

DRAINAGE NETWORK MAP-TAPI BASIN

MAP DESCRIPTION

Methodology:

The Tapi river is the second largest west flowing interstate river. It covers a large area in state of Maharashtra besides areas in the states of Madhya Pradesh and Gujarat. Tapi basin is the northern-most basin of the Deccan plateau and it lies within $72^{\circ}33'$ to $78^{\circ}17'$ E longitudes and latitudes 20° to 22° N. The Tapi river drains an area of 65,145 sq.km. out of which 80% lies in Maharashtra state.

- **Software Used:** - QGIS 3.12.3 with GRASS 7.8.3

- **Data required:-**

- 1) Digital Elevation Model (DEM) - Satellite= Cartosat-1 - Version = Cartodem version-3R1
Downloaded from www.bhuvan.nrsc.gov.in
- 2) Administrative areas (Boundaries) - Downloaded from www.diva-gis.org
- 3) Gis_OSM_Water / Gis_OSM_Waterways shapefile for location understanding
Downloaded from <http://download.geofabric.de>

- **GIS steps used:-**

- i) Download all required data from respective websites and portals.
- ii) Input data in software (QGIS 3.12.3 with GRASS 7.8.3).
- iii) Merge all downloaded DEM into one DEM using merge Tool.
- iv) Use DEM to evaluate watershed basin, flow direction, filled dem using Fill sink (Wang & Liu) SAGA.
- v) Convert watershed basin raster layer to vector layer using r.to vect. Tool.
- vi) Clip the watershed boundary of Tapi river basin from vector layer using clip tool.
- vii) Use strahler order tool to get stream order from 1 to 9, to evaluate drainage direction.
- viii) Use channel network and drainage basin tool to get channel network in catchment area.
- ix) Insert gis_osm_water/waterways vector layer and clip it from basin boundary using clip Tool.
- x) Overlay the layers in following sequence using correct symbology and labels.

Layers :- 1) Administrative boundaries 2) DEM 3) Watershed basin 4) Basin boundary
5) gis_osm_water/waterways

- **Projected coordinates used:-** EPSG: 4326 - WGS84 – Geographic

- **Complexity:** - Nothing more but there are some complexity in running algorithms in QGIS like - high-resolution DEMs are often restricted by feasibility problems (often related to the amount of computer RAM and computational time required).

- **Potential applications:-**

The study reveals that GIS techniques provide to be the potential tool in drainage delineation and analysis various morphometric parameters. The drainage network map found to be useful in river basin evaluation which ultimately provides a tool in watershed management regarding water and natural resources management of study area. GIS techniques for making maps also helpful in understand the various features like infiltration capacity, runoff potential and it can be used to find out yield from the catchment. Drainage network of the basin mapped will surely helpful in assessment of landforms and their process which lead to better planning and management and ground water recharge zone identification of the region in future.