policy brief #8

iihs
INDIAN INSTITUTE FOR HUMAN SETTLEMENTS

Cities provide a transformational opportunity to reduce risk accumulation

Indian cities are at high risk

India is one of the more vulnerable and high-risk countries in the world. Disaster loss is rising every year with grave consequences for the survival, dignity and livelihood of individuals, particularly the poor, and poses a severe setback to hard-won development gains. Growing concentrations of people, built and economic assets in cities is exponentially increasing their propensity to disaster risk. While disasters are known to compound vulnerabilities, with increasing densities in cities and access to services and resources becoming more contested, people's vulnerability to disasters is growing, making it a vicious cycle. Despite proven correlation between changing climate and increasing frequencies and intensities of hazards, the level of preparedness for such events, particularly in developing countries like India, is still very low. With limited resources available to direct towards planning and resilience building, developing economies like India end up prioritising rehabilitation and rescue in the face of an event. Lack of data, access to technology and lack of technical and institutional capacities exacerbates this situation further.

By 2011, 468 cities in India had population higher than 1 lakh. 76% of the Indian population is exposed to high-to-medium hazard risk, of which nearly 30% live in these one-lakh-plus cities. Many of these urban centres are exposed to multiple hazards, especially earthquake, cyclone, storm surge, drought, floods and fires. The impact is often exacerbated due to multiple hazards occurring together and further aggravated by the growing socio-economic and climatic vulnerabilities. Additionally, the low perception of risk leads to even greater destruction due to a lack of risk-reduction practices. Public expenditure for relief on account of natural disasters can be taxing on the budgeted social sector expenses in successive years, which makes preparedness and mitigation even more pertinent.

Why make cities resilient?

While cities are collectors of risk, they also provide an immense opportunity to reduce this risk, if managed well in time. The number of cities where people and assets are concentrated is still very small—according to the 2011 Census, the number of rural settlements (0.64 million) exceeds that of urban areas (0.008 million) by nearly two orders of magnitude. More risk can be mitigated by directing relevant research and other resources to the most vulnerable urban centres. Planned development and growth in second-tier cities would not just safeguard their future, but could also provide for enhanced lives for their citizens.

Where is risk concentrated?

The nature of urban areas in contrast to the rural increases their propensity to risk:

(a) Cities agglomerate people and economic output in small geographic areas.
(b) Poverty and vulnerabilities are growing in cities.
(c) Distress migrants from rural areas to urban and non-migrants in urban areas are more vulnerable due to a lack of choices.
(d) There are more built and other physical assets in urban areas per household than in rural areas.
(e) Urban areas are not just victims, but also contributors to increasing environmental burden.
(f) Growing urban areas and shrinking rural areas will intensify these trends further.

While cities are increasingly becoming vulnerable, one might ask where in these cities is risk concentrated, in order to prioritise risk-reduction practices. It is important to know what aspects are increasing their propensity to risk—hazard exposure, higher vulnerabilities or lower capacities—so that specific efforts can be made to address these issues.

Risk has historically been associated with external hazards, which presents a very different set of urban areas having high probability of risk. A composite multi-hazard exposure analysis shows that areas primarily located in the coastal region or the Indo-Gangetic plains are most exposed to natural hazards (Figure 1). But once vulnerabilities and capacities are integrated into the analysis, risk-prone cities appear to be located more inland within the poorer states of Bihar, Madhya Pradesh, Uttar Pradesh, Orissa and Maharashtra (Figure 2).

