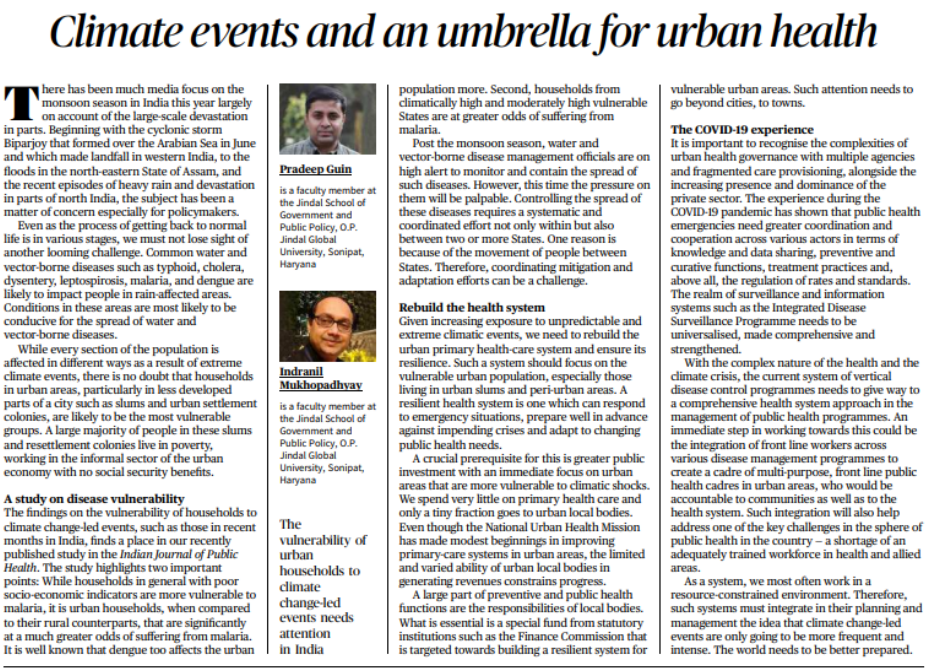
Climate Events and Urban Health

Why in News?



Climate events and an umbrella for urban health

There has been much media focus on the monsoon season in India this year largely on account of the large-scale devastation in parts. Beginning with the cyclonic storm Biparjoy that formed over the Arabian Sea in June and which made landfall in western India, to the floods in the north-eastern State of Assam, and the recent episodes of heavy rain and devastation in parts of north India, the subject has been a matter of concern especially for policymakers.

Even as the process of getting back to normal life is in various stages, we must not lose sight of another looming challenge. Common water and vector-borne diseases such as typhoid, cholera, dysentery, leptospirosis, malaria, and dengue are likely to impact people in rain-affected areas. Conditions in these areas are most likely to be conducive for the spread of water and vector-borne diseases.

While every section of the population is affected in different ways as a result of extreme climate events, there is no doubt that households in urban areas, particularly in less developed parts of a city such as slums and urban settlement colonies, are likely to be the most vulnerable groups. A large majority of people in these slums and resettlement colonies live in poverty, working in the informal sector of the urban economy with no social security benefits.

A study on disease vulnerability

The findings on the vulnerability of households to climate change-led events, such as those in recent months in India, finds a place in our recently published study in the *Indian Journal of Public Health*. The study highlights two important points: While households in general with poor socio-economic indicators are more vulnerable to malaria, it is urban households, when compared to their rural counterparts, that are significantly at a much greater odds of suffering from malaria. It is well known that dengue too affects the urban population more. Second, households from climatically high and moderately high vulnerable States are at greater odds of suffering from malaria.

Post the monsoon season, water and vector-borne disease management officials are on high alert to monitor and contain the spread of such diseases. However, this time the pressure on them will be palpable. Controlling the spread of these diseases requires a systematic and coordinated effort not only within but also between two or more States. One reason is because of the movement of people between States. Therefore, coordinating mitigation and adaptation efforts can be a challenge.

Rebuild the health system

Given increasing exposure to unpredictable and extreme climatic events, we need to rebuild the urban primary health-care system and ensure its resilience. Such a system should focus on the vulnerable urban population, especially those living in urban slums and peri-urban areas. A resilient health system is one which can respond to emergency situations, prepare well in advance against impending crises and adapt to changing public health needs.

