

## COMMUNITIES OF PRACTICE (CoP)

### Sustainable Urban Development – Smart Cities II



## Urban Resilience –

Experiences from Challenge Labs and  
Recommendations

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Mario Donga, Magdalena Hoerst

# Agenda

- 1) **The Context: Disasters a burning issue for cities**
- 2) **The Urban Resilience Concept**
- 3) **Experiences from Challenge Labs, Recommendations and Good Practices**

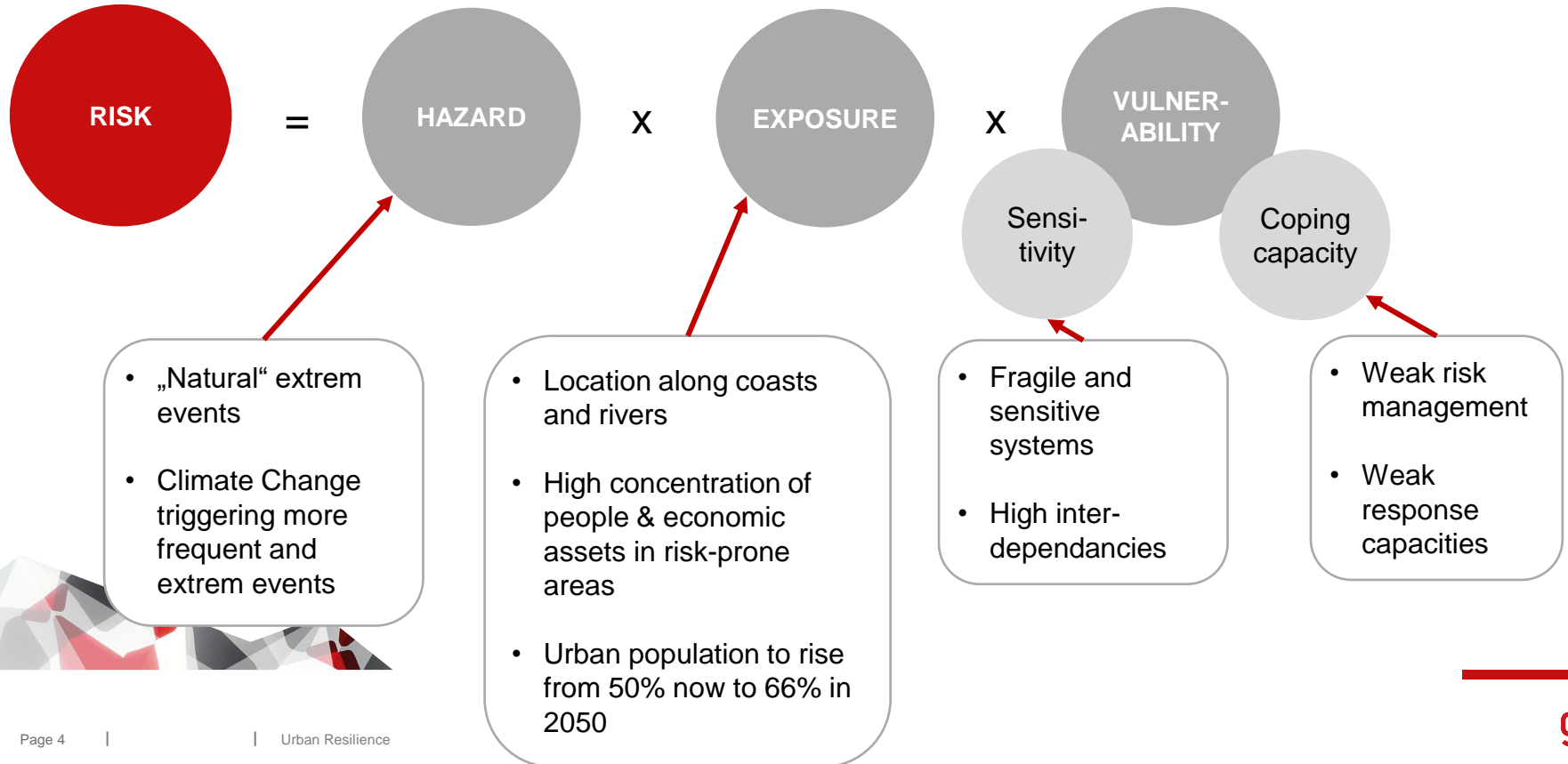


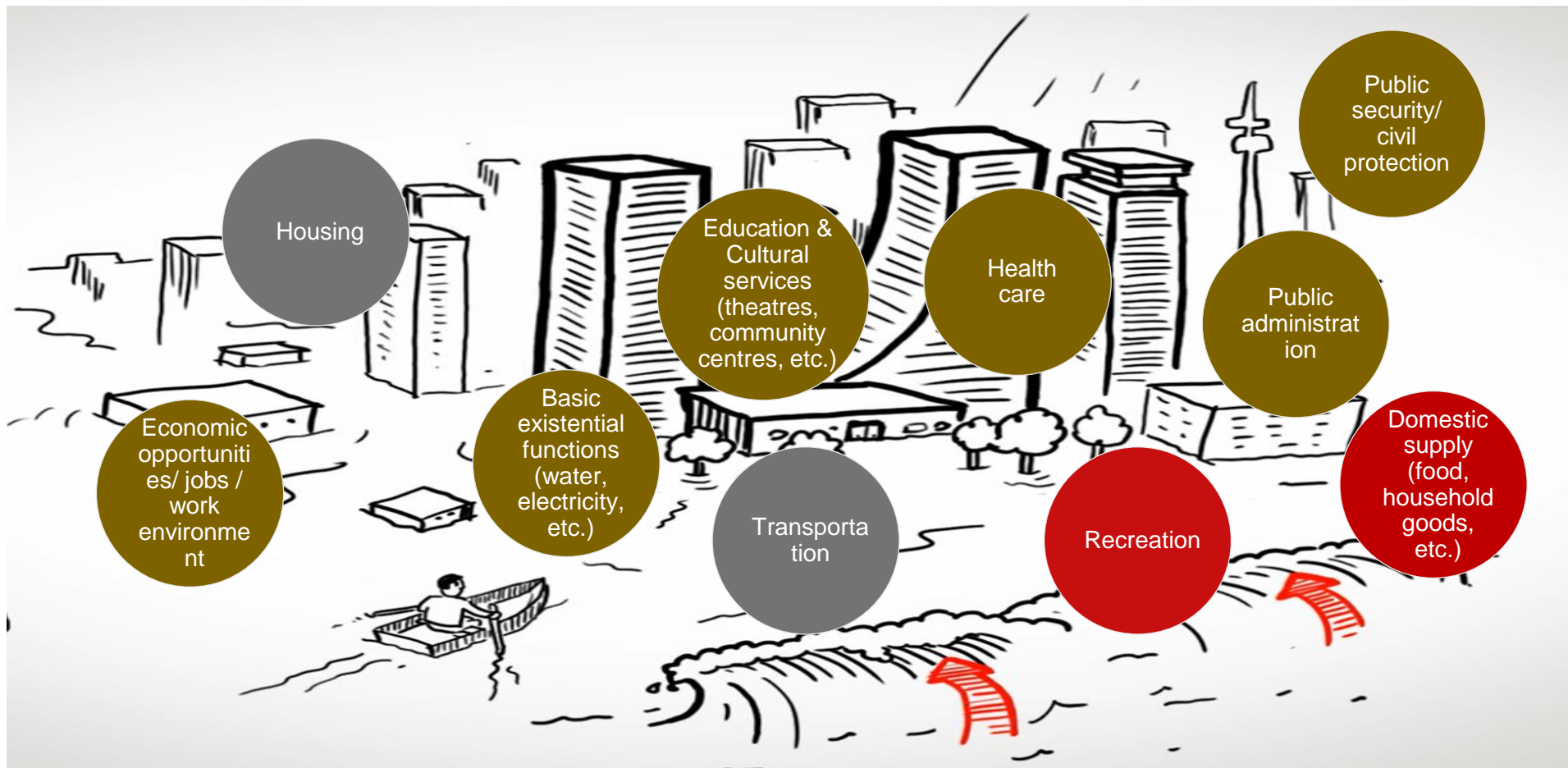
## Cities' affectedness by disasters



\$300 billion in annual average losses &  
77 million urban residents impoverished by 2030 without significant risk reduction  
(The World Bank)

