Making India Heat Ready

Proof of Concept for Anticipatory Action for Heatwaves

Aktion Deutschland Hilft
Germany's Relief Coalition

ADRA

Content Page

Acknowledgement

This whitepaper on documenting anticipatory action pilot initiatives to tackle heatwaves in India is the result of dedicated collaborative efforts and invaluable contributions from multiple stakeholders committed to enhancing community resilience and preparedness to tackle heatwaves.

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Executive Summary

India faces an escalating threat from heatwaves, intensifying risks to public health, livelihoods, and socio-economic stability, especially for marginalized communities such as informal workers, migrants, children, and the elderly. According to the India Meteorological Department (IMD), heatwave days rose from 413 (1981–1990) to 600 (2011–2020), contributing to over 17,000 fatalities since 1970. Climate change further exacerbates these challenges, underscoring the urgent need for proactive anticipatory measures.

ADRA India has implemented an anticipatory action (AA) model, aligning with international frameworks from ASEAN and the United Nations Office for Coordination of Humanitarian Affairs (OCHA). This model incorporates precise forecasting triggers, pre-planned context-specific interventions, and secured financial mechanisms for timely responses before heatwaves fully materialize.

In collaboration with the National Disaster Management Authority (NDMA) and the State Disaster Management Authorities (SDMA), ADRA India conducted pilot initiatives across Delhi, Madhya Pradesh, and Gujarat, benefiting thousands of vulnerable individuals. These pilots aimed to reduce immediate heatwave impacts, enhance community resilience, and explore the scalability of successful interventions. Significant interventions included the installation of 39 air coolers and 5 water coolers across 22 shelter homes in Delhi, Gwalior, and Ahmedabad, notably improving thermal comfort for daily wage earners and migrants. In addition, multiple public hydration points—including 4 air coolers in South Delhi and several units in MP and Gujarat marketplaces and religious institutions—substantially increased access to safe drinking water.

To provide immediate shade in high-exposure areas, 4 green sheds were installed in Delhi, with additional structures in Gwalior and Ahmedabad labour hotspots, while greening efforts saw the plantation of over 640 trees (40 in Delhi, ~600 in Ahmedabad). Cooling innovations included the pilot deployment of 4 phase-change material cooling vests for traffic police personnel in Delhi. Community preparedness was strengthened through the distribution of hundreds of hydration kits during targeted awareness drives and the delivery of culturally tailored risk communication campaigns such as street plays, community discussions, and school-based programs.

Capacity building played a pivotal role, with over 150 frontline health workers (ASHAs, ANMs, Anganwadi Workers, and Apda Mitras) trained in practical heatwave preparedness and emergency response. These integrated measures collectively enhanced thermal comfort, improved public access to safe drinking water, promoted behavioural change, and reinforced local emergency preparedness systems.

Successes of the pilot hinged on proactive community engagement, strategic partnerships ensuring infrastructure sustainability, and rigorous ground-level assessments for precise intervention targeting. However, gaps remain in localized forecasting accuracy and timely early warning dissemination, indicating areas for further improvement.

Looking forward, recommendations include scaling these anticipatory action measures across additional vulnerable states, enhancing early warning systems, institutionalizing regular frontline training, embedding cooling infrastructure into urban planning, establishing dedicated funding within disaster management frameworks, and fostering evidence generation through ongoing evaluation. This white paper presents a tested anticipatory action model for heatwaves in India, implemented across three states, reaching vulnerable individuals with targeted cooling, hydration, and preparedness measures. ADRA India's pilots demonstrate a replicable model for national resilience, effectively safeguarding India's most vulnerable populations from escalating heat risks.

Introduction

India is experiencing a marked increase in both frequency and severity of heatwaves, posing serious threats to lives and livelihoods. According to an analysis by the India Meteorological Department and the Institute for Climate Change Studies, the number of heatwave days recorded at 103 weather stations rose from 413 during 1981–1990 to 600 during 2011–2020[1,2]. This trend is echoed by broader studies: IPCC's AR6 confirms with high confidence that heatwave frequency and intensity have increased globally since the 1950s and are projected to rise further under warming scenarios[3]. Moreover, estimates indicate that India reported an average of 137 heat-wave days per decade during 2010–2019, up from 92–99 days in earlier decades, resulting in more than 17,000 heat-related deaths since 1970, with 6,496 fatalities alone in 2010–20194. These figures highlight the disproportionate impact of heatwaves on India's urban and rural poor—particularly the elderly, children, outdoor labourers, and low-income households—leading to heightened health risks, economic losses, and deepening social inequalities.

Recognizing this growing threat, anticipatory action has become both relevant and urgent. As per UN's Office for Disaster Risk Reduction (UNDRR), Anticipatory action refers to proactive measures that are taken before a disaster or extreme event occurs, aimed at reducing the impact and building resilience. Global best practices emphasize the importance of advance warning-triggered actions that mobilize resources ahead of crises, significantly reducing heat-related morbidity and mortality. ADRA India's commitment to anticipatory action (AA) is grounded in this pressing context. Adapted from ASEAN Framework on Anticipatory Action in Disaster Management and United Nations Office for the Coordination of Humanitarian Affairs (OCHA)'s Anticipatory Action Framework, ADRA India is implementing evidence-based, community-centric interventions to tackle heatwave. These actions are designed to integrate with existing systems—through partnerships with government agencies, scientific institutions, and frontline workers, providing a scalable and equitable blueprint for building urban heat resilience.

This whitepaper captures the broader framework that has guided the anticipatory action interventions and provides details of the proof of concept of these pilot interventions across 3 states in India that are severely affected by Heatwaves in India.

