

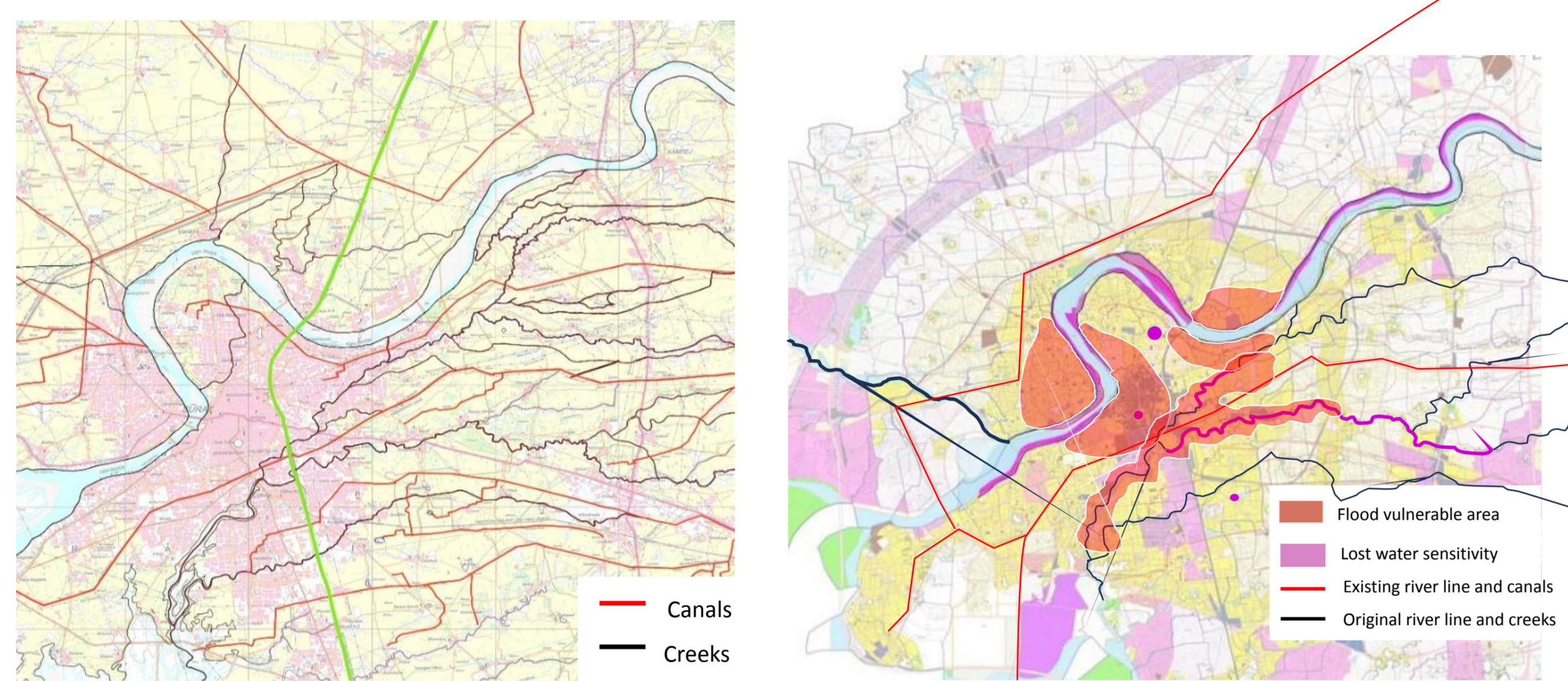
WATER-SENSITIVE DEVELOPMENT APPROACH

SUSTAINABLE URBAN TRANSFORMATION WITH WATER-SENSITIVE PLANNING APPROACH: CASE OF SURAT

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The Surat 2035 plan promotes rapid stormwater removal, putting natural water systems under strain and increasing flood threats. Despite a well-planned storm-water network covering 69% of roads, neighborhoods are affected by recurrent water-logging, pollution, and encroachment. Reduced stormwater percolation causes neglected flooding, exacerbating water-related difficulties. This research pushes for Water-Sensitive Development in Surat, emphasizing its importance. The emphasis is on conserving and improving natural water systems for flood mitigation and long-term progress. This research highlights the national need for Water-Sensitive Development, which ensures cities navigate urbanization and climate change for a sustainable future.