# Cities in the context of Disaster and Climate Risks







(1) Coping/ Resistance

(2) Prevention

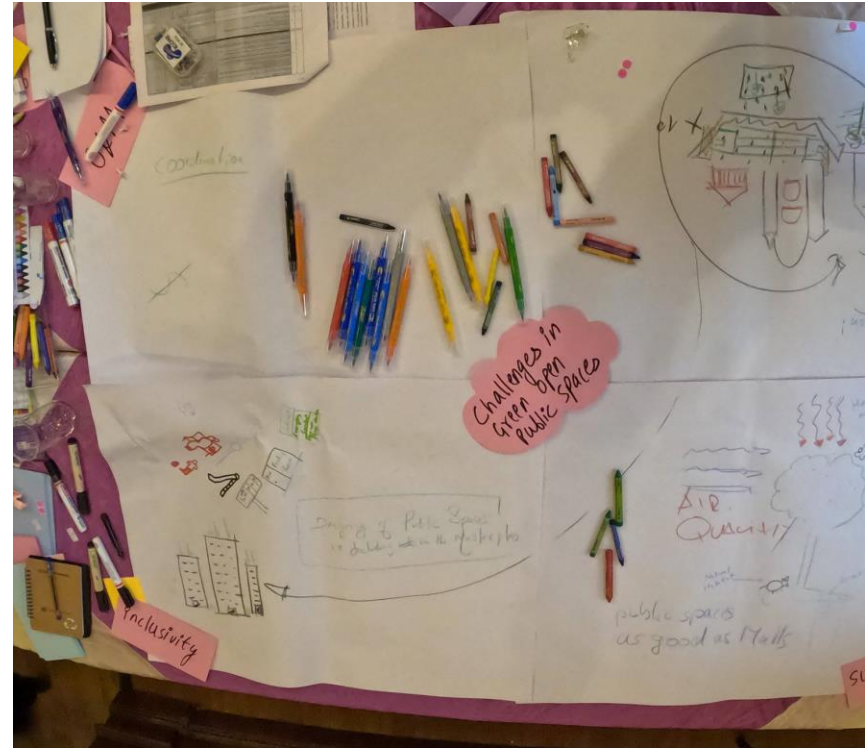
(3) Transformation

# Experiences from Challenge Labs, Recommendations and Good Practices

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## Themes of the Challenge Labs

- 1) Data requirements and management
- 2) Climate resilient urban planning
- 3) Green public open spaces
- 4) Municipal solid waste management
- 5) Urban (waste) water management



# Data requirements and management

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## Cross-thematic Challenge

- Lack of data and data management as a main bottleneck across sectors
- Availability of relevant data is key for risk-informed planning towards increased urban resilience

- **Geospatial Data Layer:** Mapping of urban landscape, highlighting vulnerabilities and guiding infrastructure planning.
- **Climate and Weather Data Layer:** Historical and real-time data aiding in risk assessment and adaptive strategies.
- **Infrastructure Knowledge Base Layer:** Detailed insights into existing infrastructure to assess vulnerabilities and plan safeguard strategies.
- **Demographic and Socioeconomic Data Layer:** Understanding social complexities and vulnerabilities within different urban communities.
- **Environmental Data Layer:** Metrics on air and water quality, biodiversity, and ecological health for a holistic understanding of the urban ecosystem.
- **Historical Disaster Data Layer:** Insights from past disasters aiding in preparedness and response planning.
- **Land Use and Zoning Data Layer:** Understanding urban space utilization and regulations.
- **Transportation and Mobility Data Layer:** Guiding the design of resilient transportation systems and evacuation routes.



