Residential Workshop on Urban Resilience and Making Cities Resilient 2030 (MCR 2030)

5th – 8th December 2022
SAARC Disaster Management Centre (IU)
Gandhinagar, Gujarat, India
State of Urbanisation

1. Rate of urbanisation
2. Demographic details
3. Status of facilities and infrastructure
4. Status of welfare & development schemes
• URBAN AREA OF INDIA
  : 77.37 LAKH HA (2001)
  : 2.52%
• URBAN POPULATION OF INDIA
  : 377.10 MN. (2011)
  : 31%
• PER CITIZEN URBAN LAND
  : 0.02 HA(2011)*
  : 0.03 HA(2001)

*Considering the 2001 urban area since 2011 figures not available
CITIES OF INDIA

DEVELOPMENT PRESSURE IS CONCENTRATED IN METROS

EVIDENT FROM INCREASE IN
- NUMBER OF METROPOLITAN CITIES
- SHARE OF URBAN POPULATION

NUMBER OF METROPOLITAN CITIES AND SHARE OF URBAN POPULATION

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cities</td>
<td>5</td>
<td>7</td>
<td>12</td>
<td>35</td>
<td>53</td>
</tr>
<tr>
<td>Share</td>
<td>18.9%</td>
<td>23.6%</td>
<td>27.7%</td>
<td>37.8%</td>
<td>42.6%</td>
</tr>
</tbody>
</table>

- MUMBAI 18.4 M
- DELHI 16.3 M
- BENGALURU 8.5 M
- CHENNAI 8.7 M
- AHMEDABAD 6.3 M
- HYDERABAD 7.7 M
- KOLKATA 14.1 M
Rapid pace of urbanisation poses an unprecedented managerial and policy challenge

- Population of India: 1210.2 MN.
- Level of urbanisation: 31%*
- Urban population: 377.10 MN.
- Increase in urban population: 15X
  
  25 MN. (1901) to 377.10 MN. (2011)

- Increase in no. of urban settlements: 4X
  
  1967 (1901) to 7935 (2011)

*Much lower than in other major developing countries, e.g. 45 per cent in China, 54 per cent in Indonesia, 78 per cent in Mexico, and 87 per cent in Brazil.
State of Urbanisation

Urban and Rural Population in India

Source: UN DESA, Urban and Rural Population India (2018)
World Urbanization Prospects: The 2018 Revision, custom data acquired via website
Status of welfare & development schemes

Smart Cities Mission

100 Smart Cities across India with focus on planned urbanisation and sustainable development as a support system for the neighbouring cities. It also involves the development of high-quality infrastructure with provision of basic amenities, education, health services, IT accessibility, digitisation, e-governance, sustainable development, safety and security

Pradhan Mantri Awas Yojana (PMAY) (Urban) or Housing for All

Swachh Bharat Mission - Urban (SBM - U)

AMRUT (Atal Mission for Rejuvenation and Urban Transformation)

AMRUT scheme was on infrastructure creation that has a direct link to provision of better services to the citizens. The scheme includes provision of water supply facilities, sewerage networks, stormwater drains, urban transport, and open and green spaces, across the selected 500 Indian cities.

Jawaharlal Nehru National Urban Renewal Mission (JNNRUM)

National Urban Sanitation Policy (NUSP)
Status of welfare & development schemes

• National Cyclone Risk Mitigation Project (NCRMP) Andhra Pradesh & Odisha
  Component A – Last Mile Connectivity
  Component B – Structural and Non-Structural Measures
  Component C - Technical Assistance for Cyclone Hazard Risk Mitigation, Capacity Building and Knowledge Creation
  Component D – Project Management and Implementation Support.

**Outcome:** The broad outcome of the project is a provision of *cyclone forecasting, cyclone risk mitigation and capacity building in multi-hazard risk management.*

The major infrastructure, which is being constructed under the project includes *multipurpose cyclone shelters* (including shelter-cum-go-down) and *approach roads/bridges to habitations and saline embankments.*

Creation of National Disaster Response Reserve (NDRR)

• National Emergency Communication Plan (NECP)
  During the major disasters of Odisha Super Cyclone, 1999 and Gujarat Earthquake 2001, it was observed that the break-down of telecommunication linkages resulted in loss of invaluable time in mobilizing National & state resources for effective response.
  Accordingly, a *National Emergency Communication Plan (NECP)* was developed to be implemented in two phases to set up reliable communication links between the decision maker and various levels and operational response team at disaster site.
Present Day Challenges

1. Sector-specific challenges
   1. Transportation
   2. Waste management
   3. Health
   4. Land Use & Land Planning
   5. Building Code & its implementation
   6. More..

