

Climate Hazards and Urban Health in Southeast Asia: Impacts, Vulnerabilities & Resilience Pathways

Pre-formed Panel Discussion Theme: Climate Resilience and Urban Health: Addressing Heat, Floods, and Air Pollution in South-east Asian Cities

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Why This Matters

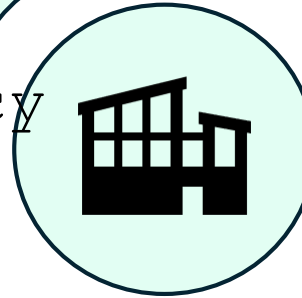


A Public Health Emergency

WHO: Climate change will cause 250,000 additional deaths/year (2030-2050) due to malnutrition, malaria, diarrhea, heat stress (1).

IPCC (2022): Projected ecosystem collapse, species loss, and increasing heatwaves, floods, and disease outbreaks. (2)

Southeast Asia among the world's most climate-vulnerable regions



Southeast Asia's Urbanization Challenge

Region urbanizing 5× faster than others. (3)

Urban growth concentrated in secondary cities → high vulnerability.

Many cities located in deltas, low-lying coasts, river basins → exposed to floods, salinity, sea-level rise.

Rapid, often unplanned urbanization → canal filling, land subsidence, overpopulation.

1. <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>
2. <https://www.unescap.org/kp/2021/state-urbanization-asia-pacific>

3. <https://www.ipcc.ch/report/ar6/wg2/>



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Defining & Understanding Urban Growth: Bangladesh

Bangladesh uses multiple urban definitions (2011 & 2022). (1)

Urban population:– 8.78% (1974) → 38.2% (2020) → 49% by 2035 (2)

Dhaka's population tripled between 1991 and 2011.

108 urban centers (1974) → 506 (2011).

50% of slum residents may be climate-driven migrants. (1)

1. BBS Urban Census: <https://bbs.gov.bd/site/page/47856ad0-7e1c-4aab-bd78-892733bc06eb/->, bbs.portal.gov.bd/sites/default/files/files/bbs.portal.gov.bd/page/d6556cd1_dc6f_41f5_a766_042b69cb1687/2025-06-26-06-38-931adf15f5d9d30e4e1f7ff082450fb5.pdf; 1. (UN-Habitat). <https://unhabitat.org>



Silent Killer

Heat-related mortality projected to rise 200-300 deaths per 100,000 people by mid-century (high-emission scenario).

Urban Heat Island (UHI) intensifies exposure in dense settlements.

Vulnerable groups:

- Elderly
- Children
- Outdoor workers
- Slum residents with poor ventilation/housing

Increased heat stress, cardiovascular strain, hypertension.

Major driver of injuries, infections, cholera/diarrhea outbreaks, and mental health stress.

Flood-induced food insecurity → child undernutrition.

Ganges-Meghna-Brahmaputra Basin:

“Supercharged” water levels destroying villages.

10+ million climate refugees.

2017 floods damaged 480 health clinics + 50,000 tube wells.

Up to 50% of Dhaka slum residents displaced by riverbank erosion and flooding.

<https://www.climate-reality-project.org/blog/how-climate-crisis-impacting-bangladesh>

Regional Emergency

Southeast Asia faces persistent transboundary haze and chronic PM2.5.

Health impacts:

- Acute respiratory infections
- Asthma, COPD
- Cardiovascular disease

Children exposed to polluted air show increased risks of pneumonia, reduced lung function.

Dhaka, Bangkok, Jakarta among the world's most polluted cities.

<https://www.iqair.com/af/newsroom/dhaka-among-top-10-most-polluted-cities-in-the-world-11-11-2025>;

<https://jakartaglobe.id/news/jakarta-tops-global-pollution-rankings-as-air-quality-plummets/#:~:text=According%20to%20IQ%20Air%2C%20an%20air%20quality,a%20reading%20of%20175%20based%20on%20PM2.5>

DOI:10.1088/2515-7620/ac3128

Urban Vulnerability Factors (Across Southeast Asia)

Aging Populations

Aging populations in Bangkok, Singapore.

