

# End-to-End Early Warning System for Ukai and Local Floods in Surat City

( On going project )

## Lead Institution:

TARU Leading Edge Pvt. Ltd.  
Surat Municipal Corporation (SMC),  
Surat Climate Change Trust (SCCT),

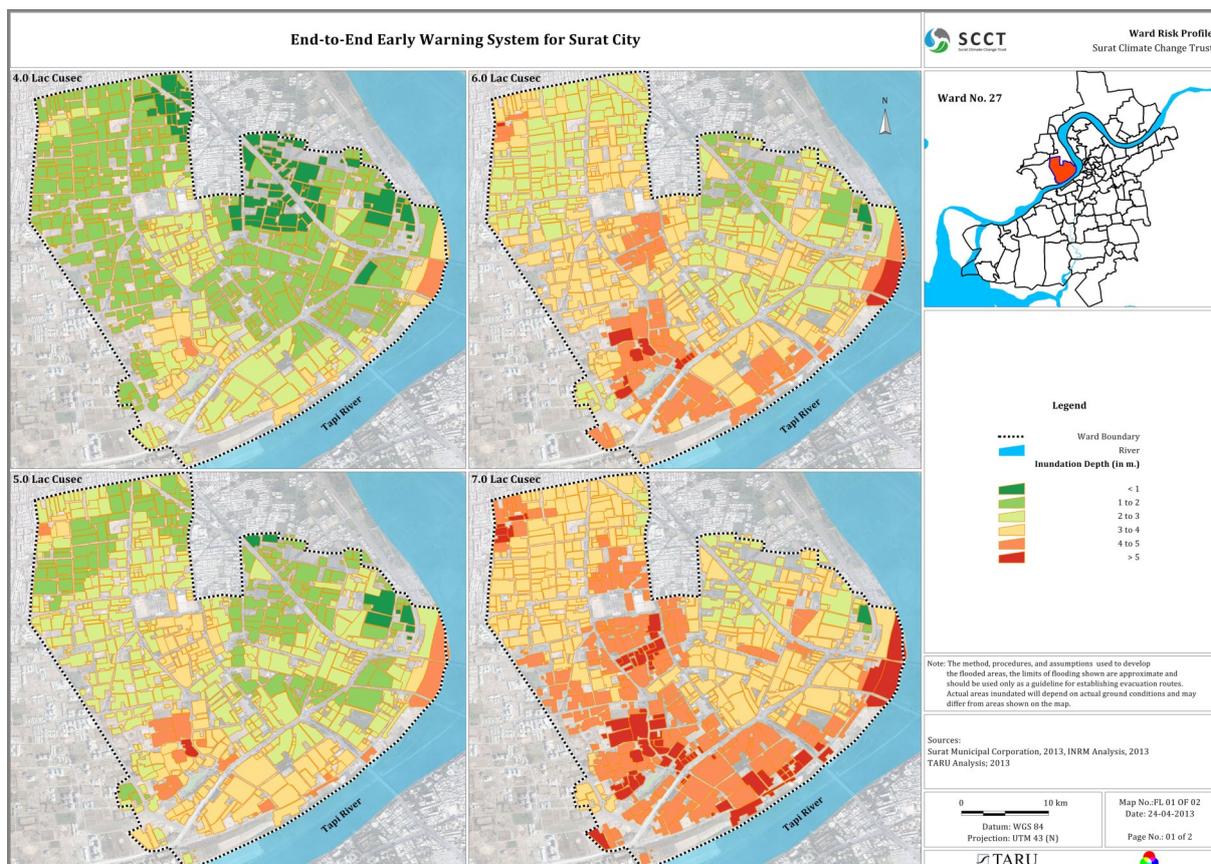
## Partner Institutions:

Southern Gujarat Chamber of Commerce & Industry (SGCCI), Narmada Water Resources, Water Supply & Kalpsar Department (NWRWS), Center of Social Studies (CSS), Sardar Vallabhbhai National Institute of Technology, Surat (SVNIT), Gujarat State Disaster Management Authority (GSDMA) and Integrated Natural Resource Management (INRM, IIT Delhi)

## Project Summary:

Surat is located in the mouth of the Tapi River, with most of its catchment lying in high variability rainfall zone. Since 1970 there has been evidence of increased demand for water (e.g. industrial), developments along flood plain thereby reducing the flow has led to the dam managers with no choice but to maximize the storage within the reservoir during the monsoon season. On the other hand, changes in river regime, siltation and development of other infrastructure on in and on the banks of river (e.g. embankments) has reduced the carrying capacity of the river within the city. During the tail end of the monsoon, when the reservoir is already filled to its maximum capacity, any increase in the inflow due to severe rainfall events within the catchment forces the dam managers to release high volume of water within short period of time. This leads to flooding in Surat.