2. Balance of population growth, economy, development
Present Day Challenges

1. Transportation
   Road congestion: As more people travel over longer distances on regular basis for employment and education purposes, will inevitably lead to road congestion.
   Parking problems: ...
   Air pollution: ...
   Deteriorating road safety:

2. Waste management
   Waste to Energy Plant. Waste power plants do not really help generate energy when the energy giving waste is only 13% of total of metro city waste. ...
   Municipalities do not consider all areas. ...
   Lack of holistic waste management plan.
Present Day Challenges

Land Use & Land Planning

• Legislative and regulatory framing for land use planning like Development Control Rules, Land use plan
• Plans for managing land use, and development and growth; and the ongoing land use planning and implementation processes. Like Master Plan, Development Plan, Regional Plan and Local Area Plan
• Vulnerability due to Physical factors. e.g. poor design and construction of buildings, unregulated land use planning, Social factors, Economic factors and Environmental factors.

Building Code & its implementation

The main purpose of building codes is to provide minimum standards to protect the public health, safety, and general welfare as they relate to the construction and occupancy of buildings and structures.
Model building codes provide protection from tragedy caused by fire, structural collapse, and general deterioration

Balance of population growth, economy, development

Due to overpopulation, India has faced several problems like unemployment, excessive dependency, insufficient income rate, insecurities, loss of jobs, development failures, and social problems.
60 MTR ROW
**Automated Land Encroachment Prevention System**

360 Degree Camera Setup

Mobile Alerts to encroachment officer

Encroachment Dashboard Alerts
PLANNING HEIRARCHY

REGIONAL PLANS
- FORMAL / FUNCTIONAL AREA REGIONAL PLANNING
- LEGISLATION: NCRPB ACT, MMRDA ACT
- BROAD POLICY DOCUMENT OF DEVELOPMENT DIRECTION

SUBREGIONAL PLANS
- JURISDICTION IS SUBSET OF REGIONAL PLAN
- LEGAL PROVISION MADE IN REGIONAL PLANNING ACTS
- DETAILS POLICIES FOR ALL SECTORS IN THE SUBREGION

MASTER PLANS
- JURISDICTION IS MUNICIPAL AREA OR LARGER URBANISED/URBANISABLE AREA
- LEGISLATION UNDER STATE GOVERNMENT
- DETAILS LAND USE ZONING AND DCR

ZONAL / LOCAL AREA PLANS
- JURISDICTION IS SUBSET OF MASTER PLAN AREA
- LEGAL PROVISION MADE IN MASTER PLAN LEGISLATION
- DETAILS LAND USES, ACTIVITIES, SITE FOR INFRASTRUCTURE
RURAL URBAN FRINGE AREAS

Benefits of the rural-urban fringe for economic developments.

- Cheap Land
- Room for Expansion
- Plenty of car-parking space
- New industries
- New/larger roads
- Recreation & Golf courses
- Shopping Centres
- Houses
- Workers available close by
- Good accessibility
- Attractive environment
- Little pollution
THE URBAN DESIGN IS A COMPLEX PROCESS OF GIVING FORMS AND SHAPES TO A CITY INVOLVING ARRANGEMENT AND DESIGN OF BUILDINGS, GREEN SPACES, PUBLIC SPACES AND TRANSPORT, BLENDING BUILDING AND LANDSCAPE ARCHITECTURE AND CITY PLANNING IN ORDER TO MAKE THE URBAN AREAS ATTRACTIVE, FUNCTIONAL AND AESTHETIC.

• Comprehensive Flood Control Master Plan (CFCMP) shall be superimposed with Land use Plan of Third Master Plan of CMDA. Accordingly, many urban planning projects for flood mitigation can be identified for the implementation.

