

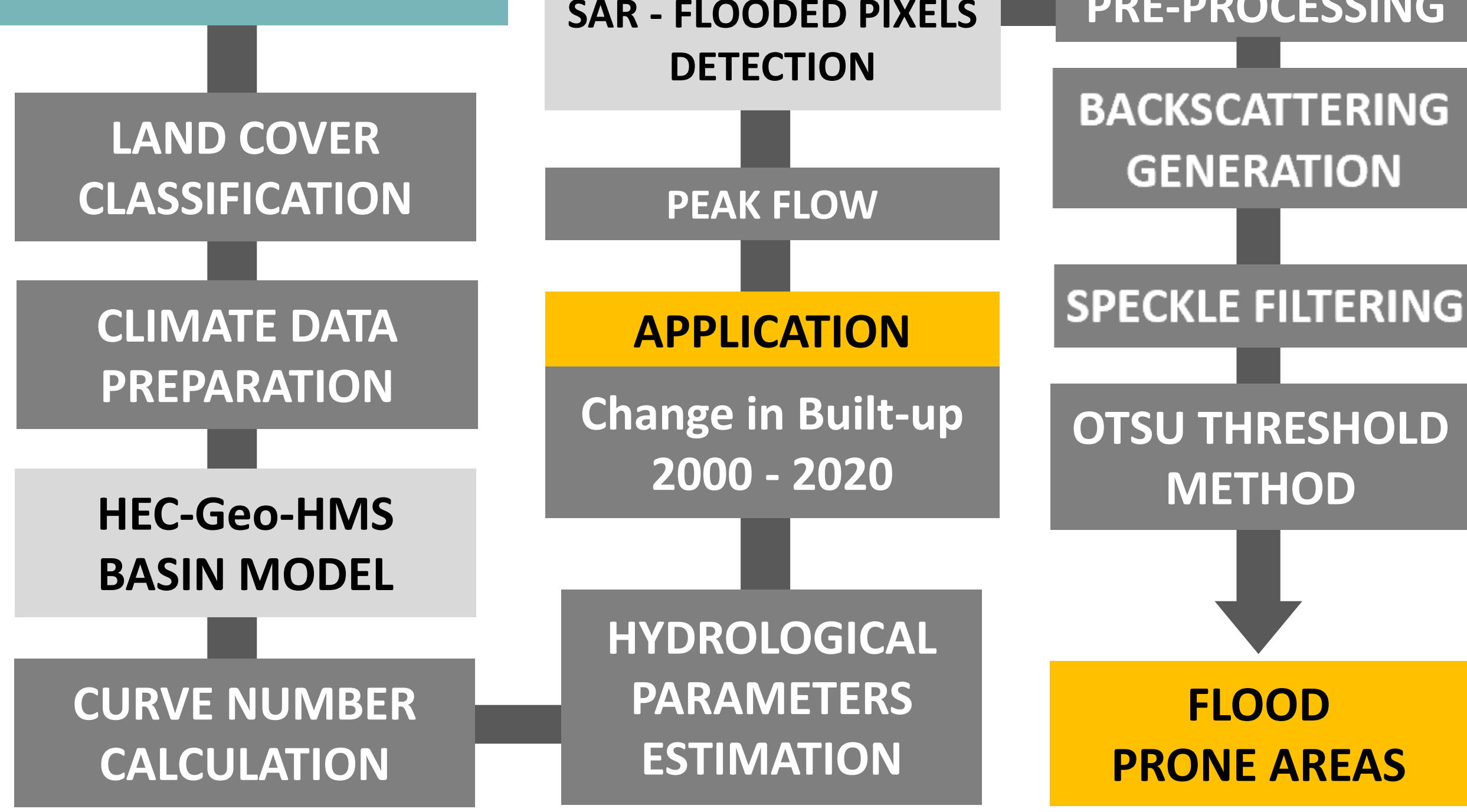
# "URBAN FLOOD RESILIENT CITIES EMPOWERED THROUGH GIS"

## AIM & OBJECTIVES

To build cities resilient towards detecting change in Hydrological processes & mapping flooded regions more effectively.

