HEALTH AND HEALTHCARE SYSTEMS

## Why climate resilience is the next benchmark for health innovation

Jun 17, 2025

WHO estimates that climate change will cause approximately 250,000 additional deaths per year between 2030 and 2050 from malnutrition, malaria, diarrhoea and heat stress alone!
(World Economic Forum, 2025)

We are the first generation to feel the effects of climate change and (perhaps) the last that can do something about it

Source: World Economic Forum (June, 2025) "Why climate resilience is the next benchmark for health innovation
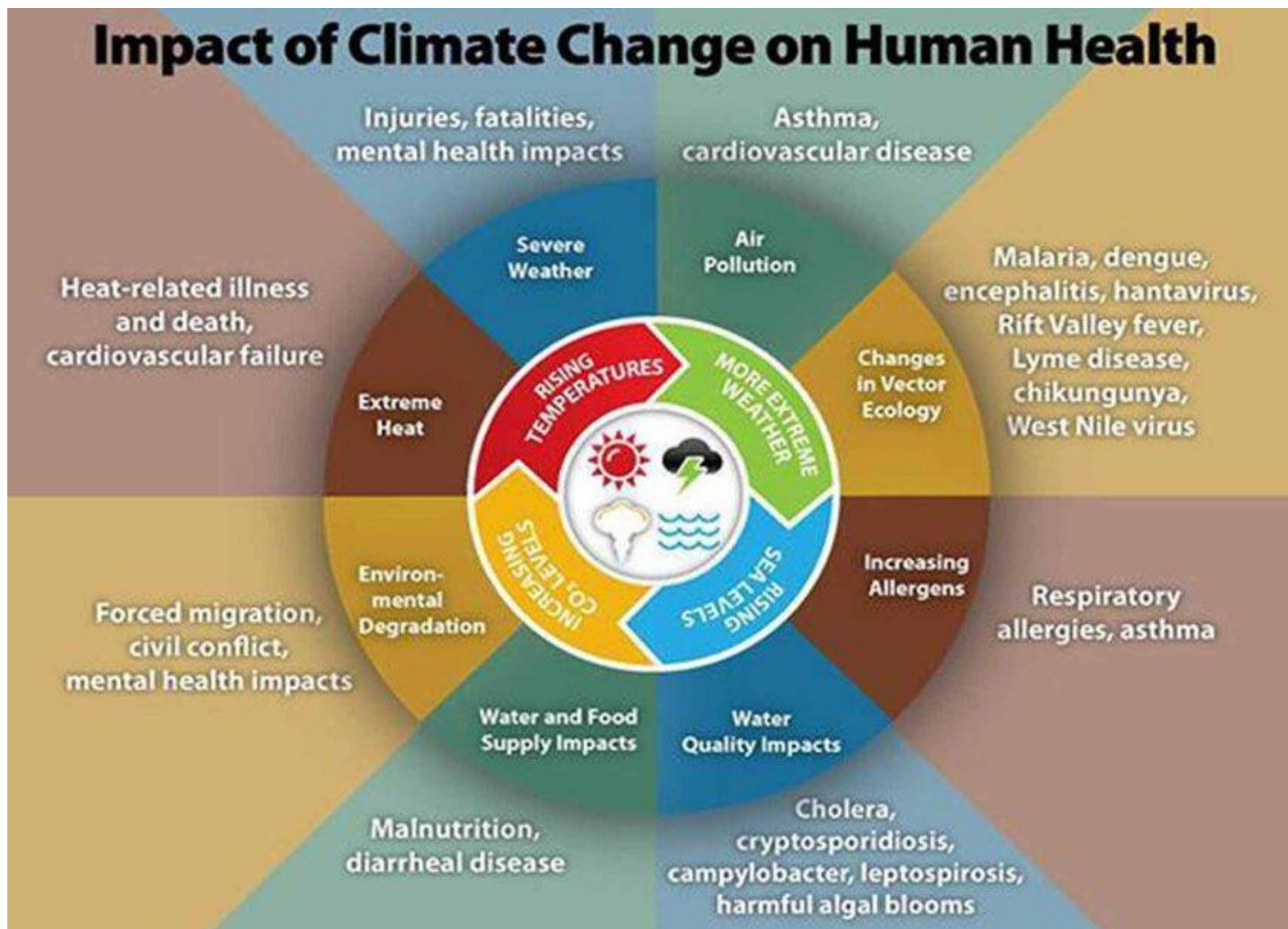
Figure 1. Impact of climate change on human health framework.
Source: Centers of Disease Control and Prevention. Climate Effects on Health. Published 3 March 2021.

