AARD
Adaptation Action
for Resilient Development

SUSTAINEDGE

Heat Action Plan (HAP) Toolkit

From heat risk assessment to city-level action

Disclaimer: The methodologies, templates, examples, and recommendations presented in this Toolkit are intended as practical guidance for developing city-level Heat Action Plans (HAPs). Users are encouraged to adapt all approaches, thresholds, datasets, and interventions to local climatic conditions, governance arrangements, institutional capacities, and available resources.

While every effort has been made to ensure the accuracy and relevance of the information contained herein, Sustainedge and Adaptation Action for Resilient Development (AARD) accept no responsibility or liability for decisions, actions, or outcomes resulting from the application of this Toolkit without appropriate local validation, technical review, and contextual assessment.

Year of publishing: June 2026

Version: 2

Suggested citation: Sustainedge and Adaptation Action for Resilient Development (AARD) (2026) Heat Action Plan (HAP) Toolkit: From heat risk assessment to city-level action.

Acknowledgement

This Heat Action Plan (HAP) Toolkit has been jointly developed by Sustainedge and Adaptation Action for Resilient Development (AARD) to support cities and local governments in addressing rising urban heat risks and strengthening climate resilience through structured, actionable planning approaches.

The development of this Toolkit benefited from the technical contributions of Fahim Shahriar Pranto at Sustainedge, particularly regarding the analytical framework, implementation structure, and technical design of the guidance materials.

The authors also express sincere gratitude to Md. Jubaer Rashid, who contributed as External Advisor to this work and provided valuable strategic guidance, technical insights, and continuous support throughout the development process.

This Toolkit has further drawn upon internationally recognised frameworks, scientific literature, and global best practices on heat risk governance, climate adaptation, public health preparedness, urban resilience, and disaster risk reduction. The authors acknowledge the contributions of international organisations, research institutions, practitioners, and local stakeholders whose work and experiences informed the preparation of this document.

It is hoped that this Toolkit will serve as a practical resource for local government officials, urban planners, architects, public health practitioners, researchers, civil society organisations, and community stakeholders in developing inclusive, evidence-based, and locally responsive Heat Action Plans for resilient urban futures.

Table of Contents

1. Introduction

Extreme heat is one of the most serious and growing threats to human health in cities and towns around the world. It affects every region, from South Asia and Sub-Saharan Africa to the Mediterranean, and beyond, and its impacts are becoming more frequent and more intense as the climate changes. Yet unlike floods or storms, heat is often invisible. It does not make headlines until people are already sick or dying.

This Toolkit makes preparation practical and accessible. It is designed for anyone involved in protecting communities from heat: local government officials, public health workers, urban planners, architects, researchers, or community organisers. Each tool is step-by-step, easy to follow, and yields a concrete result that directly contributes to a city or district's Heat Action Plan (HAP).

The Toolkit takes a participatory and inclusive approach, bringing together diverse voices: residents, community leaders, frontline health workers, and decision-makers, because the communities most affected by heat know their neighbourhoods best. The format is universal and can be adapted to any region, governance structure, or resource environment. It is not a document to file away; it is a working guide to bring into workshops, adapt to local needs, and return to each year.

2. What is a Heat Action Plan (HAP)?

A Heat Action Plan (HAP) is a coordinated framework that prepares a city or district to protect its residents from the health impacts of extreme heat. It sets out in advance: who is most at risk, what triggers a response, who does what during a heat event, and how the response is reviewed and improved over time.

Heat is one of the deadliest weather-related hazards, yet it is often underestimated because it does not cause the visible destruction of floods or storms. Its impacts, including illness, hospitalisation, and death, fall hardest on the most vulnerable: older adults, young children, people with chronic illness, outdoor workers, and residents in poorly ventilated housing.

A HAP is not a single document. It is a cycle of four phases that repeats annually, building stronger preparedness with each season.

3. Understanding heat risk

A useful way to understand and communicate heat risk is through the following relationship, widely used in international frameworks:

Risk = Hazard × Exposure × Vulnerability

Hazard: In the context of extreme heat, hazard refers to the physical heat event itself, including factors such as extreme temperatures, heatwaves, high humidity, and the duration of hot spells. Hazard assessment identifies where and when dangerous heat conditions are likely to occur and is primarily conducted through heat hazard mapping and climate data.

Exposure: Refers to the people, assets, and activities located in areas affected by extreme heat. A location may experience severe heat conditions, but the level of risk depends on how many people are exposed and the extent of economic and social activity there. Exposure may include densely populated neighbourhoods, outdoor workers, schools, markets, transport hubs, and communities with

limited access to cooling facilities. Exposure is typically assessed using population distribution, land-use patterns, and the spatial overlap between heat hazards and human activities.

Vulnerability: Describes how susceptible exposed people are to heat-related harm. Certain groups are more likely to experience adverse health and social impacts during heat events due to age, health condition, housing quality, social circumstances, or limited access to resources and services. Older adults, young children, people with chronic illnesses, residents of poorly ventilated housing, and socially isolated individuals are often among the most vulnerable. Vulnerability assessments help identify which populations require targeted support and protective measures during periods of extreme heat.