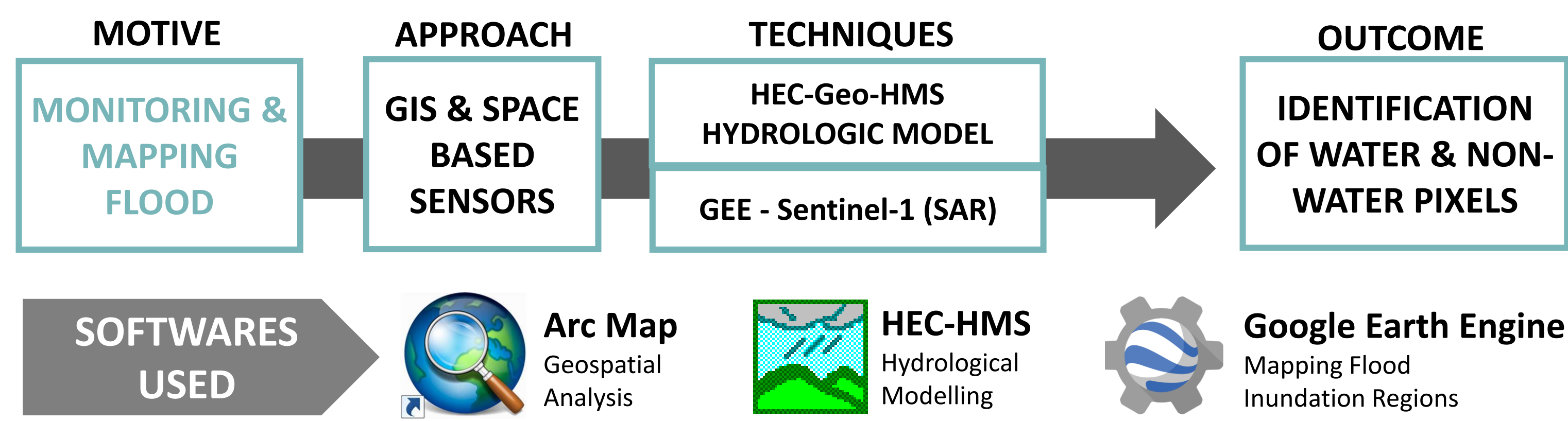
- To analyze the meteorological pattern & temporal change in land cover scenarios of the Vishwamitri watershed.
- To simulate different hydrological parameters within the Vishwamitri watershed & observe change in Peak flow.
- To detect the Flood prone regions in Vadodara city through Synthetic Aperture Radar (SAR) Sentinel-1 data.