A crucial prerequisite for this is greater public investment with an immediate focus on urban areas that are more vulnerable to climatic shocks. We spend very little on primary health care and only a tiny fraction goes to urban local bodies. Even though the National Urban Health Mission has made modest beginnings in improving primary-care systems in urban areas, the limited and varied ability of urban local bodies in generating revenues constrains progress.

A large part of preventive and public health functions are the responsibilities of local bodies. What is essential is a special fund from statutory institutions such as the Finance Commission that is targeted towards building a resilient system for vulnerable urban areas. Such attention needs to go beyond cities, to towns.

The COVID-19 experience

It is important to recognise the complexities of urban health governance with multiple agencies and fragmented care provisioning, alongside the increasing presence and dominance of the private sector. The experience during the COVID-19 pandemic has shown that public health emergencies need greater coordination and cooperation across various actors in terms of knowledge and data sharing, preventive and curative functions, treatment practices and, above all, the regulation of rates and standards. The realm of surveillance and information systems such as the Integrated Disease Surveillance Programme needs to be universalised, made comprehensive and strengthened.

With the complex nature of the health and the climate crisis, the current system of vertical disease control programmes needs to give way to a comprehensive health system approach in the management of public health programmes. An immediate step in working towards this could be the integration of front line workers across various disease management programmes to create a cadre of multi-purpose, front line public health cadres in urban areas, who would be accountable to communities as well as to the health system. Such integration will also help address one of the key challenges in the sphere of public health in the country – a shortage of an adequately trained workforce in health and allied areas.

As a system, we most often work in a resource-constrained environment. Therefore, such systems must integrate in their planning and management the idea that climate change-led events are only going to be more frequent and intense. The world needs to be better prepared.

Pradeep Guin
is a faculty member at the Jindal School of Government and Public Policy, O.P. Jindal Global University, Sonipat, Haryana

Indranil Mukhopadhyay
is a faculty member at the Jindal School of Government and Public Policy, O.P. Jindal Global University, Sonipat, Haryana

The vulnerability of urban households to climate change-led events needs attention in India

- The **cyclonic** storm **Biparjoy** that formed over the Arabian Sea, to the **floods** in the north-eastern State of Assam, and the recent episodes of **heavy rain** and devastation in parts of north India, the subject has been a matter of concern, especially for policymakers.
- **Common water and vector-borne diseases** such as typhoid, cholera, dysentery, leptospirosis, malaria, and dengue are likely to impact people in rain-affected areas.
- While every section of the population is affected in different ways as a result of extreme climate events, there is no doubt that **households in urban areas**, particularly in less developed parts of a city such as slums and urban settlement colonies, **are likely to be the most vulnerable groups**.
    - A large majority of people in these slums and resettlement colonies live in poverty, working in the informal sector of the urban economy with no social security benefits.

A Study On Disease Vulnerability

The findings on the vulnerability of households to climate change-led events, such as those in recent months in India, finds a place in our recently published study in the **Indian Journal of Public Health**. The study highlights two important points:

1. While households in general with **poor socio-economic indicators** are more **vulnerable to malaria**, it is urban households, when compared to their rural counterparts, that are significantly at a much greater odds of suffering from malaria. It is well known that **dengue** too affects the urban population more.
2. Second, households from **climatically high and moderately high vulnerable States** are at greater odds of suffering from malaria.

Post the monsoon season, water and vector-borne disease management officials are on high alert to monitor and contain the spread of such diseases. However, this time the pressure on them will be palpable.

- Controlling the spread of these diseases requires a **systematic and coordinated effort** not only within but also between two or more States. One reason is because of the movement of people between States.
- Therefore, **coordinating mitigation and adaptation efforts** can be a challenge.

Rebuild the Health System

Given increasing exposure to unpredictable and extreme climatic events, we need to rebuild the urban primary health-care system and ensure its resilience.

Such a system should focus on the vulnerable urban population, especially those living in urban slums and peri-urban areas.

A resilient health system must be build which can respond to emergency situations, prepare well in advance against impending crises and adapt to changing public health needs.

A crucial prerequisite for this is greater public investment with an immediate focus on urban areas that are more vulnerable to climatic shocks.

We spend very little on primary health care and only a tiny fraction goes to urban local bodies. Even though the National Urban Health Mission has made modest beginnings in improving primary-care systems in urban areas, the limited and varied ability of urban local bodies in generating revenues constrains progress.