Together, these three components determine the overall level of heat risk. Risk is highest when all three factors are present simultaneously. A very hot area with few people, or a dense population that is young and healthy, may pose lower risk than a moderately hot area with a large elderly population living in poor housing. A comprehensive HAP should address all three: it maps the hazard, identifies who is exposed, and targets support to those most vulnerable.

In this context, this Toolkit has been developed with practical, workshop-ready activities for users. The phase-wise activities are designed to be used sequentially, but each tool within each phase can also be used independently as needed. Additional background information on specific topics, such as maps, risk scoring, alert thresholds, and long-term interventions, is provided in the Annexes at the back of this Toolkit.

4. How to use this Toolkit

This Toolkit follows the four phases of the HAP cycle. Each phase contains practical tools, each with its group size, time requirements, materials, and step-by-step instructions. Each tool is structured consistently so users can quickly find what they need and put it into practice.

Phase 1: Assess	Phase 2: Plan	Phase 3: Respond	Phase 4: Review
Understand the local heat-risk landscape: who is vulnerable, where temperatures are highest, and which resources already exist.	Design the response: agree on alert thresholds, designate cooling centres, prepare communications, and develop long-term strategies.	Activate the plan during a heat event: deploy resources, issue warnings, and protect the most vulnerable residents.	Evaluate what worked and what did not, gather community feedback, and update the plan before the next heat season.

For topics that benefit from deeper explanation, such as classifying heat risk levels, preparing maps, defining alert thresholds, and identifying available long-term interventions, additional guidance is provided in Annexes A to F at the back of this document. Annex F presents an indicative format for a full city-level HAP, illustrating how the outputs of this Toolkit fit together to form a complete plan.

5. Phase 1: Assess

Identify who is at risk, where heat is most intense, and which resources already exist.

Tool 1.1	HEAT RISK MAPPING Locate heat hotspots and overlay vulnerable population data onto a city or district map.		
GROUP SIZE	**TIME FRAME**	**WORKSPACE**	**MATERIAL**
5 – 15 people	2 – 3 hours	Meeting/conference room, wall space	Maps, colored stickers, pens

AIM

Produce a shared visual map showing where heat is most intense in the city or district and which neighbourhoods are most at risk. This forms the spatial foundation for all subsequent planning tools.

PREPARATION AND SETUP

Print large-format base maps of the municipality at street and district levels. Prepare overlay layers where available: land surface temperature data, tree canopy cover, impervious surface cover, and population density. Invite urban planners, public health officers, and GIS staff.

Tip: Satellite-derived land surface temperature maps (e.g., Landsat, Copernicus) can be requested from your national meteorological agency or downloaded via Google Earth Engine. Step-by-step guidance on preparing these maps is provided in Annex A.

ACTION

1. Display the base map on the wall. Each participant receives 10 – 15 stickers in three colours: red (extreme heat), orange (moderate heat), and green (relatively cool).
2. Participants place stickers on locations they know to be hot or cool: parks, concrete plazas, industrial zones, etc.
3. Overlay the printed temperature data and compare it with the participant-placed stickers. Discuss and note any discrepancies.
4. Identify and circle the highest-risk heat zones. There is no fixed number; prioritise all areas where high temperatures and vulnerable populations overlap. Label each zone with the main reasons (e.g., no tree cover, dense concrete, no open water, high elderly population). See Annex B for guidance on assigning risk levels (low, medium, high, extreme) to each zone.
5. Cross-reference with vulnerability indicators: elderly population density, informal housing areas, and areas with no access to air conditioning.

References:

- Annex A: How to prepare heat risk maps
- Annex B: Risk level classification and vulnerability scoring

OUTPUT

A prioritised heat-risk map identifying the highest-risk zones and the populations most at risk within them. This map directly guides the siting of cooling centres and early-warning outreach.

Tool 1.2

VULNERABILITY ASSESSMENT SURVEY

Identify individuals and groups most at risk from heat through a structured community survey.

GROUP SIZE	TIME FRAME	WORKSPACE	MATERIAL
Fieldwork teams	1 – 2 weeks	On-site/community	Survey forms, tables, and papers

AIM

Systematically identify residents at the highest risk from heat, including older adults, people with chronic illnesses, outdoor workers, young children, and those without access to cooling. Build a registry to support targeted outreach.

PREPARATION AND SETUP

Design a short, structured survey (8 – 12 questions) covering: housing type, access to air conditioning, chronic health conditions, social isolation, and willingness to receive heat alerts. Train community health workers or ward officers to administer the survey in the highest-risk zones identified in Tool 1.1.

