

# Student Thesis Competition (STC) Season 5 on “Re-imagining Urban Rivers”

**Assessing the Influence of Vulnerability on Flood Disaster Governance: A study of Informal Settlements in Chennai, India**

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## NEED FOR THE PROJECT:

- Heavy encroachment of Chennai’s floodplains reduces natural flood absorption capacity and leads to urban floods in the entire city.
- Reclassification of waterbodies.



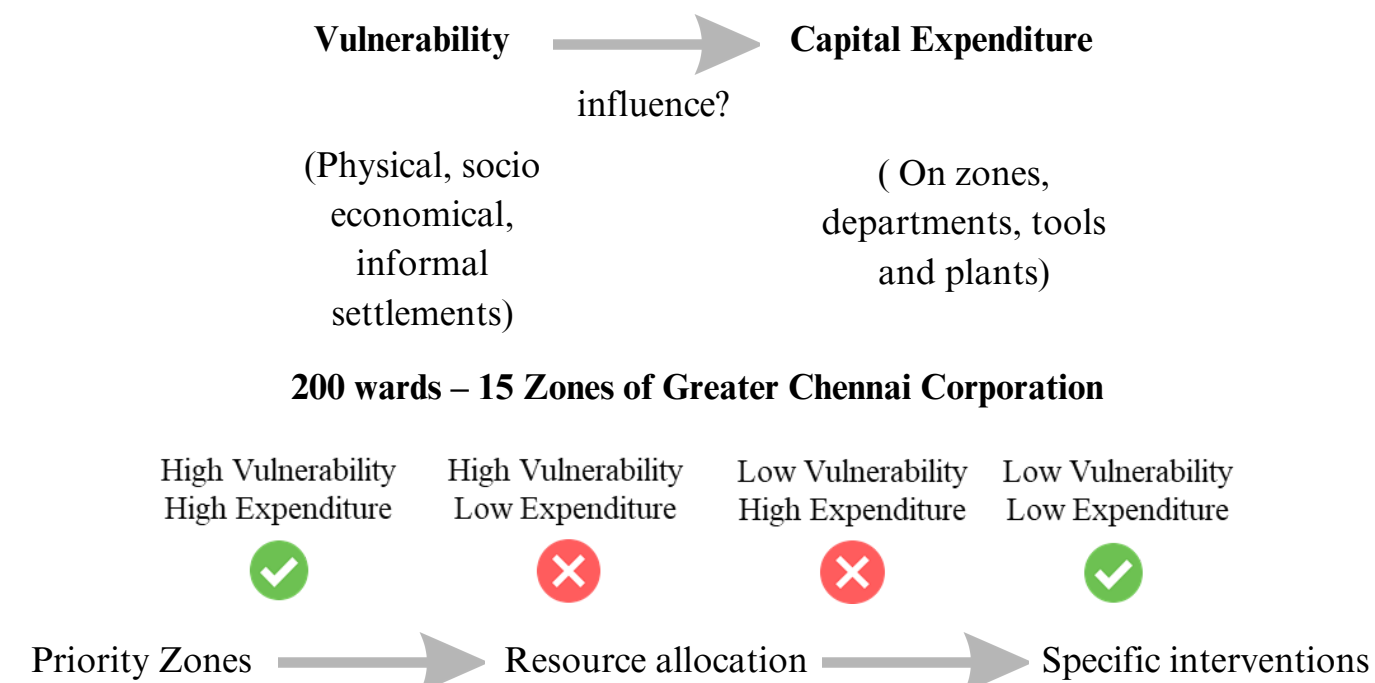
(Image showing long tank, which ran through a stretch of 11 kms is now entirely reclassified)

- Informal settlements are at high risk.
- Existing governance does not effectively integrate floodplain vulnerability.

## AIM OF THE PROJECT:

The aim of the project is to propose integrated strategies for reducing flood risk by studying the interplay between different vulnerability factors and urban governance in influencing flood management in Chennai.