## METHODOLOGY

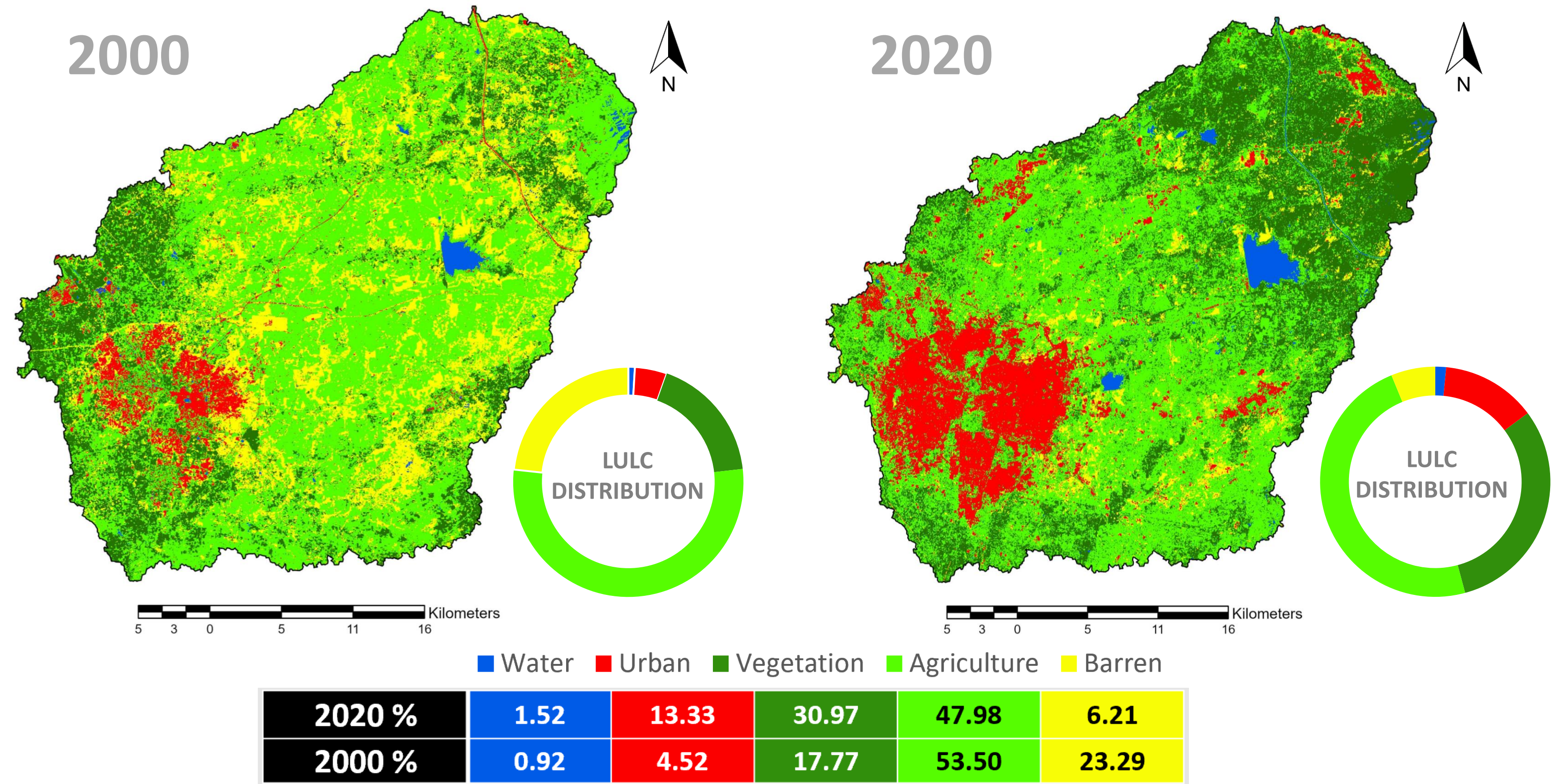


## NEED FOR STUDY

Urban Areas have been identified as a **major factor** that affects the hydrological cycle. Monitoring & mapping the information of water helps in planning and managing water resources as well as flood.

