

# Disaster-resilient cities

Lessons from Srinagar and Guwahati on how to protect our cities from natural disasters

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Devastation due to extreme rainfall over three days in Jammu and Kashmir and Assam impacted lives, property and livelihoods. Srinagar and Guwahati, with their large and dense population, suffered a lot. This raises questions for them as well as other cities:

- What can be learnt from these debacles?
- How much of the damage and loss happened because of pre-existing conditions and how can this be avoided in future?
- What kind of institutional responses are needed for better preparedness?

India has 900 cities and 4,000 “urban agglomerations”. The cities are growth engines for the economy — they contribute about 60 per cent of India’s GDP. The high concentration of people, economic activities, business, property and livelihoods in cities means that when disaster strikes, the suffering can be colossal.

India needs to strengthen its cities so that every natural hazard need not turn into a disaster. A disaster-resilient city has the capacity to deal with such hazards — in other words, it can cope with or withstand perturbations up to a moderate degree.

Disaster response has three stages:

- Emergency management:** Soon after the disaster, emergency handling and rescue operations are needed which deal with saving lives, reducing casualties and managing emergency operations. Such operations include dealing with falling trees, fire, and collapsed buildings; as well as maintaining basic services such as power, water and traffic. The latter will need particular attention to road breakdowns and bridges, and also flooding and water-logging. Typically these require responsive and alert local governments armed with heavy-duty equipment. When the hazard is very big (national-level), it requires the army, help from the home ministry and coordination by the National Disaster Management Authority (NDMA).

- After a week or so, the urgency of the disaster impact declines and hopes of rescuing more lives diminish. Then, the rehabilitation and restoration of broken-down systems is needed to bring normalcy.

- The third stage is learning lessons, and preparing for long-term risk reduction — conducting emergency drills, strengthening existing infrastructure and building new infrastructure; and creating more capacity in local bodies and communities. It is these areas that cities should keep working on, even when there is no immediate threat of a natural disaster.

A hazard turns into a disaster due to structural and managerial flaws as well as the violation of natural and man-made laws before the hazard strikes. There are three pillars that can strengthen resilience: strong infrastructure, able governance and good socio-economic conditions. Strong infrastructure is what defines a city — water supply, waste management, transport systems, power supply, storm water drainage, etc. Each of these systems needs to be maintained so that they function not only in normal times but can stretch a little, if necessary. This is where the city’s governance comes in; it needs to be alert and efficient — and serious about law enforcements whether it is building codes or encroachment. A strong socio-economic fabric needs aware, responsive and able citizens with reasonable income and low (or no) slum

**Srinagar was unprepared for the floods. Residential colonies, a hospital and even the Srinagar Development Authority are built on the Jhelum floodplain**



Rescue operations in progress at the scene of a bridge collapse caused by the floods in Jammu and Kashmir. The fact that the tragedy struck the state capital itself interfered with command and control.

population.

Effective storm water drainage is the first line of defence against flooding. Unfortunately, simple rules for providing storm water drainage close to built-up areas are often thrown out of the window. Keeping drains clean and free of clogging is also necessary. It is hard to lay storm water drainage lines when heavy traffic is routine. Preservation and management of water bodies such as rivers, lakes, canals, or ponds is also vital. Development in low-lying areas or river banks should not be permitted. Vulnerable zones need to be identified, people should be informed about the likely level of submergence of different parts of the city and development should be controlled, as is done for coastal zones. Encroachment should be prevented, as it is too difficult to evacuate people after they are settled.

Advance warning can greatly minimise human suffering, as the cyclone in Odisha showed. The India Meteorological Department (IMD) needs to be more proactive in translating their warnings into desired levels of action, and to communicate with people and local authorities in jargon-free language. The NDMA should make sure that warnings translate into action.

Topographical studies of various cities are needed to identify critical areas especially close to water bodies. Areas that are close to rivers, dams, large

lakes and coastal areas need to be fully mapped. Only then can brainstorming about how to manage and prepare for extreme rainfall begin. Digital elevation mapping will help estimate carrying capacity, and the level of submergence of various parts of a city. How much more rainfall can it handle? What is the carrying capacity of the city for additional rainfall? If such information is provided to people, citizens would avoid vulnerable zones.

Of course, it was Srinagar’s misfortune that the tragedy struck the state capital itself, depriving them of the control room for action that a capital city provides. Moreover, the total rainfall even exceeded the probabilistic forecast given by the IMD.

Awareness among city planners is essential. When we visited Srinagar as a part of our project a few months ago, we were told ‘there are no flood hazards in Srinagar and the Jhelum rarely overflows, due to the presence of its tributaries’. The preparedness of the city to respond to floods was found missing. Several residential colonies, a hospital and even the Srinagar Development Authority office are built on the floodplain. Digital maps were not available.

Agreed, one is helpless against nature’s fury, but much damage can be avoided with preparedness.

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