# NATURAL RESOURCES DATA MANAGEMENT SYSTEM (NRDMS)

## MONTHLY ACTIVITY REPORT
### April - July 2025

### Submitted by
### District NRDMS Centre
### Zilla Panchayat,
### Kalaburagi



### Submitted to
### Karnataka State Council for Science and Technology (KSCST)

*Indian Institute of Science Campus,*
*Bengaluru – 560012*

**CONTENT**

## 1. Basic information of the district:

**District Name:** Kalaburagi District
**Division:** Kalaburagi Division
**District NRDMS Centre Establishment Year:** 1993-1994
**Headquarter:** Kalaburagi
**Chief Planning Officer:** Shri SS Mathapathi
**Chief Executive Officer:** Bhanwar Singh Meena IAS
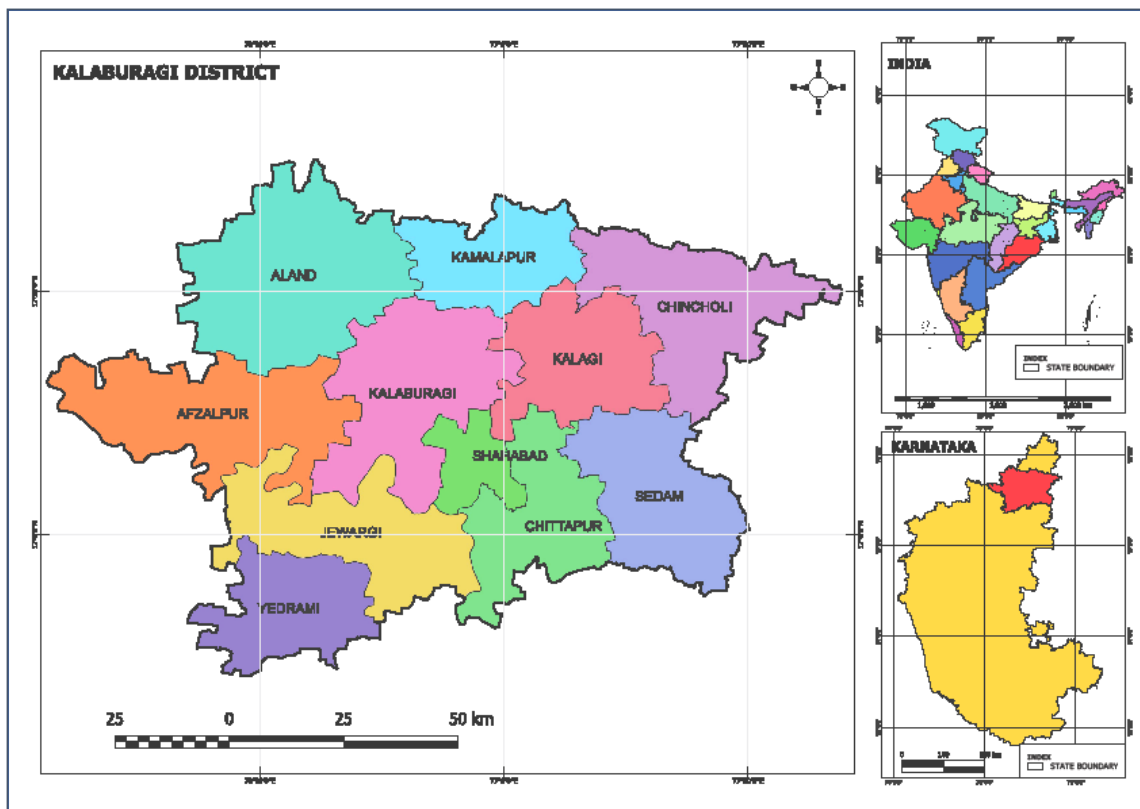


**Map:** Kalaburagi district location map

Kalaburagi (also known as Gulbarga) is a district located in the northern part of the Indian state of Karnataka. The district headquarters is located in the city of Kalaburagi.

 The district is currently divided into 11 taluks, which are administrative subdivisions. The taluks of Kalaburagi district are: Afzalpur, Aland, Chincholi, Chitapur, Kalaburagi, Jevargi, Sedam, Shahabad, Kalagi, Kamalapur & Yedrami. Each taluk is further divided into several villages and towns. Kalaburagi taluk is the most populous and serves as the district headquarters.

Geographically, Kalaburagi district is situated in the Deccan plateau and is characterized by its flat terrain with occasional low hills. The district is spread over an area of 10,990 square

kilometers and is bordered by the districts of Bidar in the north, Yadgir in the east, Raichur in the south, and Bijapur in the west.

The population of Kalaburagi district is approximately 25 lakhs people, according to the 2011 census. The major language spoken in the district is Kannada, although Urdu is spoken by a significant minority.

Agriculture is the main source of livelihood for the people of Kalaburagi district, with crops such as jowar, Tur, and cotton being the major ones.

Kalaburagi is a historical city and has been ruled by various dynasties such as the Chalukyas, the Bahmanis, and the Adil Shahis. It is home to several historic monuments, including the Sharana Basaveshwara Temple, the Khwaja Banda Nawaz Dargah, and the Gulbarga Fort. The district also has several wildlife sanctuaries, including the Great Indian Bustard Sanctuary and the Bhima River Wildlife Sanctuary.

Kalaburagi district of Karnataka state has a semi-arid to arid climate. The district experiences hot and dry summers, with temperatures ranging from 35°C to 45°C, and cool winters with temperatures ranging from 15°C to 30°C. The monsoon season lasts from June to September, with an average annual rainfall of around 600-800 mm.

The agro-climatic conditions in the district are suitable for the cultivation of crops such as pulses, oilseeds, and cotton. The predominant cropping systems in the region are rain fed agriculture and dry land farming. The soil in the district is mostly red to black cotton soil, which is suitable for the cultivation of these crops. The district is home to the Krishna river basin and the Bhima river basin, and irrigation facilities are mainly dependent on these river basins. The district also has a few small reservoirs and tanks, which are used for irrigation purposes.