## IDEA OF THE THESIS:



## THESIS APPROACH:

### PARTICIPATORY MODEL:

Community benefits from targeted expenditure + Community actively contributes to urban rivers and flood mitigation

## RESTORING RIVER HEALTH:

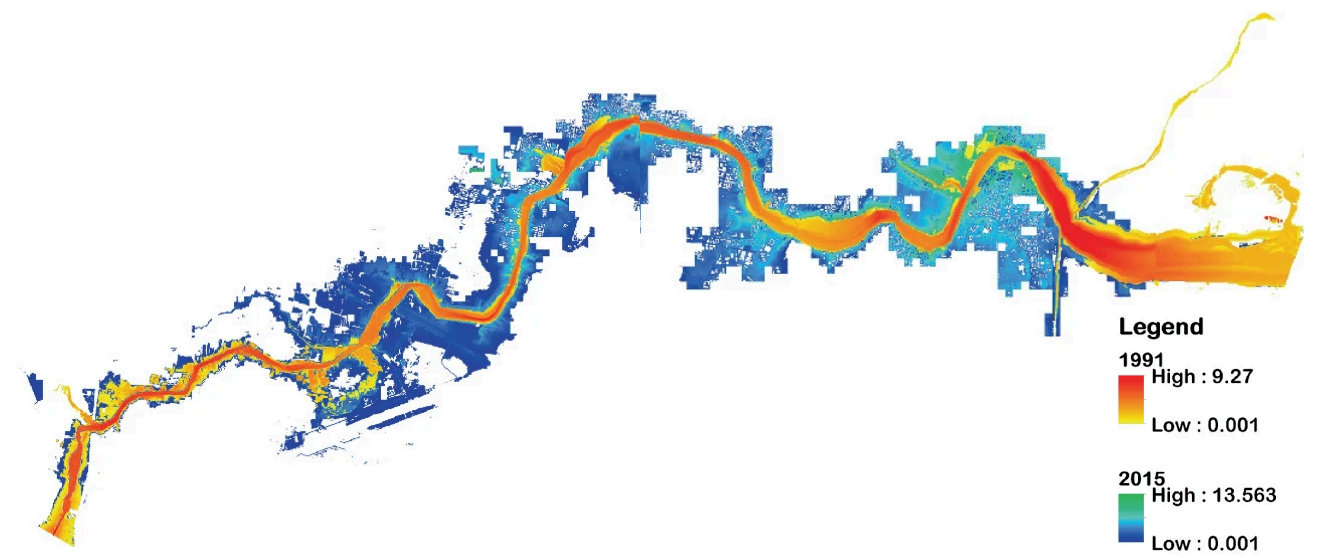
- Identifies and maps encroachments for targeted interventions.
- Sustainable land use planning to restore riverine ecosystems.
- Enhance governance for better flood risk management.
- Improving water retention and recharge capacity of floodplains.
- Reducing sedimentation and pollution levels through proper land use controls.
- Restoring ecological balance by protecting native vegetation and aquatic habitats.
- Enhancing resilience against extreme flood events and climate change impacts.



