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Climate Proofing Indian Cities: A Policy Perspective

Cities in India are major contributors to the country's GDP, and this share continues to grow. Therefore, as cities are exposed to the impacts of climate change, shifting the development paradigm towards climate resilience would reap benefits that would go beyond environmental concerns, fostering social, and economic sustainability.

The policy brief outlines emerging opportunities for Indian cities to foster climate-resilient development and recommends for the formulation of a specific new policy pertaining to urban climate resilience in India. This includes a discussion on institutional and governance mechanisms necessary for this process and outlines various components for a specific urban policy to promote climate resilience.

Introduction

Climate change is one of the foremost emerging challenges, the impacts of which are increasingly manifesting themselves through highly erratic instances of weather deviations and induced extreme events. While both urban and rural areas are vulnerable to climate change, its impacts on cities and towns are of particular concern due to high concentrations of people and infrastructure in these areas. Cities may be subjected to multiple climate hazards depending upon their geographical location and climatic conditions, ranging from increased and frequent flooding and water logging to heat and cold waves, sea-level rise, and storm surges.

While urban centres in India are the new engines of economic growth, yet they are grappling with issues such as infrastructure deficits, inadequate basic service provision, ineffective urban planning, and are completely oblivious of the geo-topographical and climatic variations of the cities. Across India, cities face climate-induced calamities regularly, often accompanied with heavy loss of life and property. India suffered a loss of over INR 10 billion plus due to the adverse winter weather in January 2013 alone (Saraswathy, 2013). Monsoon plights in the recent past in large urban centres such as Delhi and Mumbai are examples of climate-induced problems for which inadequate provisions have been made in the urban planning of the cities. With meticulous planning, taking into account considerations of climate resilience, urban planners and policy-makers can address some of the issues and improve living conditions of the people.

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KEY POLICY POINTERS

- There is a need for an urban climate policy to initiate and guide actions towards addressing climate change impacts in urban areas.
- The policy should propose a mechanism for multilevel engagement to help develop a complete ecosystem for urban climate resilience with defined roles and responsibilities for all stakeholders.
- A long-term climate resilience goal calls for integration of the resilience agenda into urban development plans, laws, and regulations.
- Financial allocation of resilience-building projects could be achieved through better resource planning and earmarked funds at the national and sub-national levels.
- Extensive capacity building with regard to understanding climate change impacts and how they can be addressed is required at all levels, including multiple and varied stakeholders, both government and the general public.
- Facilitating the introduction of techniques and tools that cities could use for assessing their risks and vulnerabilities and planning for resilience.
- Climate adaptation actions should be tailored to specific city regions.

What are climate-resilient cities?

Climate-resilient cities have the institutional, structural, social, and economic capacity to withstand the impacts of climate change. Climate change adaptation measures would help cities to successfully withstand extreme climate variations, while greenhouse gas emission mitigation measures can help reduce climate impacts.

Climate-resilient cities should therefore include mitigation and adaptation actions to take care of likely climate impacts, besides increasing the capacities of the populace, infrastructure, institutions, and governance. Response mechanisms should also focus on preparing for extreme climate events such as storm surges, landslides, and floods.

DEFINING URBAN RESILIENCE

Urban resilience can be defined as “the ability of cities to tolerate alteration before reorganizing around a new set of structures and processes” (Alberti et al., 2003). “Resilient cities in the light of climate change should be able to develop plans for future development and growth, bearing in mind the climate impacts that the urban systems are likely to face” (Prasad et al., 2009). “Building resilience also means strengthening capacities of social agents to access urban systems and to develop adaptive responses”, (Opitz-Stapleton and MacClune, 2012:4).

The risk of doing nothing

In India, the immediate urban development priorities are to provide housing, water and sewage facilities, transport,

Figure 1: Why is building climate resilience important for Indian cities?

India faces multidimensional risks to climate change with immense geographic diversity and different climate zones.

