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Extreme Weather Events and Climate Change Trends

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Recent analysis highlights a rising trend in extreme weather events globally, linked closely to climate change. These include heatwaves, floods, cyclones, droughts, and intense rainfall events. Such phenomena are becoming more frequent, severe, and unpredictable, posing significant challenges for environmental sustainability, economic stability, and human survival.?

Trend of Increasing Extreme Weather Events:

Over the past few decades, there has been a noticeable increase in the frequency and intensity of extreme weather events. Heatwaves are lasting longer, rainfall events are becoming more intense and localized, and cyclones are gaining strength rapidly. This trend reflects a shift in climatic patterns due to global warming, rather than isolated natural variability.

Role of Climate Change:

Climate change, driven primarily by rising greenhouse gas emissions, is the key factor behind these extreme events.

Increased global temperatures lead to:

Higher evaporation ? intense rainfall and floods

Warmer oceans ? stronger cyclones

Increased heat retention ? prolonged heatwaves

This demonstrates the direct link between anthropogenic climate change and extreme weather patterns.

Impact on India:

India is particularly vulnerable due to its geographic and socio-economic conditions.

Frequent heatwaves in northern and central India

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Increasing urban flooding (e.g., Mumbai, Bengaluru)

Rising intensity of cyclones in the Arabian Sea

Irregular monsoon patterns affecting agriculture

These events have significant consequences for food security, water resources, and public health.

Scientific Perspective:

Reports by the Intergovernmental Panel on Climate Change confirm that many extreme weather events have become more likely due to human-induced climate change. The concept of event attribution is used to assess how much climate change has influenced a particular extreme event.

Challenges and Concerns:

Difficulty in predicting localized extreme events

High economic losses and infrastructure damage

Disproportionate impact on vulnerable populations

Stress on disaster management systems

Developing countries, including India, face greater risks due to limited adaptive capacity.

Mitigation and Adaptation Measures:

To address extreme weather risks, both mitigation and adaptation strategies are required:

Mitigation:

Reduction in greenhouse gas emissions

Transition to renewable energy

Promotion of sustainable development

Adaptation:

Strengthening early warning systems

Climate-resilient infrastructure

Disaster preparedness and management

Water conservation and sustainable agriculture

Additional Key Facts:

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Extreme Weather Events: Events that deviate significantly from normal climatic patterns (e.g., heatwaves, floods).

Global Warming Threshold: 1.5°C rise beyond pre-industrial levels is considered critical.

India's Initiatives:

National Action Plan on Climate Change (NAPCC)

State Action Plans on Climate Change (SAPCCs)

National Disaster Management Authority (NDMA) guidelines

International Frameworks:

Paris Agreement

Sendai Framework for Disaster Risk Reduction

Urban Impact:

Urban heat island effect worsens heatwaves

Poor drainage leads to flash floods