2.  Geographical Features:
A.  **Location & Area**
        - Located in the northeastern part of Karnataka, bordering Maharashtra and **Telangana.**
        - Spread over an area of 10,951 sq. km, making it one of the larger districts in **the state.**
    - Lies between 17.12°N – 17.46°N latitude and 76.04°E – 77.42°E longitude.

**Table - 1** showing administrative details of Kalaburagi district.   Taluk-wise Administrative Setup

| Sl No | Taluk | No. of Gram Panchayats | No. of Villages | Hoblis |
|-------|-------|------------------------|-----------------|--------|
| 1 | Afzalpur | 28 | 84 | 3 |
| 2 | Aland | 42 | 123 | 5 |

| 3 | Chincholi | 29 | 101 | 4 |
|---|-----------|-----|-----|---|
| 4 | Chittapur | 22 | 95 | 3 |
| 5 | Gulbarga | 28 | 110 | 4 |
| 6 | Jewargi | 25 | 87 | 3 |
| 7 | Kalagi | 18 | 58 | 2 |
| 8 | Kamalapur | 18 | 51 | 2 |
| 9 | Sedam | 27 | 95 | 4 |
| 10 | Shahabad | 7 | 35 | 1 |
| 11 | Yadrami | 17 | 79 | 2 |
| **Total** | - | **261** | **918** | **33** |
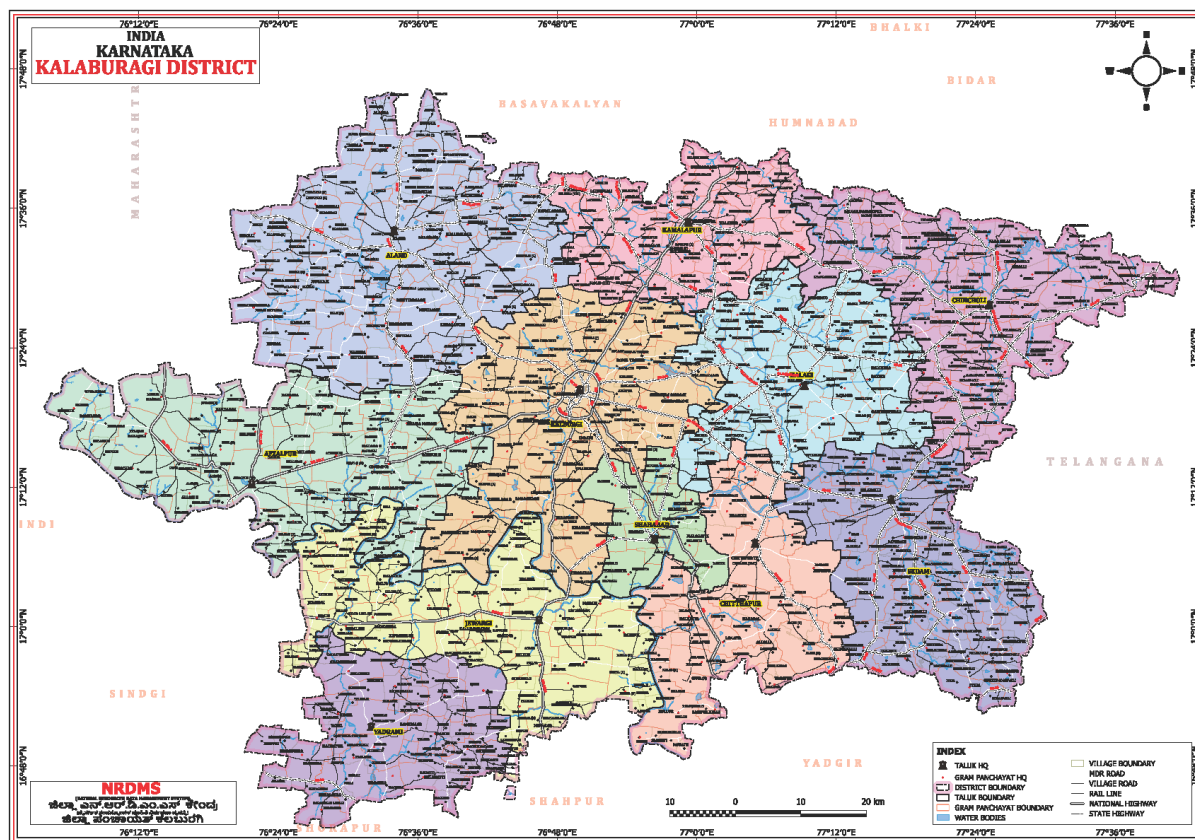


**Map :** District map with administration boundaries and road network.

### B. Topography:

- Situated on the Deccan Plateau with undulating plains and low-lying hills.

- Average elevation: ~454 meters above sea level.

- The land is mostly flat but slightly sloping towards the southeast.