ACTION

1. Conduct door-to-door surveys in identified hotspot neighbourhoods. Focus on households with elderly residents, young children, or residents with known health conditions.
2. Record the GPS location for each surveyed household. Note the housing material (tin roof, concrete, open ventilation) as a key risk factor.
3. Ask about access to cooling: fans, air conditioning, and proximity to shaded public space. Record barriers to accessing cooling centres.
4. Collect contact information (with consent) for heat alert notifications. Identify trusted community contacts to enrol as “heat wardens”.
5. Aggregate results by ward or zone. Assign a vulnerability score (low, medium, high, extreme) to each surveyed area using the scoring guide in Annex B.

Reference: Annex B: Risk level classification and vulnerability scoring

OUTPUT

A ward-level vulnerability registry and contact list for targeted heat alert outreach. Informs placement of cooling resources and priority zones for health-worker visits during heat events.

Tool 1.3

STAKEHOLDER MAPPING

Identify all actors relevant to heat-risk reduction and build a coordination foundation.

GROUP SIZE	TIME FRAME	WORKSPACE	MATERIAL
5 – 20 people	45 – 60 minutes	Working tables, wall space	Stakeholder map template, sticky notes, pens

AIM

Map all organisations, agencies, and community groups that have a role in heat risk: health departments, utilities, civil society, religious institutions, and employers of outdoor workers. Understanding who is involved (and who is missing) is essential before coordinating a response plan.

PREPARATION AND SETUP

Prepare a large-format stakeholder map with concentric circles (high relevance in the centre, low at the edges) and sector columns: National and Local Government, Health and Emergency Services, Civil Society (CSO) and NGOs, Private Sector, Community and Religious Groups. Use colour-coded sticky notes for each sector.

ACTION

1. Participants brainstorm for 10 – 15 minutes, writing one stakeholder or organisation per sticky note.
2. Place each note in the correct sector column. Position closer to the centre indicates greater relevance to HAP implementation.
3. Discuss any gaps: who is missing? Who controls access to vulnerable populations? Who has resources (vehicles, buildings, communications)?
4. Assign a responsible person in the room to follow up with each high-priority stakeholder before the planning phase begins.

OUTPUT

A completed stakeholder map that guides the engagement strategy and identifies coordination leads for the planning phase.

6. Phase 2: Plan

Design the HAP: protocols, thresholds, roles, resources, and long-term strategies.

Tool 2.1	HEAT ALERT THRESHOLD WORKSHOP Define the temperature and humidity thresholds that trigger each level of public alert and response.		
GROUP SIZE	**TIME FRAME**	**WORKSPACE**	**MATERIAL**
10 – 20 people	2 – 3 hours	Meeting/conference room	Historical temperature data, flip chart, sticky notes

AIM

Reach consensus on locally appropriate temperature and heat index thresholds that trigger each level of response, from early advisory to full emergency activation. These thresholds must be calibrated to local climate norms, not to global averages.

PREPARATION AND SETUP

Gather 10 – 30 years of maximum daily temperature data from the nearest meteorological station. Prepare a simple chart showing the frequency of temperatures at various thresholds. Invite epidemiologists, hospital administrators, meteorologists, and municipal planners.

Tip: Heat-wave thresholds vary significantly by region and should always be validated against local climate data and health records. The following are indicative reference points by region:

- **South Asia:** typically, 40°C or 4.5°C above the normal maximum for that calendar period
- **Sub-Saharan Africa:** typically, 35 – 38°C or 3 – 5°C above the seasonal normal, depending on elevation and humidity
- **Middle East and North Africa:** typically, 42 – 45°C, with humidity a critical compounding factor in coastal areas
- **Southeast Asia:** thresholds may be lower (32 – 35°C), but high humidity significantly elevates the heat index and health risk

These are reference points only. Consult your national meteorological department for locally validated criteria. Detailed guidance on defining thresholds is provided in Annex C**.**

ACTION

1. Present historical temperature data and note which years recorded spikes in heat-related illness or deaths. Identify the temperature conditions during those periods.
2. Define three alert levels (Yellow (Watch), Orange (Warning), Red (Emergency)) and draft temperature and humidity criteria for each, based on local historical data.
3. For each alert level, agree on a corresponding set of actions. Use the sample Alert Level Matrix below as a starting point; adapt it to your local context.
4. Confirm who has authority to declare each level and through which channels alerts will be communicated to the public.
5. Document decisions in a one-page “Alert Level Matrix” that all departments sign off on before the heat season.

Tool 2.1	HEAT ALERT THRESHOLD WORKSHOP Define the temperature and humidity thresholds that trigger each level of public alert and response.

GROUP SIZE	TIME FRAME	WORKSPACE	MATERIAL
10 – 20 people	2 – 3 hours	Meeting/conference room	Historical temperature data, flip chart, sticky notes

Sample Alert Level Matrix (adapt thresholds to local climate conditions):

Alert level	Threshold (example)	Key actions (example)	Responsible
Yellow (Watch)	Forecast maximum temperature >= 38°C for 2+ consecutive days	• Issue public advisory • Notify cooling centres to prepare • Brief health workers	• Communications team • Health department
Orange (Warning)	Actual maximum temperature >= 40°C or heat index >= 45°C	• Open cooling centres • Deploy mobile outreach teams • Activate warden network	• HAP Coordinator • All department leads
Red (Emergency)	Maximum temparature >= 42°C for 2+ days OR heat-related deaths reported	• Hospital surge protocol • Water distribution activated • Daily situation reports	• Mayor/District Officer • Hospital • Emergency services

Reference: Annex C: Defining heat alert thresholds

OUTPUT

A locally agreed Alert Level Matrix: three tiers with specific temperature and heat-index thresholds, required actions for each tier, responsible authorities, and communication channels, signed off by all departments.

