Effective governance for extreme heat

Integrating institutional frameworks with the energy shift

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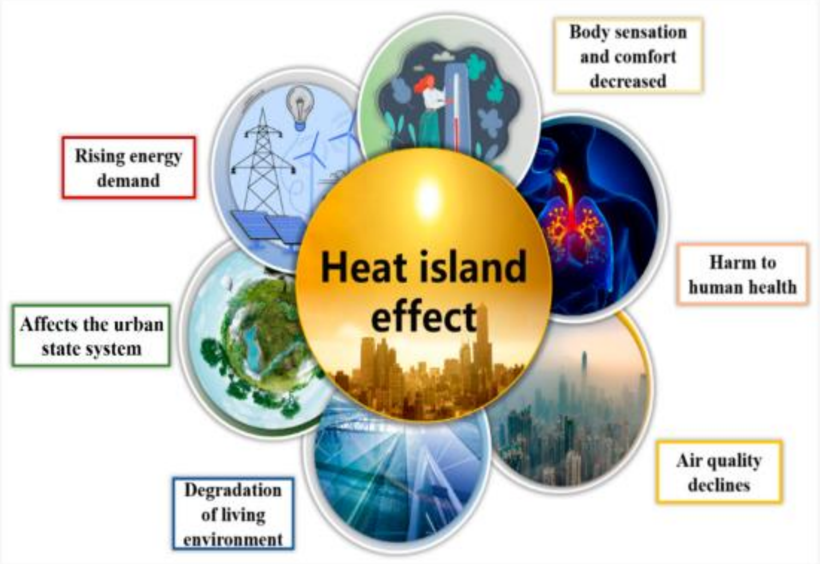
Figure 6. Impact of urban heat island effect.



Liu, et al.,. (2024). Research Overview on Urban Heat Islands Driven by Computational Intelligence. *Land*, *13*(12), 2176. https://doi.org/10.3390/land13122176

The impacts of extreme heat events

Human health impacts
Economic and infrastructure impacts
Environmental impacts
The impacts of extreme heat in Africa

1. Human health impacts

What is Extreme heat?

- often referred to as the "silent killer,"
- Poses a severe threat to global public health

Can We Survive Extreme Heat?
Humans have never lived on a planet this hot, and we're totally unprepared for what's to come
August 27, 2019
ILLUSTRATION BY SEAN MCCABE

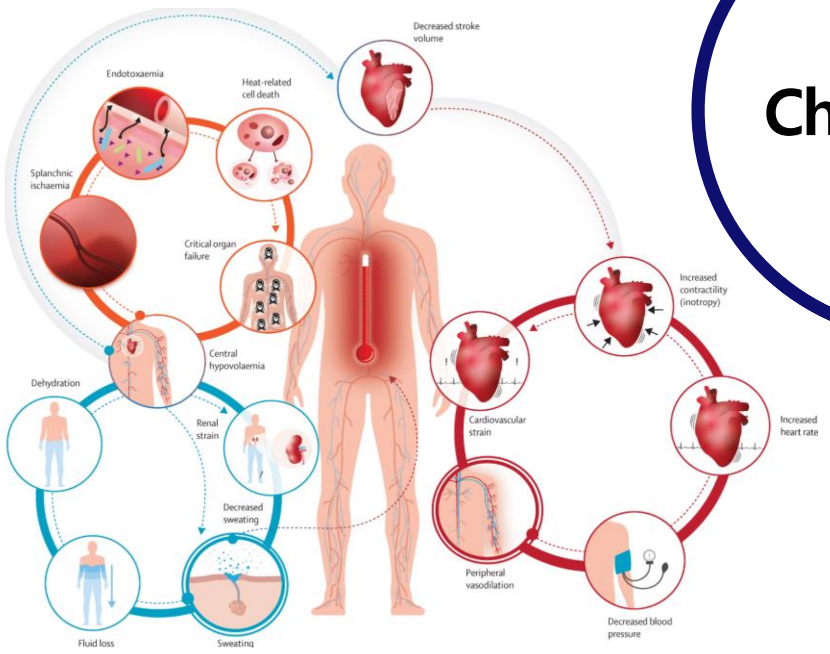
disproportionate impact

- effects are not immediately visible, but have a cumulative impact, disproportionately affecting the most vulnerable populations.
- By 2070, it is estimated that 3.5 billion people will be severely impacted by extreme heat, with 1.6 billion of them residing in urban areas.
- 356,000 deaths were associated with extreme heat across nine countries, in 2019 alone.
- This projection underscores the urgent need to address the risks associated with rising temperatures,
- particularly as extreme heat is already more lethal than all the other climate-related threats combined, including hurricanes, floods, and droughts.

- Source: Chi Xu and others, "Future of the human climate niche", *Proceedings of the National Academy of Sciences*, vol. 117, No. 21 (2020).
- 9 Katrin G. Burkart and others, "Estimating the cause-specific relative risks of non-optimal temperature on daily mortality: a two-part modelling approach applied to the Global Burden of Disease Study", *The Lancet*, vol. 398, No. 10301 (2021).

Gradual onset of symptoms

Source: Mississippi state univ. extension



Initially: mild symptoms
Prolonged: more severe conditions

Challenges?

- early identification of risk challenging → inadequate preparation and lack of preventive measures.
- exacerbate pre-existing health conditions, thereby increasing heat-related morbidity and mortality.
- may not immediately be attributed to heat. → Possibility of underestimation

Ebi, et al. (2021). **Hot weather and heat extremes: health risks** The Lancet, Volume 398, Issue 10301, p.700

Residential issues

Economically disadvantaged groups

Risk of heat-related illnesses

↑ **substandard housing**

↑ **limited access to air conditioning**

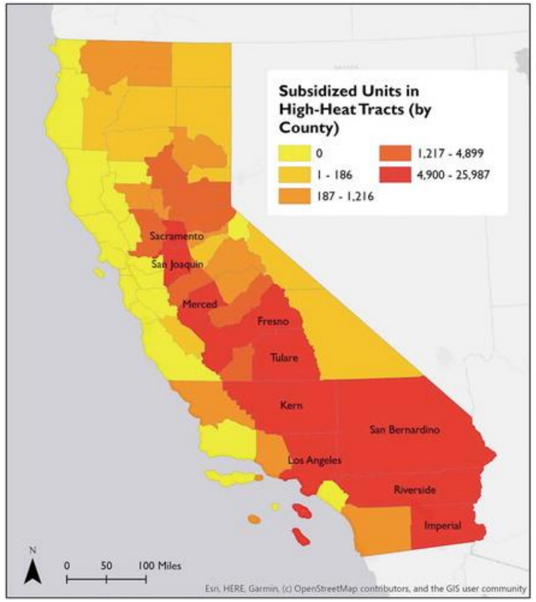
↑ **occupations like manual labor and waste collection**

prolonged exposure to extreme heat.

Concentration in High-Risk Areas (p.849) (Gabbe, C. J., & Pierce, G., 2020)

Central Valley and Inland Empire counties (e.g., Fresno, San Bernardino, Riverside) contain the largest share of high-high units.

Fresno County alone has 71% of its subsidized housing in high-high tracts (p. 853)



Environmental Deficiencies

Subsidized housing areas tend to have: Less tree canopy, More impervious surfaces, Lower access to central air conditioning (p.855)

Data Source
- Extreme heat: California state, 'Cal-Adapt'
- Subsidized housing: HUD 2017 (Department of Housing and Urban Development)
- American Community Survey (ACS), 2013-2017
- Adaptive Capacity and Sensitivity Index (ACSI)

Image: The Guardian https://www.theguardian.com/us-news/2021/sep/22/haiti-migrants-texas-us-immigration

Source: Chersich, M.F., Wright, C.Y. Climate change adaptation in South Africa: a case study on the role of the health sector. *Globalization and Health*, vol. 15, No. 22 (2019)
Gabbe, C. J., & Pierce, G. (2020). Extreme Heat Vulnerability of Subsidized Housing Residents in California. *Housing Policy Debate*, *30*(5), 843–860.

Natural hazard and Human health impacts

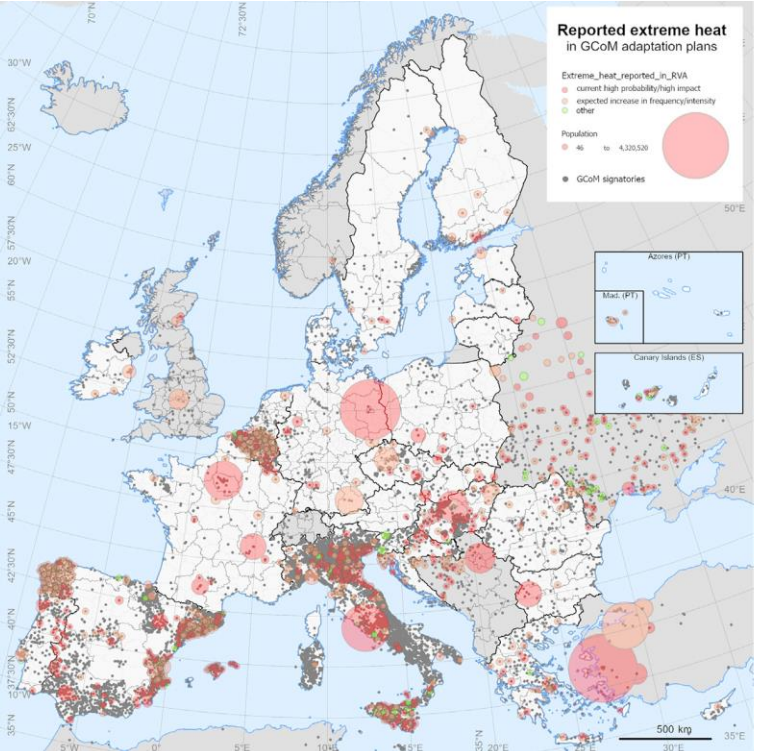


FIGURE 2.4 Map of GCoM signatories with respect to extreme heat. Red halos distinguish cities that declared extreme heat as either a high probability or high impact hazard (currently)

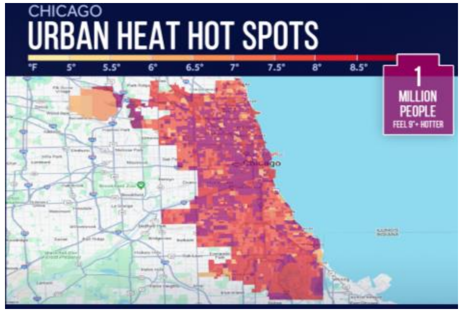


Image: Climate Central.

Extreme weather events, such as heat waves and floods, can also directly influence disease transmission and morbidity.