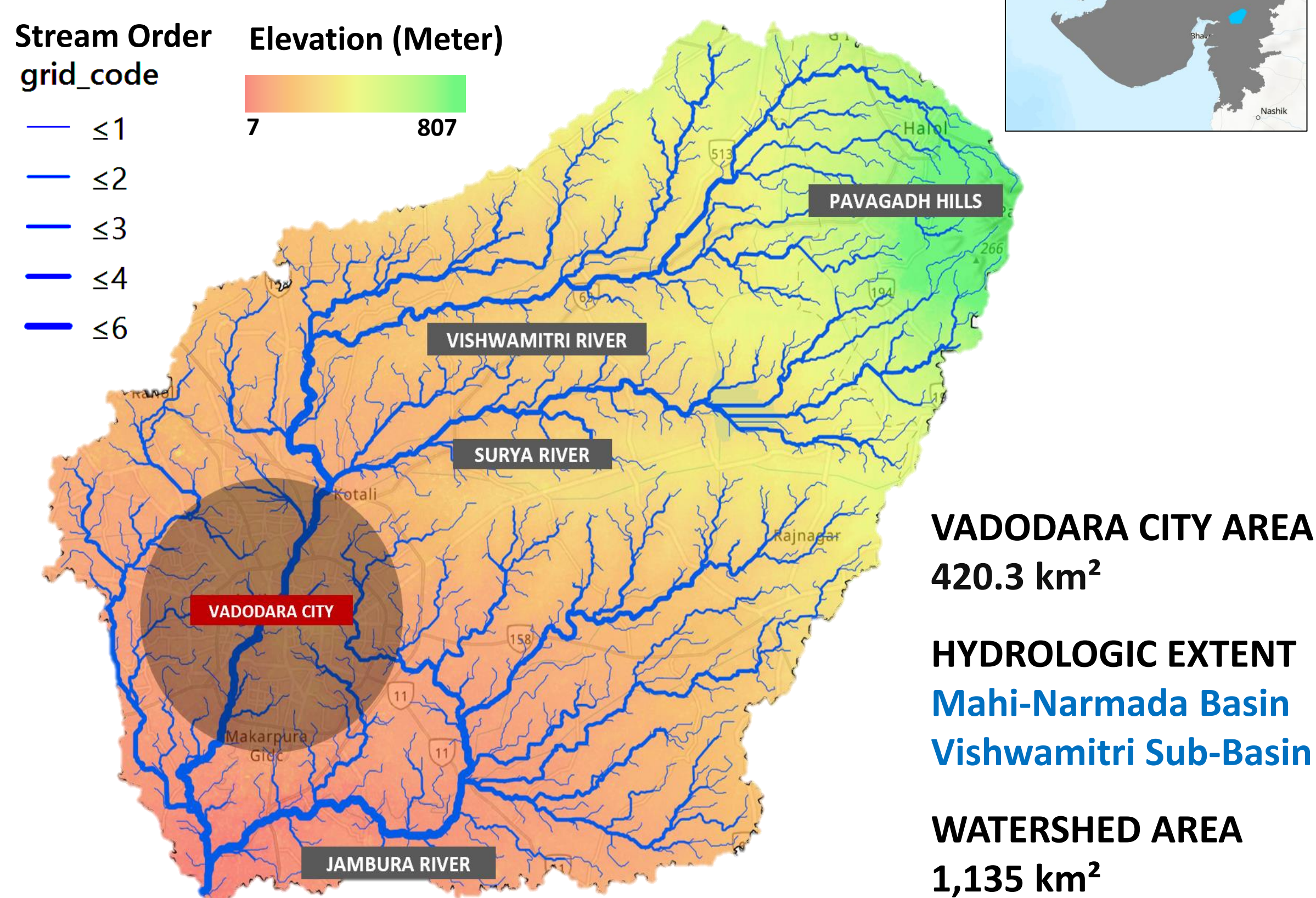


## LAND COVER CLASSIFICATION



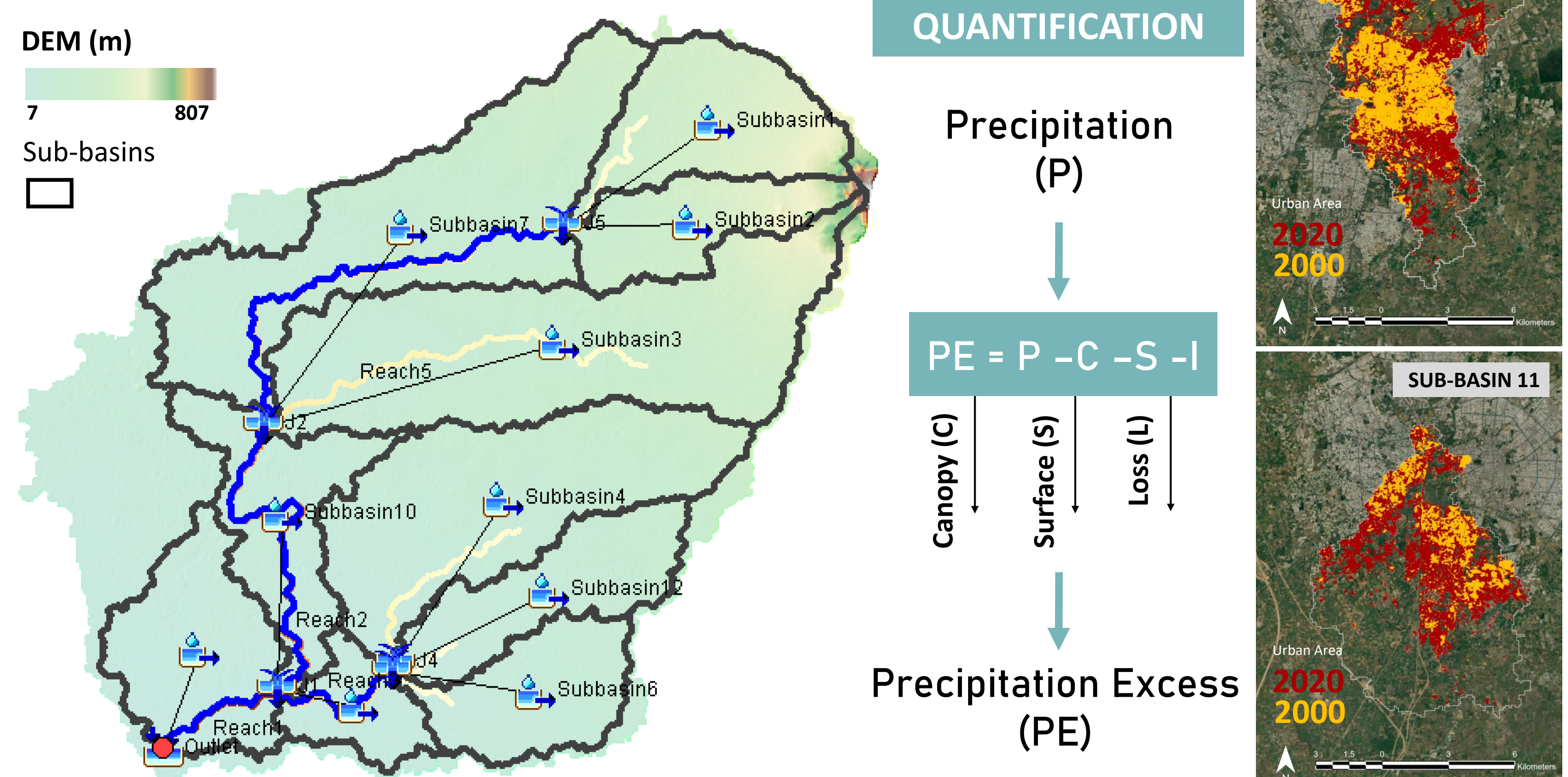
## MORPHOLOGY ANALYSIS

### Natural Hydrology of Basin



## BASIN MODEL DEVELOPMENT

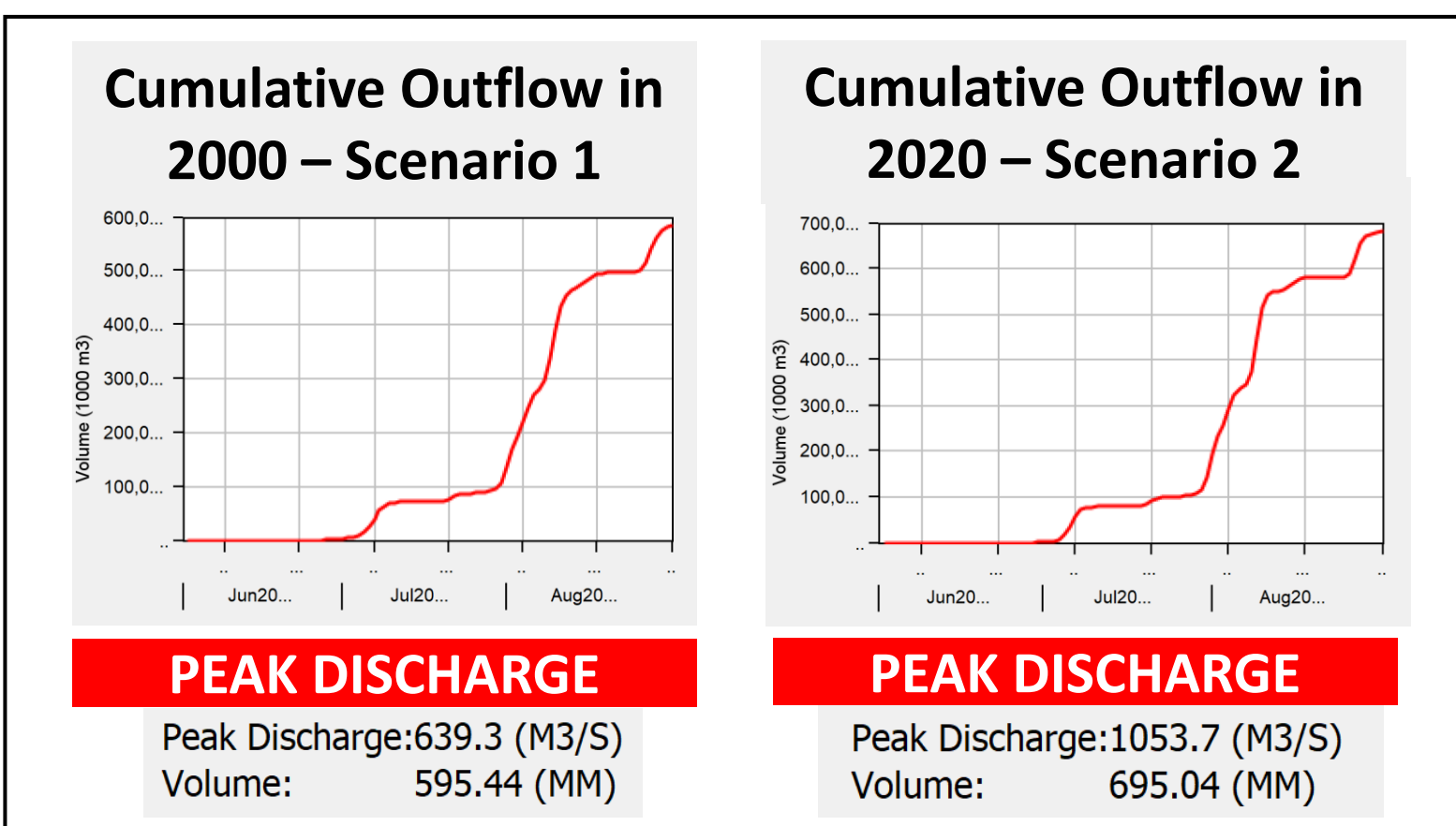
### HEC-Geo-HMS Modelling



## Natural Resources Conservation Service-Curve number

### FUNCTION OF HYDRAULIC SOIL GROUP

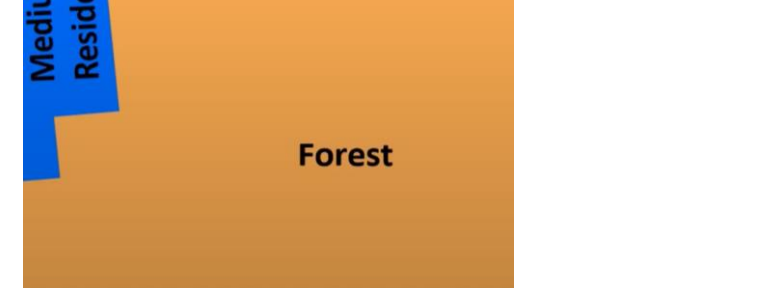
Curve number (CN) is estimated as a function of **hydrologic soil group**, **cover type**, runoff condition, and impervious area in the catchment.