[1] https://www.vifindia.org/print/10246?via=Azure
[2] https://www.hindustantimes.com/india-news/heatwave-spells-on-the-rise-imd-research-101648664746090.html
[3] Ibid.
[4] https://factly.in/data-as-temperatures-soar-across-india-different-agencies-of-the-government-provide-varied-data-on-mortality/

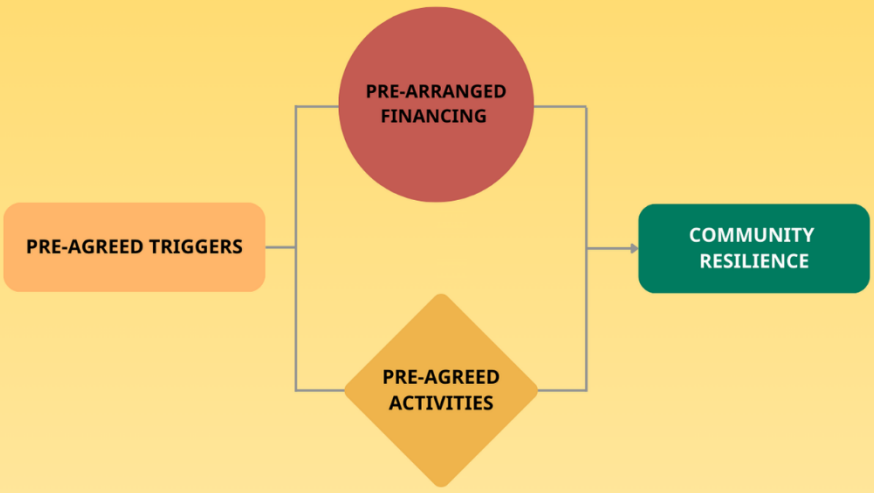
Framework for Anticipatory Action (AA) for Heatwaves

OCHA defines Anticipatory action as acting ahead of predicted hazards to prevent or reduce acute humanitarian impacts before they fully unfold[5]. As per OCHA's Anticipatory Action Framework and ASEAN Framework on Anticipatory Action in Disaster Management, Anticipatory action relies on pre-agreed triggers, pre-agreed activities, and pre-arranged financing that together enable immediate, forecast-based interventions before a hazard strikes.

Pre-agreed triggers consists of thresholds and decision-making rules based on reliable, timely and measurable forecasts. These comprise of Weather forecasts, Seasonal outlooks, Impact analyses, Situational monitoring and Pre-disaster risk assessments. **Pre-arranged financing** consists of funding that is guaranteed and available to be released based on the pre-agreed trigger towards the pre-agreed activities. This could include dedicated AA funds in DRM budgets and contingency plans and DRF instruments linked to AA triggers/protocols. **Pre-agreed activities** consists of accountable, feasible, effective and efficient actions to be implemented to support vulnerable communities in the window of opportunity between the trigger moment and the full impact of a shock. It could include standard operating procedures, menu of potential AAs, sectoral AA plans and AA protocols in contingency plans.

Figure 1 showcases the interplay between key components of the anticipatory action framework to achieve community resilience.

Figure 1: Framework for Anticipatory Action for Heatwaves



[5] https://www.youtube.com/watch?v=fEioIOvU3Wg&ab_channel=UNHumanitarian

ADRA India's Heatwave Response Model

Humanitarian response lies at the core of ADRA India's mission, with a focus on reaching the most affected areas during disasters—including those exacerbated by climate change, such as heatwaves. In alignment with this mandate, ADRA India has developed a heatwave response model centred on designing and implementing a suite of community-oriented and community-driven anticipatory interventions. These interventions are informed by pre-identified triggers, geographical risk profiles, and vulnerability indicators.

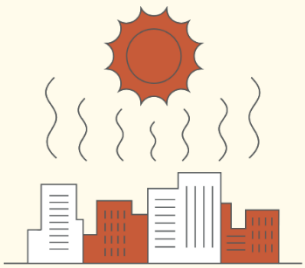
To further contextualize and strengthen these interventions, ADRA India, in partnership with NDMA and the Indian Centre for Advanced Resilience Studies (ICARS), conducted a comprehensive landscape study[6]. This study provides a structured framework for anticipatory action—ranging from trigger identification and vulnerability mapping to the operationalization of timely response mechanisms and the promotion of long-term community resilience. It also documents the pilot testing of anticipatory action protocol tools, offering nuanced insights into the patterns, impacts, and localized dynamics of heatwaves. These findings underscore the need for more timely, locally grounded, and evidence-based interventions, while contributing to the strengthening of disaster management frameworks across heat-prone regions in India.

[6] https://www.anticipation-hub.org/Documents/Reports/Study_Report_on-Diverse_Climatic_Zones_on_Anticipatory_Action_in_Heatwaves-Indian_community_perspectives.pdf

Box 1: Key Insights from the Landscape study on Diverse Climatic Zones on Anticipatory Action in Heatwaves: Indian Community Perspectives

Community Perceptions & Heatwave Experiences

Heatwaves were perceived as increasingly severe across all studied zones. Residents—especially marginalized groups like daily wage workers, women, frontline labourers, and migrants—noted rising frequency of heat events, early onset, and prolonged duration. Environmental factors like absence of green cover and limited access to cooling infrastructure exacerbate lived heat stress



Awareness of Anticipatory Action

The concept of AA was largely unfamiliar to local communities and institutional actors. Nonetheless, there was strong openness to structured action when provided with timely forecasts, clear triggers, and appropriate tools. This demonstrated high latent demand for pre-emptive measures—such as early communication, cool shelters, and water access— when adequately supported

Coping Mechanisms and Preparedness Gaps

Current responses are largely reactive and driven by households: shifting work hours, consuming more fluids, and intermittent rest in shade. These stop-gap measures fall short during prolonged heat episodes. Institutional support such as early warnings, cooling centres, or strategic public advisories was found to be extremely limited, especially in peri-urban and informal settlements.