Potential to impact the lives of the poor, who are the worst victims of non-inclusive urban development. They are most vulnerable to climate-related calamities.

Around 70% of infrastructure in India is yet to be developed which is a huge opportunity for integrating climate resilience in future infrastructure development.

Urban areas in India contribute to 60% of the GDP of the country, expected to be 75-80% by 2030.

health, and social infrastructure in order to manage growing demands on cities, high pace of urbanization, and population explosion. The urban development policies generally do not take in to account the impact of climate change as it is still considered as a distant threat.

“Within Asia, 24 per cent of deaths due to disasters occur in India, on account of its size, population and vulnerability. Floods and high winds account for 60 per cent of all disasters in India” [Tenth Five-Year Plan (2002–07)].

Not taking into account the impacts of climate change at the urban planning stage itself could lead to huge economic losses, negative health impacts, associated with high social cost burden, particularly among the vulnerable groups such as the poor, disabled, elderly, and children.

“Climate change impacts can wipe out development gains and would significantly reduce quality of life” (Prasad et al., 2009: 10).

Effective climate-resilience building should therefore be embedded in the regular urban development planning and practice to foster the larger goal of sustainable development. Thus, a policy to bring in climate resilience as an important urban agenda is a starting point towards addressing climate-related impacts and preparing cities for unforeseen climate-related extreme events and variability.

How are other countries addressing urban climate resilience?

Realizing that climate change is a reality and the urgency to address climate-related extreme events, city governments across the globe are taking policy actions to prepare their cities to face the brunt of climate change impacts. Table 1 summarises only a few of them.

Table 1: Key features of resilience strategy: Selected case studies

City/ Urban Local Body	Climate Action Taken/Name of the Strategy	Key Features
London, The UK	The City of London's Climate Adaptation Strategy in 2007 (The City of London Corporation, 2007)	<ul style="list-style-type: none"> • Systematic process of adaptation planning in the city with assigned responsibilities to the institutions and proposed mechanisms for implementation. • Prescribed the corporation to climate proof its policies and aligned itself with existing policies, guidelines, and regulations. In 2008, the Greater London Authority Bill (GLA Bill) 2007 was enacted which assigned the duty of climate protection for the city of London to its Mayor.
Halifax Regional Municipality, Canada	A six-step strategy in response to the physical and social impacts of extreme weather conditions (Hurricane Juan in September 2003 and the 'Great Maritime Blizzard' of February 2004) (Halifax Regional Municipality, 2007)	<ul style="list-style-type: none"> • Adopts a systematic approach that undertakes climate impact assessments, identifies risks and vulnerabilities, and takes into account the governance profile of the city. • Assigns institutions various measures that each public department may take to facilitate adaptation within the sector concerned.
New York, The USA	New York City's sustainability plan (PLaNYC) (The City of New York, 2007)	<p>Dynamic strategy targeting the year 2030, brings together about 40 agencies to work coherently towards a sustainable and green city.</p> <p>Came up in 2007 with an objective to:</p> <ul style="list-style-type: none"> • Prepare the city for housing ever increasing number of residents, • Strengthen city's economy, • Adapt to climate change, and • Enhance the quality of life for the residents of New York.
	The New York City Panel on Climate Change (NPCC)	Set up in 2008 to advise the city on climate change impacts. Talks about bringing in changes in building and zoning regulations and integrating climate change projections into emergency management and preparedness.
Cape Town, South Africa	Framework for Adaptation to Climate Change in the City of Cape Town (FAC4T) (Mukheibir and Ziervogel, 2006)	<ul style="list-style-type: none"> • An overarching framework for a city-wide approach to reducing vulnerability to climate impacts in response to the high likelihood of climate-induced warming, rainfall change, and extreme events projected for the region. • Defines a mechanism for integration in national and provincial acts.