# Urban Observatory (Data requirements and management)

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## Challenge Lab topic in Kochi

- The city of Kochi has the vision to set up an Urban Observatory, based in the infrastructure of their IC4
- **Huge potential** for a central data repository (urban observatory) in the city for information-based decision-making (ad hoc and long-term planning)
- Not clear how the Urban Observatory will be fed with **data from the various sources** in the city
- The **amount, type, and quality of data** among the most pressing challenges of the Urban Observatory to ensure its planned functioning



# Urban Observatory (Data requirements and management)

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## Urban Resilience perspective:

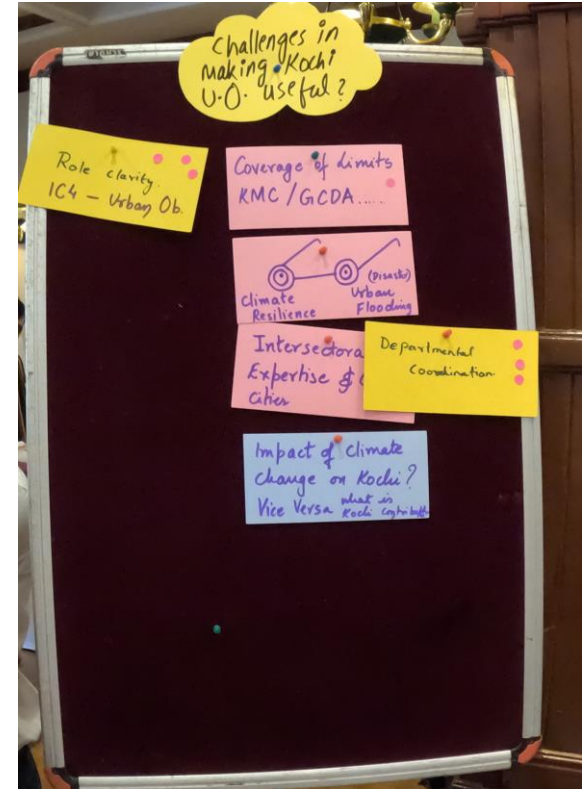
- Main objective of the Urban Observatory is to **improve disaster and climate risk management** in terms of ad hoc interventions (e.g., flood management) and long-term resilient planning
- Urban Observatory could **pool climate and disaster risk data, analyse, and evaluate** them and provide advisory service to the respective urban actors (city administration, authorities, science, private sector, civil society)
- Requirements: **analytical competencies, intersectoral expertise, a strong political commitment and funding.**



# Urban Observatory (Data requirements and management)

## Urban Resilience entry points:

- Support Urban Observatory **focusing one specific topic**, as e.g. flood risk management in the context of critical infrastructure
- Improving the information base for **flood management**
- Active consultation with users is needed
- Improving the information base for **risk informed development** (spatial master planning and/or sectoral planning) and **risk informed public investment** planning (Detailed Project Reports -DPRs)

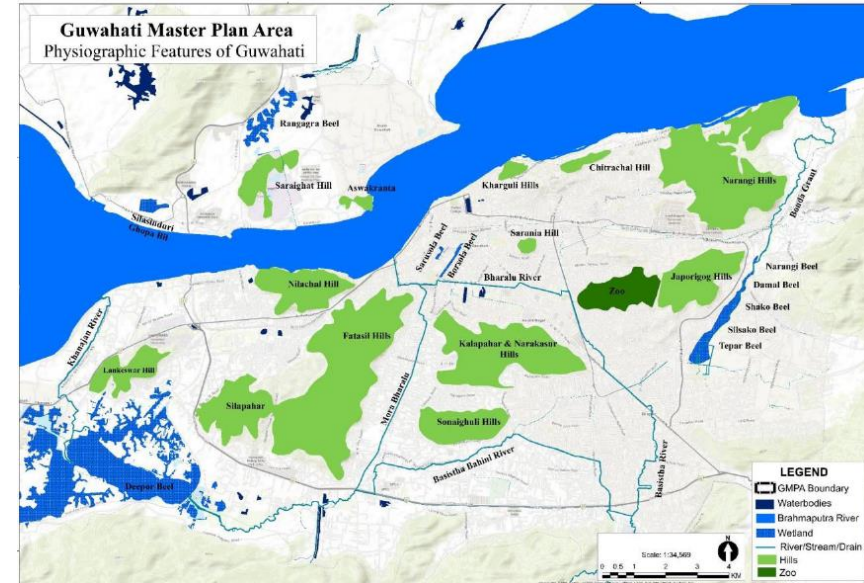


# Climate resilient urban planning

## Challenge Lab topic in Guwahati

### The Challenge

- Guwahati is a **rapidly growing** city with multi-layered vulnerabilities due to its topographic and climatic specifics
- Growth so far has **not considered urban resilience principles** leading to harm of the environment and ecology
- The city's **drainage system is not adequate** to cope with the amount of storm water
- Business as usual is not an option for sustainable development