Figure 1 : Map showing hazard-prone cities

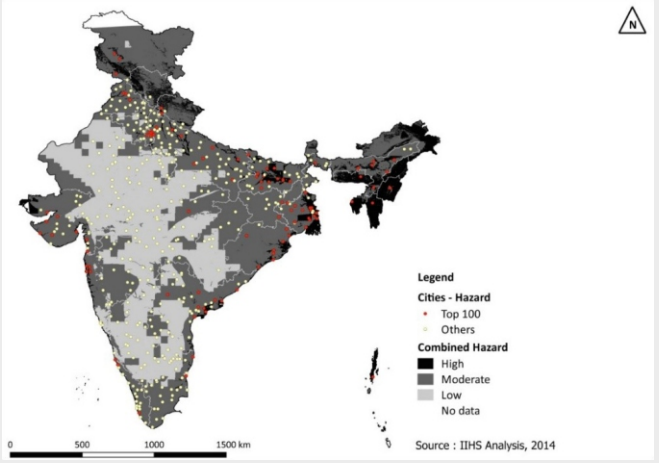
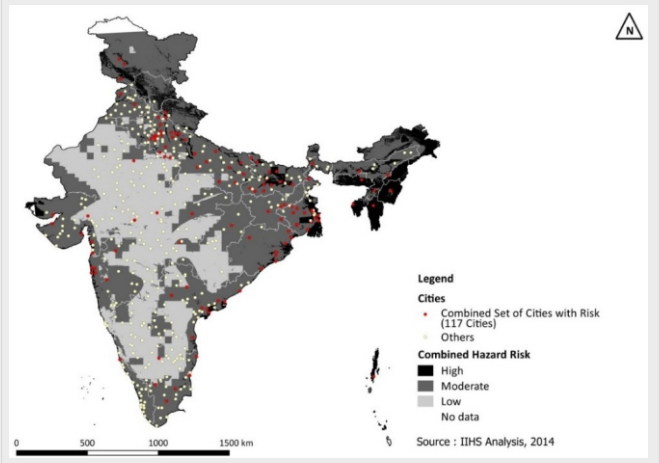


Figure 2: Map showing high-risk cities



Current policy gaps

There are **theoretical gaps** in the understanding of risk as a composite of external hazard factors, and intrinsic characteristics which may act as vulnerabilities or capacities for systems, people, economy and built environment in coping with external forces. The top-down approaches lack a focus on building these capacities by improving peoples' choices. Risk management perspective is limited to rescue and response and not risk reduction and preparedness. The imagination of holistic development which is resilient and offers sustainable development is currently missing.

Gaps in **planning decisions and processes** include basing location decisions on political economy and ease of engineering, and not hazard exposure; lack of risk-mitigation expertise and clearance in project and plan approval processes; building bye-laws limited to a few hazard risks such as earthquakes, but not to others such as cyclones and floods, which in many cities form a bulk of the risk; and processes not built on a multi-hazard approach. A National Disaster Response Fund was constituted under the NDM Act, 2005 to meet the expenses for emergency response, relief and rehabilitation. While the Act also recommends a **National Disaster Mitigation Fund** (NDMF) exclusively for the purpose of mitigation, it is yet to be constituted and modalities of its sources and uses of funds need to be formulated.

To embark on a low-carbon growth path along with building resilience of society to adverse

impacts of climate change, the national government needs to invest in adaptation measures. However, studies show that the **expenditure on adaptation** across all the sectors was 1.7 per cent of GDP for 2006–7 which increased to 2.68 per cent of GDP as per 2009–10 budget estimates. Sectors that are crucial to any adaptation intervention—such as food security, rural and urban housing for the poor and educational infrastructure—have received inadequate attention in the policy response on adaptation.

Physical prevention measures do not suffice to build a resilient city, since damage from the most severe catastrophes cannot be fully averted. An important part of resilience is how well urban societies are able to cope with the financial consequences of a disaster, which includes access to the requisite funding for relief, recovery and reconstruction. **Risk transfer through insurance** is one such means, yet, the gap between economic and insured losses is large because insurance penetration is relatively low and city infrastructure is often not insured at all. Risk sharing is skewed with more risk resting with the public (authorities and users), primarily due to disproportionate risk-sharing clauses in the contracts between public and private entities in delivering large-scale infrastructure projects. At present, unlike financing for low frequency-high impact disasters, insurance schemes do not provide an adequate alternative to government funding for disaster relief for high frequency-low intensity disasters.

Perception of potential risk by the people and authorities is underestimated primarily because of a lack of recent experience, or a lack of choice to avoid risks due to socio-economic and political reasons. There is no action for preparedness, and rescue and response remains the preferred means of action in the face of an event.

While inclusions are being made in master plans to include risk reduction, **technical and institutional capacities** in development authorities are still inadequate. There is a severe lack of expertise on critical infrastructure and its protection. Often lack of hospitals (or the lack of access thereof), and electricity and transportation disruptions exacerbate the risk impacts after an event has occurred. Severe **data gaps** add further road blocks in the adoption of risk-reduction measures. Technical information about all hazards, such as their probability of occurrence, is unavailable and hence not incorporated in planning. **Economic models to assess potential avoided losses** are not easily accessible to institutions and not put into practice.

Way forward

Multiple stakeholders across levels and time frames, need to act together using a framework of risk reduction to build urban resilience for our citizens and city systems.