The COVID-19 Experience

It is important to recognise the complexities of urban health governance with multiple agencies and fragmented care provisioning, alongside the increasing presence and dominance of the private sector. The experience during the COVID-19 pandemic has shown that **public health emergencies need greater coordination and cooperation** across various actors **in terms of knowledge** and **data sharing**, **preventive and curative functions**, **treatment practices** and, above all, **the regulation of rates and standards**.

The realm of surveillance and information systems such as the **Integrated Disease Surveillance Programme** needs to be **universalised,** made **comprehensive and strengthened**.

With the complex nature of the health and the climate crisis, the **current system of vertical disease control programmes** needs to give way to a **comprehensive health system approach** in the management of public health programmes.

The **integration of front line workers** across various disease management programmes to create a cadre of multi-purpose, front line public health cadres in urban areas, who would be accountable to communities as well as to the health system.

As a system, we most often work in a resource-constrained environment. Therefore, such systems must integrate in their planning and management the idea that climate change-led events are only going to be more frequent and intense. The world needs to be better prepared.

What is Climate Change?

Climate change means that the Earth's usual weather patterns and temperatures are changing.
While some changes come from natural things like the sun's cycles, a big part of the change since the 1800s has been because of people. We burn things like coal, oil, and gas for energy, and this sends gases into the air. These gases act like a blanket, keeping the Earth warm. Because of this warmth, ice is melting faster, which makes the sea levels go up. When sea levels rise, it can cause floods and wash away land.

Cities and Climate Change

The 21st century's urban growth is transforming the global landscape. As more people move towards cities, particularly in Asia and Africa, the challenges of climate change and urban resilience must be addressed Urban Growth in the 21st Century.

The Urban Century:

- The 21st century is marked by a significant surge in global urban populations.
- Urbanization will be a defining trend of this era.

Current Urban Population:

- In 2018, approximately 55% of the global population resided in cities.
- This percentage is projected to rise to 68% by the year 2050.

Regional Trends:

- Asian and African cities are expected to experience the most substantial increases in urban populations.

Impact on Cities:

- According to the IPCC AR6 Report (Part - II), cities will face severe challenges due to:
  - Intense heat and climate-related stressors.
  - Reduction in green spaces and natural environments.

Climate-Resilient Development:

- Escalating urbanization necessitates a focus on climate-resilient development strategies.
- Achieving net-zero emissions becomes essential in mitigating the impact of urban growth on climate change.

Public Health Benefits:

- Implementation of climate-friendly urban policies holds the potential to:
  - Reduce air pollution levels.
  - Enhance public health and well-being within cities.

Extreme Weather Events

Extreme weather events refer to weather phenomena that deviate significantly from normal climatic conditions. These events are characterized by their rarity and occurrence at specific places and times of the year.

UN IPCC Definition: The UN Intergovernmental Panel on Climate Change (IPCC) defines extreme weather events as those that are "rare at a particular place and time of year."

Indian Perspective

- In India, while there is no official universal definition of extreme weather events, the India Meteorological Department (IMD) categorizes various phenomena as such.
- Types of Extreme Weather Events (as per IMD):

Natural Disaster in India in 2022

India experienced a high frequency of natural disasters throughout the year 2022. Almost every day witnessed the occurrence of various natural calamities.

Extreme Weather Events

In the initial nine months of 2022, India faced "extreme weather events on 241 of 273 days." These events included thunderstorms, persistent rains, cyclones, droughts, heat waves, lightning, floods, and landslides.

Geographical Impact

The effects of natural disasters were widespread across the country.

- **Madhya Pradesh** witnessed the highest frequency of extreme weather events, occurring nearly every second day.
- **Assam** experienced the highest count of damaged houses and animal deaths among the affected states.
- **Karnataka,** which faced extreme weather on 82 days, accounted for over 50% of the country's affected crop area.
- **Madhya Pradesh** had no official records of crop area damage, possibly due to gaps in reporting loss and damage.
- Central and northwest regions reported the most days with extreme weather events (198 and 195 days, respectively).
- Central India saw the highest number of human lives lost (887 deaths), followed by the east and northeast (783 deaths).
- In 2022, India recorded several temperature and precipitation milestones:
    - Seventh wettest January since 1901.
    - Warmest March ever and the third driest March in 121 years.
    - Third warmest April, 11th warmest August, and 8th warmest September since 1901.
    - Eastern and northeastern India experienced its warmest and driest July in 121 years. It also saw its second warmest August and fourth warmest September.
- Various extreme weather types occurred during the nine months:
    - Lightning and storms affected 30 states and caused 773 deaths.
    - Monsoon months (June to August) saw heavy to extremely heavy rainfall, leading to widespread flooding.
    - Heat waves claimed 45 lives, impacting people's well-being, particularly in north India.

