

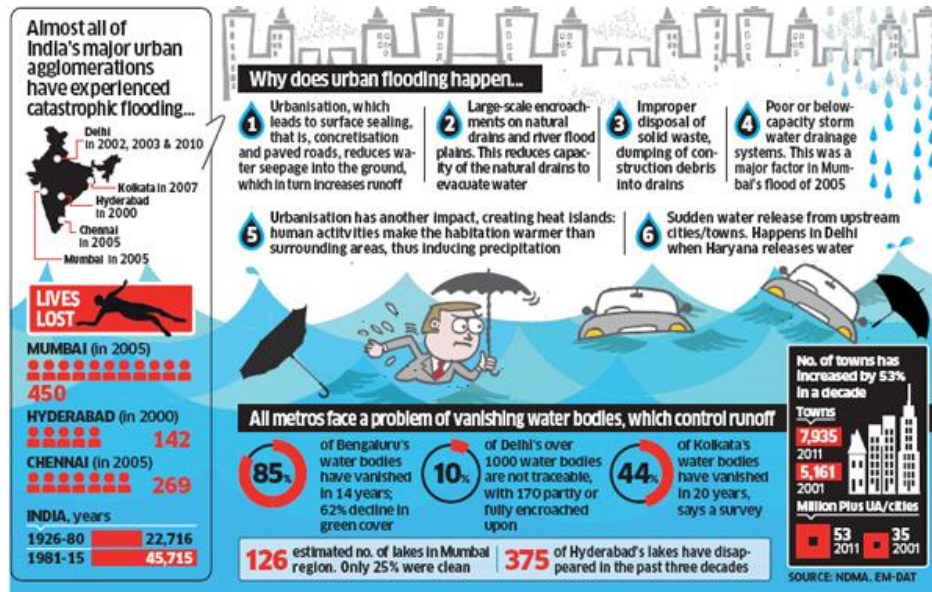


## RSTV PERSPECTIVE: URBAN DELUGE

**Context:** Several parts in Chennai and its suburban areas reported waterlogging after heavy rains lashed the city.

### Background:

- There has been an **increasing trend of urban flood disasters in India** over the past several years whereby major cities in India have been severely affected.
- Some of the most notable amongst them are **Hyderabad in 2000 & 2020, Ahmedabad in 2001 & 2020, Delhi in 2002, 2003, 2009 & 2010, Chennai in 2004 & 2015, Mumbai in 2005, Surat in 2006, Kolkata in 2007 and Srinagar in 2014.**
- According to a recent report on Urban planning capacity in India by NITI Aayog **Urban planning has not received adequate attention** and 65% of the 7933 urban settlements do not have any master plan.
- **Waterlogging — a prelude to urban flooding — is a common sight in urban India** during the monsoon.
- Urban flooding has also become increasingly common, as the **changing weather pattern resulted in more high intensity rain in fewer rain days.**
- **COVID-19 has increased the problem of waterlogging this year** as pre-monsoon desilting of drains was not carried out in full capacity.





### About Urban Flooding:

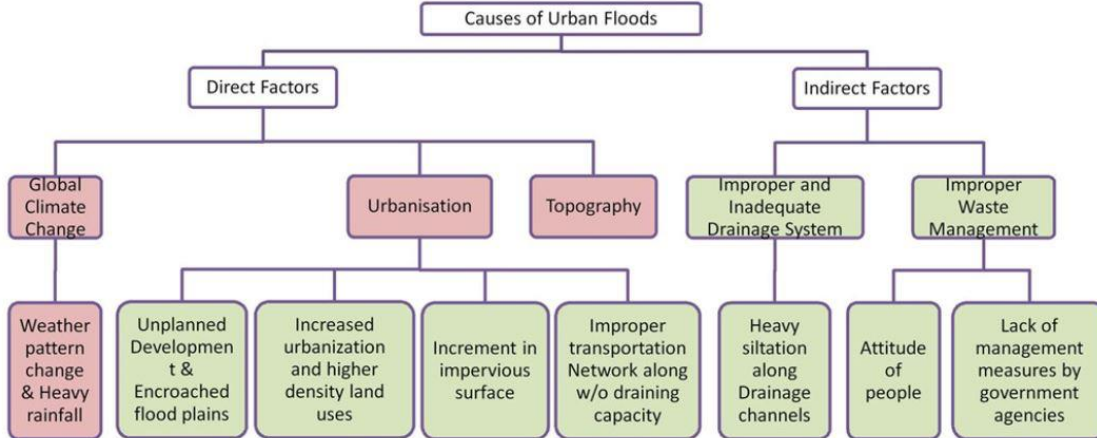
- Urban flooding is the **inundation of property in a built environment, particularly in densely populated urban areas, caused by intense rainfall (on impermeable surfaces) which overwhelms the capacity of drainage systems.**
- Urban flooding is significantly **different from rural flooding as urbanization leads to developed catchments, which increases the flood peaks from 1.8 to 8 times and flood volumes by up to 6 times.**
- Consequently, flooding occurs very quickly due to faster flow times.
- Urban areas are densely populated and people living in vulnerable areas suffer due to flooding and the **secondary effect of exposure to infection also has its toll in terms of human suffering, loss of livelihood and in extreme cases, loss of life.**
- Increasing trend of urban flooding is a universal phenomenon and poses a great challenge to urban planners the world over.
- Urban areas are also centres of economic activities with vital infrastructure which needs to be protected 24x7.