Strategic Case for Pilot Interventions

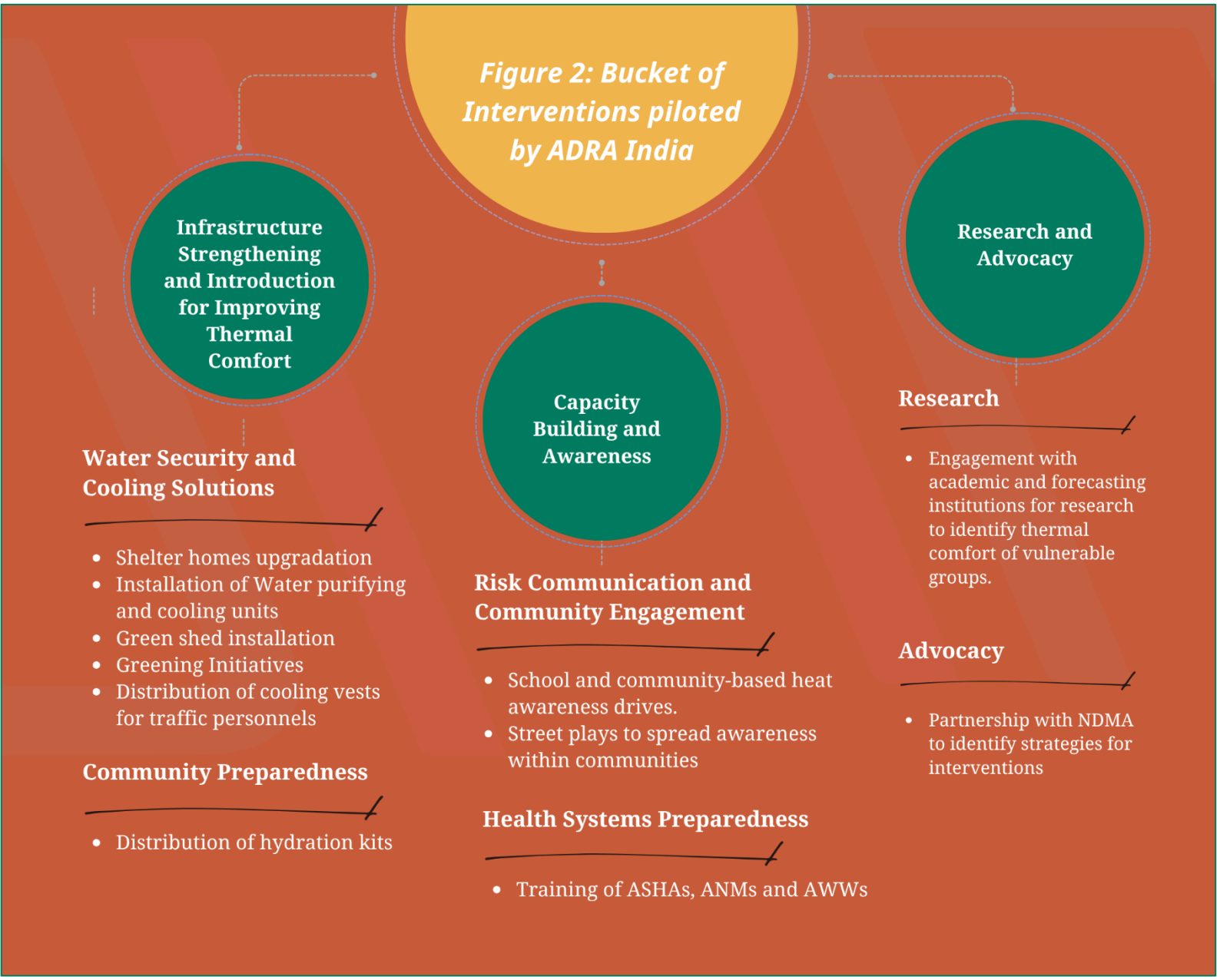
The landscape study recommended piloting AA Tools which were focused on two key areas: infrastructure development or strengthening to improve thermal comfort of people who are most vulnerable to the heatwaves and building awareness and capacities of the community and those working very closely with community at the frontline.

Selection of Geography and Target Audience

ADRA India operates across multiple States and Union Territories, a subset of which were profiled using climatic and heatwave forecasts from the India Meteorological Department (IMD). Based on the severity of heatwave occurrences over the past two years, three high-risk states were identified for pilot implementation: Delhi, Madhya Pradesh, and Gujarat. Within each of these states, one district was selected considering both heat exposure and logistical feasibility: South-East Delhi (Delhi), Gwalior (Madhya Pradesh), and Ahmedabad (Gujarat).

Within each selected district, intervention sites were further refined based on the concentration of vulnerable population groups, including informal sector workers, migrants, the elderly, children, and women in urban areas. The subsequent section on interventions provides detailed information on the specific locations and target populations engaged in the pilot activities.

Bucket of Interventions



Water Security and Cooling Solution

A series of interventions aimed at enhancing access to cool drinking water and community-level cooling infrastructure were implemented to improve thermal comfort for vulnerable populations in urban areas. The following sections detail the execution strategy, the criteria for selecting implementation sites, key lessons and challenges encountered during execution, and outcomes achieved.

Shelter Home Upgradation

Rationale for Selection of Intervention Site

To enhance thermal comfort for vulnerable urban populations, the intervention focused on upgrading government-managed shelter homes in Delhi, Madhya Pradesh, and Gujarat—states identified based on recurring heatwave alerts and high urban vulnerability. Within each state, districts were selected through a rapid needs assessment and consultation with local organizations to determine heat exposure levels and concentration of informal workers. Shelter homes were prioritized due to their institutional structure, daily occupancy by heat-exposed populations, and reliable access to electricity and water—critical for operating air and water coolers.

In Delhi, Southeast district was chosen for its dense migrant and informal workforce and alignment with the city's Heat Action Plan. In Gwalior (Madhya Pradesh), sites were shortlisted in coordination with the Municipal Corporation, based on high occupancy and poor thermal infrastructure. Gujarat followed a similar approach, focusing on shelters in areas with significant inflows of interstate migrant labour. The intervention also extended to orphanages in Madhya Pradesh based on field-level

identification of unmet needs. This targeted approach ensured that the most heat-vulnerable populations benefited from enhanced thermal comfort. The output for shelter homes across locations are mentioned in Table 1.