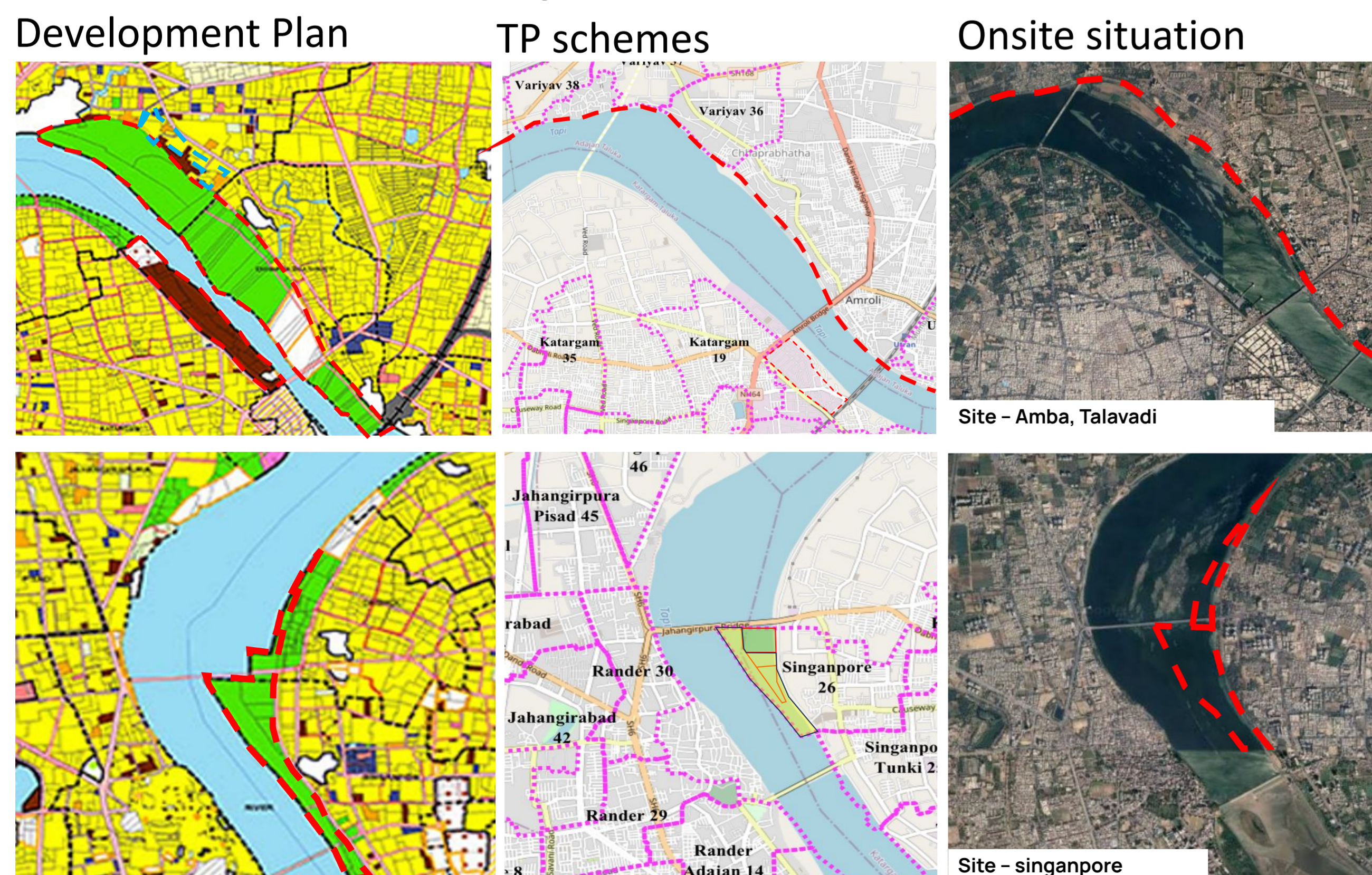
Assessing water sensitivity of Surat DP 2035 with reference to original water system from TOPO sheet 1987