**Map**: Digital Elevation map
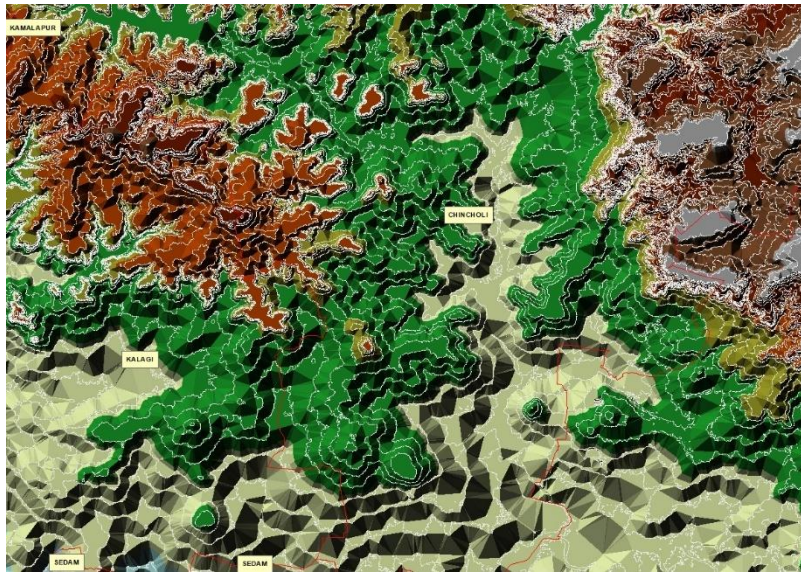
## C. Soils:

- Predominant across the district, this fertile soil is ideal for crops like cotton, groundnut, jowar, wheat, and pulses, which are major agricultural outputs.

- Patches of red soil and lateritic soil found in higher terrain.

## D. Rivers & Water Bodies:

- Major river: Bhima River, flowing west to east; supports irrigation and drinking water.

- Other rivers: Kagina, Amarja, and Bennithora—mostly seasonal.

Kalaburagi district is located in the Krishna River basin and the Bhima River basin. The district is drained by several streams and tributaries of these rivers, which originate from the surrounding hills and flow towards the plains. The major rivers in the district are the Bhima and the Kagina.

The Bhima River is the largest river in the district and originates from the Bhima Shankar hills in Maharashtra. The river enters Kalaburagi district near Sedam and flows for about 94 km within the district before joining the Krishna River in Andhra Pradesh. The river receives most of its water during the monsoon season, and its flow is highly variable depending on the rainfall. The river also provides water for irrigation purposes in the district.

The Kagina River is a tributary of the Bhima River and originates from the hills near Chincholi in the district. The river flows for about 50 km before joining the Bhima River near Jevargi. The river is a seasonal stream and is mostly dry during the summer months.

Apart from the rivers, the district also has several small reservoirs, tanks, and check dams that are used for irrigation and water supply purposes. The groundwater in the district is mostly confined to the weathered and fractured zones of the hard rock formations, and the aquifer is generally shallow and unconfined.
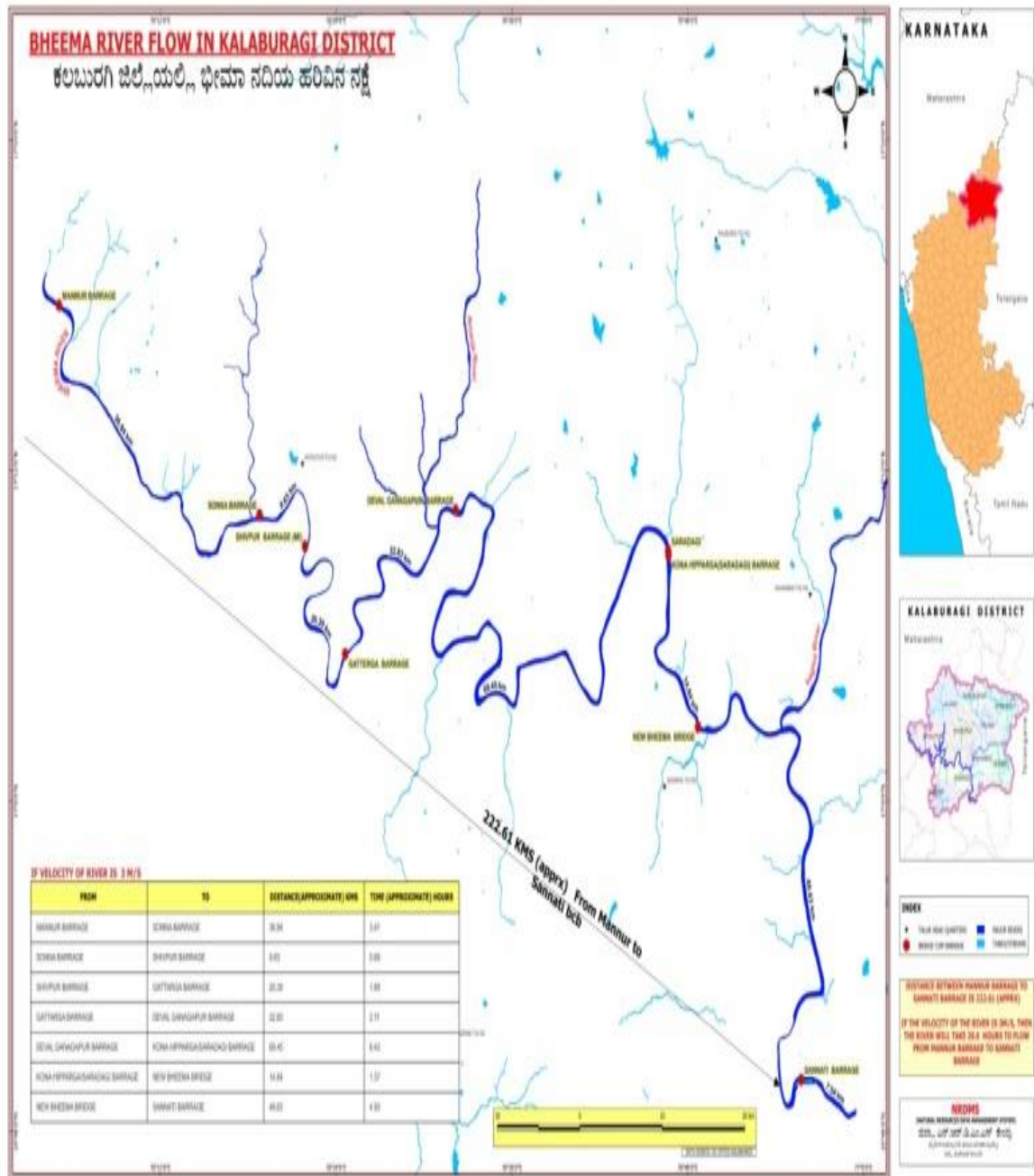