# Climate resilient urban planning

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## Urban resilience perspective

- Integration of Urban Resilience in Comprehensive Frameworks:
  - Anchoring **urban resilience within urban masterplans** and related policies
- Strategic Incorporation in Planning Processes (urban polices, building codes, etc.)
- Extending resilience integration to **other urban development plans** beyond Masterplans
- Incorporating Urban Drainage Concerns:
  - Vital integration of climate-resilient drainage systems
  - Utilizing **nature-based solutions for flood risk reduction**
- Enhancing Urban Water Management:
  - Addressing challenges in urban water management via **resilience strategies**
  - Overcoming flood risks through **integrated climate-resilient planning**



# Green public open spaces

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## Challenge Lab topic in Kochi and Manikonda

### The Challenge:

- **Underutilized green open spaces**
- Densely populated urban area and **high competition for space**
- **Lack of data** as basis for planning of more/better green open spaces
- Different sets of bottlenecks to realize more green open spaces
- Limited **financial resources**, incl. costs for operation & maintenance
- Unclear actor landscape and responsibilities
- Unfavorable urban masterplans in place
- Limited planning capacities
- Green open spaces not linked to climate and disaster policies



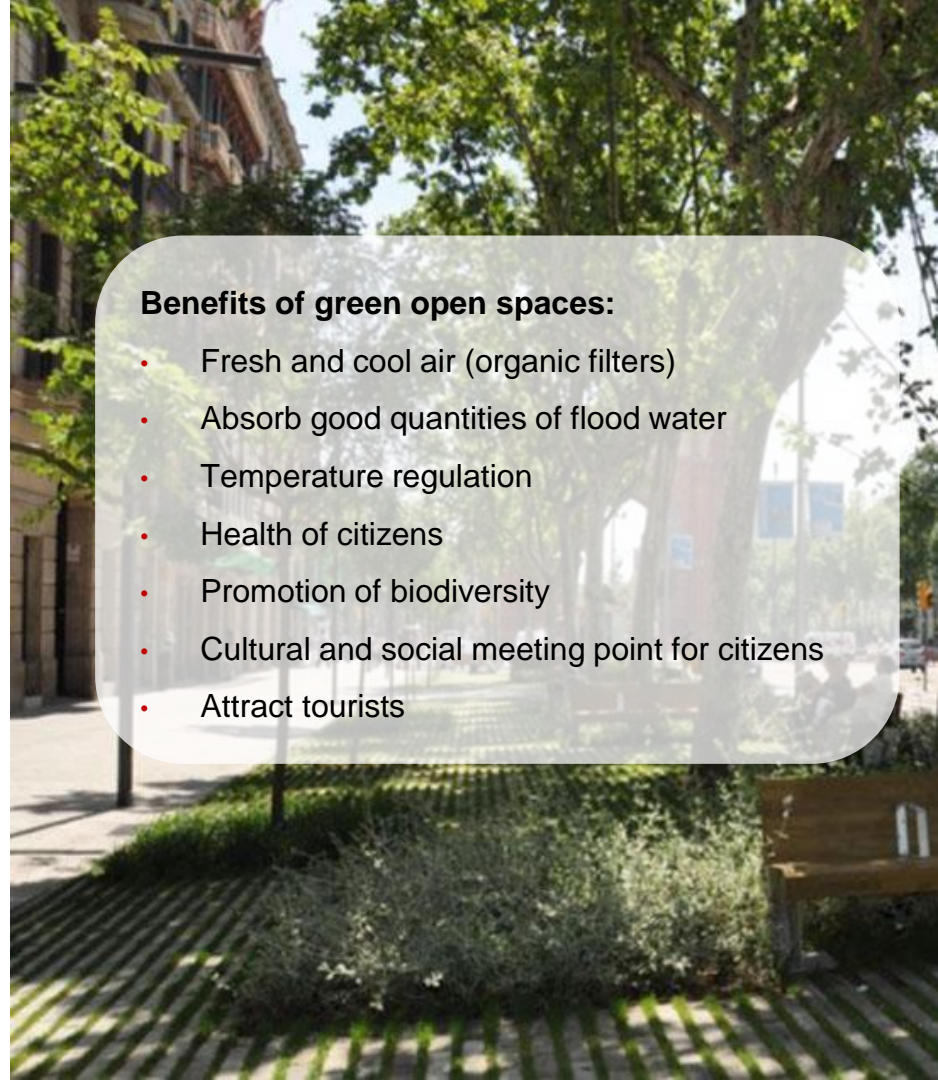
# Green public open spaces

## Urban Resilience perspective:

- Green open spaces have the potential to provide **solutions for reducing urban climate and disaster risks** and add **additional benefits** to cities.
- Green spaces in cities can **include Nature-based Solutions (NbS)**, which contribute to multiple benefits
- Green open spaces can serve as a means for **adaptation to climate related stresses**
- All benefits of NbS adopted in Green open spaces **directly enhance the cities' resilience**

## Benefits of green open spaces:

- Fresh and cool air (organic filters)
- Absorb good quantities of flood water
- Temperature regulation
- Health of citizens
- Promotion of biodiversity
- Cultural and social meeting point for citizens
- Attract tourists



# Green public open spaces

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## Urban Resilience entry point:

- Use tools to **identify** (current and future) **risk-prone areas** (e.g., heat islands, flood-prone areas, etc.) and **public open spaces** which can be developed in green open spaces (parks, playgrounds, etc.)