Mapping of original water systems from Topo Sheet

Water in-sensitive gaps found in Proposed DP 2035 of Surat

Review of Urban water systems in DP 2035

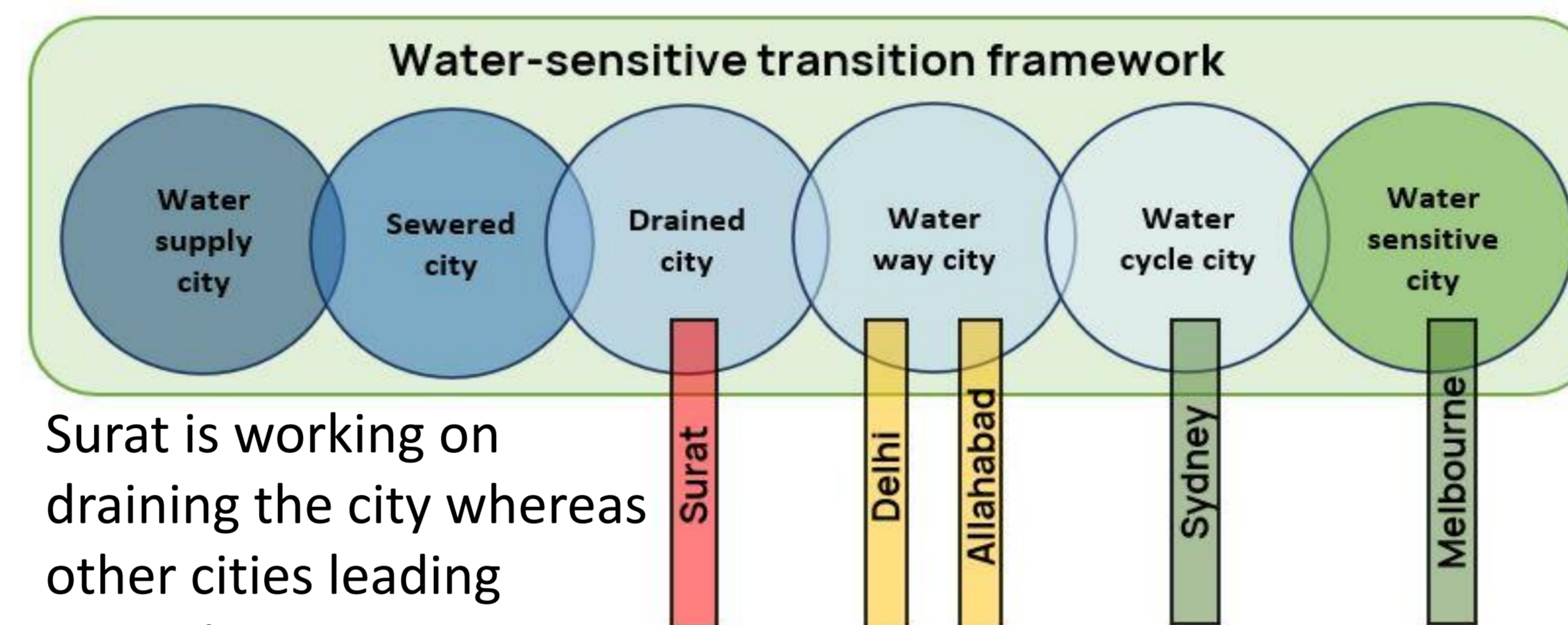


Activities permitted in DP 2035.