**Map:** Showing Bheema river flow in kalaburagi district. This is the major river in the district.
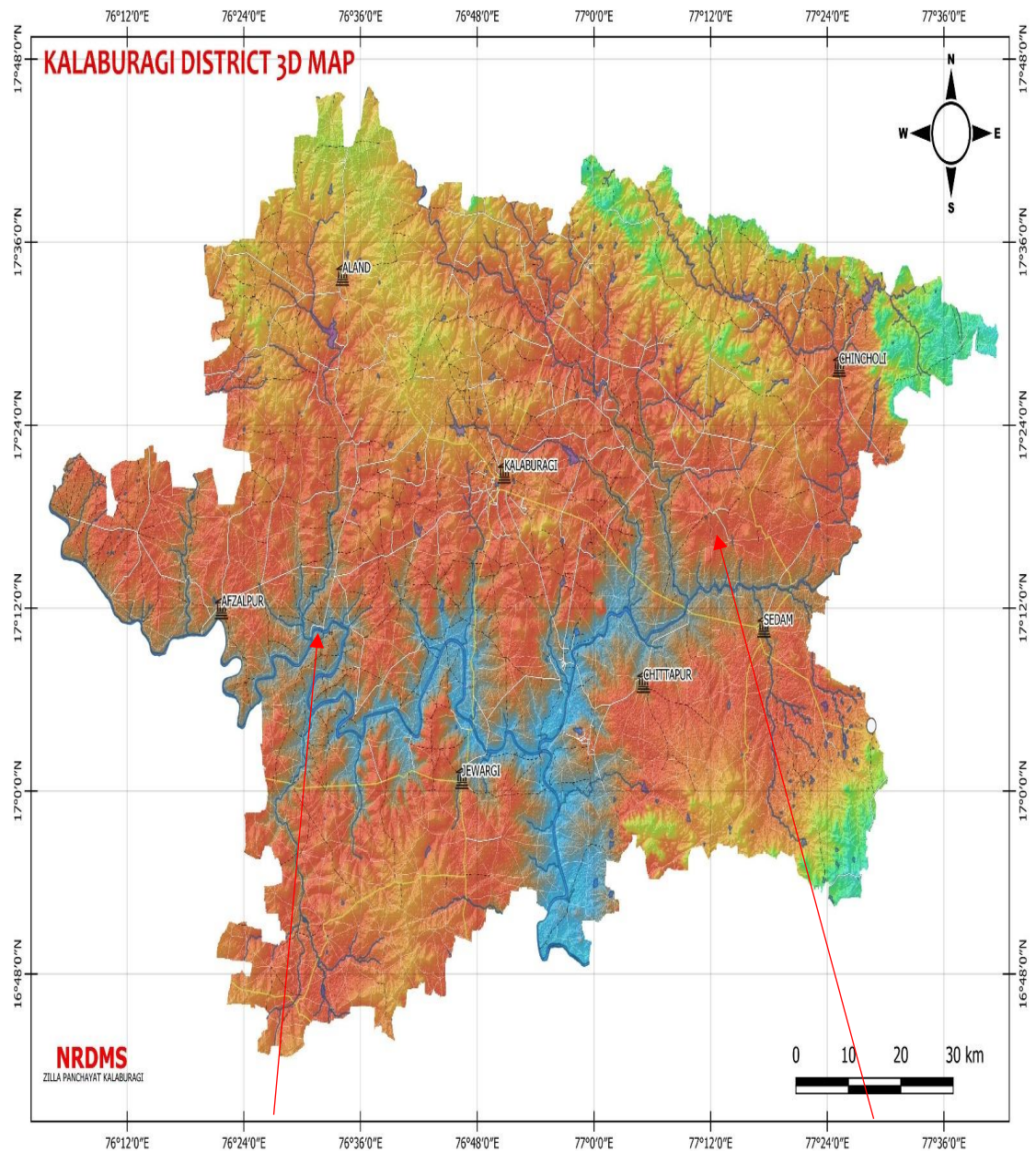
**Map:** 3D map showing hillshade and rivers flowing in the kalaburagi district

Bhima River

Kagina River

**E. Climate:**

- Semi-arid climate with distinct summer, monsoon, and winter seasons.

- Summer: Hot and dry, often exceeding 40°C.

- Monsoon: June–September; average annual rainfall ~777 mm.

- Winter: Mild and dry, temperature drops to around 15°C.

⛈ **Average Annual Rainfall by Taluk**

| Taluk | Normal (mm) |
|---|---|
| Afzalpur | 692 |
| Aland | 713 |
| Chincholi | 963 |
| Chittapur | 771 |
| Kalaburagi | 794 |
| Jewargi | 805 |
| Sedam | 791 |
| Kalagi | 766 |
| Kamalapura | 687 |
| Yadrami | 758 |
| Shahbadha | 758 |

**Table - 2** showing talukwise average rainfall

**F. Mineral Resources:**

- Rich in limestone, quartz, and fuller's earth.

- Presence of cement industries due to limestone availability.

- Minor presence of bauxite and granite.

**G. Seismic & Environmental Aspects:**

- Located in seismic zone II – considered a low-risk zone.

- Prone to droughts due to irregular rainfall and high evapotranspiration.

The **National Resource Data Management System (NRDMS)** is a program initiated by the Government of India to facilitate the collection, analysis, and dissemination of spatial and non-spatial data for effective planning and management of natural and man-made resources.

In **Kalaburagi District**, the NRDMS Centre was established to provide **GIS-based solutions and decision support systems** for district administration, line departments, and local governance bodies. The centre focuses on integrating modern technologies such as **Remote Sensing, Geographic Information Systems (GIS), and database management** to strengthen planning and development activities.