Viewing the challenge from the lens of
sustainability science

"Sustainability science is a field of research dealing with the interactions between natural and social systems, and with how those interactions affect the challenge of sustainability: meeting the needs of present and future generations while substantially reducing poverty and conserving the planet's life-support systems " Kates, et al. (2001)
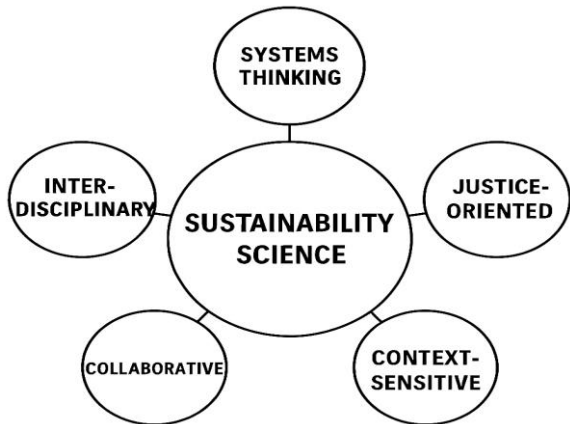
A transdisciplinary, solution-oriented approach to sustainability challenges
- ❖ **Systems-oriented:** Think in systems - seeing connections between causes, impacts, and feedback loops
- ❖ **Interdisciplinarity**: Involve different disciplines - bridging natura science, engineering, public health, social science, humanities etc.
- ❖ **Collaborative**: Working together - involving communities, governments, businesses, universities etc.
- ❖ **Context-sensitive**: Adapt to local context - tailored to the local environment and culture
- ❖ **Justice-oriented**: Ensuring solutions are fair - include the most marginalized and vulnerable

Challenge 1: Ecosystem Degradation and Climate-Linked Health Risks

General Issue:
Loss of forests, wetlands, and biodiversity increases vulnerability to heat, flooding, poor air/water quality, and food insecurity
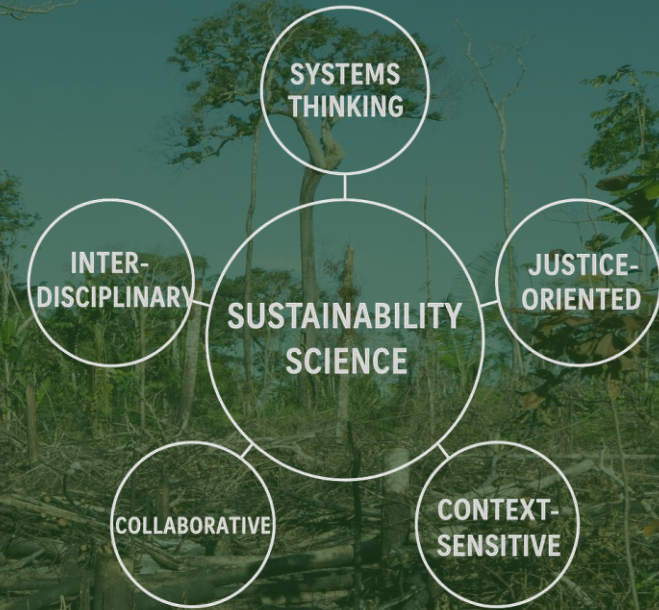
Health Impact:
Heat-related illnesses
Waterborne and vector-borne diseases
Mental health decline due to loss of green space
Reduced nutrition from degraded ecosystems

SYSTEMS THINKING

INTER-DISCIPLINARY

SUSTAINABILITY SCIENCE

JUSTICE-ORIENTED

COLLABORATIVE

CONTEXT-SENSITIVE

Low-tech ⟵——————————⟶ **Hi-tech**

Restore or protect ecosystems using traditional, local, or natural methods
Mangrove restoration | Agroforestry | Green belts| Wetland rehabilitation

Monitor, predict, and manage ecosystem–health interactions using digital and analytical technologies
Satellite-based ecosystem risk mapping | AI disease prediction models | Smart sensors

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Challenge 2: Infrastructure Inadequate for Climate Resilience

General Issue:
Physical infrastructure is outdated or unsuitable for withstanding climate extremes

Health Impact:
Heatstroke and respiratory illness
Injury and disease outbreaks during floods, droughts, or storms
Inaccessible health services during emergencies

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CONTEXT-SENSITIVE

LOW-TECH
Use simple, context-specific designs that improve resilience using natural ventilation, elevation, or traditional materials

HI-TECH
Use technology, data, and engineering innovations to build smart, responsive infrastructure

Cooling shelters with shaded roofs or natural ventilation-I Raised walkways in flood zone | Gravity-fed water systems |Rainwater harvesting tanks

IoT-based flood sensors and alerts | Solar-powered, off-grid clinics with battery backup | AI energy management in hospital | Digital twins for climate-risk planning

Challenge 3: Inaccessible or Fragmented Climate–Health Data

General Issue:
Communities lack timely, localized data to respond to climate and health risks

Health Impact:
Delayed outbreak response
Disaster mismanagement
Public confusion and anxiety due to misinformation

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CONTEXT-SENSITIVE

LOW-TECH ⟵⟶ **HI-TECH**

Use simple, locally appropriate tools to collect, share, and act on climate–health information, often through community participation

Community notice boards for weather and health alerts | Radio broadcasts in local languages | Citizen science on mosquito breeding, water levels, or air quality

Use real-time data, digital platforms, and predictive tools to deliver targeted information and alerts

AI-based disease forecasting models | Mobile apps with personalised alerts or risk maps | IoT sensors tracking air pollution, temperature, or water safety | GIS dashboards for planners and emergency services

Whether high-tech or low-tech, the best solutions are built with humility, collaboration, and care. Innovation doesn't need to be flashy - just thoughtful, inclusive, and lasting.

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Thank you