

Lessons from Srinagar and Guwahati:

Disaster Resilient Cities

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Devastation due to extreme rainfall over 3 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:

- a) What can be learnt from these debacles?
- b) How much of the damages and losses happened because of pre existing conditions and how can that be avoided in future?
- c) What kind of institutional responses for better preparedness needed?

India has 900 cities and 4000 urban agglomerations. The cities are growth engines for the economy. They contribute about 60% of GDP of the nation. There is a high concentration of people, economic activities, business, property, livelihoods all of which suffer when disaster strikes cities which can be colossal. India needs to get its act together in terms of strengthening the cities so that every natural hazard need not turn into a disaster. A disaster resilient city has the capacity to deal with the hazard i.e. the ability to cope or withstand perturbations up to a moderate degree. Disaster response has 3 cyclic stages:

- a) Emergency management: Soon after disaster, emergency handling and rescue operations are needed which deal with saving lives, reducing casualties and managing emergency operations which concern falling trees, fire, building collapse, maintaining basic services such as, power, water and traffic flows, road and bridges breakdowns, flooding and water logging etc. Typically these require responsive and alert local government armed with heavy duty equipment. When the hazard is very big (national level), it requires army, help from the home ministry and coordination by the National Disaster Management Authority (NDMA).
- b) After a week or so, urgency of disaster impact declines and hopes of rescuing more lives diminish. Then, the rehabilitation and restoration of system break-downs are needed to bring normalcy.
- c) The third stage is learning lessons and preparing for long term risk reduction e.g. conducting emergency drills, strengthening existing and building new infrastructure and capacity building of local bodies and communities. It is this area on which a city should keep working, especially while the disaster is not there.

A hazard turns into disaster due to structural and managerial flaws as well as violation of natural and man-made laws existing before the hazard strikes. There are three pillars that can strengthen resilience e.g. strong Infrastructure, able Governance and good Socio-economic conditions. Strong

infrastructure is what defines a city i.e. water supply, waste management, transport systems, power supply, storm water drainage etc. Each of these systems needs to be strong and maintained so that they function not only in the normal times but can stretch a little, if necessary. This is where the city governance comes in which needs to be alert, efficient, serious about law enforcements whether it is building codes or encroachment and responsive. Strong socio-economic fabric include aware, responsive and able citizens with reasonable income and low (or no) slum population.

Effective storm water drainage is the first line of defence against flooding. Unfortunately, simple rules of providing storm water drainage close to the built up area are often thrown out of the window. Keeping them clean and free of clogging is also necessary. It is hard to lay storm water drainage lines when heavy traffic is a daily routine. Preservation and management of water bodies such as rivers, lakes, canals, or ponds are also vital to moderate floods and water logging. Encroachment should be prevented as it is too difficult to evacuate people after they are settled.

The development in the downstream or 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 done for coastal zones.

Advance warning can greatly minimize 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 actions. Interface needs to be developed with science and society through several institutions such as Centre Water Commission or NDMA or a cell within the IMD to help bring their act together 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. Those areas close to rivers, dams, large lakes and coastal areas need to be fully mapped to start brain storming about the necessary steps, to manage and prepare for extreme rainfall. It is possible to estimate carrying capacity of down pour with digital elevation mapping and estimate 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.

Ofcourse, it was Srinagar's misfortune that the tragedy stuck on the state capital itself, depriving them 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 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 Srinagar Development Authority office is built on the flood plains.. 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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