Informal Settlements

Slums in Dhaka, Manila, Jakarta.

Socioeconomic Inequality

Limited access to healthcare services.



Inadequate Housing

Poor drainage systems in urban areas.

Weak Enforcement

Lack of land-use enforcement.

Limited Green Space

High-density heat island zones.



Impact: Climate hazards disproportionately harm children, elderly & poor urban residents.



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Based Disaster Management (CBDM) and Gender-Sensitive Preparedness

Integration: Moves from reactive relief to proactive risk reduction by involving local communities, particularly women, in planning and response.

Health Impact: Reduced health impacts from floods (e.g., waterborne diseases, injuries) due to early warning systems and community-led drainage/shelter maintenance.

Flood Risk Management (IFRM) focusing on green infrastructure (GI) and canal network management.

Integration: Uses a combination of traditional engineering and Nature-based Solutions (NbS), such as restoring canals and increasing permeable surfaces.

Health Impact: Improved water quality, reduced stagnation (which curbs mosquito-borne diseases like dengue), and the added benefit of green spaces for mental and physical well-being.

https://www.preventionweb.net/files/9440_ADPCCriticalGuidelines.pdf?startDownload=true

Heat Action Plan (HAP) development.

Integration: Involves meteorological services, health agencies, and the city government. Actions include early heatwave warnings, public awareness campaigns, establishing cooling centers, and monitoring heat-related illnesses.

Health Impact: Prevents heatstroke and mortality, particularly among vulnerable populations like outdoor workers and slum residents.

Reducing Heat Impacts in Rajshahi City, Bangladesh (Policy Brief by Climate and Development Knowledge Network - CDKN, 2022)\; Link: <https://www.google.com/search?q=https://cdkn.org/sites/default/files/2022-04/RCCC%2520Policy%2520Brief-Rajshahi,%2520Bangladesh.pdf>

Strategies for Reducing the Urban Heat Island (UHI) effect

Integration: Green infrastructure (Skyrise Greening/LUSH schemes), use of cool paints and reflective materials on buildings, and sophisticated urban climate modeling (Digital Urban Climate Twin - DUCT) to optimize wind corridors and shade.

Health Impact: Direct reduction in ambient temperature, lower energy bills (improving indoor comfort and reducing poverty-related health stress), and increased access to thermal refuges.

Strategies for Cooling Singapore (C40 Knowledge Hub/Cooling Singapore Initiative, 2021)
https://www.c40knowledgehub.org/s/article/Strategies-for-cooling-Singapore?language=en_US

Emerging Lessons for Urban Health Resilience

Key Takeaways

- ❑ Community-led approaches outperform top-down models.
- ❑ Nature-based solutions = cost-effective & health-promoting.
- ❑ Climate-smart health systems must anticipate heat stress, floods, and disease outbreaks.
- ❑ Data integration (GIS, early-warning, climate-health surveillance) is critical.
- ❑ Cross-sector coordination (health-urban-environment) is essential.



elderly & poor urban residents.

Implications for Policy & Health System Readiness

*“Climate resilience
IS urban health
resilience.”*

1.

Climate resilience must be embedded in core health system functions—from climate-proofed health facilities to heat-alert protocols and flood-adaptive service delivery.

2.

Urban planning and public health must converge: cities need green infrastructure, permeable drainage systems, and community cooling spaces to prevent heat- and flood-related morbidity.

3.

Strengthening frontline capacity—especially in informal settlements—offers the highest return, protecting millions living in hazard-exposed urban areas.

4.

Pro-poor social protection and targeted services for migrants, slum residents, children, and the elderly reduce climate-driven health inequities.

5.

Regional and cross-sector coordination is no longer optional: climate hazards, air pollution, and disease vectors cross borders and require harmonized preparedness strategies.

6.

Donor investment can catalyze scalable, evidence-based resilience models that integrate climate adaptation with universal health coverage and urban governance reforms.



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