- **Integrate green public open spaces in urban masterplans**





# Municipal solid waste management

Challenge Lab topic in Coimbatore, Mangaluru, Manikonda

## The Challenge:

- **Inefficient management**, lack of coordination in waste management cycle
- **Non-segregation of waste** (at source, due to lack of citizens awareness, incentives)
- **Lack of data**
- No SOP/regulations in place or not adhered to
- No capacities to absorb the growing amount of solid waste



# Municipal solid waste management

## Urban Resilience perspective:

- Risks entail fires on sanitary landfills, heavy wind leading to littering around landfill sites, soil and water contamination
- Seasonal flooding and heavy rainfalls put even **more stress on deficient waste management cycle** (collection not possible)
- **Clogging of drainage channels exacerbates flood risk**
- Co-benefits for urban resilience can be achieved through more effective waste management, e.g. reduction of health risk



# Municipal solid waste management

## Urban Resilience entry points:

- Improvement of waste segregation and the recycling rate
  - Reduction of water contamination, air pollution, secondary hazards like fires, etc.
  - Needs awareness raising, incentive schemes for waste segregation, marketplace for raw material
- Improved handling of waste to reduce cascading negative effects like health risks as well as flood risks stemming from clogging of water ways
- Improved waste collection system



# Urban (waste) water management

Challenge Lab topic in Coimbatore and Mangaluru

## The Challenge:

- **Managerial deficits** along the entire urban water management cycle
- **Lack of data** availability and governance
- Uncontrolled release of wastewater into environment
- Treatment plants not appropriate to handle entire amount of wastewater
- Limited connection of households to UDG
- High percentage of non-revenue water
- Freshwater demand of growing population cannot be met



# Urban (waste) water management

## Urban Resilience perspective:

- (Waste) water **infrastructure at risk** due to disasters and climate extreme events
- Discharge of hazardous water into environment is a risk to the ecology and urban population
- Unequal distribution/availability of freshwater throughout the year
- **Climate change will amplify water scarcity**

## Urban Resilience entry points:

- Reduction of chemical hazardous waste in sewerage systems
- Reduction of the risk of water shortage by improved re-use of the water
- Improved water storage





**Thank you very much  
for your attention**