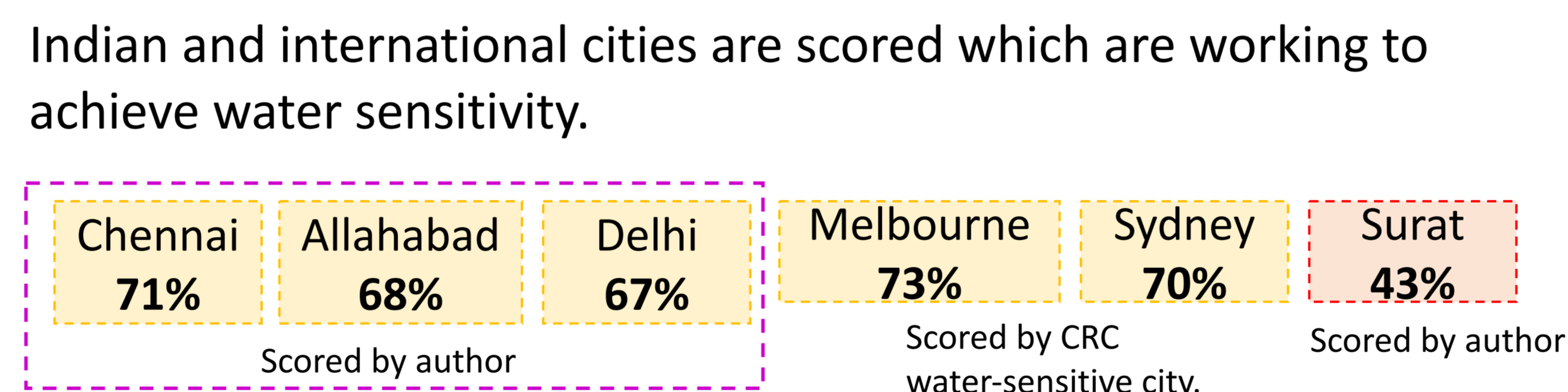
1. Permission for **construction** inside the riverbed area.
2. Conversion of the river area into a buildable land.
3. No buffer between the river and the residential area.
4. Available open spaces around the River are **being developed**.
5. Reduced creek width for embankment and covering of creek.
6. Proposal of solid waste dumpsite along the

These are the types of development being followed in Surat and the city is losing its water sensitivity.

Current water-sensitive performance of Surat



The water-sensitive cities benchmarking score.



Indian and international cities are scored which are working to achieve water sensitivity. If DP 2035 is implemented, then the score will drop. Based on the water-sensitive cities benchmarking index developed by the cooperation research. Surat scored the lowest score and there are few initiatives in Surat's DP 2035 which if executed, the city's existing score may drop, and this indicates that there is a need for effective water management in Surat to protect it from future flooding events and water-sensitive DP can be one of the ways to achieve it.