Human and Environmental Toll

The cumulative toll of these disasters:

- Caused the loss of around 2,755 lives.
- Affected approximately 1.8 million hectares of crop area.
- Led to the destruction of over 416,667 houses.
- Resulted in the death of nearly 70,000 livestock.

Natural Disaster in 2023

As of the current period in 2023, India is grappling with multiple natural disaster events. Assam is dealing with a second wave of floods caused by elevated water levels in the Brahmaputra River, leading to widespread impacts. Northern parts of the country, including Punjab and Haryana, have experienced torrential downpours resulting in casualties.

Assam Floods: Recently, Assam, in northeastern India, had faced a second wave of floods due to elevated water levels in the Brahmaputra River.

- Increased water levels are a result of water release from Bhutan.
- Around 98,800 people across 371 villages in 13 districts are affected, as reported by the Assam State Disaster Management Authority (ASDMA).
- Kaziranga National Park and Tiger Reserve have been submerged for the past two days.

Rain-Related Incidents in Punjab, Himachal Pradesh, Uttarakhand and Haryana: Recently Rains in northern India led to rain-related incidents like floods in Delhi, Punjab and Haryana.

- At least 62 individuals lost their lives due to these incidents.

- Ongoing relief and rescue efforts are taking place in these states.
- Recently, Himachal Pradesh, Uttarakhand experienced Heavy to very heavy rainfall and experienced extreme destruction due to extreme weather conditions.

Diseases Associated with Extreme Weather Conditions

Extreme Weather Condition	Diseases	Examples
Heatwaves	Heat exhaustion, heatstroke	Example: During a severe heatwave, individuals working outdoors without proper hydration and protection may suffer from heat exhaustion, characterized by heavy sweating and weakness. If not treated promptly, it can progress to heatstroke, with symptoms like high body temperature, confusion, and even unconsciousness.
Cold Snaps	Hypothermia, frostbite	Example: In extremely cold weather, individuals exposed to low temperatures for prolonged periods can develop hypothermia, leading to shivering, confusion, and eventually loss of consciousness. Frostbite can occur in exposed skin, causing tissue damage and potential amputation.
Floods	Waterborne diseases, vector-borne diseases	Example: After a flood, contaminated water can lead to outbreaks of waterborne diseases like cholera and dysentery. Additionally, standing water can become breeding grounds for disease-carrying mosquitoes, leading to diseases like malaria and dengue fever.
Hurricanes/Cyclones	Injuries, water-related illnesses, mental health issues	Example: In the aftermath of a hurricane, injuries from flying debris and flooding can be common. Contaminated water sources can lead to waterborne diseases, and the trauma of losing homes and communities can result in increased stress and anxiety.
Wildfires	Respiratory issues, cardiovascular problems	Example: During wildfires, smoke and particulate matter can degrade air quality, exacerbating respiratory conditions like asthma. The increased air pollution can also contribute to cardiovascular problems, including heart attacks.
Droughts	Water scarcity, crop failures	Example: Prolonged droughts can lead to water scarcity, increasing the risk of dehydration and the spread of waterborne diseases. Crop failures during droughts can result in food shortages and malnutrition-related health issues.
Heavy Rainfall/Flooding	Vector-borne diseases, waterborne illnesses	Example: After heavy rainfall and flooding, stagnant water can become breeding grounds for disease-carrying insects, leading to diseases like malaria and Zika virus. Contaminated floodwaters can also cause waterborne infections upon contact.

India's Effort Against Climate Change

India, as a responsible participant on the global stage, has engaged in numerous international frameworks, conventions, and treaties related to climate change. These agreements reflect the nation's dedication to

Admission Help Line: +91 9823256625 & 9579247470 (WhatsApp)
Email: info@iqraias.com, support@iqraias.com

addressing the pressing challenges of environmental degradation and climate crisis. Here are some of the key international commitments that India has undertaken:

International Frameworks and Treaties

United Nations Framework Convention on Climate Change (UNFCCC)	• India is a signatory to the UNFCCC, a global treaty aimed at stabilizing greenhouse gas concentrations and mitigating climate change impacts.
Paris Agreement	• Under this 2015 global accord, India submitted its Nationally Determined Contribution (NDC) to balance climate change concerns, sustainable development, poverty eradication, and economic growth.
Kyoto Protocol	• As a developing country, India signed and ratified the Kyoto Protocol in 1997, which sets emission reduction targets for developed nations.
Montreal Protocol	• India is part of the Montreal Protocol, a treaty designed to protect the ozone layer by curbing the production and consumption of ozone-depleting substances.
Convention on Biological Diversity (CBD)	• India has committed to the CBD, a treaty focused on conserving biodiversity and ensuring equitable use of genetic resources.
United Nations Convention to Combat Desertification (UNCCD)	• India has signed the UNCCD to address desertification and drought effects, particularly in drought-prone regions like Africa.

India's Updated NDCs

In August 2022, India revised its NDCs, setting ambitious targets for 2030:

- Reduce emission intensity of GDP by 45% from 2005 levels.
- Achieve 50% of cumulative electric power capacity from non-fossil fuel sources.
- Create 2.5 to 3 billion tonnes of additional carbon sink through forests.

National Action Plan on Climate Change (NAPCC)

Launched in 2008, NAPCC comprises 8 national missions to address climate change challenges:

National Solar Mission	**National Mission for Enhanced Energy Efficiency**	**National Mission on Sustainable Habitat**	**National Water Mission**	**National Mission for Sustaining the Himalayan Ecosystem**	**National Mission for A Green India**	**National Mission for Sustainable Agriculture**	**National Mission on Strategic Knowledge for Climate Change**

Admission Help Line: +91 9823256625 & 9579247470 (WhatsApp)
Email: info@iqraias.com, support@iqraias.com

State Action Plans and Adaptation

- States / UTs have developed State Action Plans on Climate Change (SAPCC) in line with NAPCC, addressing state-specific climate issues.
- SAPCCs outline sector-specific actions, including adaptation and resilient infrastructure development.

National Adaptation Fund for Climate Change (NAFCC)

- NAFCC supports adaptation efforts in climate-vulnerable Indian states and UTs.
- Implemented through projects, NAFCC has sanctioned 30 projects across 27 regions.
- India achieved a 24% reduction in emission intensity of GDP between 2005 and 2016.

International Coalitions and Initiatives

India initiated global coalitions to combat climate change:

- **International Solar Alliance (ISA):** Aims to promote solar energy use through international cooperation.
- **Coalition for Disaster Resilient Infrastructure (CDRI)**: Focuses on resilient infrastructure to mitigate disaster impacts.
- **Infrastructure for Resilient Island States (IRIS):** Supports sustainable infrastructure development in island states.
- **Green Grids Initiative (GGI-OSOWOG):** Promotes interconnected global grids for renewable energy sharing.
- **Leadership Group for Industry Transition (LeadIT):** Encourages businesses to adopt low-carbon practices.

Mission LiFE

Mission LiFE is a global movement led by India to encourage environmental protection.

- Aims to mobilize 1 billion Indians and global citizens for environmental preservation by 2027.
- Seeks to make 80% of villages and urban local bodies in India environment-friendly by 2028.

Long-Term Low-Carbon Development Strategy (LT-LEDS)

Submitted in November 2022 at COP27, India's LT-LEDS targets net-zero emissions by 2070. Based on seven transitions to low-carbon development pathways:

- Low Carbon Development of Electricity Systems
- Integrated, Efficient, Inclusive, Low-Carbon Transport Systems
- Promoting Adaptation in Urban Design and Sustainable Urbanization
- Low-carbon Industrial Systems
- CO2 Removal and Engineering Solutions
- Enhancing Forest and Vegetation Cover

Disaster Management and Early Warning

- National Disaster Management Authority (NDMA) provides guidelines for managing climate-related disasters.
- National Disaster Management Plan (NDMP) assists stakeholders, including state governments, in disaster risk management.
- Indian Meteorological Department implements early warning systems to prevent loss of life due to floods and cyclones.

Coastal Zone Management

- Integrated Coastal Zone Management project (ICZMP) maps hazard lines and eco-sensitive areas.
- Supports disaster management by projecting sea level rise impacts and shoreline changes over 100 years.
- In its dedicated efforts against climate change, India actively participates in international agreements, implements strategic plans, and fosters cooperation for a sustainable future.

Admission Help Line: +91 9823256625 & 9579247470 (WhatsApp)
Email: info@iqraias.com, support@iqraias.com