



Large Urban Population: An Enormous Challenge for Governance

Issues and Approaches



Effects of Climate Change on the State

- Rise in sea level
- Occurrences of more intense storms and cyclones
- Increased probability and intensity of droughts and heat waves
- Spread of disease
- Changes in seasonal pattern and ecosystem
- Flash floods and Landslides
- Effects on Vulnerable Group



Increased occurrence of large floods in Kolkata...

Period	Vulnerable Areas of Kolkata
1978: Sept 4-Sept 10	Monsoon rains caused unprecedented damage and made millions of people homeless in large parts of Northern India. Some areas of the state of West Bengal were 18 feet (5.5 meters) below water.
1986: Sept 24-Oct10	Flooding from heavy rains in some areas of Kolkata, Hooghly, Howrah, Parganas and Midnapore
1999: Sept 24-Sept 29	Tropical cyclones caused destruction of an estimated number of 1500 villages. Floods due to brief torrential rains affected areas of Kolkata, Burdwan and Birbhum
2000: Sept 18-Oct 21	Late monsoon rains that triggered flash floods
2001: July31-Sept01	Monsoonal rains caused flooding in Kolkata
2004: June 20 Oct 07	Heavy monsoonal rains affected several districts
2006: Sept18- Oct05	Monsoonal rains and tropical cyclone-driven storms in the Bay of Bengal hit India and Bangladesh. West Bengal re- corded 50 deaths, 300 were injured and 30,000 mud houses destroyed. Heavy rains left large parts of Kolkata city under water; subsequently 2,000 people were evacuated from the city
2007: July03- Sept22	The hazard affected Kolkata and several other districts. Eighty-three deaths were reported, and millions of people were marooned in 3000 villages in coastal areas of the state



Rehabilitation of Man-Entry Brick Sewers

- Rehabilitation of about 25 KM of century old sewer system
- Reduction of water logging in Kolkata city
- To benefit a population of 17.19 lakh
- Project cost Rs. 402.91 crore
- Sharing:
 - Govt of India : 141.02 crore
 - GoWB : 141.02 crore
 - KMC : 120.87 crore



**Condition of sewer
before revamp**



**Cleaning after
desiltation**



Cleaned sewer

Manufacturing of Glass reinforced fibre linings



GRF Linings



**Sewers after lining
with GRF lining**



Anthropogenic Actors of Climate Change

- Rapid degree of urbanisation
- Automobile emission
- Dump sites receiving mixed solid waste with high percentage of bio-degradable matter
- Industrial emissions without any pollution abatement measures
- Disappearance of waterbodies and wetlands by human habitat encroachments
- Deforestation
- Dependence on conventional energy produced by GHG-emitting thermal power plants





Regulatory Measures Adopted by State Government

- West Bengal Municipal Building Rules, 2007 provide for:
 - Conservation of water bodies vide rule no. 8(3), (4) & (5)
 - Rainwater harvesting and tree–cover vide rule no. 171
 - Use of solar energy vide rule no. 174
 - Recycling of waste water vide rule no. 172
 - Fire prevention & safety measures vide rule nos. 75 – 85
 - Green buildings vide rule no. 155 (iv)
 - Environment protection in hill areas – landslide prevention, rain water harvesting, solar energy use and protection of natural drainage – vide rule nos. 156, 157, 166, 167



More measures by State Govt...

- Mandatory for ULBs to utilise 50% of 12th FC Grant for scientific SWM
- 35 electric crematoria in ULBs
- Aforestation programme
- Integrated Low Cost Sanitation System in 126 ULBs
- Guidelines for preservation of water bodies in the state being drafted
- Compost plants under JBIC & JNNURM programmes
- Industrial waste recycling unit at Haldia
- Plastic waste recycling unit at Sonarpur



Some more measures...

- Pilot projects for segregated SWM at Kamarhati and Old Malda
- Regulating industrial emission and enforcing installation of pollution abatement and control measures
- Measures for bio-medical waste management – five common regional treatment facilities set up
- Sewerage schemes in towns on the Ganga river bank under NRCD & JNNURM progs.
- 30 water supply projects with project cost of Rs. 3519 crores, some with gravity distribution – less energy consumption



Present status and constraints

- Provision for rain water harvesting and solar energy in Building Rules seldom followed by ULBs
- ULBs utilised 12th FC Grant mostly for fleet augmentation – little scientific disposal after optimum recovery process
- ULBs reluctant to install electric crematoria due to high energy cost
- Compost plants suffering due to low offtake



Action Plan to Mitigate the Effects of Climate Change



Regulatory Measures

- Create testing and monitoring infrastructure
- Set up regulatory body to monitor GHG emissions every 3 months and oversee compliance with Action Plan by all relevant depts.
- Promote public awareness and IEC



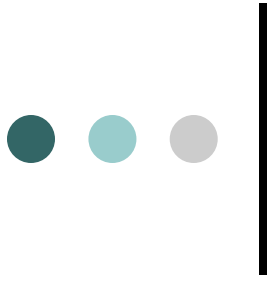
Preventive Measures

- Desiltation of major rivers to check initial shock load of floods
- Promote CNG/LPG use in public transit
- Replace coal based furnaces with gas/oil
- Promote construction of energy efficient buildings
- Rationalize power tariff for electric crematoria
- Subsidise environment friendly appliances
- Preservation of water bodies as per guidelines
- Promote 24 x 7 water supply systems – save energy



More preventive measures...

- Encourage industries to be energy-efficient and seek BEE star rating
- Promote waste recycling, scientific disposal of solid waste and energy extraction from solid waste
- Promote environment friendly urban planning approaches
- Promote changes in food habit of livestock – check methane (GHG) emission
- Incentivise the use of rain water harvesting, waste water recycling, solar energy etc.
- Encourage developers to earn carbon credits through CDM



Now in action...



Kolkata Bus Rapid Transit System

- Nearly 20 Km along EM By Pass from Ultadanga to Garia
- 7.2 meter wide dedicated corridor
- Proposed cost of Rs.254.91 crore
- Government of India to invest Rs.89.22 crore
- Rest to be mobilized by State Priority to public transit
- Encouraging car owners to shift to public transit
- Expected reduction in vehicular emission



WATCH



Parama Island - Park Circus Flyover





Thank you