These are international examples where city government and sometimes the national government have introduced regulations and mechanisms to facilitate climate resilience agenda in the cities. Considering the political economy of India, it is recommended that a policy should be initiated

at the national level, and the state governments and city governments should follow actions based on the said policy. It is therefore pertinent for the Indian government to consider bringing in climate resilience into the development discourse through a national policy.

Preparing for a urban climate resilience policy

Action to address climate change in urban areas should be multi-level, involving national-, state-, and city-level governments, as well as multi-sectoral including sectors such as infrastructure and services, urban planning, transport, disaster risk reduction, and housing and construction. For cities to internalize resilience planning into the urban development process, an effective policy will be that which provides for capacity building, mainstreaming, facilitating data, tools, and techniques to enable risk assessment and climate projections.

The policy should bring forth the importance of and need to introduce urban climate resilience into the urban planning framework, draw out a structure of the institutions and regulations needed to implement the same, and identify windows for financing the actions.

The policy should begin with facilitating the preparatory actions on which the cities would base their actions towards resilience. This includes a risk and vulnerability analysis of cities to potential climate impacts in the near future, i.e., in the next 15–30 years. This requires past climate data and future projections of climate and various other sectoral datasets, to help assess the vulnerability, and coping capacity of city systems to climate events. This requires engagement and communication among various institutions, departments, and stakeholders to complement the multi-sector needs and requirements of such an exercise. The second important milestone in this discourse is to provide for need-based area-specific training for officials at all levels to enable planning for climate resilience and preparedness for dealing with any climate-induced emergency situation. In addition to building capacity of relevant stakeholders, the policy should call for raising awareness of citizens about the need to include climate resilience in the urban development planning process.

To facilitate all the above, a strong regulatory and institutional backing is required which also draws out financing mechanisms to support the cause.

An important point of consideration is the fact that resilience requires multi-sectoral and cross-sectoral interventions and may not fit into the present divisions of institutional responsibilities. Therefore, while the policy can guide the overall mechanisms to support resilience mainstreaming into urban development discourse, it should also identify various entry points within existing institutional mechanisms and regulatory framework.

The urban climate resilience policy should address a number of factors. These have been explained in the Sections A to E.

A. Making a case for climate-related actions and investment

The policy must make a case for cities to conduct risk and vulnerability analyses to understand their specific

requirements for resilience building and develop city-specific strategies for adaptation and mitigation. This would also include response mechanisms and coping strategies, particular to the city's context. The policy should also call for exploring inter-linkages with the existing disaster management set up in the country and facilitate response mechanisms and preparations for any unforeseen disaster events.

This stage requires specific datasets such as socio-economic data, climate trends, and sector-specific datasets to enable formulation of resilience strategies:

- **Climate projections**

Climate resilience is based on parameters related to climate, its variability, and change. Studying past climate trends and developing climate projections therefore are essential components of risk and vulnerability assessments. Climate modelling is a specialized field which requires capacity building and technical expertise, which could be achieved by forming a repository of institutions and experts at the state or national level to act as resource persons for cities obtaining climate projections.

- **Data**

Most cities in India lack the proper information systems required for addressing the various aspects of climate change impacts; e.g., data on weather anomalies, frequency, and extent of urban floods. Integrating resilience planning in the urban planning process requires very specific data sets on various local and regional climate parameters. Hence, maintaining a repository of city and region specific data using Management Information Systems (MIS) would be an essential step, which could be used to develop time-series and spatial data bases in this regard.

B. Capacity building

Climate resilience is a new concept in India, requiring specific technical know-how and data for cities to draw up their resilience plans. It also needs awareness generation to be built among civil society to foster interest and support. The policy to facilitate action to climate-proofing cities must ensure capacity building, competence, and adaptability at various levels of urban governance that would eventually be dealing with mitigation and/or adaptive practices on ground. The Mission on Sustainable Habitat discusses overall climate resilience of urban centres in India through adaptation and mitigation approaches. However, there is a need for creation and dissemination of knowledge that penetrates from local to federal level of governance, across communities to sensitize various stakeholders and facilitate action towards climate resilience.