Image: The Guardian

- **climate change and its effects—particularly heat waves and humidity—have altered the behavior of the Anopheles mosquito, the vector for malaria, increasing its survival rate.** (WHO, *2023, World Malaria Report.)*

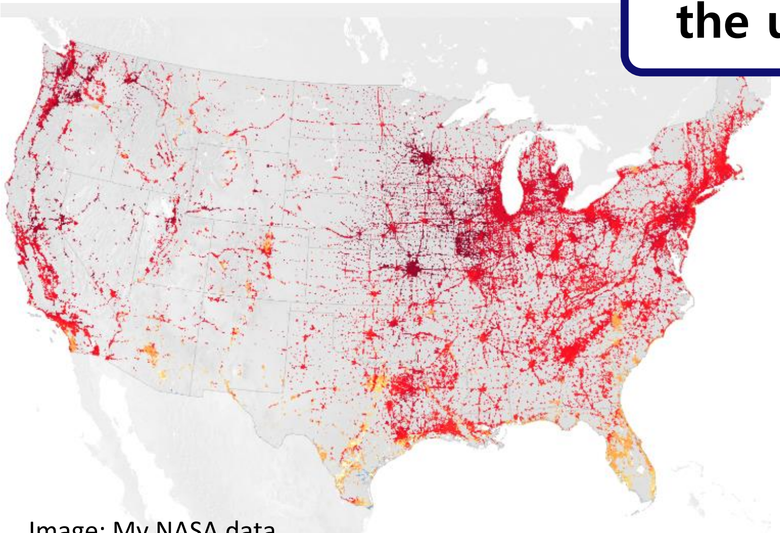


Image: My NASA data
https://mynasadata.larc.nasa.gov/basic-page/urban-heat-islands

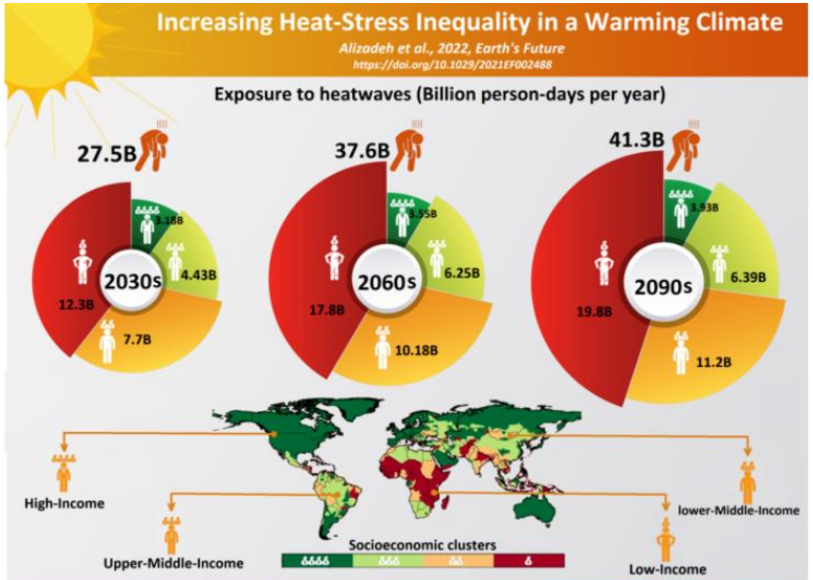
the urban heat island (UHI) effect

- **Experience significantly higher temperatures than surrounding rural areas.**
- **It is mainly due to the built environment trapping heat from buildings, roads, and other impervious surfaces.**
- **Also, it leads to potentially dangerous heat waves with increased health risks for residents.** Source: WHO, *World Malaria Report 2023* (Geneva, 2023).

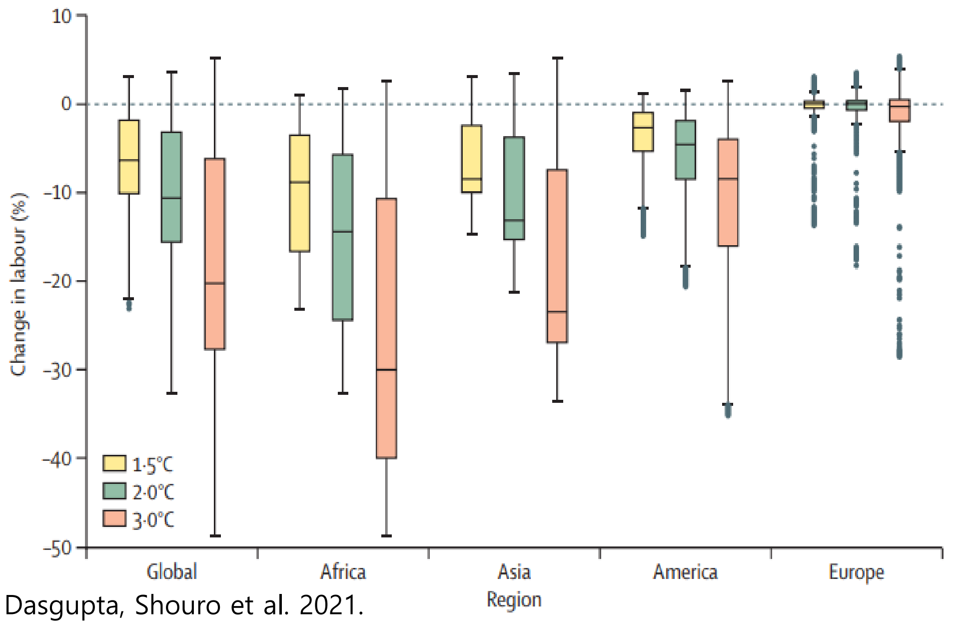
2. Economic and infrastructure impacts

Economic problems? (possible)

- Labor productivity, urban infrastructure, etc.
- exacerbates social and economic inequalities
- disproportionately affects vulnerable groups
- imposes significant economic pressures on communities
- increased demand for public services
- rising healthcare costs.



CREDIT Mohammad Reza Alizadeh (CC BY 4.0)



Dasgupta, Shouro et al. 2021.

At least 2.41 billion workers worldwide (71% of the working population) are exposed to excessive heat.

→ 22.85 million injuries and 18,970 death annually.

In 2020 alone, 295 billion work hours were lost globally due to extreme heat.

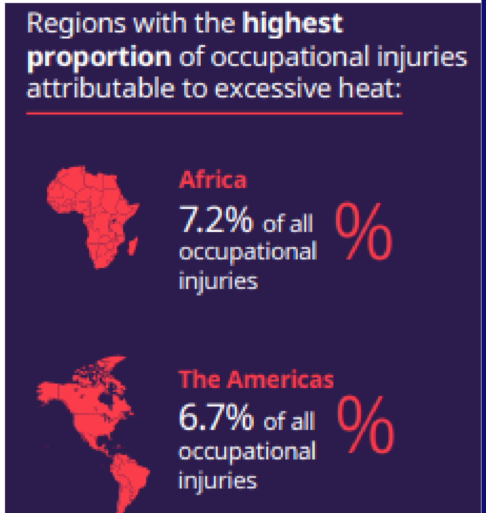
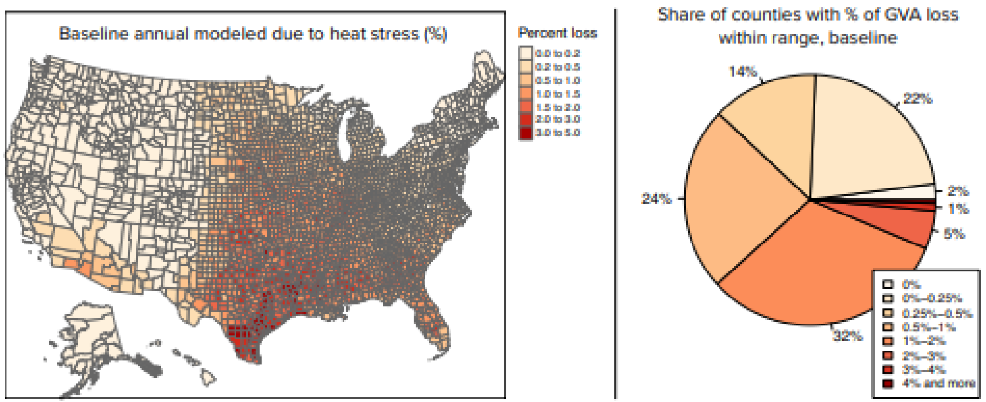


Image Source: Flouris. (2024, p. 14)

In the United States, associated labor productivity losses could double to nearly $200 billion by 2030 and reach $500 billion by mid-century.

By 2050, extreme urban heat is projected to reduce global labor capacity by 20% during hot months.

Figure 2: Distribution of Economic Losses from Reduced Worker Productivity Due to Heat Stress, Baseline Scenario



Note: Gross value added lost across all sectors of the economy in 2020, based on historical climate data from 1986 to 2005.

Source: Vivid Economics. Data
Climate Research Center (WCRC

Source: Vivid Economics. Woodwell Climate Research Center (WCRC). (as cited in Adrienne Arsht-Rockefeller Foundation Resilience Center, 2021, p. 6).

Source:

- Andreas Flouris and others, eds., *Heat at Work: Implications for Safety and Health – A Global Review of the Science, Policy and Practice* (Geneva, ILO, 2024).
- David Dodman and others, "Cities, settlements and key infrastructure", in *Climate Change 2022: Impacts, Adaptation and Vulnerability – Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, Hans-Otto Pörtner and others, eds. (Cambridge, Cambridge University Press, 2022).
- Sustainable Energy for All, *Chilling Prospects: Tracking Sustainable Cooling for All* (2022).
- Adrienne Arsht-Rockefeller Foundation Resilience Centre, *Extreme Heat: The Economic and Social Consequences for the United States* (2021).
- Ridhima Gupta, E. Somanathan and Sagnik Dey, "Global warming and local air pollution have reduced wheat yields in India", *Climate Change*, vol. 140 (2017).

Agriculture productivity and extreme heat

Reduction in crop yields for staples

- **Annual losses in the United States**

  ($720 million → $1.7 billion by 2030)

➡ **Threatening food security and export capacity**

Danger of rising temperature

- **In India wheat production,**
- **A mere 1°C increase in temperature**

➡ **4-5% decline in yields**

“erratic rainfall patterns linked to climate change”

IPCC’s warning

- **potential crop failures**

➡ **increased food prices heightened risk of famine in vulnerable communities.**

Need of substantial mitigation efforts

- **global food production could drop by as much as 30% in certain regions by 2050**

➡ **intensifying poverty and hunger issues**

Source:

- Ridhima Gupta, E. Somanathan and Sagnik Dey, “Global warming and local air pollution have reduced wheat yields in India”, Climate Change, vol. 140 (2017).
- Intergovernmental Panel on Climate Change. *Climate Change 2021: The Physical Science Basis*.