Tool 2.2

COOLING CENTRE PLANNING

Identify, designate, and prepare a network of public cooling centres throughout the city.

GROUP SIZE	TIME FRAME	WORKSPACE	MATERIAL
Small teams (3 – 8)	Half day, site visits	Maps, Meeting/conference room, fields	City map, site checklist, camera

AIM

Identify a network of accessible, well-distributed cooling centres where residents can safely shelter during extreme heat. Centres must be reachable on foot or by public transport from the most vulnerable areas.

PREPARATION AND SETUP

Compile a list of publicly owned or accessible buildings: schools, libraries, mosques, temples, churches, community halls, and markets. Prepare a site assessment checklist covering: ventilation, capacity, water access, toilet facilities, proximity to public transport, and opening hours.

ACTION

1. On a city map, mark all candidate buildings. Cross-reference with the heat risk map from Tool 1.1; centres must be accessible from all high-risk areas.
2. Conduct rapid site assessments using the checklist. Rate each site as suitable, suitable with improvements, or unsuitable.
3. Negotiate agreements with building owners or managers. Document operating hours, capacity limits, and staffing responsibilities.
4. Assign a coordinator to each centre. Define their roles: visitor registration, water distribution, health monitoring, and liaison with emergency services.
5. Create printed and digital maps of all cooling centres for public communication. Translate them into local languages.

OUTPUT

A finalised cooling centre network map, including contact details, capacities, and designated coordinators, ready for public communication and immediate activation during a heat event.

Tool 2.3

COMMUNICATION STRATEGY WORKSHOP

Design heat alerts and public messaging tailored to every audience group and communication channel.

GROUP SIZE	TIME FRAME	WORKSPACE	MATERIAL
10 – 20 people	2 hours	Meeting/conference room/workshop room	Flip chart, sticky notes, sample messages

AIM

Develop clear, culturally appropriate, and actionable heat warnings for different population groups and across communication channels: SMS, radio, loudspeakers, mosque announcements, social media, and printed flyers. Ensure no group is left without a reachable channel.

PREPARATION AND SETUP

Before the workshop, compile a draft list of potential target audiences relevant to your city or district; this gives participants a starting point rather than a blank page. Gather examples of past heat-related public messages or emergency communications (if any exist locally) for reference. Prepare a simple template for the communication matrix on flip chart paper, with columns for audience, channel, message, responsible department, and approval authority. If possible, invite one or two community representatives to the workshop so that messages can be tested for clarity and cultural appropriateness on the same day.

ACTION

1. List all target audiences: the general public, the elderly, parents of young children, outdoor workers, school teachers, religious leaders, and media contacts.
2. For each audience, identify the most reliable communication channel (e.g., SMS for workers, announcements from religious institutions for elderly residents, and local TV for the general population).
3. Draft three core messages, one per alert level, in plain language. Test the drafts with representatives of the target audience to assess comprehension.
4. Assign ownership: which department sends each message, when, on which platform, and who approves it.
5. Pre-draft all messages and visuals so they can be released within 30 minutes of an alert declaration. Store them in a shared folder accessible to all communication leads.

OUTPUT

A communication matrix: Audiences x Channels x Pre-drafted messages x Responsible departments, ready for rapid release at each alert level.

Tool 2.4	LONG-TERM STRATEGY PLANNING WORKSHOP Identify and prioritise infrastructure, social, and environmental interventions to reduce heat risk over time.		
GROUP SIZE	**TIME FRAME**	**WORKSPACE**	**MATERIAL**
10 – 25 people	Half day	Meeting/conference room/workshop room	Flip chart, sticky notes, city maps, dot stickers

AIM

Emergency response saves lives during a heat event, but it cannot reduce heat risk on its own. This tool helps municipal teams identify medium- and long-term investments in infrastructure, the built environment, social support systems, and mental health to reduce the city's vulnerability to heat over time.

PREPARATION AND SETUP

Prepare a simple list of intervention categories (see below) on a flip chart. Invite a diverse group: urban planners, public health officials, social welfare officers, park and infrastructure departments, and at least one or two community representatives.

ACTION

1. Briefly present the four intervention categories to the group. Allow 5 minutes for questions.
2. In small groups of 4 – 6, participants brainstorm specific interventions for each category on sticky notes (one idea per note). Allow 20 minutes.
3. Groups share their ideas with the room. Cluster similar ideas. Use dot voting (3 stickers per person) to identify the highest-priority interventions in each category.
4. For the top 2 – 3 intServentions per category, discuss: Who is responsible? What budget is needed? What is a realistic timeline? Note these decisions on a flip chart.
5. Document the agreed long-term priorities and assign a lead department to each. These feed into the annual HAP update (Tool 4.3) and the city's broader urban and health planning.