**Major activities of NRDMS in Kalaburagi District**

1. **Support to Revenue Department**
   o Updating administrative boundaries (Taluks, Hoblis, Villages) and cadastral maps.
   o Providing spatial data for land records, land use planning, and revenue management.
   o Identifying flood-prone villages and areas for emergency response.

2. **Support to Police Department**
   o GIS-based mapping of police jurisdictions, stations, and resources.
   o Facilitating crime mapping and location analysis for better law enforcement planning.
   o Integration of police data with other administrative resources for rapid decision-making.

3. **Support to All Line Departments of Zilla Panchayat**
   o Water Supply & Irrigation: Prioritization of rural water supply projects, rejuvenation of minor irrigation tanks, watershed planning.
   o Health & Education: Mapping of schools, hospitals, health centers, and monitoring of service delivery.
   o Urban & Rural Infrastructure: Mapping roads, public utilities, and village assets for efficient planning and resource allocation.
   o Tourism & Environment: GIS-based monitoring of tourist spots, forest cover, natural resources, and environmental planning.

4. **Disaster Management and Emergency Planning**
   o Flood-prone area mapping and identification of relief centers.
   o GIS-based decision support for rapid response during natural calamities.

5. **Capacity Building & Outreach**
   - o Training Zilla Panchayat staff and line department officials in GIS and spatial data applications.
   - o Conducting science outreach activities in schools with KSCST support.

6. **Decision Support & E-Governance**
   - o District-wide resource and infrastructure profiling for integrated planning.
   - o Support for election management systems and administrative planning.

The NRDMS Centre in Kalaburagi acts as a central hub for resource management and planning, providing critical support to Revenue, Police, and all line departments of the Zilla Panchayat, ensuring data-driven governance and efficient service delivery.

**We use Geospatial Data from various National/State Survey and Mapping Organisations**

✓ **Survey of India – Base maps (Scale 1:50k)**



✓ **NRSC/SRSC - Thematic maps (Scale 1:50k, 1: 25k,1: 10k)**
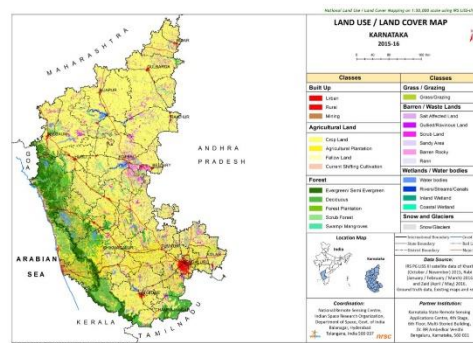


✓ **Survey Settlement and Land Records - cadastral (Scale 1: 7920)**
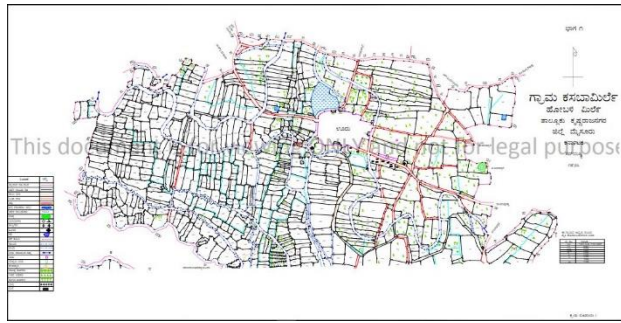
- ✓ **Non-spatial (Census & MIS of line departments)**
- ✓ **GSI/NBSSLUP/FSI etc. – Specific themes**
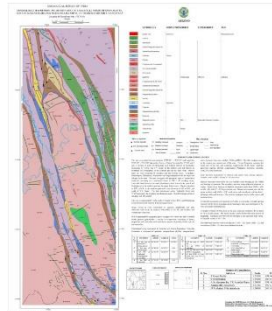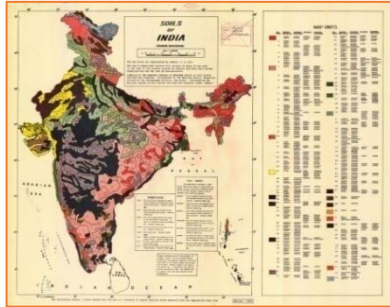


- ✓ **POI/Asset mapping – (line departments & NRDMS)**
- ✓ **Satellite imageries/GPS – being used for updation and data capture**
- ✓ **KSNDMC/IMSD – Climate/weather etc.**
- ✓

**Major Databases Maintained at NRDMS Centre Kalaburagi**

- **Natural Resources**
  - Drainage
  - Waterbody
  - Geology
  - Soil
  - Lineaments
- **Thematic Data**
  - Geomorphology
  - Land Use/Land Cover (LULC)
  - Slope
  - Groundwater prospectus
  - Lithology, etc.
- **Administrative Boundary**
  - District
  - Taluk
  - Hobli
  - Gram Panchayat
  - Village
  - City / Towns
  - Wards
- **Constituency Boundary**
  - LAC (Legislative Assembly Constituency)
  - PC (Parliamentary Constituency)
  - Zilla Panchayat
  - Taluk Panchayat
  - Gram Panchayat
- **Watershed Levels**
  - Basin
  - Catchment
  - Sub catchment
  - Watershed
  - Sub watershed
  - Micro watershed
- **Transportation**
  - National highway
  - State Highway
  - MDR Roads
  - Railway