Table 1: *Outputs for shelter home upgradation initiative*

Interventions	**Water Coolers**	**Air coolers**
South-East Delhi	Not required	**9** Coolers across **7** centres
Gwalior	**5** Water Coolers across **5** shelter homes	**10** Coolers across **5** shelter homes
Ahmedabad	Not required	**20** Coolers across **10** shelter homes

Execution Strategy

Successful implementation relied on strategic collaboration with local government bodies and shelter home management agencies. In Delhi, engagement with the Delhi Urban Shelter Improvement Board (DUSIB) and its implementing NGOs facilitated access, approvals, and maintenance commitments for installed cooling systems. In Madhya Pradesh and Gujarat, Municipal Corporations played a central role in identifying high-need shelters and coordinating installation logistics.

Community engagement further supported effective site selection and intervention design. Field teams conducted assessments using a standardized checklist to evaluate ventilation, infrastructure adequacy, and service availability. Shelter home operators were engaged through on-site discussions to ensure clarity on roles and responsibilities post-installation. Regular coordination with district authorities also enabled quick troubleshooting and reinforced local ownership. This multi-tiered engagement model ensured responsiveness, operational feasibility, and sustainability of the intervention.

Lessons Learnt

- **On-Site Assessments Are Critical for Accurate Targeting**: Administrative data alone was insufficient to identify shelter homes most in need of support. Field visits helped validate conditions, revealing discrepancies and ensuring that interventions were directed to sites with the greatest infrastructure gaps.
- **Formal Institutional Ownership Strengthens Long-Term Sustainability**: Collaborating with government bodies and NGO partners responsible for shelter management proved effective in ensuring accountability for post-installation

maintenance. Orientation sessions reinforced their role in upkeep, especially for equipment like air coolers requiring seasonal maintenance.

- **Tailoring Interventions to Context Improves Effectiveness**: The suitability of each shelter home was assessed based on criteria such as ventilation, structural conditions, occupancy levels, and access to utilities. This context-driven approach ensured that support addressed real needs and maximized impact.
- **Infrastructure Readiness Varies Across States and Must Be Anticipated**: In states like Madhya Pradesh, shelter homes lacked basic facilities such as potable water, unlike those in Delhi and Gujarat. Flexibility in intervention design allowed teams to adapt by including water cooler installations where necessary.
- **Prioritization Mechanisms Help Manage High Demand**: With many shelter homes requiring support, a stringent selection checklist was essential to allocate resources effectively. This ensured a transparent, needs-based approach despite operational constraints.
- **Field Validation Is Vital to Compensate for Inaccurate Records**: Some shelters marked as needing support were found to be well-equipped upon inspection, while more vulnerable facilities had been overlooked. Ground-level validation emerged as a non-negotiable step in ensuring intervention relevance and accuracy.

Installation of Water Purifying and Cooling Units (other than Shelter Homes)

Rationale for Selection of Intervention Sites

The selection of water cooler sites was guided by a focus on maximizing impact for heat-exposed populations, particularly informal workers, migrants, and children. In Delhi, a total of 4 water coolers were installed across South-east, North and Northeast districts, due to high concentrations of street vendors and daily wage labourers, and alignment with the Delhi Heat Action Plan. Religious sites were selected not only for their public accessibility but also for their ability to support long-term upkeep through institutional management.

Execution Strategy

To enhance community access to safe drinking water during extreme heat, water coolers were installed in high-footfall public areas beyond shelter homes. During the field-level assessments conducted for identification of shelter homes, consultations involving the community stakeholders, NGOs, and local authorities reflected the demand for water coolers in public areas beyond shelter homes was identified as those in shelter homes could only be accessed by a limited stakeholder group. Key criteria

included reliable access to water and electricity, proximity to vulnerable populations, and availability of local partners for maintenance.

Religious institutions such as temples and mosques were prioritized in Delhi due to their central locations, steady footfall, and the presence of caretakers who could oversee maintenance. Local market associations and residential welfare groups were also engaged to host and manage coolers in crowded commercial areas. In response to rising community demand, the intervention expanded beyond initial targets to include additional locations, such as labour congregation points and orphanages identified by field teams, where children lacked access to clean, chilled drinking water.

Lessons Learned During Execution

- **Religious Institutions Offer a Reliable Maintenance Model**: Temples and mosques provide ideal sites for installations, offering both visibility and in-built support systems for regular maintenance. Their centrality also ensured steady access for target communities.
- **Community Demand Can Drive Expansion**: Public appreciation and feedback led to an organic expansion of the intervention. Requests from community members and local leaders resulted in the addition of new sites, including informal labour hubs and child-serving institutions like orphanages.
- **Site Readiness Must Be Verified Early**: While need was high across many areas, technical constraints—such as lack of stable water or electricity—prevented installation in some priority locations. Early infrastructure checks proved critical.
- **Local Partnerships Enhance Sustainability**: Engaging market associations, religious committees, and shelter home operators from the outset ensured shared responsibility for upkeep, promoting long-term sustainability of the intervention.
- **Child-Serving Institutions Also Require Inclusion**: The identification and inclusion of orphanages in Madhya Pradesh underscored the need to expand the definition of vulnerability beyond adult labourers to include children in institutional care without access to basic cooling infrastructure.

Green Shed Installation

Execution Strategy

The green shed intervention was designed as a low-cost, rapidly deployable solution to provide shaded rest areas for informal and daily wage workers exposed to extreme heat. The execution began with field reconnaissance to identify high-traffic public spaces where labourers typically gathered—such as labour chowks, market junctions, and informal rest points near industrial zones.

The sheds were constructed using green shade netting material, selected for its cost-effectiveness, easy maintenance, and resilience to dust storms (Details in Box 2.) Procurement was done through verified vendors based on widely used public space designs. Installation was carried out in partnership with local municipal authorities and field teams, who ensured that the structures did not obstruct existing traffic or urban infrastructure.

Box 2: Material Technology of Greening Sheds and their Benefits

Material Technology & Features	Key Benefits
Virgin HDPE Fabric: Made from high-density polyethylene, offering durability and lightweight performance. **UV-Stabilized (50%)**: Protects against harmful sun rays and enhances longevity. **Knitted Mesh Design**: Allows airflow while providing effective shading and heat reduction.	**Heat Protection**: Reduces sunlight exposure by up to 80% and lowers ambient temperatures, offering thermal comfort in outdoor spaces. **Versatile Use**: Suitable for labour rest areas, gardens, markets, and public shelters. **Low Maintenance & Cost-Effective**: Easy to install and replace, making it ideal for scalable community interventions.