Infrastructure	Environment	Social	Psychological
• Cool roofs • Reflective pavements • Shading structures • Building ventilation upgrades • Water supply expansion	• Urban tree planting • Green corridors • Urban parks • Wetland restoration • Urban gardens	• Community support networks • School heat education • Heat warden programme formalisation • Care for isolated elderly	• Awareness of heat anxiety • Mental health support for outdoor workers • Community resilience and peer support programmes

Tool 2.4	LONG-TERM STRATEGY PLANNING WORKSHOP Identify and prioritise infrastructure, social, and environmental interventions to reduce heat risk over time.		
GROUP SIZE	**TIME FRAME**	**WORKSPACE**	**MATERIAL**
10 – 25 people	Half day	Meeting/conference room/workshop room	Flip chart, sticky notes, city maps, dot stickers

Reference: Annex E: Long-term heat interventions: Infrastructure, environment, social, and psychological approaches

OUTPUT

A prioritised long-term intervention shortlist with responsible departments, indicative budgets, and timelines ready to be incorporated into the city's planning and budgeting cycle.

7. Phase 3: Respond

Activate the plan, coordinate teams, and protect residents during a live heat event.

Tool 3.1

HEAT EVENT ACTIVATION CHECKLIST

A step-by-step checklist for activating the HAP the moment a heat alert threshold is crossed.

GROUP SIZE	TIME FRAME	WORKSPACE	MATERIAL
HAP coordinator/leads	30 – 60 min activation	Emergency Operations Centre (EOC)/government office	Printed checklist, contact list

AIM

Ensure that when a heat-alert threshold is crossed, all departments take the right actions in the right order, with no confusion about who does what. The checklist removes ambiguity in a stressful, time-sensitive situation.

PREPARATION AND SETUP

Print this checklist and distribute it to all department leads before the heat season. Laminate copies for the Emergency Operations Centre (EOC). Test the checklist during a tabletop simulation drill before the season begins.

ACTION

1. Within 30 min: HAP Coordinator notifies all department leads, confirms the alert level, and authorises the release of public communications.
2. Within 1 hour: Communications team releases pre-drafted alerts across all channels. Cooling centre coordinators are notified, and centres are opened.
3. Within 2 hours: Mobile outreach teams deploy to the highest-risk zones. Water distribution points are activated if a Red-level alert is declared.
4. Daily during the event: Morning situation report is shared among all leads. Hospital admissions, cooling centre usage, and field reports are reviewed. A decision is made to maintain, escalate, or de-escalate the alert level.
5. On all-clear: Formal de-escalation is communicated publicly. Cooling centres close according to agreed protocol. Data collection begins for review (Phase 4).

OUTPUT

A coordinated, time-stamped activation of all HAP components, with clear accountability at each step.

Tool 3.2	COMMUNITY HEAT WARDEN PROGRAMME Train and deploy local volunteers to check on neighbours and extend the reach of the formal response.		
GROUP SIZE	**TIME FRAME**	**WORKSPACE**	**MATERIAL**
Volunteers per ward	Half-day training, ongoing	On-site neighborhoods	Training kit, warden card, visit checklist

AIM

Extend the reach of formal emergency services into every neighbourhood through trusted local volunteers, “heat wardens”, who check on vulnerable households, recognise signs of heat-related illness, and know how to refer residents to medical support. This is especially critical where door-to-door outreach by government staff is not feasible at scale.

PREPARATION AND SETUP

Before recruitment begins, review the vulnerability registry compiled in Tool 1.2 to identify the wards and street blocks that require the most urgent warden coverage. Map the coverage areas so that no high-risk household falls outside a warden's assigned zone. Prepare the training materials in advance, including printed training guides in the local language, warden identification cards, visit checklists, and ORS packets. Identify and brief a ward supervisor for each area to serve as the wardens' daily point of contact during heat events. Ensure the emergency contact number that wardens will use to escalate cases is confirmed, tested, and printed on every warden card before the training day.

ACTION

1. Recruit 1 – 2 volunteers per street block or per 50 households from the vulnerability registry contacts identified in Tool 1.2. Prioritise those already trusted in the community, such as teachers, religious figures, and shopkeepers.
2. Conduct a 3-hour training covering: signs and symptoms of heat exhaustion and heat stroke; first-response steps; when and how to call the emergency line; and how to record household visits.
3. Provide each warden with: a printed list of assigned households, an emergency contact card, and Oral Rehydration Salts (ORS) packets to distribute.
4. During active heat events, wardens conduct daily check-ins on assigned households and report back to the ward supervisor each evening via phone or messaging app.

OUTPUT

A functioning network of trained community wardens providing last-mile coverage to vulnerable households significantly extends the reach of the official HAP response.