- **Rural drinking water supply**
  - Borewell locations
  - Wells, Kalyani's and Kunte locations
  - Jack well locations
  - overhead tank locations
- **Police department infra**
  - Police Stations jurisdiction
  - Commissionerate jurisdiction
  - Police station locations
  - Beat jurisdictions
  - Traffic police stations jurisdictions
- **Spatial Information on Infrastructure**
  - Hostels
  - Schools
  - Colleges
  - Anganwadi
  - MI tanks
  - PRE tanks
  - Cold Storages
  - Religious place's locations
  - Major industry's locations (cement factories, sugar factories)
  - Major quarries
  - Check dams, BCB and Farm Ponds locations etc.
- **Headquarters**
  - District
  - Taluk
  - Hobli
  - Village Settlements
  - TP (Town Panchayat)
  - ZP (Zilla Panchayat)
  - Tanda's locations
- **Health Department & Veterinary Department**
  - Government hospitals
  - UPHC locations
  - PHC, CHC &Subcenters Locations
  - Animal Husbandry clinics

| | |
|---|---|
| — Village Roads<br>— Residential Roads (City & towns) etc. | — PHC & CHC Jurisdictions<br>— Private clinics and hospital's locations<br>— Veterinary Hospitals<br>— Veterinary Dispensaries<br>— Veterinary Clinics |

1. Key Activities Undertaken during April 2025 to JULY 2025

**ACTIVITY 1 :Surveillance Camera Locations Identified Using GIS in Chowk Police Jurisdiction**

| Title of work | Surveillance Camera Locations Identified Using GIS in Chowk Police Station Jurisdiction |
|---|---|
| **Department Name** | Police Department Kalaburagi |
| **Objectives** | To identify and map strategic locations for installing surveillance cameras within the Chowk Police Station jurisdiction using GIS tools. This aims to enhance public safety, improve crime monitoring, and support effective police patrolling through data-driven spatial analysis. |
| **Data Used** | 1. Base map of Kalaburagi city<br>2. Chowk Police Station jurisdiction boundary<br>3. Crime hotspot data (if available)<br>4. Road network and junction points<br>5. Key public places and sensitive areas (markets, schools, banks, etc.)<br>6. Satellite imagery / Google Earth<br>7.QGIS software for mapping and analysis |
| **Data Process** | Jurisdiction boundaries and road networks were overlaid in QGIS. Key locations such as road intersections, crowded zones, and past crime hotspots were identified using spatial analysis. Suitable points for camera installation were selected based on visibility, accessibility, and coverage |
| **Type of Data Provided** | PDF & JPEG File. |