### Urban Flood Risk In India:

- A special feature in India is that we have **heavy rainfall during monsoons.**
- **Storm surges can also affect coastal cities/ towns.**
- Sudden **release or failure to release water from dams** can also have severe impact.
- In addition, the **urban heat island effect** has resulted in an increase in rainfall over urban areas.
- **Global climate change** is resulting in changed weather patterns and increased episodes of high intensity rainfall events occurring in shorter periods of time.
- Then the threat of **sea-level rise** is also looming large, threatening all the coastal cities.
- Cities/towns located on the coast, on **river banks, upstream/ downstream of dams, inland cities and in hilly areas** can all be affected.
- Further, the **systems very often do not work to the designed capacities because of very poor maintenance.**
- **Encroachments** are also a major problem in many cities and towns.

**Impacts:** Urban flooding has wide ranging impacts:

- **Damage to vital urban infrastructure** causing disruptions in transport and power
- **Loss of life and damage to property**
- **Risk of epidemics** due to exposure to waterborne and vector borne infections
- **Deterioration of water quality**
- **Economic losses** due to disruption in industrial activity, supply chains etc
- **Displacement of population** in low lying areas
- **Accidents and fires** due to short circuit



### NDMA guidelines on urban flooding:

- It **designates Ministry of Urban Development as the Nodal Ministry for Urban Flooding.**
- Among key provisions of the Guideline are **Early Warning System and Communication**
- Create a **National Hydro-meteorological Network-** for providing early warning in all urban centres.
- Developing **local networks for real-time rainfall data collection with a 'Local Network Cell' in the IMD headquarters.**
- **Sub divide Cities/ towns on the basis of watersheds and develop a protocol** for forecasting rainfall for urban areas on the basis of watershed.
- Design and Management of **Urban Drainage System**
- A **watershed based and ward-based inventory of the existing storm water drainage system** to be prepared.
- **Pre-monsoon desilting** of all major drains to be completed by March 31 each year.
- **Every building in an urban area must have rainwater harvesting** as an integral component.
- Concept of **Rain Gardens** to be incorporated in planning for public parks.
- **Integrated Planning and interactions** between Water and Solid Waste Management.

### Case studies:

#### Mumbai:

- Mumbai is often referred as a prime example when it comes to discussing urban floods in India.
- A United Nations Habitat paper on monsoon floods in Mumbai mentions that **even after 10 days of intense rainfall, the suburban and low-lying areas near the Mithi river remain waterlogged without services, appropriate shelter, potable water or food.**
- This area is estimated to have 70 per cent occupancy by slums and pavement dwellers, including one of the largest slums in the world — Dharavi.
- The recurrent urban flooding in Mumbai is a **prime example of lagged response by the government.**
- The major factor is the city's old drainage system, which is heavily silted and damaged.
- While there have been multiple plans and proposals to update Mumbai's storm water disposal system, no conclusion has been arrived at it yet.



- The **BRIMSTOWAD (Brihanmumbai Storm Water Disposal System)** project, proposed in 1993, was intended to be a long-term roadmap for the city's vulnerability to flooding; but no action was taken on it till the major flooding of 2005. The system has not been fully updated yet.
- Recently, Ministry of Earth Sciences (MoES) in coordination with Municipal Corporation of Greater Mumbai developed an **Integrated Flood Warning System for Mumbai** called 'IFLOWS-Mumbai'.

#### Gurugram:

- It takes only one seasonal downpour to bring the city to a standstill.
- Gurugram has seen an explosive growth in the urban population as well as infrastructure in the recent years.
- As a result of **poor planning, unregulated construction and mismanagement of environmental resources, water reservoirs and wetlands have vanished over the years.**
- The number of water bodies has reduced to 123 in 2018 from 644 in 1956.
- Green cover is only 9 per cent, which ideally should have been at least 33 per cent.
- Better late than never, the city has fortunately identified areas of intervention and is drafting a **district action plan as part of 'Gurujal' project.**
- The Municipal Corporation of Gurugram (MCG) has identified **38 sensitive areas that are most prone to urban flooding.**
- The district administration is pushing for several measures to improve water management including stringent building bylaws, enforcement and campaigning.

#### Way forward:

- **Integrated approach should be adopted** for sustainable urban planning by empowering and educating Urban Local Bodies in decision making and planning of flood mitigation infrastructure.
- Focus on **increasing the resilience of communities and adaptive capacity of our infrastructure is needed.**
- **Water sensitive urban design and planning techniques** — especially in the context of implementation — are of utmost importance. These methods take into consideration the topography, types of surfaces (pervious or impervious), natural drainage and leave very less impact on the environment.
- **Vulnerability analyses and risk assessments** should form part and parcel of city master plans.
- **Disabling encroachment in sensitive zones** through robust anti-encroachment laws and by providing adequate affordable housing can help reduce number of persons vulnerable to changing climate.



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