Over the past two decades, the flood frequency is increasing due to, increased variability of rainfall (extreme events) especially within the Tapi river catchment. Flood levels for a similar flow is also increasing due to embankments, bridges, land filling of flood plain resulting in increasing afflux effects. Following map represents the ward level risk profile.



## Objective:

To set up an End-to-End Early Warning System that will be used for floods caused by extreme precipitation events in Upper and Middle Tapi basin as well as Khadi (tidal creeks) floods. The main objective of this project is to **reduce the intensity of floods and resultant flood damage** to Surat through **improved reservoir operation to minimize peak floods** and systems to enable institutions and society to handle flood emergencies.

## Project Components:

- Developing Management Framework:
  - Surat City Stakeholder Trust
  - Technical Committee (Committee of experts or subject matter specialist to advice and monitor the system during & after project period)
- Climate change informed hydrological and hydraulic modeling
- Early warning and disaster management system
- Information and support for the poor
- Ensuring sustainability of the system beyond project period

## Implementing Approach:

The stakeholders responsible for flood information generation, dissemination, preparedness, warning and management range from national to state to district to city institutions. Earlier there were limited platforms available for members of these institutions to interact before and after floods to share learnings and take integrated actions. In order to establish an end to end warning systems spanning over three states (Tapi catchment extends from Madhya Pradesh and Maharashtra to Gujarat), a trust Surat Climate Change Trust (SCCT) was established with representing members from all key institutions. This trust provided the much required platform for joint deliberation and action.

Currently, SCCT under the aegis of Surat Municipal Corporation (SMC) is anchoring the establishment of end to end warning system in Surat. The establishment of the warning system includes the installation of weather systems, data transfer mechanism from catchment to reservoir to city, development of weather and flow prediction models, improvement of existing flood preparedness and action plans.

## Key Achievements:

- 1) Surat climate change trust has been established with members from national, state and city institutions
- 2) Reservoir inflow and outflow prediction models have been developed
- 3) Ten automatic weather stations and two water level measurement units have been installed across the city to provide detailed weather, tide and flow information
- 4) City level spatial data has been created (in GIS) for flood management
- 5) Flood preparedness, response and mitigation plans are under development.

Hydrological model is developed and tested. During monsoon, this provides advance information (5 day inflow forecasts) to key decision makers. During this year (2013) monsoon, SCCT used this system for predicting floods caused by extreme precipitation events in Middle and Lower Tapi basin as well as Khadi (tidal creeks) floods. Spatial maps to aid in Flood preparedness and management are developed. Capacity building on how to use this information is expected to begin shortly. Also, based on this year's test results, the flood prediction model and the inundation model are being improved.

## Organisation Details:

**TARU Leading Edge Pvt. Ltd** is a private research consultancy organization with an expertise is primarily in six core sectors: Disaster Risk Management & Climate Change, Governance & Institutions, Natural Resource Management, Social Development, Urban Development, and Water, Sanitation & Hygiene. Within these sectors we undertake policy analysis, strategy development, action research, programme design, project management support, assessments and evaluations.



**ACCCRN** was launched in 2008 and is funded by The Rockefeller Foundation as part of their 9-year initiative aimed at building Climate Change Resilience. Climate change resilience is the capacity of an individual, community, or institution to dynamically and effectively respond to shifting climate impact circumstances while continuing to function at an acceptable level. Simply, it is the ability to survive, recover from, and even thrive in changing climatic conditions. ACCCRN works at the nexus of climate change, vulnerable and poor communities, and urbanization.



**Surat Municipal Corporation** is a local self government which has come into being under the Bombay Provincial Municipal Act, 1949. It carries out all the obligatory functions and discretionary functions entrusted by the BPMC Act, 1949 with the mission to make Surat a dynamic, vibrant, beautiful, self-reliant and sustainable city with all basic amenities, to provide a better quality of life.



**Surat Climate Change Trust (SCCT)** is a city level public trust registered under Bombay Public Trust Act 1950 (Registration No. E-7266/Surat) having its office at City Engineer's Office, Surat Municipal Corporation, Main Office, Muglisara, Main Road, Surat, Gujarat – 395 003. Surat Climate Change Trust is promoted by Surat Municipal Corporation (SMC), which comprises of members from various institutions including Surat Municipal Corporation, South Gujarat Chamber of Commerce & Industries (SGCCI), Academic Institutions (SVNIT, CSS) and state level stakeholders such as NWRWS as well GSDMA etc. at Surat.