8. Phase 4: Review

Evaluate the response, capture lessons learned, and strengthen the plan for next season.

Tool 4.1	AFTER-ACTION REVIEW (AAR) A structured debrief with all departments is conducted within two weeks of each heat event.		
GROUP SIZE	**TIME FRAME**	**WORKSPACE**	**MATERIAL**
15 – 30 people	2 – 3 hours	Meeting/conference room/workshop room	Flip charts, sticky notes, event data summary

AIM

Systematically capture what worked, what did not, and what should change from the perspectives of all departments and frontline responders. The After-Action Review (AAR) transforms operational experience into institutional knowledge to improve the next response.

PREPARATION AND SETUP

Schedule the AAR within two weeks of the heat event ending, while memories are fresh. Prepare a summary sheet of key event data: dates and duration, alert levels reached, cooling centre usage, hospital admissions, mobile outreach visits, media coverage, reported complaints, and any recorded deaths.

ACTION

1. Present the event data summary. Allow 15 minutes for clarification questions only; no evaluation yet.
2. Ask each department to write responses to four questions on sticky notes: What was planned? What actually happened? What went well? What should change?
3. Group responses by theme on a flip chart. Identify the top issues that recur across multiple departments.
4. For each issue, agree on a concrete corrective action, a responsible person, and a deadline before the next heat season.
5. Document all decisions and circulate the AAR report to all participants and senior leadership within one week.

OUTPUT

An AAR report with agreed corrective actions, responsible leads, and deadlines, feeding directly into an updated HAP before the next season.

Tool 4.2	COMMUNITY FEEDBACK COLLECTION Gather residents' experiences of the heat response to identify gaps and improve future outreach efforts.		
GROUP SIZE	**TIME FRAME**	**WORKSPACE**	**MATERIAL**
Large groups/public	1 – 2 weeks (field)	On-site/public spaces	Survey cards, sticker boards, pens

AIM

Understand how residents experienced the community's heat response: Did they receive alerts? Were cooling centres accessible? Did they know where to get help? This perspective is essential for evaluating equity and improving outreach for future events.

PREPARATION AND SETUP

Design the feedback card in advance, keeping it to five simple questions in plain local language, for example: Did you hear about the heat warning? Did you know where to go for cooling? Did you feel safe during the heat event? Pilot the card with one or two community members before printing to check clarity. Print sufficient copies for all deployment locations, and brief the heat wardens and community health workers on how to administer them consistently. For the sticker-voting boards, prepare large, clearly worded display boards with the questions and three response columns (Yes/No/Somewhat), and identify three or more public locations with the highest foot traffic. Arrange for someone to monitor each board daily to prevent damage and collect completed responses.

ACTION

1. Deploy heat wardens and community health workers to distribute 5-question feedback cards at key community locations, including markets, mosques, and cooling centres.
2. Set up a simple sticker-voting board in at least three public spaces, asking: Did you know there was a heat warning? and Were you able to access a cooling space? (Yes/No/Somewhat/No stickers).
3. Collect and tabulate responses. Map geographic patterns to identify which wards had the lowest awareness or access. These become priority areas for improvement.
4. Share summary findings with the HAP team and incorporate them into the AAR (Tool 4.1) and the updated plan.

OUTPUT

Community-level feedback report identifying gaps in awareness, access, and trust, used to update communication strategies, cooling centre siting, and warden coverage ahead of the next heat season.

Tool 4.3	ANNUAL HAP UPDATE WORKSHOP Formally revise and strengthen the HAP before the next heat season begins.		
GROUP SIZE	**TIME FRAME**	**WORKSPACE**	**MATERIAL**
15 – 25 people	Full day	Meeting/conference room/workshop room	Current HAP document, AAR report, data summaries

AIM

Bring all HAP stakeholders together once a year, ideally 2 – 3 months before the expected start of the hot season, to formally update the plan based on AAR findings, community feedback, new climate data, and any changes to resources or personnel.

PREPARATION AND SETUP

Schedule the workshop 2 – 3 months before the expected start of the next heat season, while there is still time to act on its findings. Circulate the AAR report, community feedback summary, and the current HAP document to all participants at least one week in advance so everyone arrives prepared. Prepare a simple tracking sheet showing the status of each corrective action agreed at the previous AAR (completed, in progress, or not started). If climate or population data has been updated since the last cycle, print relevant summaries for discussion. Ensure the right people are in the room: department leads with operational responsibility, not just representatives, as decisions made in this workshop need to be held.

ACTION

1. Review the previous year's AAR corrective actions: which were completed? Which are outstanding? What were the results?
2. Update the vulnerability map and registry if population data has changed. Confirm that cooling centre agreements are still valid. Update contact lists.
3. Review and revise the alert thresholds and communication strategy. Are there new channels to add? New population groups to reach?
4. Review the long-term intervention priorities from Tool 2.4. What progress has been made? What new priorities should be added?
5. Assign roles and confirm budgets for the coming season. Schedule the simulation drill. Set a date for the next AAR.
6. Sign off the updated HAP document. Distribute it to all departments and post a summary publicly.