Rationale for Selection of Intervention Sites

The intervention sites were chosen to support vulnerable groups with prolonged exposure to direct sunlight—primarily informal workers, gig workers, construction labourers, and street vendors. Site selection was based on footfall patterns, informal worker congregation, and limited access to natural or built shade.

In **Delhi**, areas in the Southeast district were selected under the city's Heat Action Plan, focusing on labour congregation zones and informal markets, where 4 green sheds were installed. In **Madhya Pradesh**, locations in Gwalior were proposed near daily wage labour pick-up points and markets frequented by vulnerable workers. In **Gujarat**, district authorities recommended specific urban sites such as bus stops and vendor markets in Ahmedabad where exposure to high heat was particularly intense.

District officials and local bodies provided insights on where urban labourers typically rested or assembled during peak heat hours, which ensured strategic siting of the structures for maximum benefit.

Lessons Learned During Execution

- **Administrative Coordination Accelerates Site Access**: Early engagement with district administrations facilitated faster approvals and identification of priority zones, making installation smoother across all three states.
- **Material Selection Must Balance Durability and Cost**: The green shade material was effective in providing relief and could be easily replaced in case of weather damage. Its affordability made it suitable for scale, but regular checks are needed to maintain its structural integrity in high-wind areas.
- **Worker Congregation Areas Are Dynamic and Must Be Observed Directly**: While planned locations were initially identified via consultation, real-time field observation was essential to confirm actual usage patterns, especially as informal workers often shift locations based on seasonal work.
- **Community Awareness is Key to Utilization**: Since green sheds were new to many communities, informal awareness through field teams and visibility signage helped drive use, particularly among transient worker populations.
- **Maintenance Responsibilities Require Clear Assignment**: Although the structures were low maintenance, ensuring their upkeep depended on local ownership—such as involvement of market associations or municipal gardeners. This was more successful in parks or designated resting areas where municipal maintenance staff were already deployed.

Greening Initiatives

Execution Strategy

The greening intervention focused on urban tree plantation to enhance thermal comfort and mitigate heat island effects in high-exposure areas. Implementation began with consultations with local authorities such as the Forest Department, Horticulture Department, and Municipal Corporations. These stakeholders supported the identification of suitable plantation sites and provided saplings in Delhi and later in Madhya Pradesh and Gujarat.

In Delhi, saplings were supplied by government departments, and the implementing team supported

identification and mobilization at designated locations. In Madhya Pradesh and Gujarat, initial challenges in sourcing saplings and gaining administrative support delayed activities. However, after successful rollout of other interventions, local officials re-engaged and provided planting materials and permissions. Planting was carried out in collaboration with municipal staff, with designated officials responsible for ongoing maintenance.

Rationale for Selection of Intervention Sites

Tree plantation sites were selected based on heat vulnerability, footfall, and the absence of natural shading. In **Delhi**, locations aligned with the Heat Action Plan, targeting urban pockets lacking greenery, such as market areas and open public spaces with high exposure to sun, where 40 trees were planted. In **Gujarat**, sites included public corridors and community spaces in densely populated urban areas, especially where shelter and cooling infrastructure was limited. Around 600 trees were planted across Ahmedabad. The overarching aim was to provide long-term heat mitigation in spaces regularly accessed by vulnerable groups, including daily wage labourers, market vendors, and low-income residents.

Lessons Learned During Execution

- **Community and Administrative Buy-In Affects Continuity**: Locations where community members or municipal gardeners were involved in upkeep showed better survival rates of planted saplings, underscoring the importance of assigning maintenance responsibilities.
- **Demonstrated Commitment Builds Trust**: Local officials were more responsive in MP and Gujarat after observing successful execution of other interventions (e.g., shelter home upgradation), indicating that visible progress can generate wider institutional support.
- **Plantation Efforts Must Account for Seasonal & Climatic Conditions**: Dust storms and erratic rainfall in May impacted the survival of newly planted saplings in some areas, suggesting that plantation timing and post-care planning are essential for resilience.

Cooling Vests for Traffic Personnels

Execution Strategy

The cooling vest intervention was piloted in Delhi as a targeted heat adaptation measure for traffic police personnel, who are among the most heat-exposed government workers. ADRA India procured specially designed cooling vests (details in Box 3) and handed them over to the National Disaster Management Authority (NDMA), which is coordinating with the Delhi Government and Delhi Traffic Police for further deployment.

The pilot involved four traffic beat officials and aimed to assess both the practicality of the vest in real working conditions and its acceptability among frontline personnel. The formal handover and deployment were planned in coordination with NDMA to ensure institutional visibility and alignment with ongoing heatwave response strategies.

Rationale for Selection of Intervention Sites

The intervention was implemented exclusively in **Delhi** during its initial phase. The rationale for this focused deployment included:

- **High Urban Heat Exposure**: Delhi's traffic personnel face extreme heat conditions due to prolonged outdoor duty in asphalt-heavy environments with minimal shade.
- **Strategic Alignment**: The initiative aligned with Delhi's Heat Action Plan and served as a government-endorsed demonstration of adaptive gear for frontline workers.
- **Government Readiness**: The Delhi Government, in collaboration with NDMA, expressed readiness to support and observe the pilot, making the city an ideal testbed.

Box 3: Material Technology of Cooling Vests and their Benefits

Material Technology & Features	Key Benefits
Phase Change Material (PCM): Uses PCM cooling packs that absorb body heat and maintain a stable cooling temperature during use. **Bio-Based & Non-Toxic:** Safe, FDA-certified material suitable for prolonged contact. **Lightweight & Adjustable Design:** Ergonomically designed for comfort and ease of use over or under uniforms.	**Effective Core Cooling:** Regulates body temperature, reducing heat stress during prolonged outdoor exposure. **Works in Humid Conditions:** Unlike evaporative vests, PCM vests remain effective even in high humidity. **Reusable & Durable:** Easy to recharge using a freezer or ice water; long-lasting and washable. **Ideal for Outdoor Workers:** Especially suited for traffic police and frontline workers operating in extreme heat.