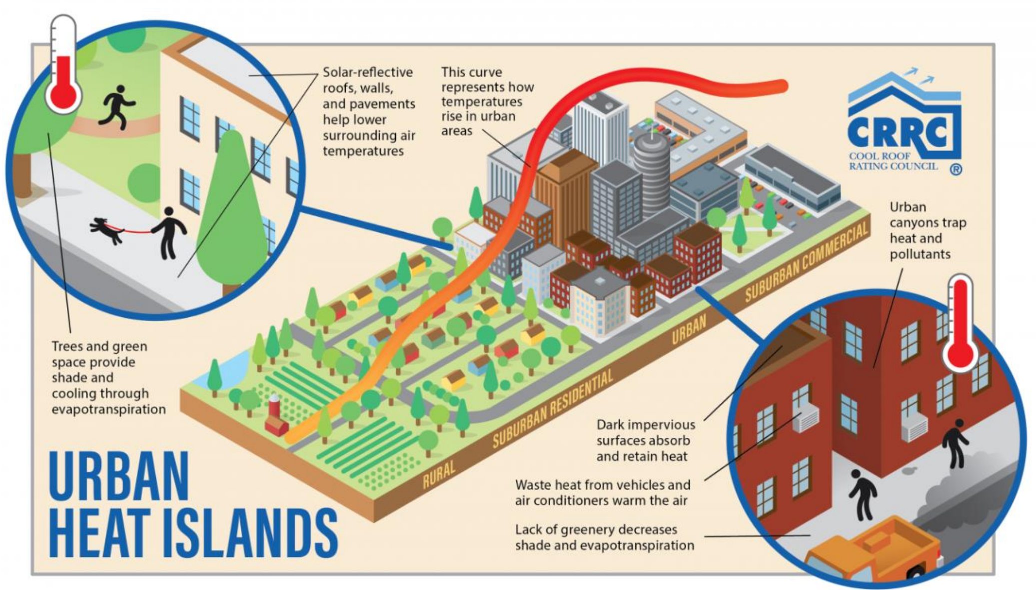
Problem with infrastructure

Over capacity problem

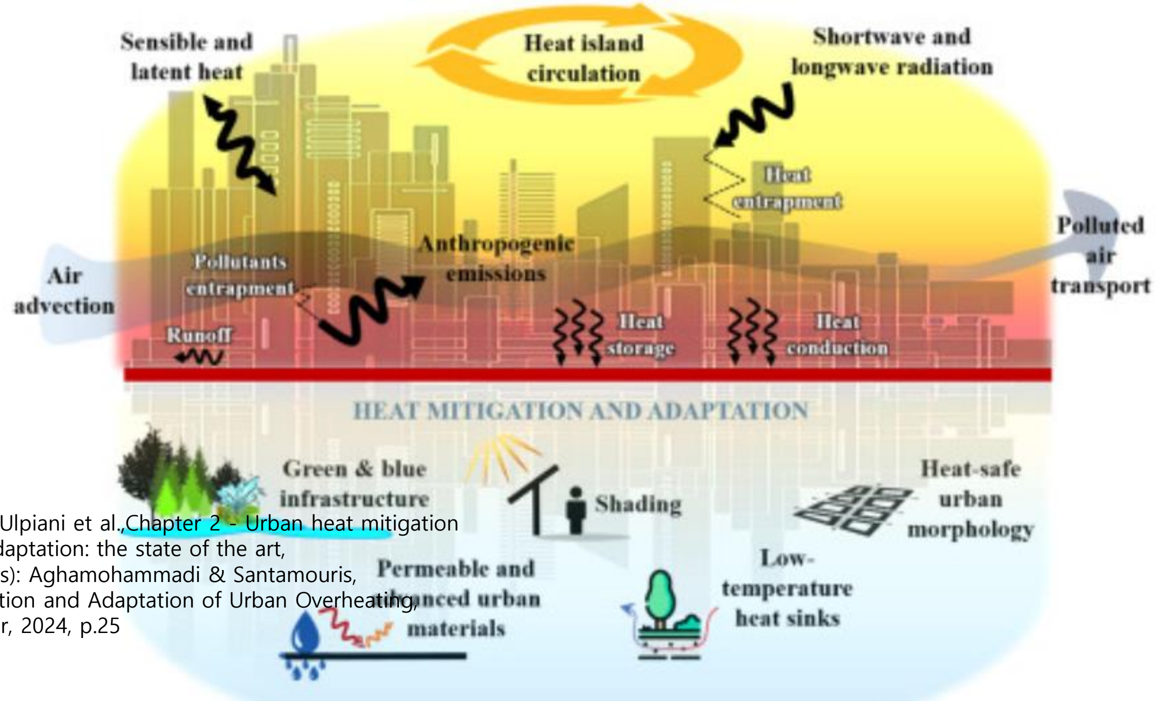
- Roads, power lines, and buildings face structural damage and system failures
- Energy infrastructure struggles to meet the increasing demand for air conditioning during heat waves.

Concern for Heat-induced infrastructure failures

- could have cascading impacts on health and economic activity
- particularly in urban areas already exacerbated by the UHI effect.



Source: https://coolroofs.org/resources/urban-heat-island-mitigation



Giulia Ulpiani et al.,Chapter 2 - Urban heat mitigation and adaptation: the state of the art,
Editor(s): Aghamohammadi & Santamouris,
Mitigation and Adaptation of Urban Overheating,
Elsevier, 2024, p.25

3. Environmental Impacts

Environmental impacts

- ecosystem
- Natural resources
- Air & water quality

drought and wildfires → depletion of soil moisture → ocean warming

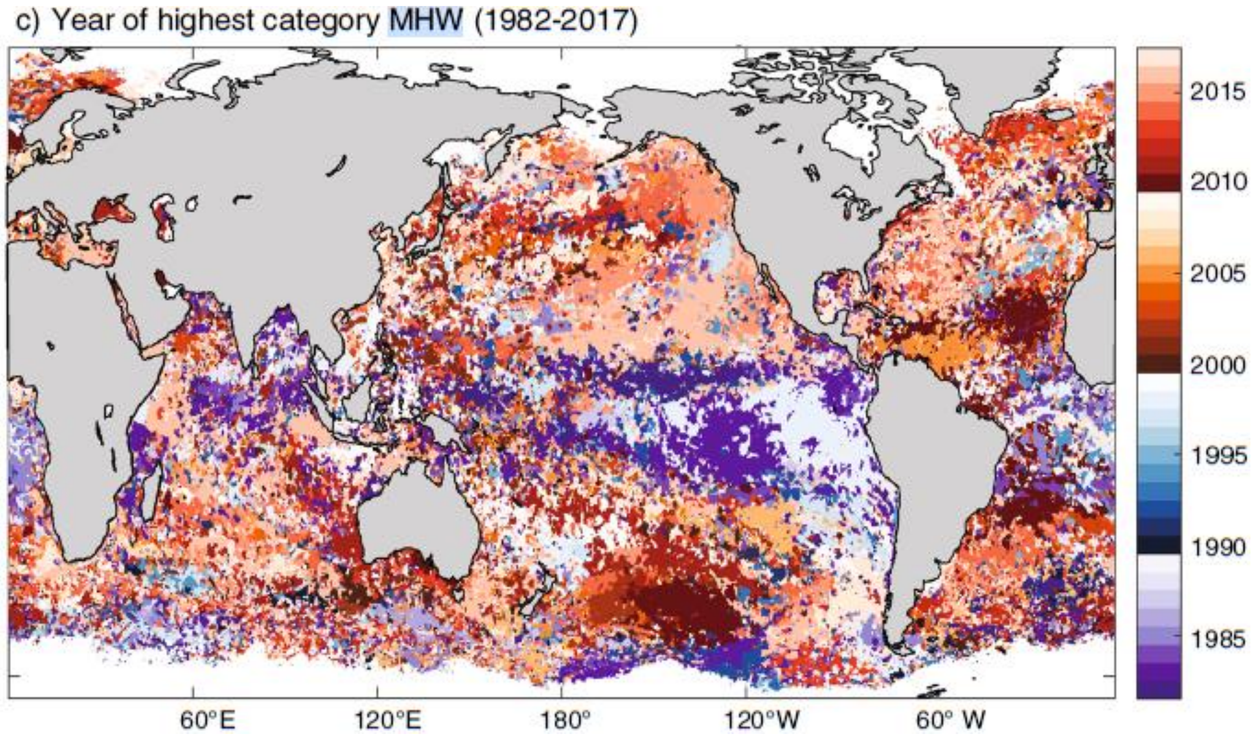


Figure: Characteristics of Marine Heat Waves(MHW) category and intensity: Year of maximum recorded category (i.e. when the severity index was highest; the associated year of maximum intensity is shown in Figure)
(Gupta et al., 2020, p.3).

severe stress on terrestrial ecosystems

- threatening biodiversity
- disrupting ecological balance

disrupt marine ecosystems

- impacting fisheries, coral reefs, and other marine life
- potentially influencing weather patterns like hurricane intensity.

Source: Alex Sen Gupta and others, "Drivers and impacts of the most extreme marine heatwave events", *Scientific Reports*, vol. 10, No. 19359 (2020).

Water resources problem

1.42 billion people – including 450 million children – are already living in areas of high or extremely high **water vulnerability.**

Various regions worldwide are experiencing **more frequent and severe droughts** driven **by elevated temperatures.**

conflicts and compel communities to adjust to shifting environmental conditions.

Less than 3 percent of the world's water resources **is freshwater**, and it is growing **increasingly scarce.**

Lead to **intensified competition for water resources.**

stresses freshwater ecosystems and **raises salinity levels, adversely affecting aquatic life.**

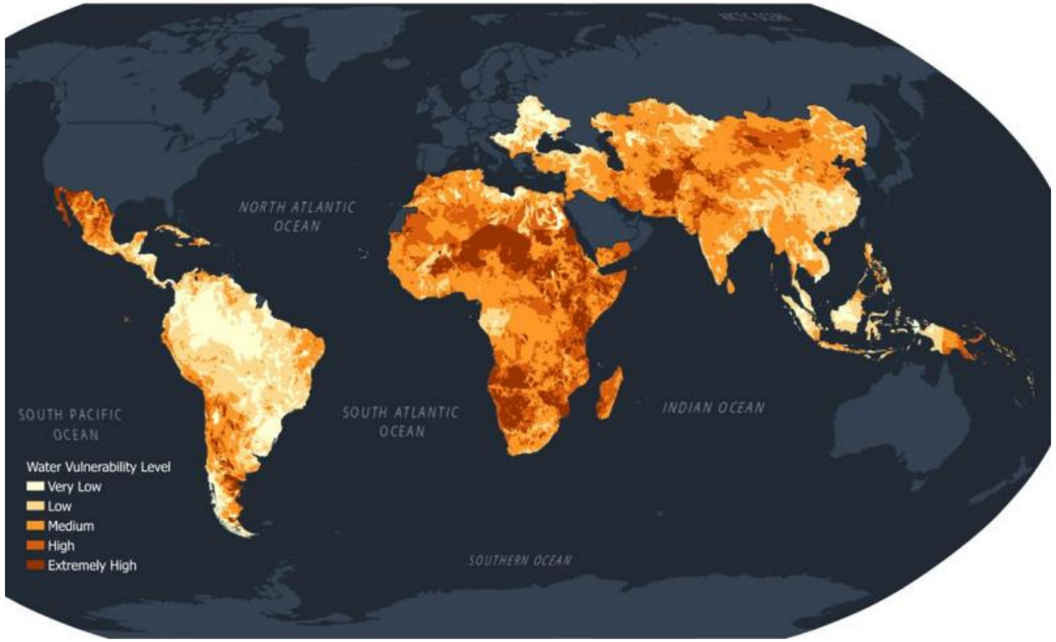


Figure:

Map of areas of high or extremely high water vulnerability. (UNICEF, 2021, p.13).

