Mains Practice Question

Q. Urban areas are increasingly susceptible to disaster risks due to unplanned development and overcrowding. Suggest strategies for making urban infrastructure and communities more resilient to disasters. **(250 words)**

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Approach

- Introduce by mentioning rising urbanization and pressure on urban infrastructure
- Highlight how unplanned development and overcrowding make cities disaster magnets
- Suggest strategies for making urban infrastructure and communities more resilient
- Conclude by mentioning relevant SDG.

Introduction

The **United Nations projects that by 2050**, nearly **70% of the global population** will reside in urban areas, placing unprecedented pressure on urban infrastructure and systems.

- Urbanization is a global phenomenon, but when it **happens haphazardly**, it creates a **recipe for disaster.**

Unplanned Development and Overcrowding Make Cities Disaster Magnets Due to:

- **Reduced Capacity to Absorb Impacts:**
  - **Blocked Drainage Systems**: Unplanned construction often leads to encroachment on natural drainage channels and wetlands.
    - This reduces the city's capacity to absorb heavy rainfall, leading to flash **floods and waterlogging.**
    - **Example: Gurugram's chronic waterlogging** is partly attributed to blocked storm water drains due to unplanned constructions.
  - **Increased Surface Runoff:** Uncontrolled expansion replaces natural landscapes with concrete jungles.
    - This reduces the infiltration of rainwater into the ground, leading to increased surface runoff and overwhelming drainage systems.
    - **Example**: The **rising number of heatwaves days in Delhi** is linked to the **reduction in green cover due to unplanned urbanization.**
  - **Overburdened Infrastructure**: Existing infrastructure like power grids, water supply systems, and transportation networks were not designed to handle the surge in population that comes with unplanned development.
    - This leads to overloading and increased risk of failure during disasters.
    - **Example**: Power outages become more frequent and widespread during extreme weather events in cities with overloaded electrical grids.
- **Limited Access and Evacuation Challenges:**
  - **Narrow Streets and Congestion:** Unplanned development often disregards the need for wide roads and open spaces.
    - This creates congested cityscapes with narrow streets, hindering emergency

response and evacuation efforts.
        - **Example:** The **2011 tsunami in Japan** highlighted the dangers of congested coastal areas with limited evacuation routes/
    - **Informal Settlements and Slums:** Overcrowding often leads to the proliferation of informal settlements and slums in high-risk zones like floodplains or hillsides.
        - These settlements lack basic infrastructure and are difficult to access during disasters.
- **Social and Economic Vulnerabilities:**
    - **Livelihood Loss and Displacement:** Disasters disproportionately impact the poor and marginalized living in high-risk areas.
        - Loss of homes, businesses, and infrastructure can lead to economic hardship and displacement.
        - **Example:** The **Chennai floods in 2015** severely affected low-income communities living in coastal areas.
    - **Limited Access to Resources**: Overcrowding can strain resources like healthcare and sanitation.
        - This leaves communities less prepared to cope with the aftermath of a disaster and increases the risk of disease outbreaks.
        - **Example**: The **Covid-19 pandemic** highlighted the challenges of managing public health emergencies in densely populated areas.

Strategies for Enhancing Urban Resilience:

- **Risk-Informed Urban Planning:** Implement comprehensive land-use planning that incorporates disaster risk assessments.
    - Developing and enforcing building codes tailored to local hazards, and restricting development in high-risk areas.
    - **Example**: **Tokyo's strict building codes ensure** earthquake resistance.
- **Upgrading Infrastructure**: Retrofit existing buildings and infrastructure to withstand disasters.
    - Improve drainage systems to prevent urban flooding and develop multi-purpose resilient infrastructure.
    - **Example: Rotterdam's water squares,** which serve as both public spaces and flood control measures.
- **Green Infrastructure and Nature-Based Solutions**: Preserve and expand urban green spaces to reduce the heat island effect and absorb flood water.
    - Implement green roofs and permeable pavements, and restore urban wetlands and mangroves for natural flood protection.
    - **Singapore's ABC (Active, Beautiful, Clean) Waters Programme** is a notable example.
- **Early Warning Systems and Emergency Response:** Develop integrated early warning systems for various hazards, establish community-based disaster response teams, and create evacuation plans with designated safe shelters.
- **Smart City Technologies:** Utilize IoT sensors for real-time monitoring of infrastructure and environmental conditions.
    - Implement **AI-powered predictive maintenance systems** and develop mobile apps for disaster alerts and information dissemination.
    - **Example: Rio de Janeiro's Operations Center** integrates data from multiple agencies for effective disaster management.
- **Inclusive Resilience Strategies**: Address the vulnerabilities of marginalized communities in disaster planning.
    - Ensure **accessibility of disaster information and services for all group** s and promote social cohesion for community-based resilience.
    - **Surat's inclusive climate resilience strategy,** focusing on slum communities, is a significant example.

Conclusion

Unplanned development and overcrowding are **ticking time bombs** when it comes to disaster preparedness. By prioritizing **sustainable urban planning, investing in resilient infrastructur**e, and

empowering communities, we can mitigate these risks and build safer cities for the future and move towards achieving **SDG 11: Sustainable Cities and Communities.**