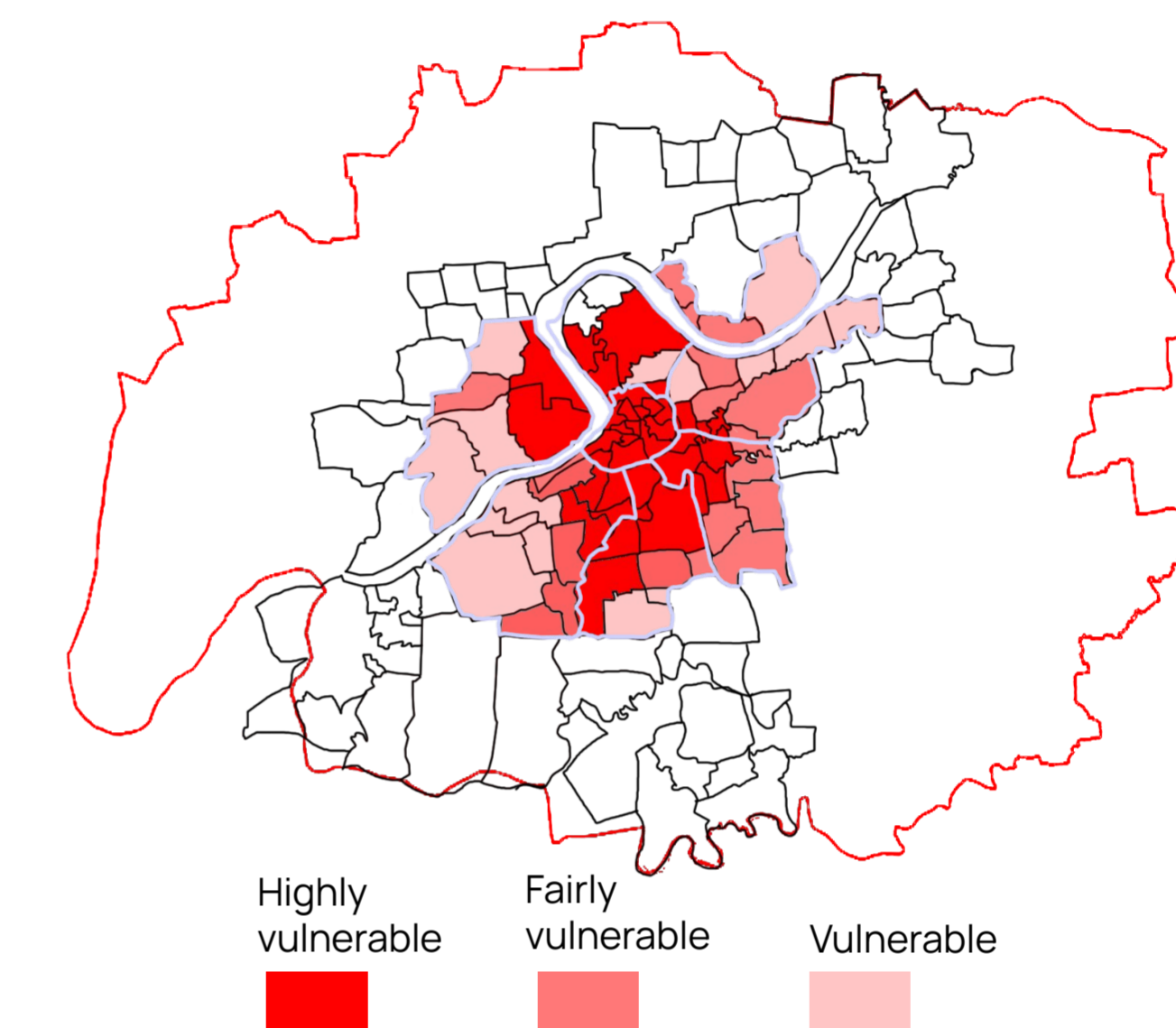
Vulnerability index for selection of pilot area

vulnerability assessment based on 8 parameters for the selection of the most vulnerable area and that area is chosen for the implementation of an action plan that is created for the area-specific problems for making the city water-sensitive and lowering its vulnerability.

Parameters considered for vulnerability assessment.

- High population density
- High Built density
- Flood affected area
- Insufficient stormwater network
- Low lying area with no embankments
- Maximum water logging complaints
- areas where natural stormwater systems are interrupted by human interventions.

Final Vulnerability index and Action plan based on a set of problems



1st Priority - Highly vulnerable

- Rehabilitation and extension of SW. network
- Rehabilitation and extension of embankments
- Floodplain marking & and vulnerability assessment
- Clearing the encroached floodplains and water body buffers.
- Scientific Creek development.