* Water stress, interannual variability, seasonal variability, and groundwater table decline were derived from the WRI Aqueduct Water Risk Atlas, drought events derived from the UNEP Global Data Risk Platform, and drinking water service level data were derived from the JMP data set.

Source: UNICEF, "Reimagining WASH: water security for all", March 2021

Air quality problem

- **extreme heat negatively impacts through the increased formation of ground-level ozone**

- **a pollutant that exacerbates respiratory ailments and other health issues.**

- **In urban environments, like LA and Beijing, elevated temperatures catalyze the chemical reactions responsible for ozone smog, putting millions of residents at risk.**

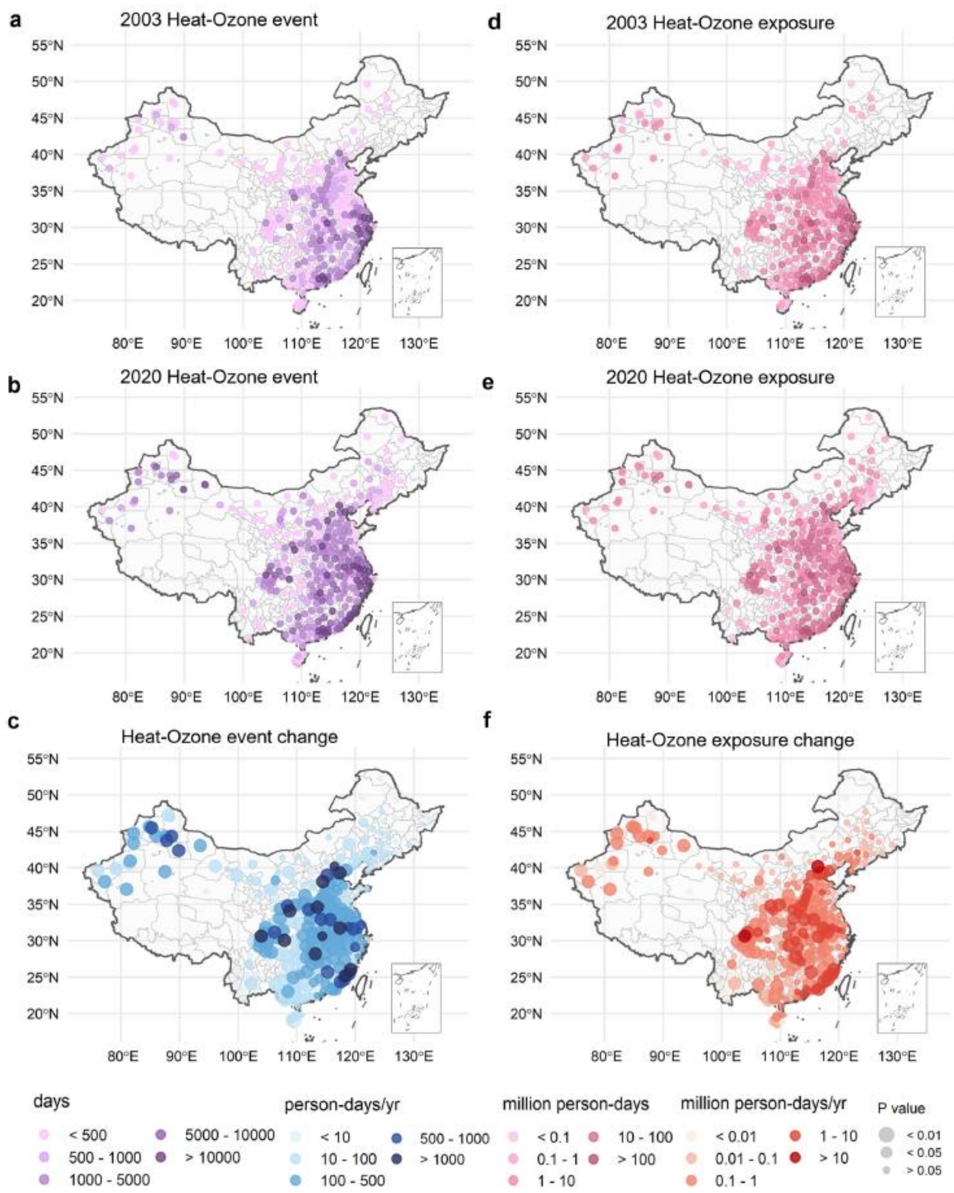


Figure: **City-level compound extreme heat and ozone pollution event days and exposure spatial distribution.**
a &b) Number of compound events days in 2003,2020 .
c) the rate of increase in the total number of days from 2003 to 2020.
d & e) Person-days of compound exposure in 2003, 2020.
f) increase in the rate of urban population exposure to compound events from 2003 to 2020.

Source: Su, J., Jiao, L., & Xu, G. (2025). Intensified exposure to compound extreme heat and ozone pollution in summer across Chinese cities. *Npj Climate and Atmospheric Science*, *8*(1), 1–8. https://doi.org/10.1038/s41612-025-00966-5

4. The impacts of extreme heat in Africa

Fragile and insufficient electricity and water infrastructures

Infrastructure in many African cities

characterized by **growing urban populations**

inadequate services

unable to adapt promptly to extreme weather conditions

cannot adequately deal with spiking cooling and water demands.

Source: WMO, *State of Climate in Africa 2021* (Geneva, 2022).

Cape Town case (2018)

critical vulnerabilities in its **energy infrastructure**

age-related deficiencies

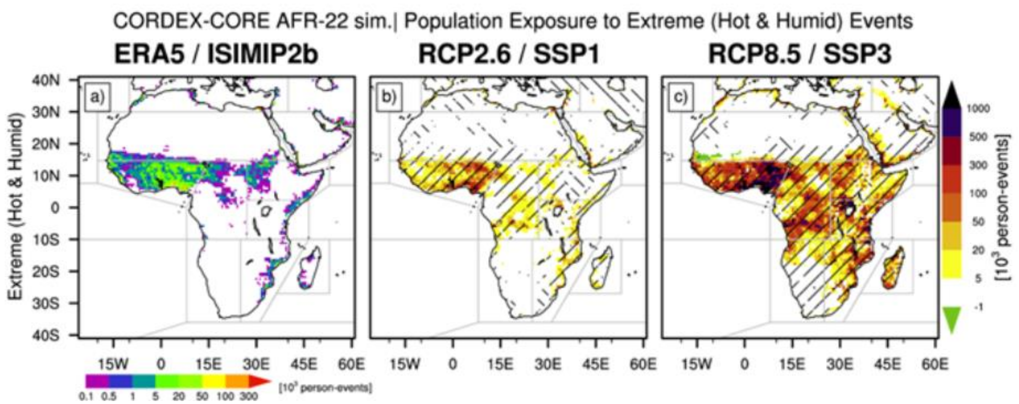
the inability to cope with extreme weather events

Strengthening these infrastructures **requires significant investment**

a daunting **challenge in resource-limited contexts**

budget constraints often hinder development efforts.

World Meteorological Organization, *The State of Climate in Africa 2021.*



Alain Tamoffo 2025.03, Government

Fig. 1: The average number of people affected yearly (from 1981 to 2010) by extreme heat and humidity co-occurring (a). The expected change in the number of people exposed to these extreme conditions by 2069–2098 is shown for two scenarios: one with strong climate action (b) and one with little or no action (c).

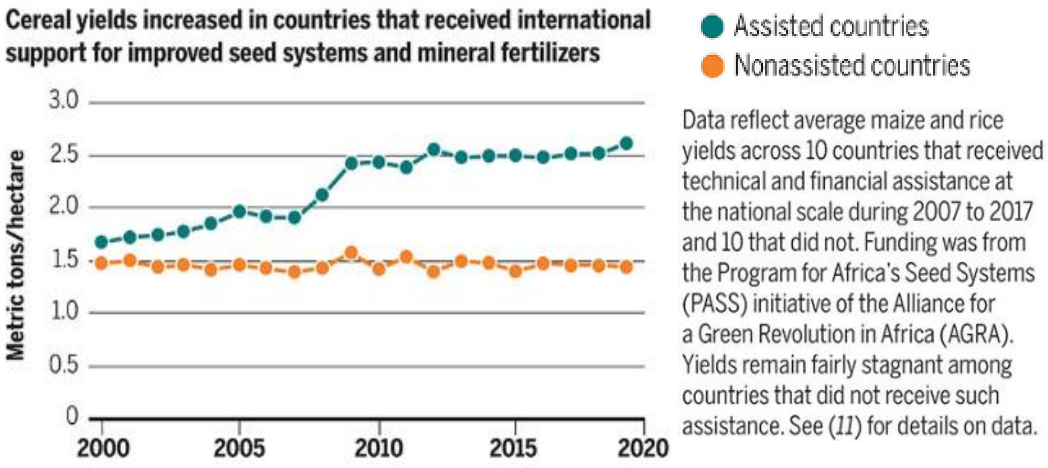
Agricultural productivity and labor capacity (In sub-Saharan Africa)

Rising temperatures → Significant decline in crop yields of critical staples

Thermal stress on workers → Lower productivity and economic output in agricultural sectors

↓

Food supply in regions reliant on these sectors dwindles

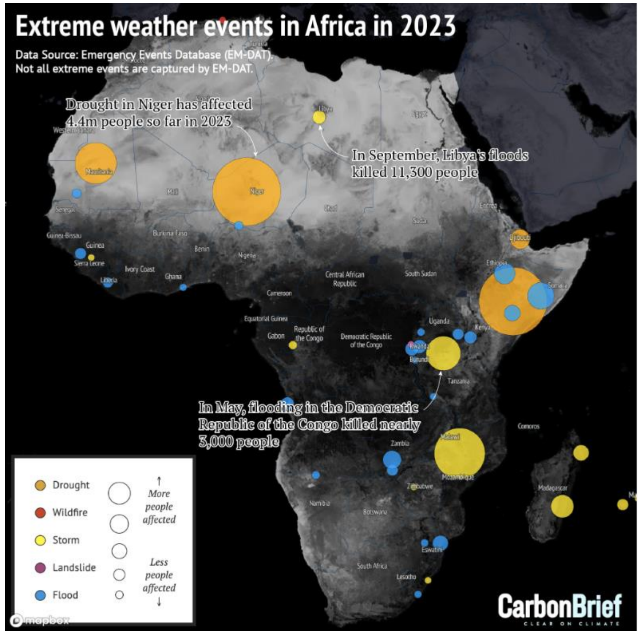


Tomas et al., 2021. Agricultural productivity must improve in sub-Saharan Africa

Vicious cycle of poverty and food scarcity

Source: Diogo Baptista and others, *Climate Change and Chronic Food Insecurity in Sub-Saharan Africa*, (Washington, D.C., International Monetary Fund, 2022).