Community Preparedness

Distribution of Hydration Kits

Execution Strategy

The hydration kit distribution was implemented as part of broader heatwave resilience activities, aiming to reduce dehydration risks among vulnerable populations. Initially planned for shelter homes, the strategy was adapted based on feedback that these facilities already had access to ORS (oral rehydration salts). Instead, the distribution

was integrated into ongoing community-level awareness activities such as street theatre performances and information sessions.

Kits containing ORS sachets and related IEC (Information, Education, and Communication) materials were distributed directly to individuals during events in public spaces, schools, and labour congregation zones. Distribution was coordinated by field teams who aligned timing with community availability, often conducting sessions early in the morning or late evening to ensure better participation.

Rationale for Selection of Intervention Sites and Target Audience

Sites were selected based on high population vulnerability to heat stress and limited access to hydration resources. In **Delhi**, areas within the Southeast district—particularly labour markets and dense informal settlements—were prioritized. In **Madhya Pradesh**, kits were distributed in shelter homes and adjacent communities, with a focus on daily wage labourers and migrants. In **Gujarat**, target sites included school campuses and urban labour clusters where awareness sessions were already underway.

The primary target audience included Informal and daily wage workers, Migrant labourers, Children in low-income schools and community members attending awareness activities in high-exposure areas.

Lessons Learned During Execution

- **Flexibility in Implementation Improves Reach**: Redirecting hydration kit distribution from shelter homes to broader community events allowed access to a larger, more diverse group of at-risk individuals.
- **Timing and Accessibility Are Crucial**: Conducting distributions outside typical working hours (early mornings/evenings) increased participation among labourers and minimized disruption to their livelihoods.
- **Awareness Drives Demand**: Community members, after learning about the benefits of ORS during sessions, often requested hydration kits—indicating high receptivity and the importance of linking distribution with educational outreach.
- **Gender and Safety Considerations Matter**: Evening distributions posed safety challenges for field teams, particularly female staff, reinforcing the need for careful planning around timing and locations.
- **Pre-existing Government Supply Must Be Considered**: Shelter homes in some areas already had ORS supplies through government programs, underscoring the importance of site-level coordination to avoid duplication.

Risk Communication and Community Engagement

Under this category of intervention, a series of awareness drives and IEC campaigns were conducted with community members and school children. Some street plays were also conducted in high footfall areas to create awareness about heatwaves and measures to prevent them.

School-Based & Community Heat Awareness Drives and Street Theatre Performances

Execution Strategy

The awareness drives were rolled out through a combination of interactive community meetings, school-based sessions, and street theatre performances. These activities aimed to disseminate practical heatwave preparedness messages, promote hydration and rest practices, and encourage community-level resilience behaviours.

IEC materials—including posters, leaflets, and verbal demonstrations—were adapted from NDMA advisories. Sessions were held in local languages, with timings scheduled to accommodate working hours of informal labourers. In communities, labour chowks, market areas, and informal settlements served as venues. In schools, sessions were conducted in classrooms and common spaces, often in collaboration with teachers and school management.

Street theatre was used as a key engagement tool to capture attention and convey messages through culturally resonant storytelling. Local actors performed plays in Hindi or regional dialects, depending on the state, to ensure maximum understanding. Box 4 elaborates on the key messages that the awareness drives in communities and disseminated. Box 5 provides an overview of the key aspects of the street play that should be kept in mind while designing such an awareness campaign.

Rationale for Selection of Intervention Sites

Intervention sites were selected based on heat exposure, vulnerability, and footfall. In **Delhi**, the focus was on Southeast district neighbourhoods with high concentrations of informal workers and low-income schools. In **Madhya Pradesh**, interventions were conducted near shelter homes and in industrial clusters. In **Gujarat**, areas with a significant migrant population and limited public cooling infrastructure were prioritized. Schools were chosen for their role in sensitizing children, who could act as change agents within families and communities. The

Lessons Learned During Execution

- **Timing and Location Impact Participation**: Awareness activities conducted in early morning or evening hours were better attended, especially by labourers. Late evening sessions, however, posed safety challenges for staff.
- **Street Theatre Is Highly Effective**: Performances drew large crowds and helped deliver messages in an engaging, relatable manner. Use of local dialects in Gujarat significantly improved audience comprehension.
- **Children Are Effective Messengers**: School-based drives not only informed students but also enabled message transmission to families, expanding community-level impact.
- **Employer Sensitization Is Needed**: While community members were receptive, behavioural change—such as avoiding peak heat hours—was often constrained by employer practices. Future programs may need to engage employers or industry stakeholders.
- **Visibility and Repetition Enhance Recall**: Repeating key messages across multiple formats (print, performance, demonstration) helped reinforce knowledge and encourage behaviour adoption.

Box 4: Key Message for school and community awareness campaigns

Hydration and Nutrition

- Emphasized regular water intake and traditional cooling drinks like ORS and lemon water.
- Encouraged light, water-rich foods while discouraging dehydrating and stale items.

Protection from Heat Exposure

- Highlighted reduced outdoor activities during 12–4 PM.
- Stressed adjusted work schedules and shaded breaks for outdoor workers.

Clothing & Personal Protection

- Promoted loose, light-coloured cotton clothing and head coverings.
- Reinforced use of sunglasses and footwear for protection.

Home Cooling Practices

- Shared tips like using cross-ventilation, night-time cooling, and white-painted roofs.
- Encouraged decluttering and avoiding indoor cooking during hot hours.

Vulnerable Group Care

- Prioritized care for children, elderly, pregnant women, and those with chronic conditions.
- Emphasized regular hydration and limited heat exposure for at-risk groups.

Community Action

- Promoted collective care practices like sharing water tips and protecting pets and livestock.
- Warned against leaving children or animals in parked vehicles.