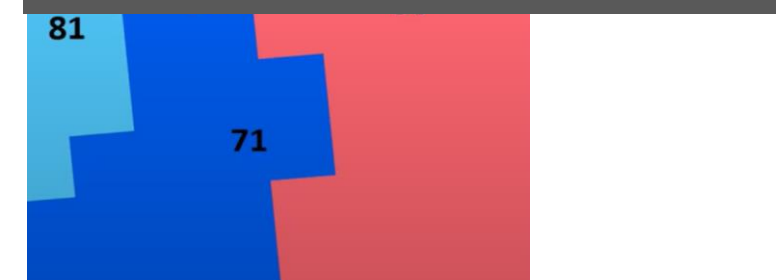
### HYDROLOGIC SOIL GROUP



### LAND COVER TYPE

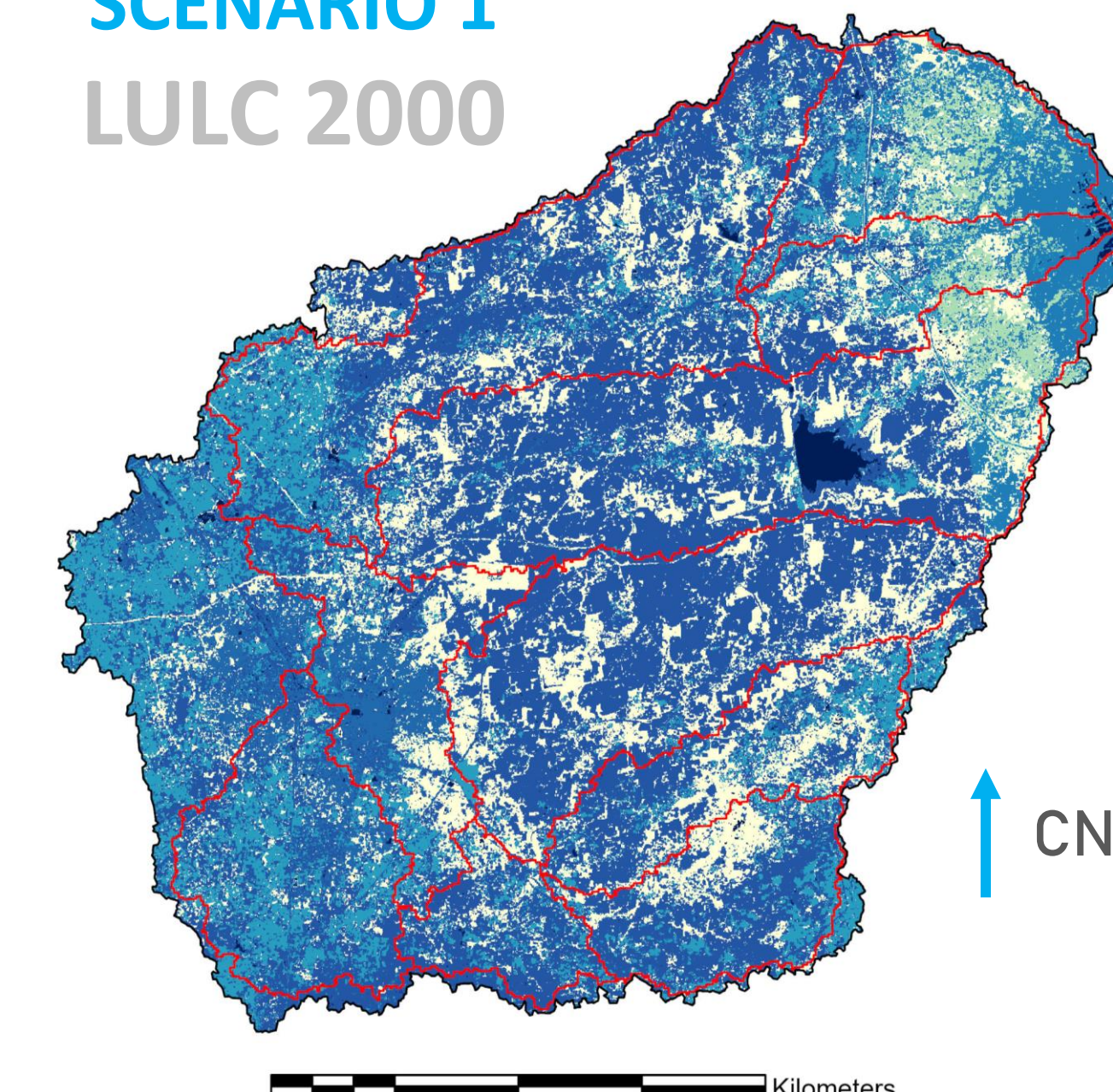


### CURVE NUMBER (CN)

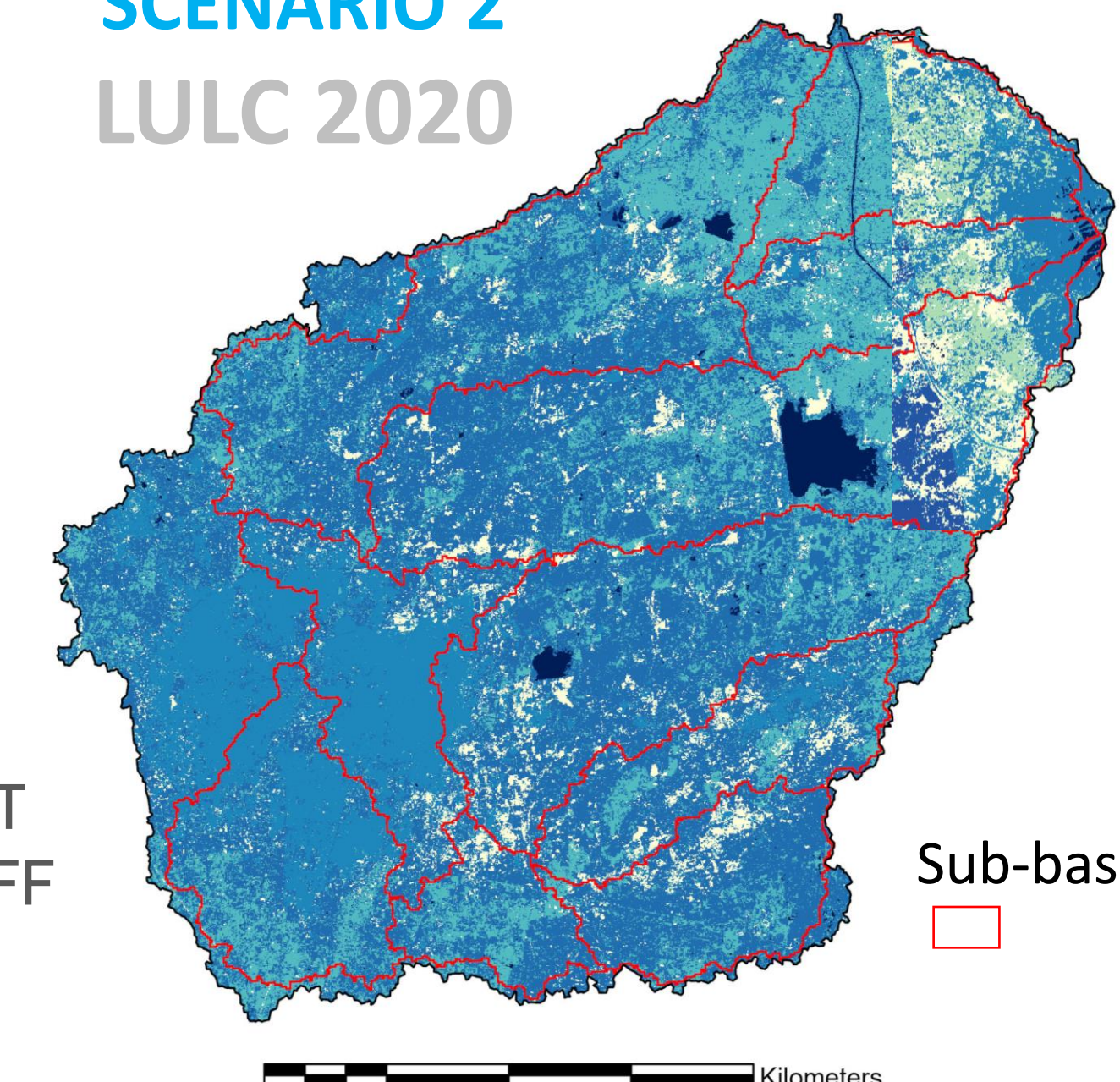