**Map:** Satellite image showing the suggested surveillance camera locations

SURVEILLANCE CAMERA LOCATIONS
KALABURAGI
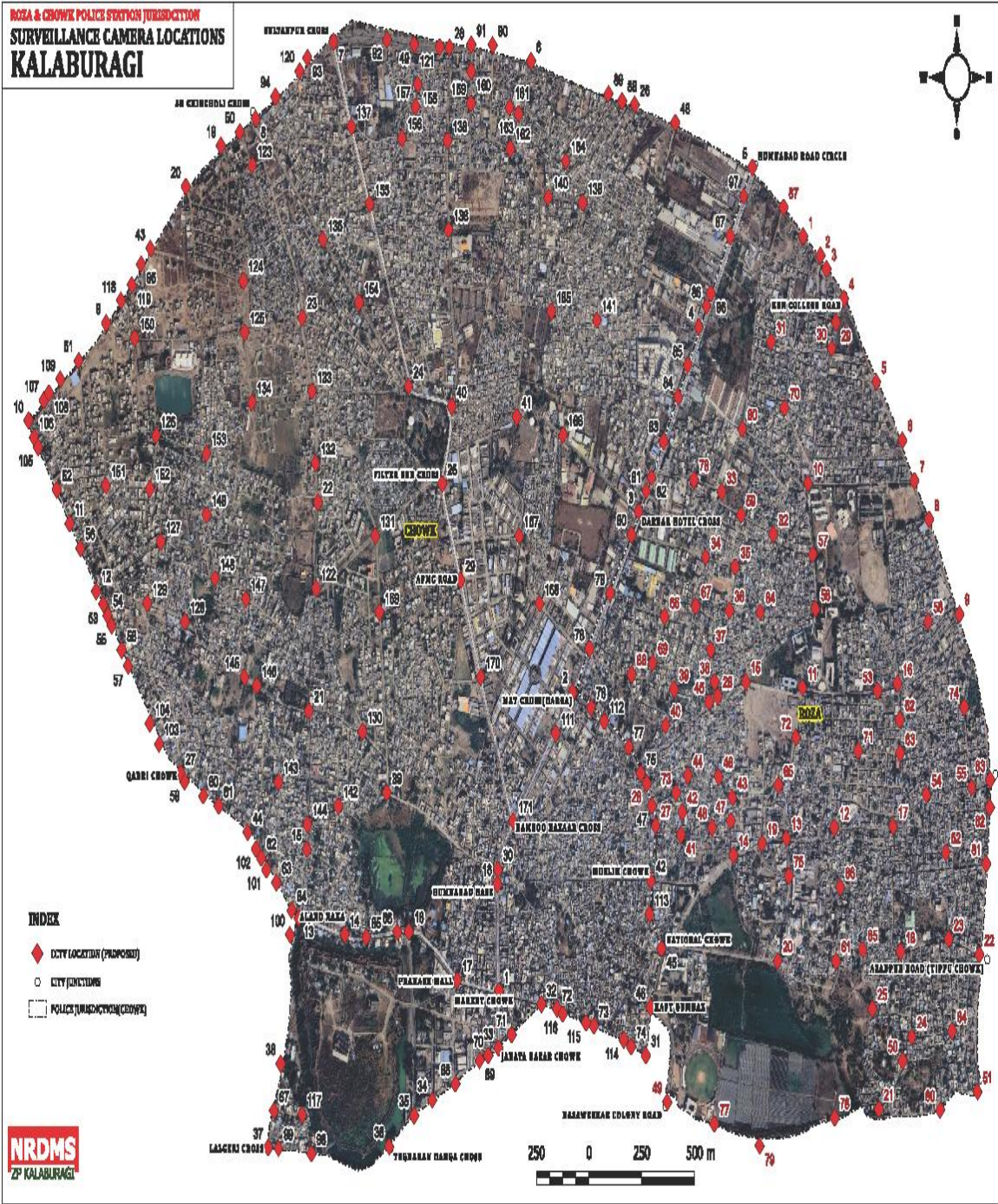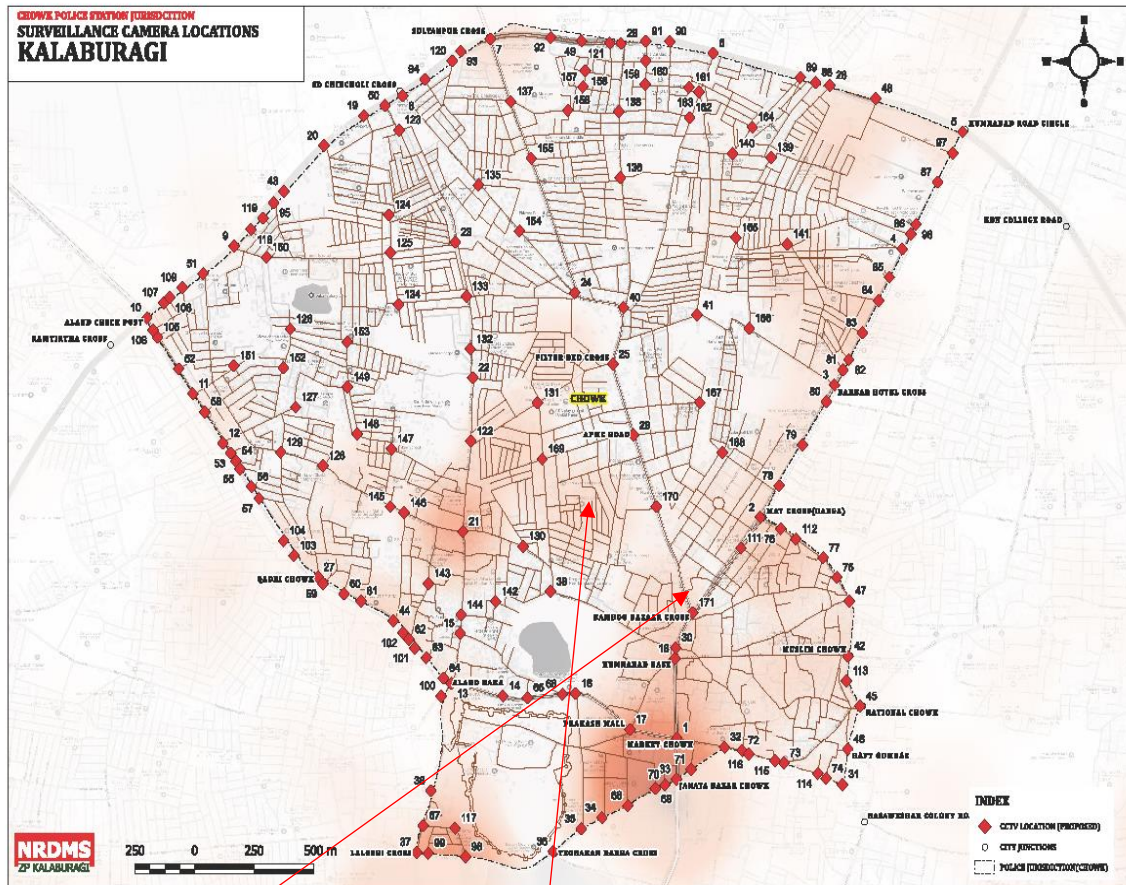
**Population Density & Crime spots**

**Suggested Location**

**ACTIVITY 2 : Slope Map Generation from Carto DEM using ArcGIS.**

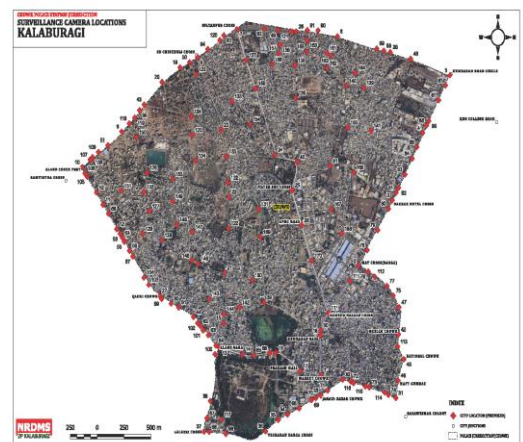| Title of work | Slope Map Generation from Carto DEM using ArcGIS. |
|---|---|
| **Department Name** | Zilla panchayat Kalaburagi |
| **Objectives** | The main objectives of generating a **slope map** from CartoDEM using ArcGIS are:<br>1. **To acquire and preprocess CartoDEM data** for the study area to ensure high-quality elevation input for slope analysis.<br>2. **To calculate slope values** (in degrees or percent) using ArcGIS Spatial Analyst tools for accurate terrain gradient representation.<br>3. **To classify slope ranges** into meaningful categories (Flat, Moderate, Steep, Very Steep) for easy interpretation and decision-making.<br>4. **To create supporting terrain visualizations** such as contour maps, TIN models, and hillshade layers to enhance map readability.<br>5. **To develop a color-coded slope map** for planning, resource management, and hazard assessment purposes.<br>6. **To provide actionable geospatial outputs** that support land-use planning, watershed management, environmental studies, and disaster preparedness. |
| **Data Used** | 1. **CartoDEM v3 R1**<br>   ○ **Source:** ISRO's Bhuvan Portal<br>   ○ **Description:** A high-resolution Digital Elevation Model of India, generated using satellite data, LiDAR, and ground surveys.<br>   ○ **Resolution:** 30 meters<br>   ○ **Purpose:** Used as the primary dataset for slope calculation and terrain analysis.<br><br>2. **Study Area Boundary (AOI)**<br>   ○ **Source:** Survey of India / District GIS datasets<br>   ○ **Description:** Administrative boundary shapefile or polygon of the selected study area.<br>   ○ **Scale:** 1:50,000<br>   ○ **Purpose:** To clip the DEM and focus slope analysis within the study limits.<br><br>3. **Topographic Maps**<br>   ○ **Source:** Survey of India (SOI)<br>   ○ **Description:** Maps showing terrain elevation, rivers, roads, and other features.<br>   ○ **Scale:** 1:50,000 |