Workplace Safety

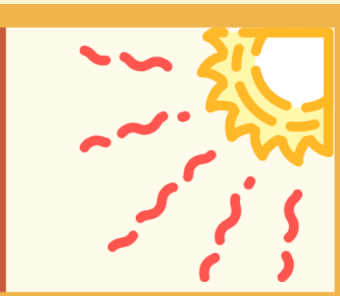
- Advocated for shaded rest areas, hydration access, and flexible work hours.
- Encouraged worker education on heat risks and symptom recognition.

Health & Emergency Response

- Raised awareness about symptoms of heat illness and quick response actions.
- Urged timely medical help for severe cases like heatstroke.

Staying informed

- Reinforced the value of tracking weather forecasts and heat alerts through media and government sources.



Box 5: *Unique features of the street plays*

Relatable Characters & Settings
The play features everyday characters like children, labourers, homemakers, and workers, making the storyline familiar and relatable for diverse audiences.

Conversational Tone with Humour
It uses humour and colloquial language to convey serious messages in an engaging and accessible manner.

Narrative Structure
The play is divided into three connected acts: the first shows a child collapsing from heatstroke after playing outside; the second depicts an adult suffering due to ignoring his wife's warnings; and the third presents a labourer demonstrating simple preventive actions like using a wet cloth and drinking lemon water.

Interactive & Musical Elements
Clapping slogans, a parody song, and rhythmic chants are used to reinforce messages, while the live use of a percussion instrument (ढपली) helps attract attention and mark transitions between scenes.

Layered Messaging for Different Audiences

Children are educated about heat risks through playful dialogue, adults are shown the consequences of neglecting precautions, and workers are offered practical survival tips, making the play inclusive and multidimensional.

Training Programmes for Frontline Health Workers

Execution Strategy

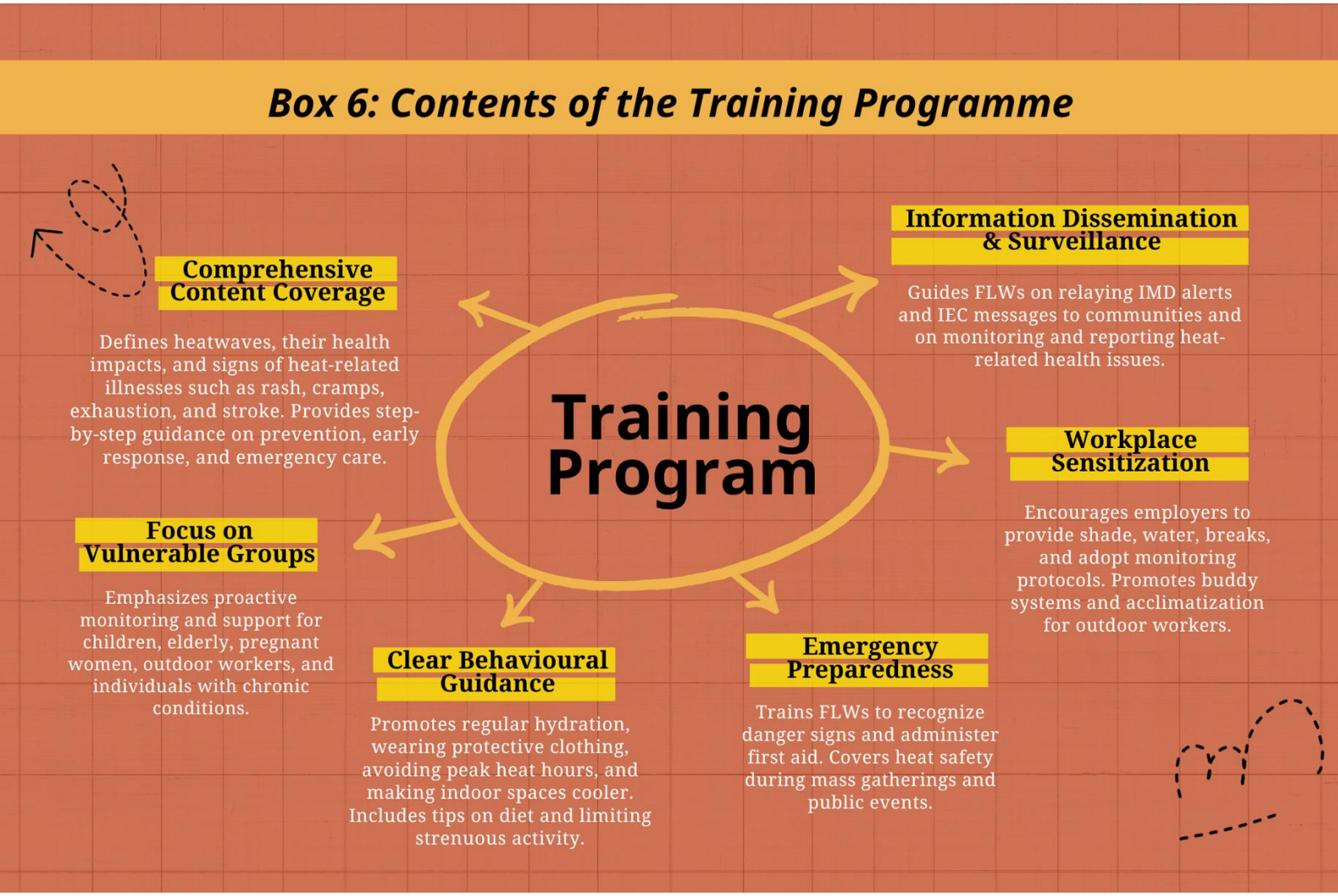
The frontline health worker (FLW) training program on heatwave preparedness was a community-focused initiative tailored to state contexts and delivered through participatory modules and practical demonstrations. It aimed to equip ASHAs, ANMs, Anganwadi Workers, and Apda Mitras with actionable knowledge on identifying and managing heat-related illnesses, promoting hydration, and implementing preventive practices.