A perspective policy must make adequate human resource development plans for all the levels of urban governance. Designing specific training programmes to suit

local variations and availability of adequate resources for the training programmes would be a prerequisite.

The target stakeholder for these would include city planners, decision-makers and practitioners, political representatives, sector experts, city managers, engineers, and citizens. The broad objectives of the capacity building would be to:

- Generate awareness about climate change impacts on urban areas.
- Acquaint stakeholders with the principles of resilience planning and its benefits for the cities' sustainability and development.
- Develop techniques, methods, and tools for assessment of climate risks and vulnerability to climate change in cities. Customized material such as toolkits, guidelines, and case studies can be developed for use in resilience planning.
- Strengthen the role of institutions and governance in fostering climate-resilient development.

C. Multi-level engagement

Resilience planning is successful and apt when an integrated approach to various urban sectoral needs is followed through continuous stakeholder consultations, inter-departmental and institutional coordination and community participation. The policy should establish a mechanism to institutionalize the process of this multi-stakeholder engagement; For example; the national government could incorporate climate resilience in the reforms agenda and resource planning under national schemes, and bring in incentive mechanisms for states and cities. They could also facilitate partnerships with international and non-government actors for technical and implementation support.

The state government should support the national government's intervention towards the goal of resilient urban systems by integrating climate resilience into state-level laws and regulations, budgeting for climate resilience, and initiating and implementing capacity-building programmes at the state and city levels. Cities would need to assess and understand their vulnerability and develop responses to climate-proof urban systems.

D. Integrating climate resilience into urban development laws and regulations

Considering that the resilience options are not independent of the regular sustainability goals and planning needs of the city, it is pertinent to dovetail climate resilience to the urban development framework. This means integrating:

- Climate-related issues and addressing them through the state-level acts and regulations. For example, the State Town Planning Acts could have clauses that integrate climate parameters into master planning processes.

- Resilience interventions could be included into the development regulations of the cities, e.g., building by-laws, development controls, and zoning regulations.
- Integrating measures to bring in climate resilience into national and sub-national schemes and plans such as the town planning schemes and City Development Plans (CDPs) of the cities.

There is merit in establishing a nodal body at the city level; e.g., the Municipal Corporation, that would have the statutory authority to coordinate and direct the resilience planning and implementation efforts with relevant officials, semi-official, and non-governmental agencies operating there. Capturing local communities' interest and involvement could be one of the responsibilities of the nodal body.

E. Financing urban resilience

Reinforcing and climate proofing existing infrastructure would require additional funds. Therefore, financial allocation for resilience building and adaptation projects would also be an integral part of the proposed policy. Establishing national- and state-level climate funds and resource planning under various national schemes such as the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and the Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT) can go a long way in this direction.

Conclusion

The east coast of India had faced two large cyclones — Phailin and Helen — affecting the states of Andhra Pradesh and Odisha within a period of two months in 2013.

In June 2013, the northern state of Uttarakhand faced great devastation when settlements together were wiped away after the melting of a massive glacial lake above Kedarnath¹ and rise in water levels due to heavy and incessant rains (PTI, 2013).

Even though these events cannot be attributed completely to impacts of global climate change, their severity and the volume of damage that they have caused demonstrate that actions for resilience and climate-proofing settlements are all the more important. These events call for better planning and preparedness to deal with new and unforeseen climatic changes in the future. There is a need for a paradigm shift in which the cities of today are planned and managed. Integration of a climate resilience agenda has the potential to systematically build resilience of cities and its systems, reduce vulnerability and achieve the desired development goal. A policy towards this end is an important stepping stone to achieve the larger goal of sustainable and climate-resilient cities.

¹ A famous and important religious centre for Hindus.

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