Drought and Food & water system



Extreme weather events in Africa in January-October 2023. Data source: [Emergency Events Database](#) (EM-DAT) and Map by Joe Goodman and Tom Prater for Carbon Brief.

extreme heat → **Worsening drought**

- **further drive food insecurity across the continent**
- **leading to price increases**
- **lower dietary intakes that primarily affect poorer populations.**
- **food price inflation**
- **reducing overall access to nutritious foods.**
- **accelerated depletion of water sources**

Hugh Turral, Jacob Burke and Jean-Marc Faurès, *Climate Change, Water and Food Security* (Rome, Food and Agriculture Organization of the United Nations, 2011).
See for example, UNICEF, "Water crisis in the Horn of Africa", 2022.

III. The connection between extreme heat and energy transition

Extreme Heat and Electricity Demand

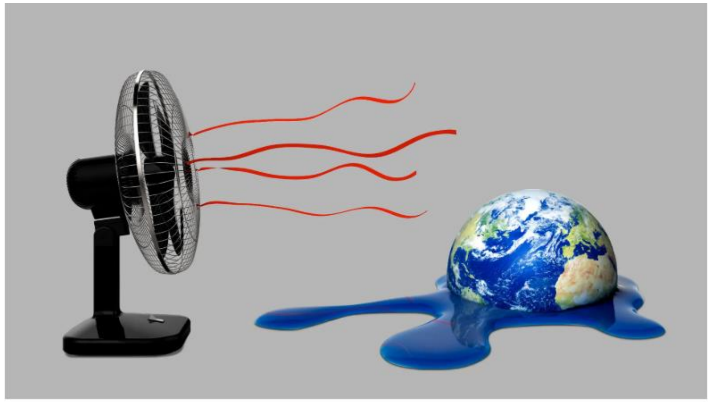


Illustration: Aïda Amer/Axios

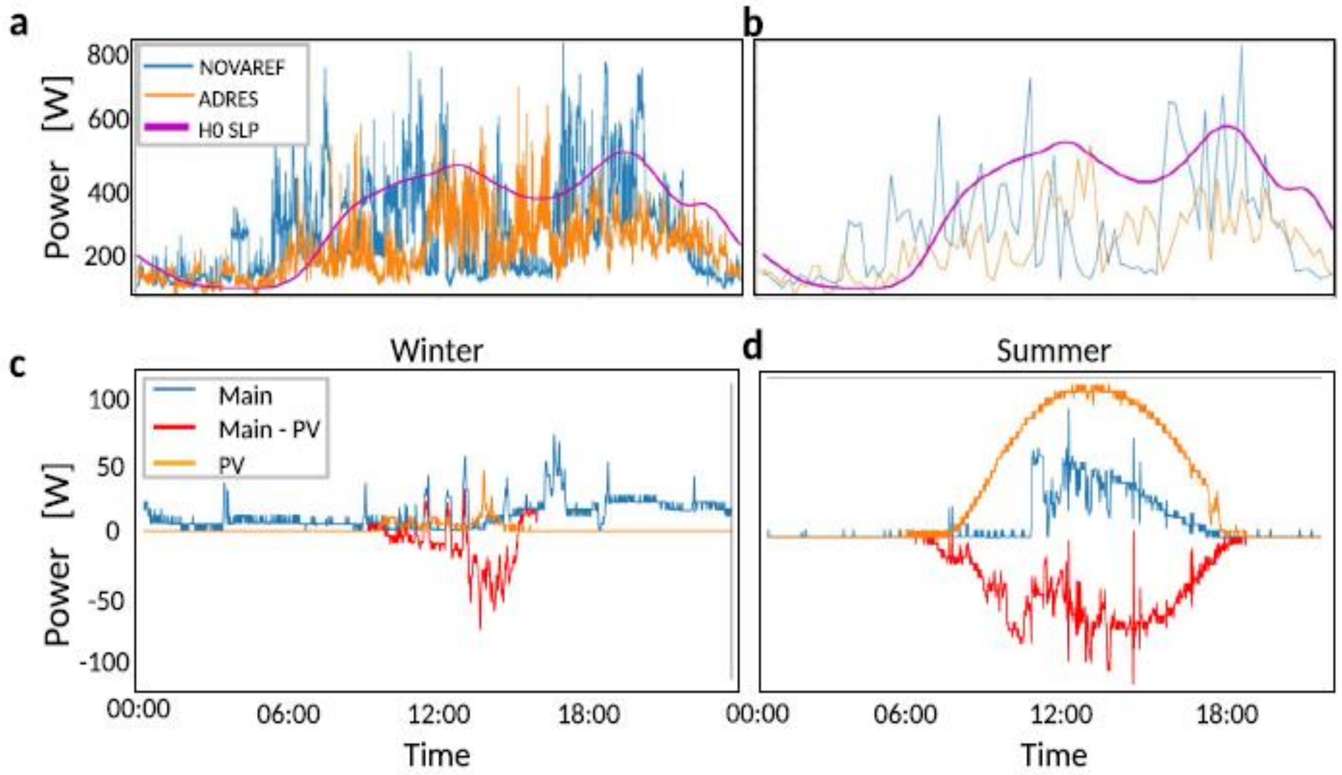
- Extreme heat leads to **significant spikes in electricity usage**
- Increased demand for **cooling devices** (e.g. air conditioning, fans, heat pumps)
- Cooling devices require more energy as **air temperature increases**
- Poor **insulation** in buildings exacerbates energy use

India is the world's fastest-growing market for air conditioners

A woman fans her child with a sheet of paper as a fan sits idle amid a power outage during a heat wave in Jacobabad, Pakistan, on May 11. Aamir Qureshi/AFP via Getty Images

Grid Stress and Infrastructure Risk

- Cooling demand peaks during hottest hours
- Extreme temperatures reduce efficiency of power lines and stress equipment
- Risk of blackouts and grid failure
- Transformers and other infrastructure face reduced lifespan
- Real data show sharp, short-term demand spikes
- Grid models (like H0 SLP) underestimate true load
- Summer PV helps, but not enough to cover peaks



- **H0 SLP** vs. **real household consumption data** on a winter day
- Data from **NOVAREF** (Germany, 12 houses) and **ADRES** (Austria, 30 houses)
- All datasets **upsampled to 2-second resolution (0.5 Hz)**
- (b) shows the same data at **15-minute resolution**, showing **worse trend mismatch**
- (c, d): show **single household** data in **winter** and **summer** (with and without PV)
- **PV generation** measured at **1-minute resolution**
- Spikes are smaller in (a, b) due to **averaging across households**
- Spikes are more visible in (c, d) due to **single household data**

Image Source: Anvari, M., Proedrou, E., Schäfer, B. *et al.* Data-driven load profiles and the dynamics of residential electricity consumption. *Nat Commun* **13**, 4593 (2022).

Demand Response Program in Korea

Emergency power-saving demand response programme by Korea Electric Power Corporation

Why?

Address peak demand surges and ensure grid stability

Effect

Stabilizing the grid

Minimizing reliance on fossil fuels

Managing electricity during heatwaves

How?

Provide financial incentives to large electricity consumers

Reduce energy usage during peak demand periods

How to Manage Power Demand

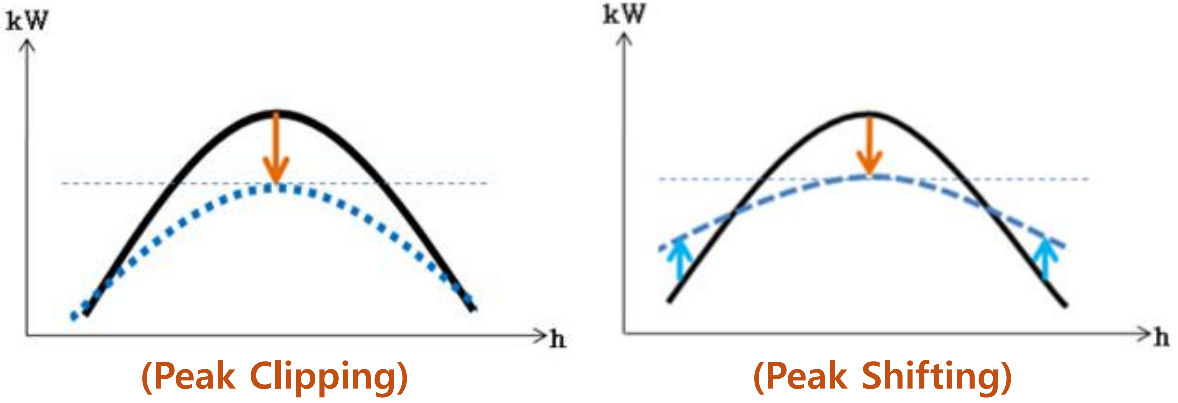


Image Source: https://home.kepco.co.kr/kepco/CY/K/htmlView/CYKAHP001.do?menuCd=FN0207010101

Energy Transition and Extreme Heat Mitigation

Possible Scenario

extreme temperatures → lower the performance of solar panels

water scarcity during droughts → limit hydropower generation.

Solutions?