## CURVE NUMBER VALUE

### SCENARIO 1 LULC 2000

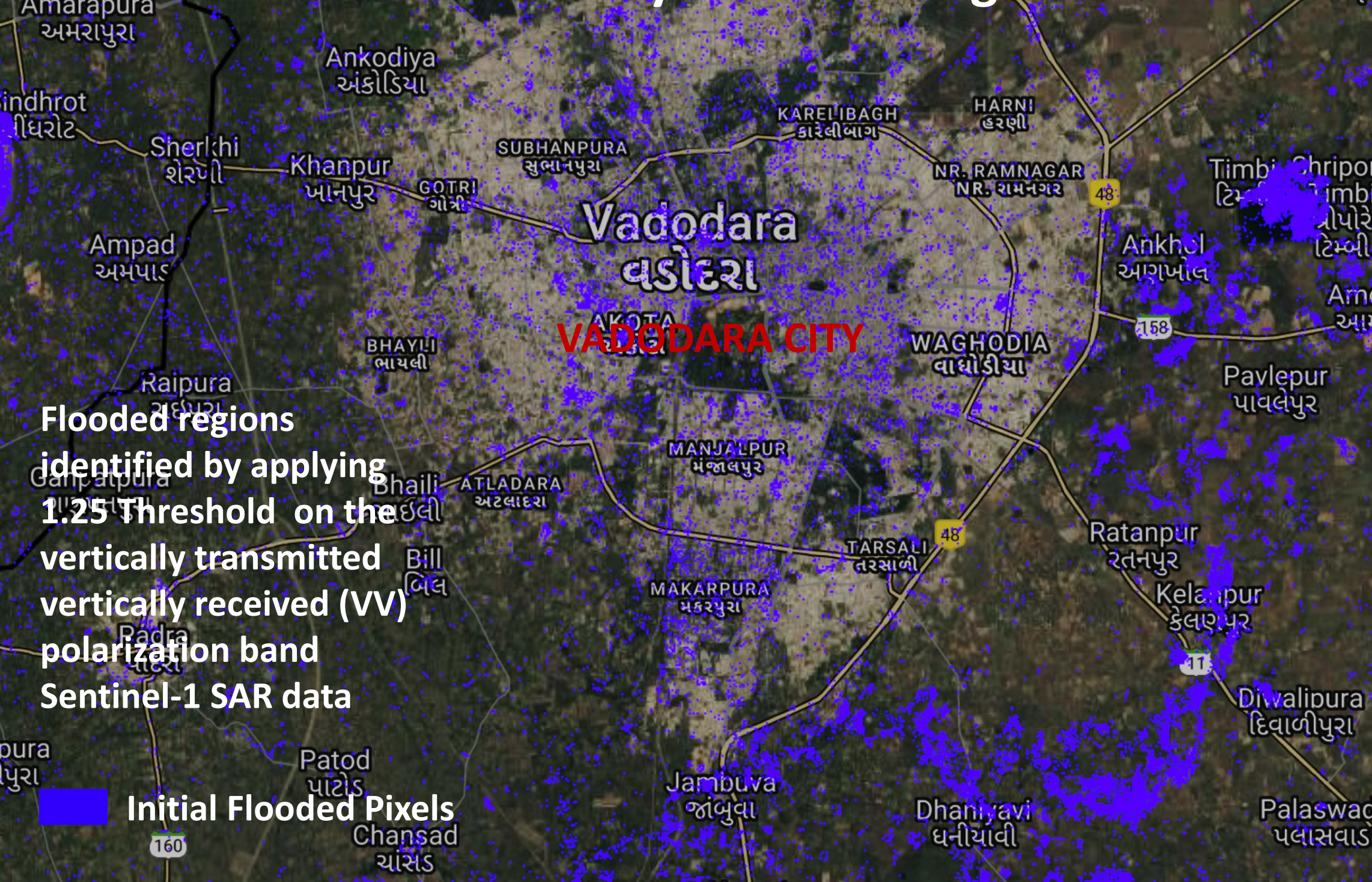


### SCENARIO 2 LULC 2020



## MAPPING FLOODED PIXELS

### Flooded Pixels Estimated by Thresholding SAR Sentinel-1



### CHANGE FROM (2000-2020)



### PRE-PROCESSING OF SENTINEL-1 GRD DATA FOR THRESHOLDING

- Orbit Filtering
- Border Noise Remover
- Multi-look Correction
- Speckle Removal
- False Positives Removal (Shadow Effect)
- Terrain Correction