Group Housing layout should indicate the system of storm water drainage, rain water harvesting structure and recharging well.
FACTORS WHICH MAKE CITIES:

1. LOCATION
   (Connectivity, Topography, Climate, Accessibility)

2. RESOURCES
   (Human Skills, Economic infrastructure, Water, Tradable Commodities, etc)

3. TECHNOLOGY
   (Railways, Internet, Preservation, Medicine, Water Supply, etc.)
Emergent Risks & Future Challenges

1. Climate Change Scenario
2. Climate Impacts (foreseen and unforeseen)
3. Steps taken towards climate action (climate change adaptation & mitigation)
Heat waves frequency and intensity are increasing in India because of climate change.
• Urban flooding
• Air pollution
• Water scarcity
• Urbanisation
• Storms, heat waves, rising sea levels, melting glaciers and warming oceans

More than 40% of India's population may face water scarcity by 2050 and at the same time the country's coastal areas, including big cities like Mumbai, will be affected by rising sea levels. Severe landslides and floods are projected to become increasingly common in such states as Assam.
Steps taken towards climate action (climate change adaptation & mitigation)

Mitigation and adaptation to climate change

1. Practice Energy efficiency.
3. Electrification of industrial processes. Recharge point is an issue
4. Efficient means of transport implementation: electric public transport, bicycle, shared cars ...
5. Carbon tax and emissions markets.
   India does not levy an explicit carbon price. Fuel excise taxes, an implicit form of carbon pricing, cover 54.7% of emissions in 2021,
Steps taken to ensure risk-informed development & resilience

1. Support from the National Government to the Local Governments to foster disaster risk reduction (DRR) & climate action
2. Good cases of risk-informed development
3. Good cases of community-driven / multi-stakeholder driven DRR or climate action initiatives
PLANNING IS AN INTERVANTION TO MANAGE URBANISATION AND DEVELOPMENT

**CENTRAL GOVERNMENT**

**MINISTRY OF URBAN DEVELOPMENT**
- TCPO
- HUDCO
- CPHEEO

**NITI AYOG (PLANNING COMMISSION)**

**STATE GOVTS & UNION TERRITIES ADMN.**

**TOWN PLANNING DEPTS.**

**URBAN LOCAL BODIES & DEVELOPMENT AUTHORITIES**

**CENTRE**

**STATE**

**LOCAL**
Support from the National Government to the Local Governments to foster disaster risk reduction (DRR) & climate action

The Government of India launched National Action Plan on Climate Change (NAPCC) on 30th June, 2008 outlining eight National Missions on climate change. These include:

1. National Solar Mission
3. National Mission on Sustainable Habitat
4. National Water Mission
5. National Mission for Sustaining the Himalayan Eco-system
6. National Mission for a Green India
7. National Mission for Sustainable Agriculture
8. National Mission on Strategic Knowledge for Climate Change
## Good cases of risk-informed Development

<table>
<thead>
<tr>
<th>HAZARDS</th>
<th>RISKS</th>
<th>SOLUTION</th>
<th>PLANNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATER LOGGING</td>
<td>FLOOD</td>
<td>PROPER DRAINAGE</td>
<td>DRAINAGE NETWORK INFRASTRUCTURE</td>
</tr>
<tr>
<td>UNSTABLE SLOPES</td>
<td>LAND SLIDING</td>
<td>RETAINING WALLS AND AFORESTATION</td>
<td>LANDSCAPING AND SLOPE ANALYSIS</td>
</tr>
<tr>
<td>UNHYGIENIC AREAS</td>
<td>DISEASES</td>
<td>SEPTIC TANK, SOLID WASTE MANAGEMENT SYSTEM</td>
<td>SEWERAGE NETWORK AND SOLID WASTE MANAGEMENT SYSTEM</td>
</tr>
<tr>
<td>UNSTABLE BUILDINGS</td>
<td>BUILDING COLLAPSE</td>
<td>STRUCTURAL DESIGN</td>
<td>BUILDING APPROVAL</td>
</tr>
<tr>
<td>UNPLANNED GROWTH</td>
<td>TRAFFIC JAM, ENVIRONMENTAL RISK</td>
<td>PROPER SETBACK AND FSI, CIRCULATION</td>
<td>PROPER LANDUSE MAP AND POLICY</td>
</tr>
<tr>
<td>OUTDATED INFRASTRUCTURE</td>
<td>WATER, DRAINAGE AND CIRCULATION PROBLEMS</td>
<td>SCADA WITH TREATMENT PLANTS</td>
<td>SMART TECHNOLOGY</td>
</tr>
</tbody>
</table>
Good cases of risk-informed Development—DISASTER RISK REDUCTION IN URBAN PLANNING