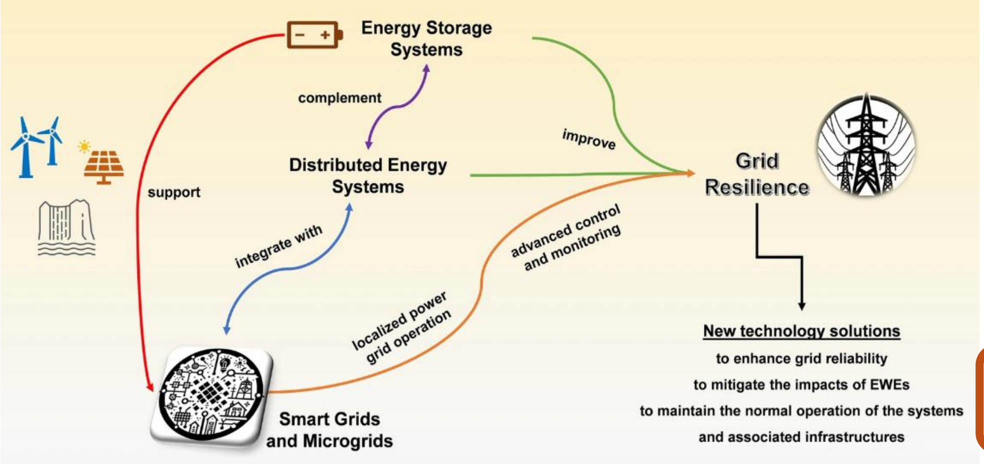
Resilience of energy infrastructure matters.

energy storage systems must be adapted to **manage demand fluctuations** effectively during peak heat periods.

Decarbonizing, adopting **Renewable Energy Sources**
solar, wind and hydropower reduce temperature rise

reduce the carbon footprint of power generation
decrease the frequency of extreme heat events

Need for **Innovative Solutions** to meet rising electricity demand



Gonçalves, *et al.* Extreme weather events on energy systems: a comprehensive review on impacts, mitigation, and adaptation measures. *Sustainable Energy res.* **11**, 4 (2024).

Urban Heatwave Policies

Maximizing Policy Impact

- Focus on high ROI policies (e.g., support for vulnerable groups)

Balanced mitigation and Adaptation Strategies

- Address both health impacts and root causes of urban heat

Long-Term Planning

- Heat shelters & green areas → ensure sustainability and equity

Invest in High-Efficiency Cooling Systems

- Reduce energy use & improve public access to cooling

Enhance Collaboration Between Stakeholders

- Local governments, policy makers & communities working together
- Enables efficient execution & fair distribution of resources

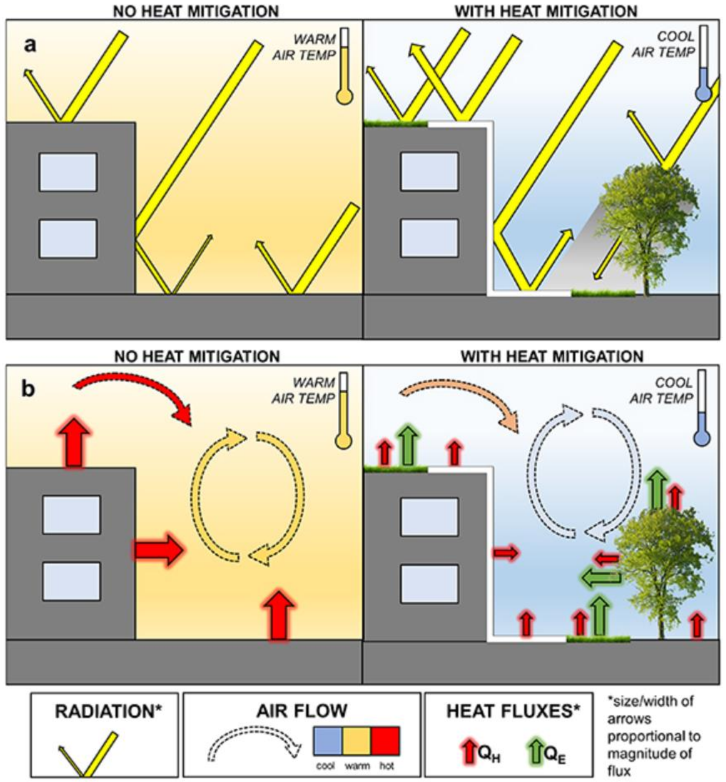


Figure. Urban heat mitigation strategies and their impacts on direct shortwave radiation (a) and convective sensible (Q_H) and latent (Q_E) heat fluxes and resulting air temperature (b).
Source. Krayenhoff, E. S., Broadbent, A. M., Zhao, L., Georgescu, M., Middel, A., Voogt, J. A., ... & Erell, E. (2021). Cooling hot cities: a systematic and critical review of the numerical modelling literature. *Environmental Research Letters*, *16*(5), 053007. p.3.

IV. Effective Governace for Addressing Extreme Heat and Accelerating the Energy Transition

Global, National and Subnational Collaboration

Effective Governance at the National Level

National Governments → Provide structured framework → **Local Governments**

Strategic guidance & coordination

- Combating extreme heat
- Enhancing energy resilience
- Promoting renewable energy

Effective and cohesive implementation of strategies and policies

Developing & executing initiatives → **Specific contexts**

Example : renewable energy mandates

- Promote the transition towards cleaner energy sources
- Help to alleviate the strain on energy systems

Diversifying energy portfolios

Effective Governance at the National Level

National Cooling Action Plans

How?

- Align cooling policies ih national development goals
- Address gaps in cooling access
- Ensure 1)energy efficiency, 2)environmental sustainability, & 3)equitale access to resources and cooling technologis

Effect

- Enhance instituitional coordination
- Close gaps in policy implementation

Promoting Renewable Energy Solutions

How?

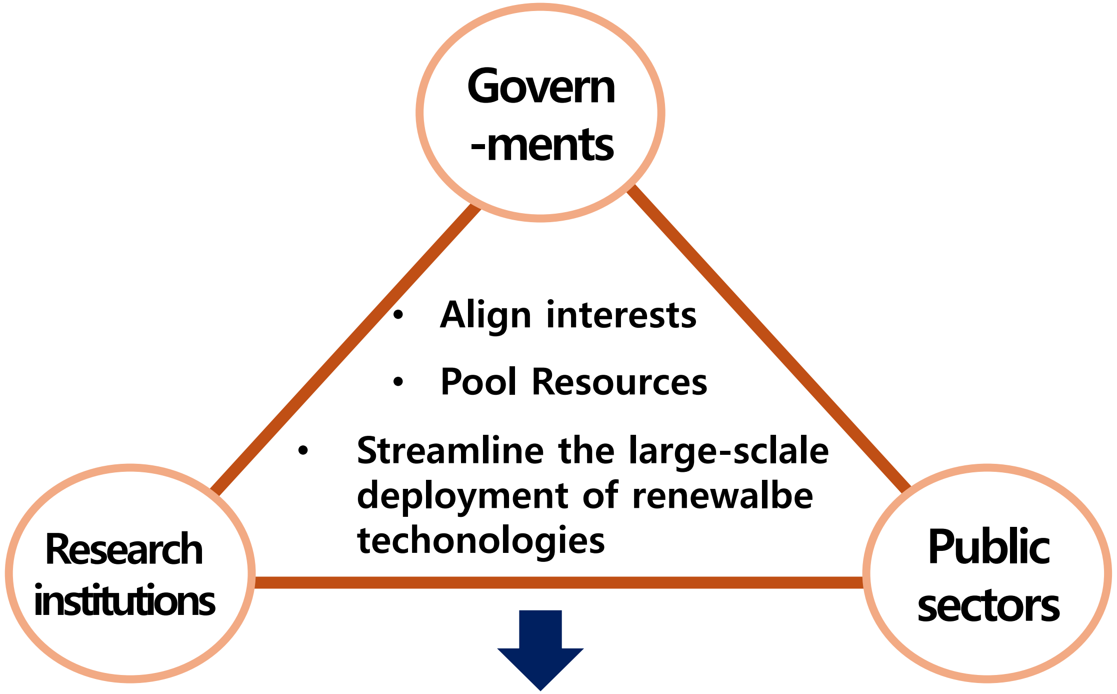
- Develop national energy efficiency standards (e.g. minimum energy performance standards)
- Adopt energy efficiency measures (e.g., better insulation, smart grid technologies)

Effect

- Prevent surges in electricity demand
- Build long-term resilience

Effective Governance at the National Level

Multi-stakeholder Collaboration



- Reduce costs
- Accelerate the adoption of renewable energy solutions

Growing complexity of interactions and integration of activities from networking to collaboration

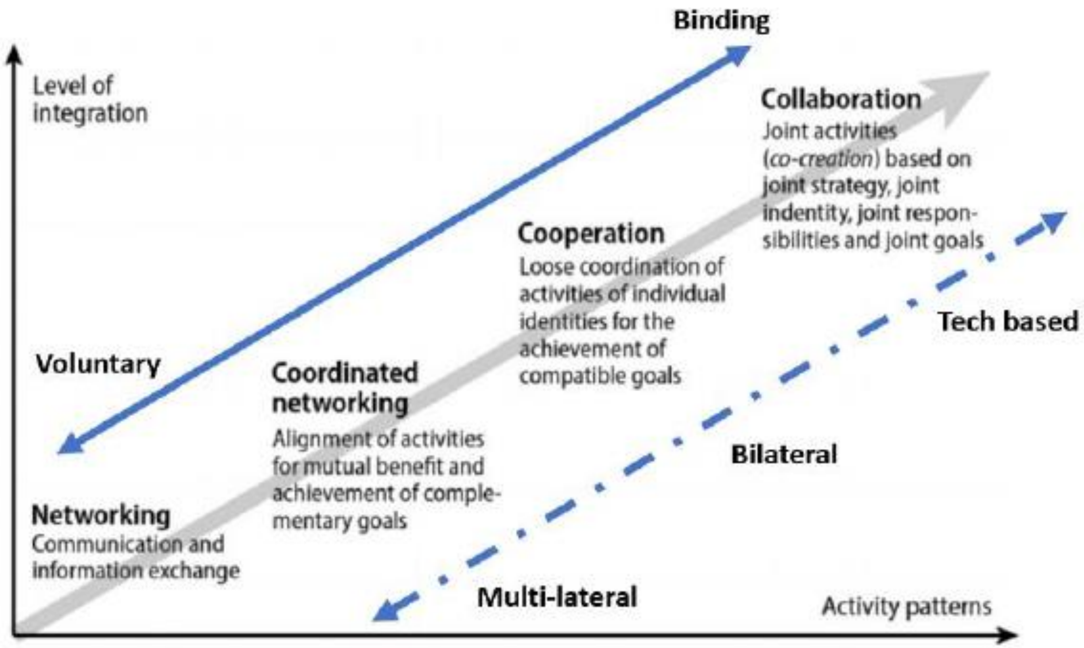


Image Source: Mission Innovation, "Mission Innovation beyond 2020: challenges and opportunities", 2019. . p.16

*Figure: Growing complexity of interactions and integration of activities from networking to collaboration (Russell & Smorodinskaya, 2018).