Framework of Resilience. City resilience describes the capacity of cities to function so that the people living and working in cities, particularly the poor and vulnerable, survive and thrive no matter what stresses or shocks they encounter.

Figure 3: Cycle of Risk Reduction

National Government. Departments of urban development and poverty alleviation should become the nodal agencies for urban resilience and programme design at the national level. A national cell can work along with apex institutions and collate state-level risk atlases to develop a National Risk Atlas that maps all elements of risk including climate change-related risks, vulnerabilities and exposures and also estimate potential national losses to economic activity and capital stocks. Ministry of Finance could define fiscal and financial measures like domestic market for carbon credits linked via appropriate institutions to the global market. A National Resilience Programme of Action and a Technical Mission for Sustainable Cities should be developed. Bureau of Indian Standards must develop a new series of national building, service-delivery and lifeline infrastructure risk-mitigation standards.

Functions of climate change and disaster risk management should be relocated from the Ministry of Environment and Forestry to the Cabinet Secretariat or the Planning Commission along with the Ministry of Finance.

State Governments. All states must instate a State Risk Management Authority (SRMA), on the lines of the Gujarat State Disaster Management Authority. These SRMAs must develop a State Risk Atlas that maps hazard risks including climate change-related risks, vulnerabilities and exposures, down to the district level and estimate potential losses to economic activity and capital stocks. Boards of departments of finance and planning need to integrate risk management into their medium-term expenditure frameworks. Training, capacity building and other appropriate changes are needed in the state housing, urban development, and town planning and infrastructure legislations.

City and urban local bodies. Planning authorities must re-examine City Development Plans to include risk management measures and develop strategic hazard defences at the city level. Transportation, building and energy sectors should be enabled for city-led adaptation and mitigation strategies. Public entitlements and service delivery to the poor and vulnerable must be developed to address existing asymmetries and structural vulnerabilities. Interventions in the real estate and housing markets and public service delivery are also needed. Multi-lingual online GIS-based city and zonal risk management plans linked with public land records, real estate information, building permissions and public investments in infrastructure would help a great deal.

Private Sector. It could develop appropriate risk assessment, adaptation and mitigation plans or resilience plans for clusters of enterprises in vulnerable areas. It would help to delineate corporate social responsibility funds towards resilience-building activities, particularly for settlements in the more vulnerable and exposed locations. Private enterprise-led building and infrastructure upgrading, retrofitting and technical support initiatives to enable and scale resilience activities are possible. The private sector could help propagate business continuity plans as a basic requirement for any enterprise of any size. Finally, the use of insurance and re-insurance products could be promoted.

Neighbourhood-level stakeholders and civil society. Civil society could take a lead on advocacy and mobilisation of public-private-resident partnership for resilience-building activities centred on the provisions and extensions of basic services, entitlements and finance, build and retrofit housing and infrastructure to risk-resistant standards. It could promote and propagate neighbourhood pilot projects to test new methods and use these to promote risk-related awareness. It can provide independent feedback, and technical advice to public- and private-sector institutions.

International and National Funding Agencies. These should promote scientific data creation and knowledge sharing between different stakeholders. They should invest more in preparedness and mitigation, apart from rescue and rehabilitation activities.

Further reading

HyogoFramework. (2005). *Hyogo framework for action 2005–2015: Building the resilience of nations and communities to disasters*. Paper presented at the World Conference on Disaster Reduction, January.

IFRC. (2005). World Disasters Report 2005 : Focus on informations in disasters.

Jain, G. (2014). The role of private sector for reducing disaster risk in large scale infrastructure and real estate development : Case of Delhi. *International Journal of Disaster Risk Reduction, Elsevier*.

Revi, A., Satterthwaite, D., Aragón-Durand, F., Corfee-Morlot, J., Kiunsi, R. B. R., Pelling, M., . . . Tuts, R. (2014). IPCC WGII AR5. (Chapter 8 Urban Areas).

Silva, J. d. (2014). City Resilience Framework : City Resilience Index. *Rockefeller Foundation and Arup International Development*.

Sundermann, L., Schelske, O., & Hausmann, P. (2014). Mind the Risk : A global ranking of cities under threat from natural disasters. *Swiss Re*.

iihs
INDIAN INSTITUTE FOR HUMAN SETTLEMENTS

IIHS City Campus
No. 197/36, 2nd Main Road
Sadashiva Nagar
Bangalore 560 080. India
T +91 80 6760 6666

www.iihs.co.in | info@iihs.co.in