Training content covered early symptom recognition, use of oral rehydration solutions, simple home-based cooling measures, and emergency response. Sessions were adapted to local languages—Hindi in Delhi and Gwalior, and regional dialects in Gujarat—to ensure relevance and accessibility.

Edutainment tools like street plays, community meetings, and flipbooks enhanced engagement and message retention, enabling FLWs to disseminate key messages effectively. Practical guidance included low-cost interventions such as damp cloth use, light clothing, and ventilation improvements.

Conducted in coordination with local health departments, municipal bodies, and NGOs, the program trained over 150 FLWs nominated by district administrations to promote sustained community resilience. Box 6 summarizes the content of the Training Programme.

Box 6: Contents of the Training Programme



Lessons Learnt

- **Role Clarity Improves Uptake:** Clearly defining the specific responsibilities of each cadre—ASHAs, ANMs, AWWs, and Apda Mitras—helped ensure that messages were disseminated more efficiently and consistently during their routine interactions with the community.
- **Practical Demonstrations Reinforce Learning:** Hands-on sessions demonstrating simple heat-mitigation practices—like preparing ORS, using wet cloths, or managing early signs of heatstroke—helped FLWs feel more confident about applying and teaching the same within their communities.
- **Need for Refresher Sessions:** Some FLWs expressed the need for periodic refreshers to retain technical knowledge and stay updated on new advisories, suggesting the value of institutionalizing seasonal or annual heatwave preparedness briefings.

Research and Advocacy Activities

Research Study to Understand Impact of Heatwaves

Despite existing heat action plans, limited research has been conducted on how low-income groups perceive and respond to extreme heat and what solutions they find feasible and effective. To address this, a study in Delhi is ongoing to understand the thermal comfort of people, specifically the informal workers and gig workers.

This proof-of-concept study aims to generate evidence on the feasibility and effectiveness of cool roof interventions in reducing indoor heat exposure among vulnerable urban households in India. With rising temperatures and intensifying heatwaves, urban poor communities face disproportionate risks to health and well-being due to poorly insulated housing. The study will install cool roof prototypes across four urban sites and apply a mixed-methods approach to assess their impact. Quantitative monitoring using temperature and humidity sensors will be complemented by structured household surveys and focus group discussions to understand perceived thermal comfort, behavioural adaptations, and community-level insights.

Rather than functioning as a rigorous evaluation, the study focuses on practical learning, local feasibility, and initial proof of concept. It aims to inform urban heat adaptation strategies, promote community-led thermal comfort solutions, and support integration of climate-responsive design into local planning processes. Findings will help identify what works, what's acceptable to communities, and how such measures could be scaled up in future urban resilience programming.

Stakeholder Consultation on Anticipatory Action for Heatwaves

The stakeholder consultation on anticipatory action (AA) for heatwaves aimed to advance collaborative dialogue on embedding forecast-based, pre-emptive interventions into India's climate resilience and disaster preparedness strategies. It brought together representatives from NDMA, SDMAs, the India Meteorological Department, civil society, community organizations, and development partners. The consultation enabled shared learning, identification of gaps, and actionable pathways for integrating AA approaches into planning frameworks.

Key outcomes included consensus on developing pre-agreed triggers based on reliable forecasts and integrating AA into State and District Disaster Management Plans. Participants emphasized the need to localize early warning systems for timely, inclusive communication and highlighted the importance of flexible financing mechanisms to enable early interventions. Strengthening capacity across frontline workers, local institutions, and community volunteers was also identified as essential.

The consultation concluded with a collective commitment to promoting community-led, evidence-based anticipatory action as a core component of climate adaptation in India.

Way Forward and Recommendation

The anticipatory action pilot initiatives implemented by ADRA India across Delhi, Madhya Pradesh, and Gujarat offer compelling proof of the effectiveness of proactive, community-based responses to heatwave risks. These pilots improved thermal comfort, enhanced access to safe water, and strengthened local preparedness, underscoring the need for wider replication across India's heat-prone regions and promote proactive measures for early action from 2025 onwards at all levels to support vulnerable populations by activating heat mitigation and prevention measures. To scale this success, short and long-term strategic actions are recommended below.

Immediate Measures

Institutionalizing Capacity Building: Regular training and refresher sessions for frontline workers (ASHAs, ANMs, AWWs, Apda Mitras) should be embedded within state disaster and health department systems. Integrating anticipatory action modules into existing public health curricula will ensure continuous local readiness.

Enhancing Community Engagement: Innovative IEC approaches—such as street theatre, digital campaigns, and school outreach—should be expanded. Engaging faith leaders, influencers, and community champions can help normalize protective behaviours during heatwaves.

Strengthening Infrastructure: Measures such as cool roofs, public hydration points, and shaded community spaces should be prioritized. Scaling green sheds and promoting heat-resilient urban design can significantly reduce heat stress in dense urban areas.

Integrating AA into Urban Planning: Anticipatory action measures—such as permanent cooling infrastructure, shaded public spaces, heat-resilient building designs, and accessible hydration points—should be embedded into city master plans and zoning regulations to ensure long-term heatwave resilience.

Long-term Measures

Exploring Sustainable Funding Pathways: Anticipatory Action measures should be incorporated in existing Missions and Government interventions focussing on urban planning or disaster management. For example, Smart City Mission and State Climate Action Plans. These will ensure that the funding for anticipatory action measures to tackle heatwaves is formalised.

Leveraging Public-Private Partnerships: CSR funding and private sector collaboration can support infrastructure deployment and resource mobilization. This could include financing cooling units and hydration stations in public spaces. To formalise the CSR funding pathway, direction for including anticipatory action measures for heatwaves can be included in CSR guidelines so that it is considered as an acceptable area of intervention under CSR.

Developing Robust Financial Mechanisms: Pre-allocated, flexible funds within disaster management budgets can ensure timely activation of early action interventions before extreme heat events occur.

Promoting Research and Evaluation: Systematic documentation, impact tracking, and academic partnerships will strengthen the evidence base, enabling informed scale-up and long-term integration into resilience planning. A community of practice on anticipatory action on heat implementation should be incorporated in research and academic institutions.