Effective Governance at the National Level

Infrastructure Investment

Diversifying energy portfolios

Utility-scale solar farms

Wind power

Enhance reliability and reduce vulnerability to climate-related disruptions

+

High efficiency cooling system

Reduce energy consumption and enhance public access to cooling during heatwaves

More effors to the regions vulnerable to extreme heat events

Support the immediate energy needs of at-risk population

Contribute to long-term sustainability goals

Days per year that max temperature exeeds 35° C, by city

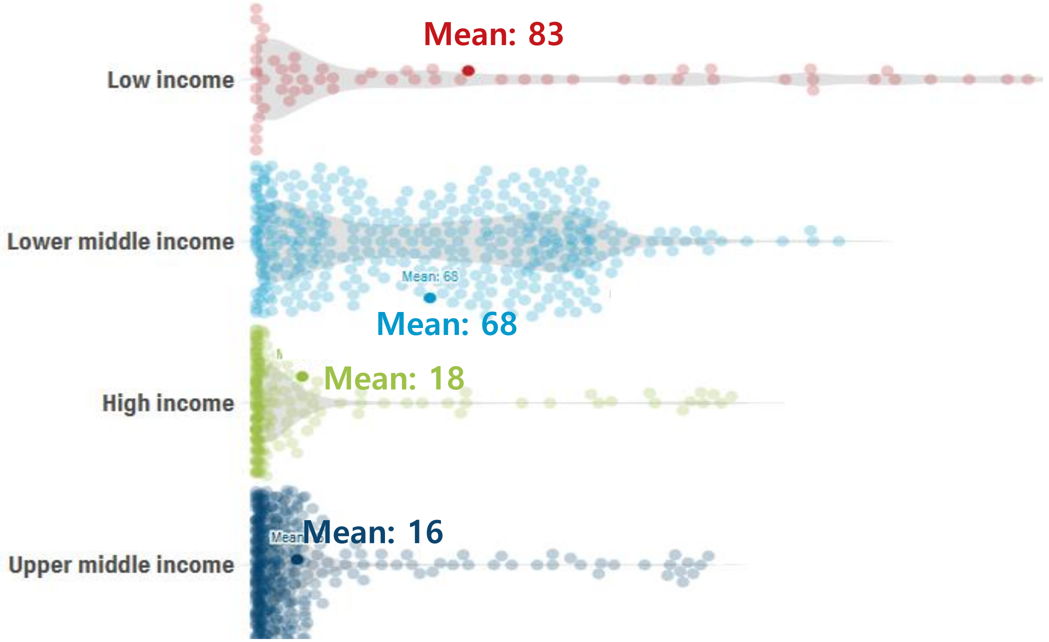


Image Source: 1. https://www.renewableenergyworld.com/solar/utility-scale/texas-likely-to-add-10-gw-of-utility-scale-solar-capacity-in-the-next-two-years/International Atomic
2. Energy Agency, Climate Change and Nuclear Power: Financing Nuclear Energy in Low Carbon Transitions (Vienna, 2024).
3. https://www.wri.org/insights/future-extreme-heat-cities-data

Effective Governance at the National Level

Advancing New Technologies

Passive cooling systems & Thermal insulation

- Ruduced energy consumption during peak heat periods
- Improved comfort and community resilience
- Less pressure on power grids
- Supports effective energy management and long-term savings

Context-Specific & Inclusive Implementation

- Adoption must reflect local environment, community needs, and infrastructure
- Requires local actors' involvement in design and implementation
- Must address vulnerable groups and intersecting sectors: Energy, Health, Labour
- Calls for a whole-of-government approach
  → Fosters coordination and ensures policy coherence

Sustainably cooling buildings

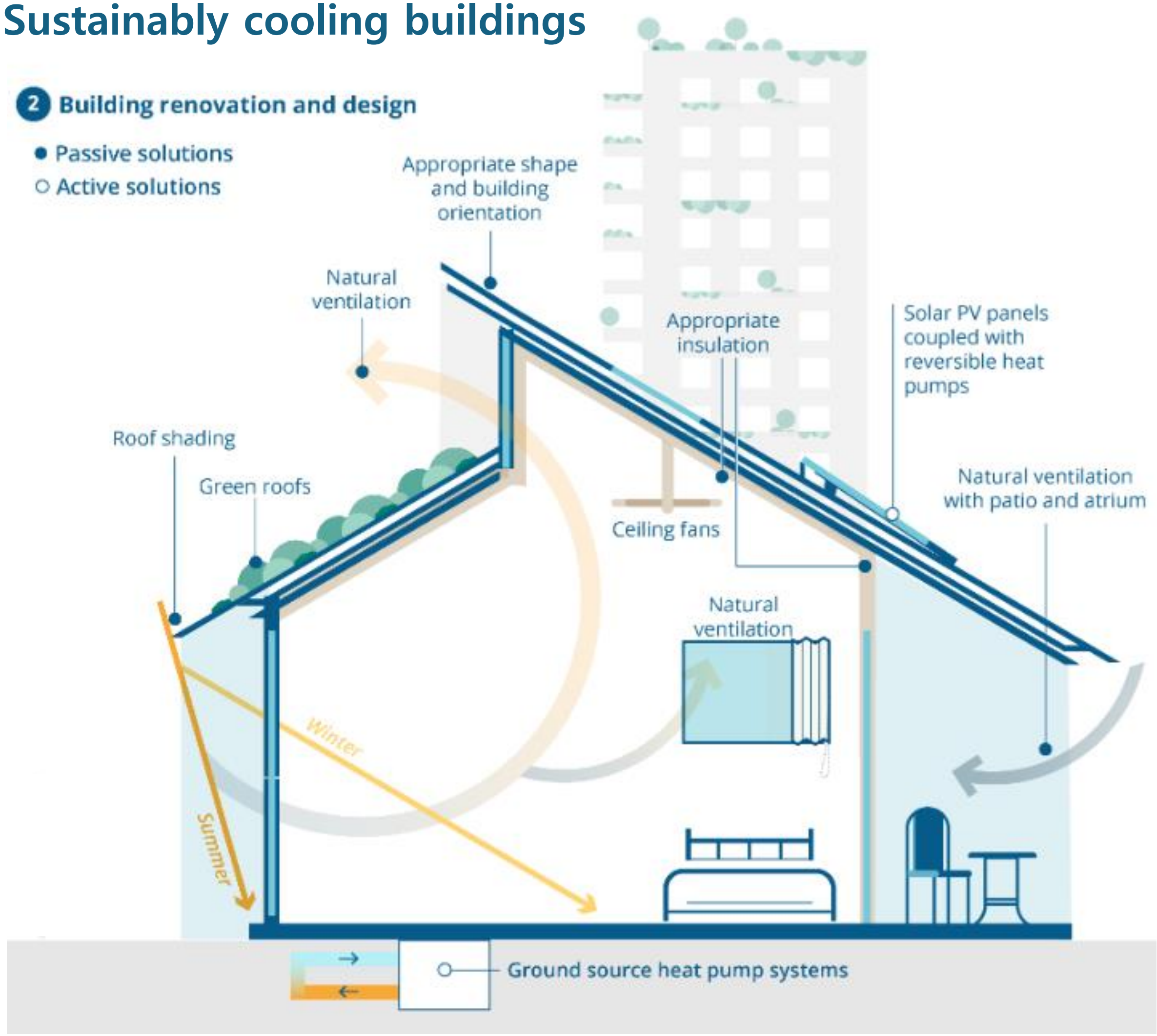


Image Source: European Environment Agency, "Cooling buildings sustainably in Europe: exploring the links between climate change mitigation and adaptation, and their social impacts", 10 November 2022. p.14

39, 40, 41

Effective Governance at the subnational level

1. Local Grvemmnets at the forefront

- Extreme heat has highly localized effects → requires targeted responses
- Solutions must be tailored to the needs of diverse demographic groups and occupations

2. Whole-of-Government Approach

National Governments	Local Governments
set guiding principles (e.g., national action plans)	define and implement context-specific and community-based solutions

Collaboration among municipal authorities, community organizations, and private actors enhances relevance and impact

3. mitigation & adaptation

- **mitigation**: address root causes (e.g., reducing greenhouse gas emissions)
- **adaptation**: manage ongoing impacts (e.g., cooling centres, reducing heat-related illnesses)

An evidence-based approach is essential for efficient resource allocation

- Focus on high return on investment
- Provide targeted support for vulnerable groups

Case Study by Son, C. H., Ryu, Y. E., & Ban, Y. U. (2024).

Dynamic modeling and policy simulation to reduce heat-related illness risk from urban heatwaves in Seoul, South Korea. *City and Environment Interactions*, *21*, 100133.

Background

Despite increased Policy budgets, **the patients of heat-related illness(HP) continues to rise**

Due to the intensification of urban heatwaves, **current urban heatwave policies are insufficient for long-term HP reduction**

Research Questions

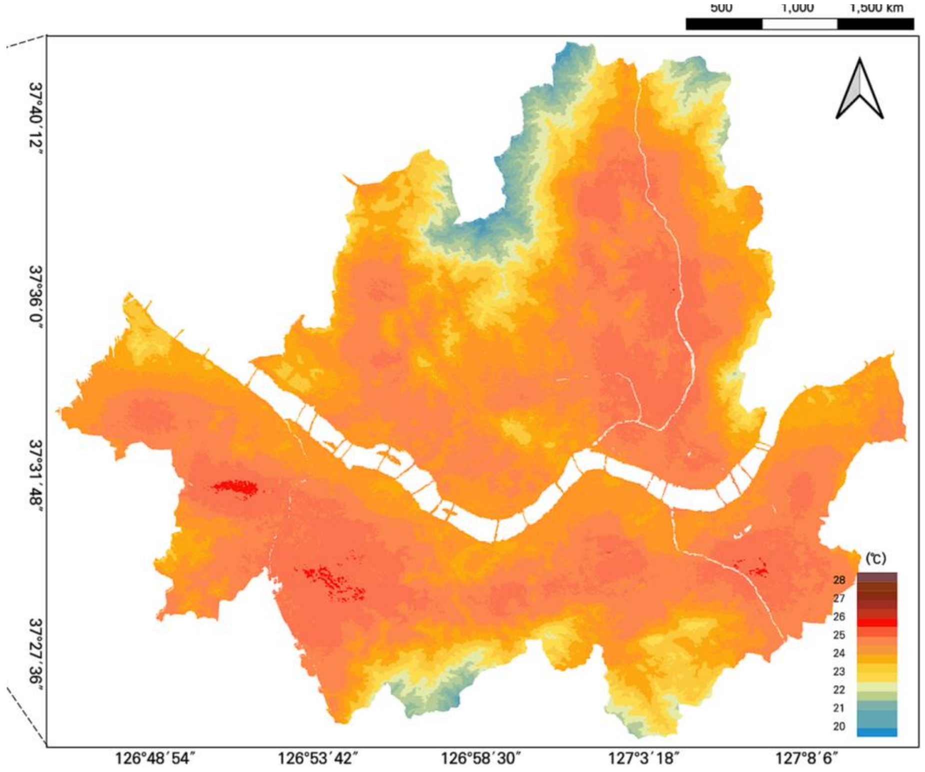
1. Whether **a dynamic urban heatwave policy could reduce the incidence of HP** in the future