- **CHECK UNPLANNED URBANISATION AND ENSURE SAFER HUMAN HABITAT AGAINST ALL FORMS OF DISASTERS.**
- **INTEGRATION OF LAND-USE PLANNING (MASTER PLAN) WITH DISASTER MANAGEMENT PLAN, ENVIRONMENTAL PLAN, HAZARD MAPPING AND VULNERABILITY ASSESSMENT.**
- **URBAN MAPPING OF INFRASTRUCTURE OF SPATIAL RESOLUTION USING GIS AND LINKED WITH DECISION SUPPORT SYSTEM (DSS) FOR MANAGING URBAN RISKS.**
- **DEVELOPMENT CONTROL REGULATIONS.**
- **BUILDING BYE-LAWS AND STRUCTURAL SAFETY FEATURES.**
- **IMPROVE URBAN DRAINAGE SYSTEMS WITH SPECIAL FOCUS ON NON-OBSTRUCTION OF NATURAL DRAINAGE SYSTEMS.**
- **MICRO-INSURANCE SCHEMES AND MARKET-BASED MECHANISMS.**
Steps taken to ensure risk-informed development & resilience

The National Disaster Risk Reduction Management Plan (NDRRMP) outlines the activities aimed at strengthening the capacity of the national government and the local government units (LGUs) together with partner stakeholders, to build the disaster resilience of communities and to institutionalize arrangements and measures for reducing disaster risks, including projected

• Identification and measuring disaster risk.
• Education and knowledge development.
• Informing people about their risk (awareness raising)
• Incorporating DRM into national planning and investment.
• Strengthening institutional and legislative arrangements.
Community-driven / multi-stakeholder driven DRR or climate action initiatives

- Social empowerment and awareness tool;
- Bottom-up DRR planning;
- Establishment of emergency and maintenance funds;
- Innovative development of information, education and communication materials;
- Local resource-based bio-engineering interventions; ...

Movement of diesel-run heavy/medium goods vehicles in city banned;
- Diesel LMVs in Delhi and bordering districts of NCR (essentials exempted) also not allowed in the city.
- Construction not allowed at linear public projects such as highways and flyovers.
- Trucks not carrying essentials banned; only electric & CNG trucks are allowed in the city.

The rivers must be cleaned of garbage and encroachments, and wetlands protected at all costs.
The city's plans must be redrawn to make space for rainwater both on the ground and below the ground.

Besides cleaning and regular maintenance of drains, widening of waterways, moderating the River/storm water flow water flow, de-silting and dredging projects, hydrological examinations

Central Communication Center in each cities in the country. Effective communication is key and it can make or break the response measures.

- Shift from conventional / reactive approach to strategic approach on preparation of Master Plan and Disaster Plan. Mainly focus on Disaster Risk Reduction.
- Restoration of existing water bodies, natural drainage, resettle the encroachment, enforcement of rain water harvesting etc. to moderate the discharge.
- Disaster response has to be ‘people centric’. People with strong civic sense and resilience make all the difference
Sustainable Urban Drain (SUD) is essential to prevent urban flooding in Metropolitan Area. Water logging is one of the major water issues in cities and directly restricts urbanization processes. The construction of Sponge City is an effective approach to solving the urban water issues, particularly for the water logging.

It was found that the current storm water management focused on the construction of gray infrastructures (e.g., drainage network and water tank) based on the fast discharge idea, which was costly and hard to catch up with the rapid expansion of city and its impervious surface, while green infrastructures (e.g., river, lake and wetland) were ignored. In order to mitigate the flood disaster in prime area, sponge area can be designed in and around Chennai along with storm water drain and by preserving existing water
Bhubaneswar: The outcomes of the climate change projects taken up under the National Adaptation Fund for Climate Change (NAFCC) in Nuapada district have been found quite rewarding for the people.

“Five check dams have been constructed over Kharkhara nullah under the State and NAFCC funding. The groundwater level has increased in the villages nearby the project area. Six pani panchayats have been formed involving local farmers for irrigation planning,” official sources said.

Around 400 farmers have adopted crop diversification methods by shifting from single paddy culture to horticulture. Organic farming has been started by 400 households. The farmers are being imparted training on crop diversification and sale of their products.
You are the Change

BE THAT ONE PERSON THAT WILL MAKE A DIFFERENCE

Thank you