2nd Priority - Fairly vulnerable

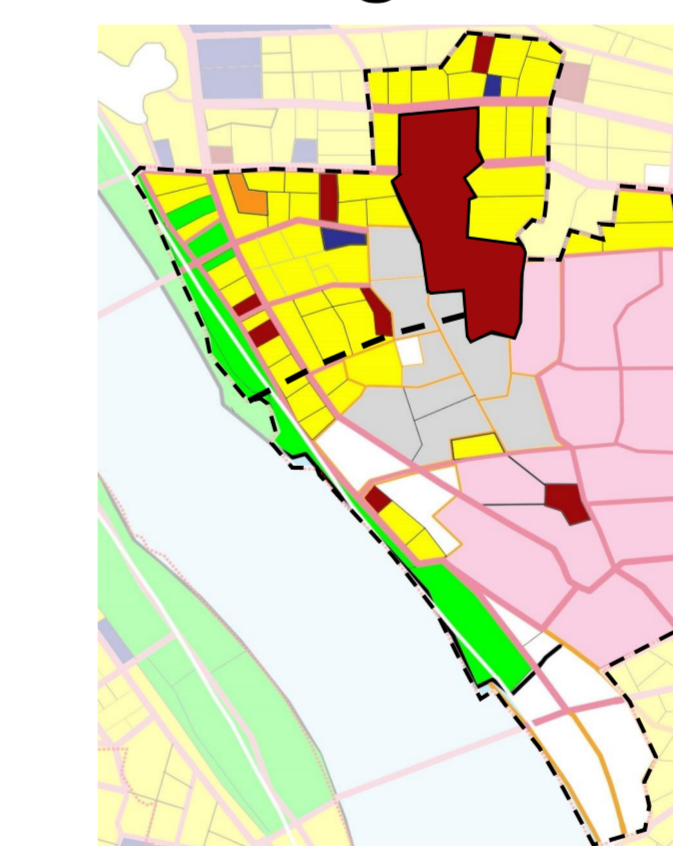
- Mapping GW. protection zones.
- Rainwater harvesting.
- Increasing the city's per capita green space.

3rd Priority - vulnerable

- Water bodies interlinking.
- Room for Tapi project.
- Sustainable Riverfront development.

Onsite implementation of action plan

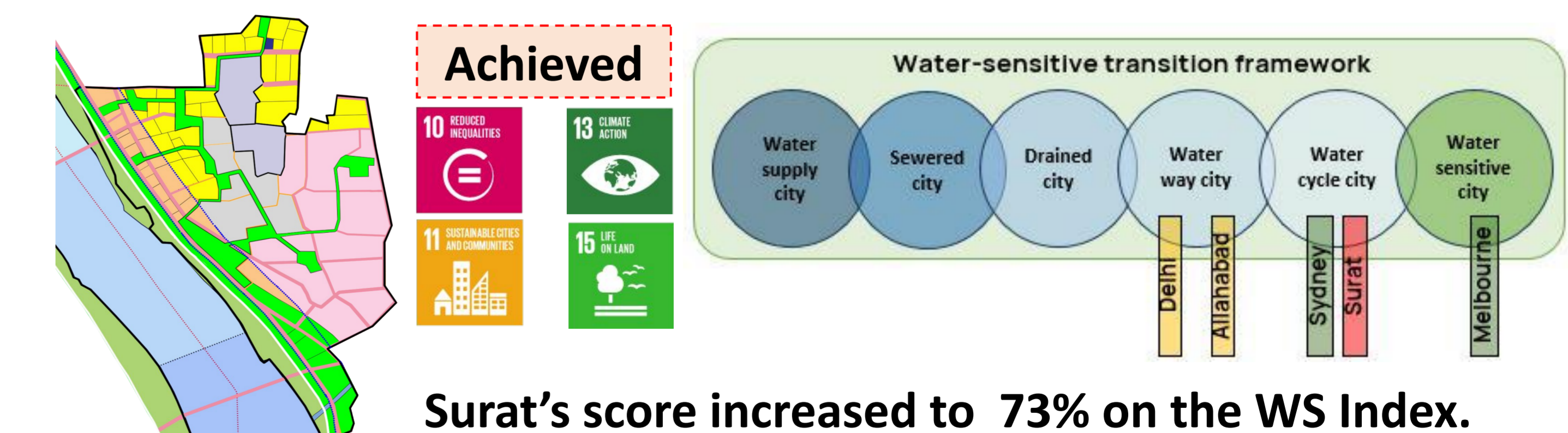
The original situation of site represented in the development plan 2035



Site – Singapore is the most vulnerable area in a city, derived from the vulnerability index

As a complex location, when water enters the site and no provision for removal of this water, surrounding areas will be affected. To prevent that LAP is proposed to demonstrate how the suggested actions will achieve water sensitivity.

The site turned water-sensitive after the implementation of action plan.



Surat's score increased to 73% on the WS Index.

By following this method Surat moved on to the water cycle stage on the transition framework and eventually, it will reach the WS stage.