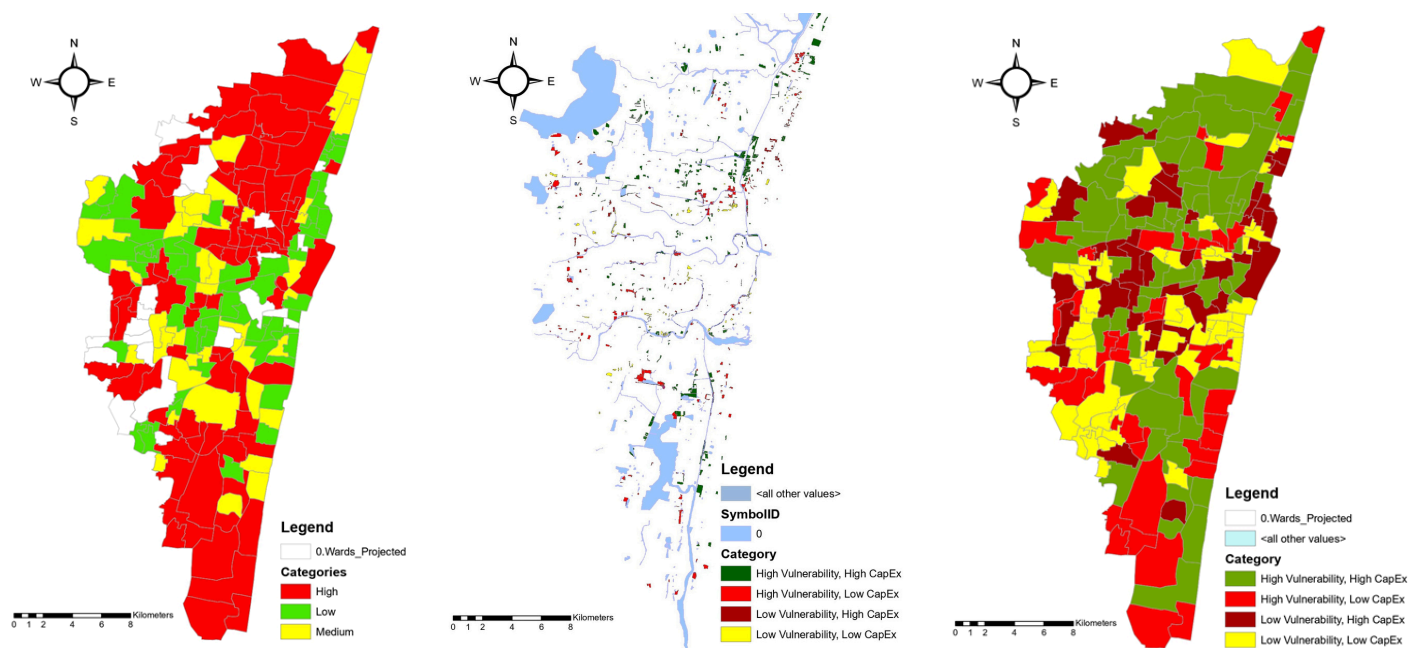
(Image showing an example of restoration of a waterbody)

## UNIQUENESS OF THE PROJECT:

- Floodplain delineation is done to identify high-risk areas.
- Socio economic vulnerability and physical vulnerability mapping is integrated with land use analysis.
- Linking capital expenditure insights with flood resilience
- Integrated approach using GIS and remote sensing for more accurate floodplain assessments.
- Provides a framework for policy recommendations tailored to floodplain management and urban planning.



(Image showing flood inundation map of Adyar river in 1991 and 2015, delineating the floodplain)



(Images showing vulnerability categories in the city ward wise, and the spatial distribution of slums with respect to the waterbodies and the final categorization of wards with respect to capital expenditure and vulnerability)

## CLASSIFICATION:

### 1. High Vulnerability, Low Capital Expenditure (Underfunded risk zones)

These areas face significant flood risks but receive minimal investment. This indicates policy neglect or inefficient allocation of resources.

### 2. High Vulnerability, High Capital Expenditure (Ineffective Investment Zones)

Despite receiving substantial capital expenditure, these areas remain highly vulnerable. This suggests poor planning, ineffective spending, or implementation issues.

### 3. Low Vulnerability, Low Capital Expenditure (Naturally Resilient Zones)

These areas have low flood risk despite receiving minimal funding. This could be due to natural resilience (high elevation, good drainage).

### 4. Low Vulnerability, High Capital Expenditure (Efficient Investment Zones)

These areas receive adequate capital expenditure and show low flood vulnerability, indicating effective urban governance and well-planned infrastructure.

