IMPACT OF CLIMATE CHANGE ON CITIES

TRAINING PROGRAM ON
URBAN CLIMATE CHANGE RESILIENCE

20-22 April 2015

Bhubaneswar

Rozita Singh

Research Associate,

Sustainable Habitat Division

The Energy and Resources Institute

Urbanisation in India

- The urban population in India grew from 286 million in 2001 to 377 million in 2011.
- Nearly 30% of the population in India is now living in the urban areas.
- It is estimated that by 2030, more than 40% of the population would be living in the urban areas.

Contents

- Vulnerability of Cities
- Direct Physical Risks of Climate Change on Cities
- Associated Impacts on Urban Systems

Vulnerabilities of Cities

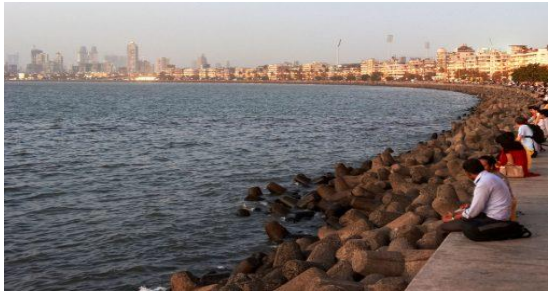
- Cities house
  - More than half of the world's population,
  - Trade, businesses, economic activities
  - Built assets
- Cities are the centres of economic growth generating more than 80% of the global GDP
- Urbanization and economic growth go hand in hand.
- Cities also responsible for a significant share of the GHG emissions and consequent climate change.
- Due to high concentration of people, economic activities, business, property and livelihood.

Cities will be hit hard by Climate Change

Imperative to understand the impacts of Climate Change on cities.

Direct Physical Impacts

Sea level rise



Increase of cyclones

Climate Change A unique challenge for cities.

Increase of heavy precipitation events

Increase of extreme heat events & droughts

INCREASE IN HEAVY PRECIPITATION EVENTS

Landslides

Flooding

Disruption of Traffic

Massive destruction
of lives and property

INCREASE IN EXTREME HEAT EVENTS

- Increased use of mechanical means for thermal comfort and climate control.
- Increase in heat island effect.
- Effect on demand and supply of energy.
- Increased incidences of diseases.
- Lowers overall human productivity and efficiency.

SEA LEVEL RISE

- Impact on large population and crucial economic assets.
- Impact on coastal and port cities.
- Flooding of wetlands and tidal flats.
- Erosion of beaches, sedimentation of river floors in estuarine zones.
- Decreasing coastal aquifers affect fresh water supply and peri-urban agriculture.

INCREASE IN EXTREME DROUGHT AFFECTED AREAS

•Water shortages due to changes in precipitation.

•Water stress due to increased water demand

•Decline of water quality.

•Reduced food supplies.

• Raised food prices &food insecurity.

•Frequent power outages(when hydropower source of electricity)

INCREASE IN FREQUENCY AND INTENSITY OF CYCLONES

•Large scale destruction of lives, property and assets and ecosystems.

•Inundation and Power shutdowns

•Disruption of normal lives, business, and economic activities for several days.

•Heavy financial burden to bring the city back to normalcy.

• Vulnerable to the outbreak of water borne diseases.

Odisha’s climate vulnerability

- Orissa is placed at the head of the Bay of Bengal where weather is formed. So even a slight change in the sea's behaviour can have an immediate impact on the coast.

- The bay becomes the centre of low pressure, bringing heavy rain and cyclones to the sub-continent, especially in Orissa.

- The state's mean daily maximum and minimum temperature is gradually rising

According to data from the weather department, in the last 50 years the state's average temperature has gone up by 1 degree. The Titilagarh and Koraput belt comprising south and west Orissa has witnessed an exceptional increase in daily maximum and minimum temperatures. Even the coastal areas have recorded high temperatures. Earlier, western Orissa was a known calamity hotspot. But now the coastal areas are also experiencing heatwaves

Past record

- **Floods**: Between 1834 and 1926, floods occurred at an average interval of 3.84 years. Between 1961 and 2000, floods became an annual affair.
- **Drought**: During the 1950s only three districts were drought-prone. By the 1980s, the whole of western Orissa, consisting of five districts, became drought-prone. During the 1990s, 25 of the 30 districts became drought-prone.
- **Cyclones**: During the 1970s and 1980s only two severe cyclones hit the state. During the 1990s, two severe cyclones hit the state and the number of cyclonic conditions rose. With 13 severe cyclones in the last 100 years, Orissa is the worst-affected state in India.

Source: http://infochangeindia.org/environment/features/disaster-dossier-the-impact-of-climate-change-on-orissa.html

Associated Impacts on Urban Systems

- Complex systems with extensive interlink ages.
- Impacts on a broad spectrum of city functions, infrastructure and services:
  - Impacts on economic activities
  - Impacts on physical infrastructure
  - Damage of lives and property
  - Impacts on urban poor
  - Health
  - Air Pollution
  - Nutritional issues
- Aggravates the existing stresses in the city
- Disruption of physical infrastructure impairs the functioning of the city.
- Eventually impacts living conditions, economic activities and livelihood of the city.
- Damage particularly severe in low lying coastal cities where most of the worlds' largest cities are located

Cities need to…

- Identify risks and vulnerabilities
- Tackle the impacts of climate change and direct the focus on developing climate resilient urban systems.
- Consider both current and future climate risks as well as other likely changes in the urban environment for climate resilient urban planning

THANK YOU