2. **Identifying the most effective urban heatwave policy scenario** for reducing HP considering the budget

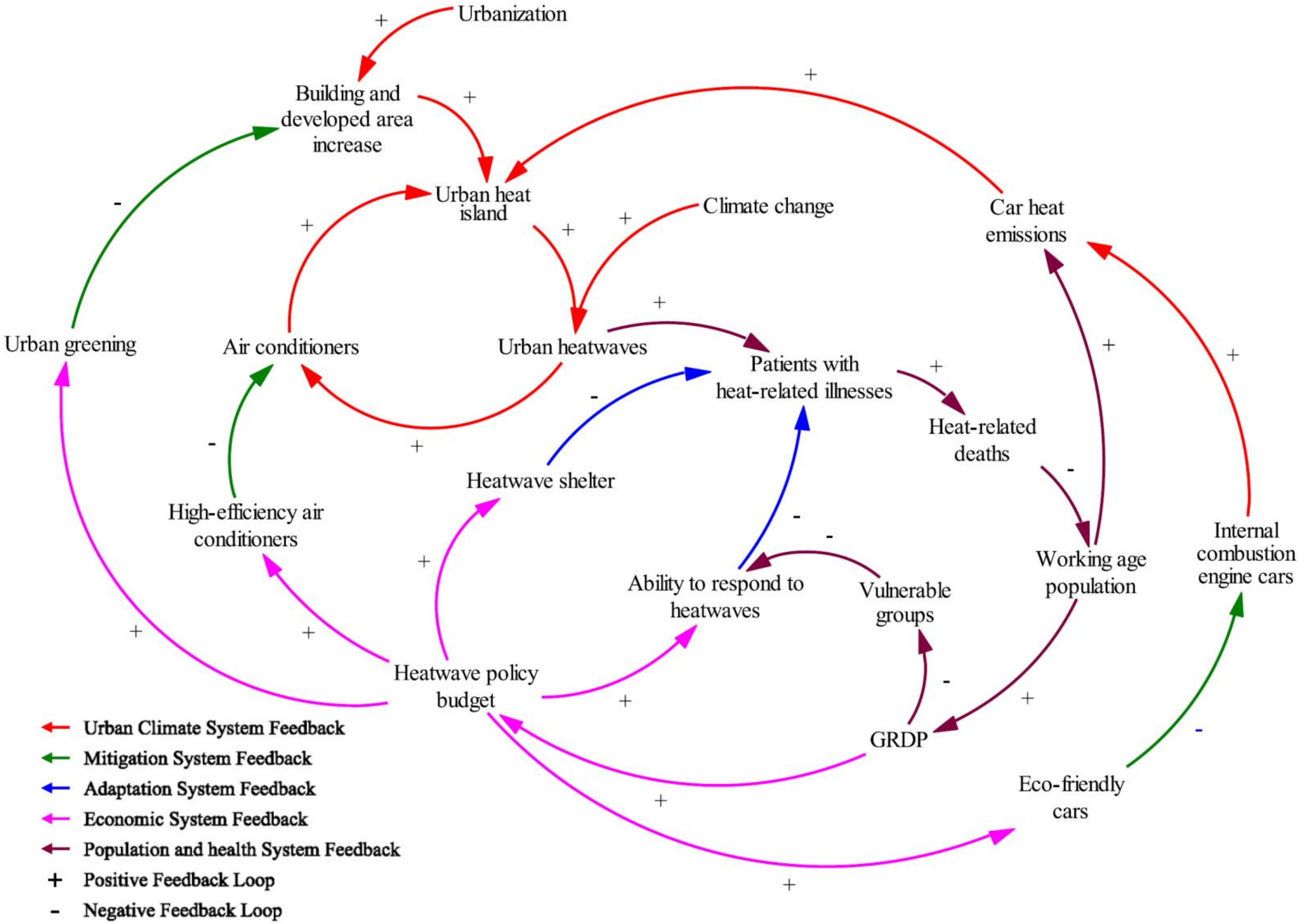
Purpose

Reduce HP by modeling urban heatwave impacts through subsystem analysis and historical data-based simulation

Dynamic modeling and policy simulation to reduce heat-related illness risk from urban heatwaves in Seoul, South Korea.



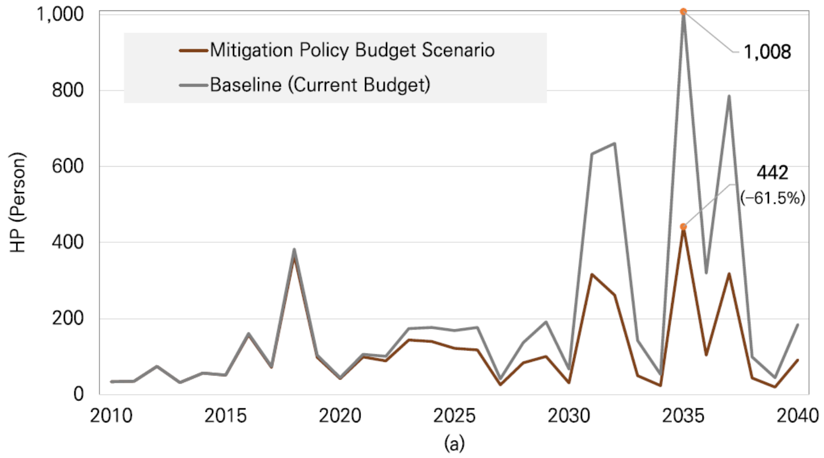
Heat distribution map of the study area, Seoul, Korea (Ministry of the Interior and Safety) p.2

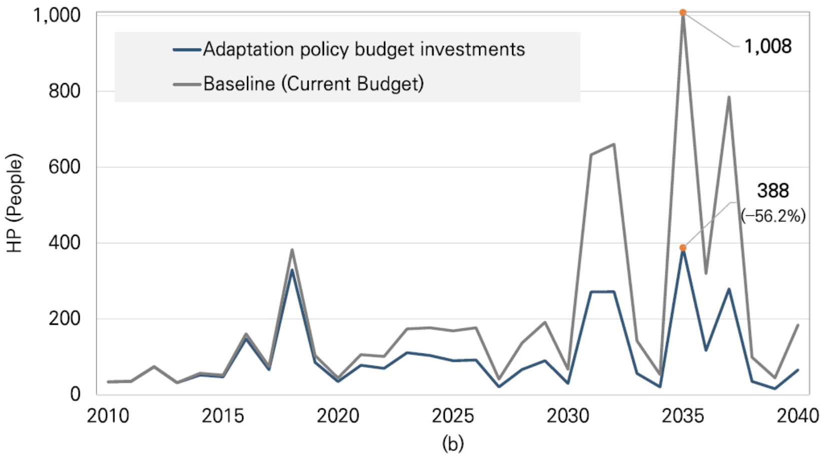


Causal loop diagram of heatwave-related variables for reducing the risks of HP from urban heatwaves. p.4.

Dynamic modelling and policy simulations (Seoul, Republic of Korea)

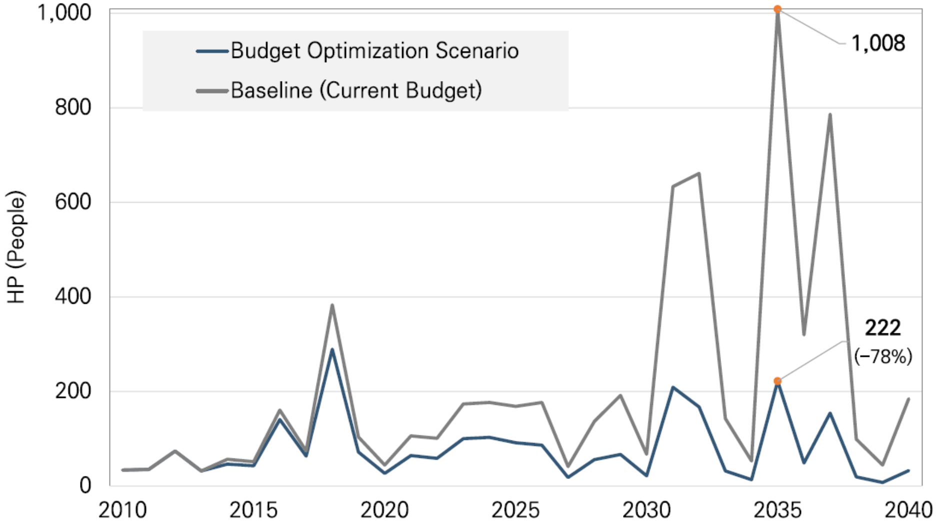
Son, et al.,(2024) p.9





- Tested budget scenarios for heat-related illness reduction
- **Total Budget**: KRW 440 billion
- **Goal**: Reduce heat-related illness (HP) through mitigation, adaptation, or a combination of both

Effect of budget allocation scenario of mitigation policies (a) and adaptation policies (b) on patients with HP



Effect of budget allocation in optimization scenario on patients with HP p.9.

Strategy	Reduction in HP	Budget allocation
Mitigation only	56.2%	High-efficiency air conditioners, eco-friendly vehicles
Adaptaion only	61.5%	Support for vulnerable groups, green areas, shelters
Optimized (combined)	78.0%	81.5% → Support for vulnerable groups 16.7% → High-efficiency air conditioners 0.91% → Heatwave shelters 0.82% → Green area expansion 0.09% → Eco-friendly vehicle expansion

Dynamic modeling and policy simulation to reduce heat-related illness risk from urban heatwaves in Seoul, South Korea. Son, et al.,(2024) p.10

conclusion

- Urban heatwave policies alone cannot counteract future climate-induced HP increases
- However, policy effectiveness can improve with optimized budget strategies
- This study validates a system dynamics (SD) approach using VECM and Bayesian modeling
- Results provide a strong basis for evidence-based policymaking
- The framework is transferable to other cities and countries for heatwave policy planning

Effective Governance at the subnational level

Data driven Approach

➔ maximize the impact of urban heatwave policies

long-term planning

➔ integration into climate resilience strategies (e.g., Heatwave shelters, Cooling and misting stations, Green area expansion)

1. sustainable and equitable resource allocation

Higher Government → financial & technical assistance → **Local Government**

essential actors, yet often lack capacity

Training, capacity-building, coordination guidelines, stakeholder engagement

2. Whole-of-government Approach

- Enables subnational action aligned with national resilience goals
- Promotes effective coordination across regions and population groups

3.Integrating Heat Strategies into Existing Schemes

- Subnational interventions can leverage sectoral programmes (e.g., Passive cooling in State-funded low-cost housing)
- Enhances community resilience and maximizes limited financial resources

Thank you!