OUTPUT

An updated, signed HAP for the coming season, with revised thresholds, updated contact lists, confirmed resources, and assigned responsibilities.

9. Annexes

The following Annexes provide additional background information to support the tools in this Toolkit. They are intended as reference material for use when a deeper understanding is needed and are not required reading before using the tools. Each Annex is cross-referenced from the relevant tool in the main text.

9.1. Annex A: How to prepare heat risk maps

Maps are an essential foundation for the HAP. This Annex outlines the key map types, the data required to prepare them, and step-by-step guidance for teams with limited GIS capacity.

Key map types

- **Land Surface Temperature (LST) map:** Identifies the hottest areas of the city at ground level, typically derived from satellite imagery. Useful for identifying heat islands.
- **Vulnerability map:** Overlays population data (age, health, housing type) with temperature data to pinpoint where high heat and high vulnerability coincide.
- **Cooling resource map:** Maps the locations of cooling centres, water points, parks, and shaded public spaces relative to high-risk zones.
- **Composite risk map:** Combines LST, vulnerability, and resource data into a single map highlighting areas of greatest need for intervention.

Steps for preparing maps with limited GIS capacity

1. Contact your national meteorological department or disaster management authority to request any existing temperature or risk maps for your city or district.
2. If digital data is unavailable, use the participatory mapping approach in Tool 1.1 as a starting point. Physical maps produced in workshops can be digitised later.
3. For satellite-derived temperature data, free tools include Google Earth Engine (earthengine.google.com) and NASA's EARTHDATA portal. LST data from Landsat or MODIS can be visualised without advanced GIS software via these web-based interfaces.
4. Overlay population data from the most recent census. Most national statistics offices publish ward-level age-distribution data that can be manually placed on a base map.
5. Print all maps in large format (A1 or A0) for use in workshops. Laminated maps can be annotated with dry-erase markers and reused.

9.2. Annex B: Risk level classification and vulnerability scoring

This Annex explains how to assign risk levels of Low, Medium, High, or Extreme to geographic zones and individual households. Consistent scoring enables the HAP team to prioritise resources and communicate urgency clearly.

Assigning risk levels to geographic zones (Tool 1.1)

Use the following criteria when labelling heat hotspot zones on the city map:

Risk level	Temperature	Vulnerability indicators	Recommended priority
Low	At or below seasonal average	• Low elderly/child population • Good housing • Access to cooling	• Monitor. No immediate action required
Medium	1 – 2°C above seasonal average	• Some vulnerable households • Mixed housing quality	• Include in outreach planning • Ensure cooling access
High	3 – 4°C above seasonal average	• High elderly/child density • Poor ventilation • Limited cooling	• Priority for warden deployment • Cooling centre siting.
Extreme	5°C+ above seasonal average	• Dense vulnerable population • Informal housing • No cooling access	• Highest priority • Mobile outreach and daily check-ins required

Vulnerability scoring for households (Tool 1.2)

During the vulnerability survey, assign one point for each of the following factors present in a household. The total score determines the vulnerability level.

Factor	Score	Note
Resident aged 60 or over	1	Per elderly resident
Child under 5 years old in household	1	Per young child
Chronic illness (heart, lung, diabetes)	1	Any household member
No fan or air conditioning	1	At time of survey
Metal or tin roof/no ceiling insulation	1	
Lives alone/socially isolated	1	
No knowledge of nearest cooling centre	1	
Unable to travel independently	1	Mobility or transport barrier

Score 0 – 2: Low vulnerability. **Score 3 – 4:** Medium. **Score 5 – 6:** High. **Score 7+:** Extreme.

Households scoring High or Extreme should be included in the heat warden programme and prioritised for daily check-ins during heat events.

9.3. Annex C: Defining heat alert thresholds

Setting the right alert thresholds is critical: thresholds set too high will delay life-saving responses, while those set too low will cause alert fatigue and reduce public trust. This Annex explains the key principles and data-based approach.

Key principles

- Thresholds should be based on local historical data, not global standards. What constitutes a dangerous heat event in a cool-climate city may be a normal summer day in a tropical city.
- Use at least 10 – 30 years of daily maximum temperature data from the nearest reliable meteorological station.
- Where possible, use the heat index (combining temperature and humidity) rather than temperature alone, as high humidity significantly amplifies heat stress on the human body.
- Cross-reference temperature records with health data (hospital admissions, reported heat-related deaths) to identify the temperature range at which health impacts spike in your locality.
- Review thresholds annually and update them based on observed health outcomes from the previous season.

Step-by-step threshold definition

1. Obtain at least 10 – 30 years of daily maximum temperature data from your national meteorological authority.
2. Calculate the monthly average maximum temperature (climatological normal) for each month of the year.
3. For Yellow (Watch) level: set the threshold at 2 – 3°C above the monthly average maximum, or at the level that historically precedes health system pressure.
4. For Orange (Warning) level: set the threshold at 4 – 5°C above average, or at the temperature at which hospital admissions for heat-related illness historically begin to rise sharply.
5. For Red (Emergency) level: set the threshold at 6°C+ above average, or at any temperature at which heat-related deaths have previously been recorded in your area.
6. Present the proposed thresholds to health authorities and meteorologists for validation before finalising.

