from participants' narratives. This open-ended process enabled deeper exploration of community-specific perspectives and values.

Together, these approaches provided a structured yet flexible framework for capturing both anticipated and novel insights from the FGDs.

Generating themes from the codes

Building on the initial coding process conducted using NVivo, the next step involved organizing codes to identify recurring patterns within the data. Themes were developed through an iterative process of interpreting and comparing clusters of related codes to refine meaningful patterns that capture key insights from participants' experiences relevant to the research questions.

Review and Refine Themes

The themes were reviewed by revisiting the data to ensure they were clear, distinct, and well-supported by evidence, with definitions for each theme subsequently clarified.This process helped to refine theme boundaries, identify overlaps or gaps, and confirm their relevance to the research questions.

Reporting

The final step involved clearly documenting the analysis process and presenting a coherent interpretation of the data. Sharing the codebook and theme descriptions enhanced transparency and rigour in reporting.

Reflexivity and Minimizing Bias

Recognizing that thematic analysis involves subjective interpretation, the researcher actively reflected on their own positionality and potential biases throughout the process. To minimize confirmation bias, especially during the deductive coding phase, efforts were made to identify and consider contradictory evidence within the data.

Codebook for Deductive Analysis

Name	Description
Section A - Observations on Impacts	**Observations on Impacts of Extreme-Climatic Events and Social Vulnerabilities**
Affected Groups	The communities in the city that are more affected than others by climate events
Age-Related Groups	Populations whose climate vulnerability is driven chiefly by their life stage (children, students, older adults).
Gender, Disability, Care	Groups affected by gender roles, disability, or unpaid care duties that alter exposure and adaptive capacity
Housing and Settlements	Populations whose risk is intensified by informal, insecure, or inadequate housing and land tenure.
Livelihood & Work Settings	Employment-based identities where climate hazards disrupt income, safety, or productivity.
Mobility & Place-Specific Groups	Communities defined by migration status or distinct localities that create unique climate impacts.
Socio-economic status	People or households differentiated primarily by income or class—whose economic standing shapes their exposure to, and capacity to cope with, climate-related loss and damage.
Climate Impacts	**Key climate-related impacts faced by communities in the city**
#1 Extreme Heat & Urban Thermal Stress	high ambient temperatures, heat-wave events, urban-heat-island hot-spots, intense night-time heat, or indoor thermal discomfort caused by climate change and/or built-form features.
#10 Exposure & Vulnerability Contexts	Spatial, demographic, or social circumstances that heighten sensitivity to climate impacts or constrain adaptive capacity—serving as modifiers rather than direct impacts.
#2 Heat-Health Effects	Reference to illnesses, symptoms, or medical risks that are explicitly attributed to heat
#3 Flooding	Inundation events caused by heavy rainfall, river or creek overflow, or drainage failure
#4 Water Scarcity & Quality	Water scarcity and quality issues due to climate events
#5 Electricity & Energy Loop	Disruptions to energy supply or demand-driven feedbacks
#6 Livelihood & Economic Strain	Reductions in earning capacity, productivity, or household purchasing power directly attributable to climate-related hazards or related market effects.
#7 Service & Infrastructure Disruptions	Breakdowns or reduced functionality of essential public services, facilities, or physical infrastructure that limit community access or resilience during climate events.

#8 Psychosocial Impacts	Mental-health, emotional, or social-role stresses that arise from climate hazards, prolonged exposure, or adaptive burdens placed on individuals or groups.
#9 Climatic Variability Signals	Observed shifts or anomalies in local weather or seasonal patterns
Loss Categories	The kinds of loss that the communities have experienced due to climate events/risks.
ELD	Economic Loss and Damage
NELD	Non-economic Loss and Damage
Section B - Types of L&D	
Missing Losses from city lists	Losses observed in work that are missing from the lists presented during FGDs
Most relevant losses	L&Ds that are most relevant or recurring for the communities you work with
Section C - Measuring L&D	**Measurement and Evidence of L&D**
Data gaps - Unreported losses	Losses that are currently not being documented at all either by government or non-government stakeholders.
Informal data sources	Informal data sources of L&D collected by NGOs that could be better integrated
Institutional Sources and Potential Loss Data	Organisations that are recording any of these losses
NELD Data - Govts	Types of data could be collected at the institutional level
NELD Data - NGO	Types of data that could be collected at the grassroots level by non-government stakeholders
Recording Challenges	Challenges in recording these losses
Section D - Coping Strategies	**Coping mechanisms, Recovery Efforts and Limits of Adaptation**
Coping Strategies	Coping or recovery strategies communities have used in the city
Limits to Coping	Observed points where coping strategies no longer work
Section E - Recommendations	**Recommendations and Next Steps**
Good Practices	Policy mechanisms or community-driven good practices in addressing L&D—either locally or from other cities
Local Terminology	Local terms/concepts that capture perceptions of L&D
Recommended Changes	One change you'd recommend to current L&D approach

List of economic and non-economic Losses and Damages discussed during the workshop

	Economic L&D	Non-Economic L&D
Nation /State / City	- Loss of human capital - Inflation - Slowdown of economic growth - Trade (supply chains, transport infrastructure, debt) - Agriculture and food security (crop damage, food prices, availability)	- Loss of life - Displacement - Migration - Geopolitical security threat
Governance / Institutional	- Increased poverty and disparity - Loss of infrastructure - Loss of governance structures	- Human rights violation: gender-based violence / Increased violence against vulnerable groups - Increased hunger issues - Increased water scarcity
Individual aspects	- Loss of property - Loss of assets - Loss of livelihoods	- Loss of identity
Health-related aspects	- Amplified debt	- Loss of education: discontinuation of education / damage to education infrastructure - Loss of social cohesion - Loss of community resilience - Loss of traditional knowledge - Loss of cultural heritage: loss of traditional recipes / customary ways of life - Social inequality
Nature	- Resource scarcity - Loss of natural forests	- Ecosystem and biodiversity loss - Loss of ecosystem services

6.6 Annexure VI: Household Survey Data Analysis

Compare from normal months (in %)	Ahmedabad (Amount increased in %)		Surat (Amount increased in %)	
	Heat	Flood	Heat	Flood
House repair cost Increased	30%	70%	35%	65%
Food Inflation	20%	14%	20%	40%
Water Purchase	75%	75%	67%	67%
Expenses Increased	31%	44%	32%	42%
Income loss	25%	20%	18%	55%

Note:

- *The above data represents the higher end of the range of figures received from the household survey and FGD.*
- *Home repair expenditure was reported to be higher in Ahmedabad, as most respondents there owned their houses, whereas in Surat, the majority reported migrants living in rented houses.*

Compare from normal months (in%)	Ahmedabad (in rupees)			Surat (In rupees)		
	Normal Months	Heat Months	Flood/Heavy Rains months	Normal Months	Heat Months	Flood/Heavy Rains months
Electricity Bills	1200	3000	1600	1400	2800	2000
Health Expenses	500	1500	2000	700	2500	4000
Food Cost	3500	4200	4000	2500	3000	3500
Water purchase (Drinking/ Daily Use)	400	700	700	300	500	800
Overall Monthly Expenses	8000	10500	11500	9500	12500	13500

Note:

- *The above data represents the higher end of the range of figures received from the household survey and FGD.*

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