9.4. Annex D: Sample communication messages by alert level

The following sample messages can be adapted to the local language and context. They are intended as starting points only. Always review with community representatives before finalising.

Yellow (Watch): Sample SMS

HEAT WATCH: <City> Health Department

Very hot weather is expected over the next 2 days. Stay out of direct sunlight between 11 AM and 3 PM. Drink plenty of water. Check on elderly neighbours. Cooling centres are now open at <Location 1> and <Location 2>.

Red (Emergency): Sample public announcement

HEAT EMERGENCY: Urgent Public Notice

An extreme heat emergency has been declared in <City>. Stay indoors. Do not go out between 10 AM and 4 PM. If you feel dizzy or weak, or stop sweating, call [emergency number] immediately. All cooling centres are open 24 hours. Emergency water distribution is available at the following locations:

- <location list>

Health workers will be visiting high-risk neighbourhoods.

9.5. Annex E: Long-term heat interventions: Infrastructure, environment, social, and psychological approaches

Emergency response tools save lives during heat events but cannot reduce the underlying heat risk. Long-term interventions address the structural and environmental causes of urban heat vulnerability. This Annex summarises indicative intervention types, not limited to those listed, to support the discussion in Tool 2.4.

Infrastructure interventions

- **Cool roofs:** Applying reflective coatings or light-coloured materials to rooftops reduces heat absorption in buildings, particularly in informal housing with metal or tin roofs.
- **Reflective pavements and surfaces:** Light-coloured or permeable paving materials reduce the urban heat island effect compared with standard asphalt.
- **Ventilation upgrades in public buildings:** Improving cross-ventilation in schools, health centres, and community halls reduces indoor temperatures and lowers the cost of mechanical cooling.
- **Water supply expansion:** Increasing reliable access to water, especially in informal settlements, is critical for hydration, evaporative cooling, and personal heat management.

Environmental interventions

- **Urban tree planting:** Trees provide shade and evaporative cooling, reducing ambient temperatures by 2 – 5°C in well-canopied streets. Priority should be given to high-risk zones identified in Tool 1.1.
- **Green corridors and parks:** Connected green spaces allow cool air to move through the city. Protecting and expanding existing green space is more cost-effective than creating new parks from scratch.
- **Urban wetlands and water bodies:** Water surfaces cool surrounding areas through evaporation. Restoring urban wetlands or water-retention areas can provide localised cooling.

Social interventions

- **Formalisation of the heat warden programme:** Transforming the volunteer warden network (Tool 3.2) into a sustained, funded programme with ongoing training and support extends year-round community resilience.
- **Heat education in schools:** Teaching children and young people to recognise heat illness, stay hydrated, and protect family members builds long-term community awareness.
- **Care programmes for isolated elderly:** Regular welfare checks for elderly people living alone, not only during heat events, reduce heat-related mortality and strengthen social cohesion.

Psychological and wellbeing interventions

- **Awareness of heat-anxiety:** Extreme heat is linked to higher rates of anxiety, irritability, and mental health crises. Heat response plans should include liaison with mental health services.
- **Support for outdoor workers:** Workers in construction, agriculture, and delivery sectors face disproportionate heat stress. Awareness programmes, rest-break entitlements, and hydration provision reduce risk.

- **Community resilience programmes:** Building neighbourhood social cohesion and mutual aid networks beyond the heat season increases the speed and effectiveness of community response to any emergency.

9.6. Annex F: City Heat Action Plan format

This Annex provides an indicative structure for a formal city-level HAP document. It shows how the outputs of this Toolkit's tools come together to form a complete, official plan. Cities may adapt the structure to local requirements, governance arrangements, and available data.

To access the format, go to this link: City Heat Action Plan (HAP).

About Sustainedge

Sustainedge is an impact-focused organisation specialising in social sustainability, ESG and sustainability reporting, gender equality, climate change, and urban development. By integrating assessment, research, policy, advocacy, training, and implementation, we address complex social, environmental and governance challenges holistically. In collaboration with a wide range of stakeholders, we equip individuals, institutions, industries, and communities with the knowledge and tools to drive transformative, long-term sustainability initiatives that foster equity, resilience, and real-world change.

About AARD

Adaptation Action for Resilient Development (AARD) is a sustainability and resilience-focused organisation advancing climate adaptation, urban resilience, and adaptive development through research, policy, and action. AARD works with national and local governments, institutions, and communities to design innovative, inclusive, and future-ready solutions for resilient cities and sustainable futures.

Contact

House 12 (Flat A5), Road 20, Nikunja 2, Khilkhet, Dhaka 1229, Bangladesh
Email: info@sustainedgebd.org
Website: www.sustainedgebd.org