| | |
|---|---|
| |    o **Purpose:** Used for terrain reference, slope verification, and accuracy checks.<br><br>  4. **Satellite Imagery (Optional)**<br>    o **Source:** ISRO (Cartosat), Sentinel, or Landsat (Open-Source)<br>    o **Resolution:** 10–30 meters<br>    o **Purpose:** For cross-verification of landforms, terrain features, and elevation accuracy.<br><br>  5. **Software and Tools**<br>    o **Software:** ESRI ArcGIS (ArcMap/ArcGIS Pro)<br>    o **Purpose:** Used for DEM preprocessing, slope calculation, visualization, and map production. |
| **Data Process** | The CartoDEM and supporting datasets were processed systematically to prepare accurate slope maps. The main steps are as follows:<br>**1. Data Acquisition**<br>• Downloaded **CartoDEM v3 R1 (30 m resolution)** for the study area from ISRO's Bhuvan portal.<br>• Collected **Study Area Boundary** shapefile and **SOI topographic maps** for reference.<br><br>**2. Data Clipping and Projection**<br>• Clipped the DEM to the **Area of Interest (AOI)** using the boundary shapefile.<br>• Ensured all datasets were in the **same projection system** (e.g., WGS 84 / UTM Zone 43N).<br><br>**3. Noise Removal (Median Filtering)**<br>• Applied a **Median Filter** to remove salt-and-pepper noise and random elevation errors.<br>• This enhanced DEM accuracy while preserving important terrain features.<br><br>**4. Void Filling (If Required)**<br>• Identified and filled any missing elevation values using interpolation techniques to ensure a complete dataset.<br><br>**5. Resampling**<br>• Resampled the DEM to a **consistent 30 m resolution** for uniform analysis.<br><br>**6. Quality Check** |

|  |  |
|---|---|
|  | • Cross-checked processed DEM with topographic maps and satellite imagery for accuracy before slope calculation. <br> 📌 *Result:* A **clean, clipped, and noise-free DEM** ready for slope map generation in ArcGIS. |
| **Type of Data Provided** | PDF & JPEG File. |

**Introduction**: A slope map is a crucial thematic map that represents the steepness or gradient of terrain, derived from a **Digital Elevation Model (DEM)**. It shows how elevation changes over space and is widely used in:

- **Land-use planning** (construction suitability, agriculture)

- **Watershed and hydrological modeling**

- **Disaster risk analysis** (landslides, floods)

- **Environmental and geological studies**

In this study, **CartoDEM (30 m resolution)** data was used to prepare a detailed slope map of the study area using **ArcGIS Spatial Analyst** tools. The process involved preprocessing DEM data, generating slope values, and post-processing outputs for better visualization and interpretation.

 **Data Source: Carto DEM**

Carto DEM is a high-resolution DEM developed by **ISRO**, in collaboration with **Survey of India (SOI)** and **NRSC**.

- **Resolution:** 30 m

- **Coverage:** Entire India

- **Data Derivation:** Satellite imagery, LiDAR, and ground surveys

- **Applications:** Terrain analysis, hydrology, natural resource management, and disaster planning

- **Access:** Freely available from ISRO's **Bhuvan Portal**

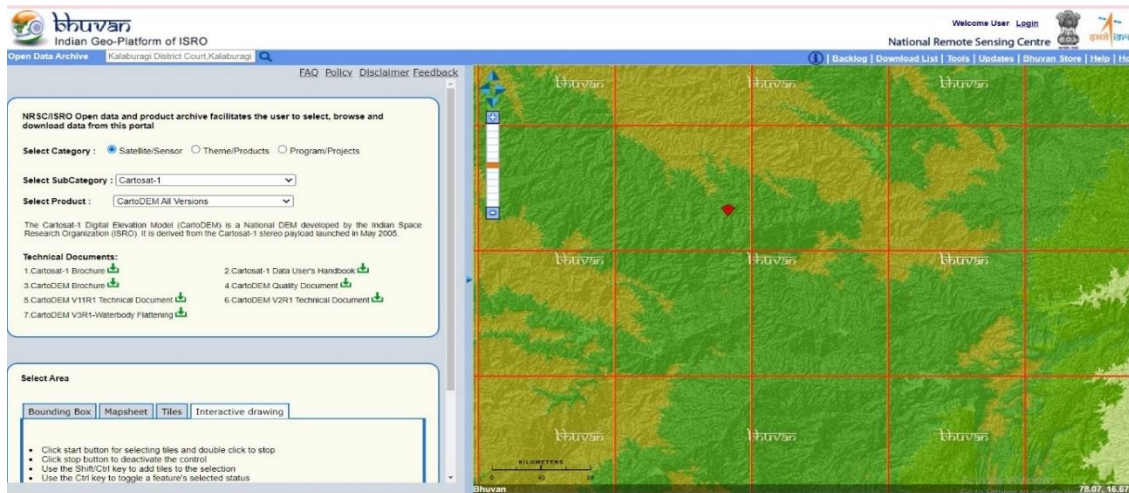*Carto DEM provides precise elevation data essential for GIS-based terrain modelling and slope calculations.*
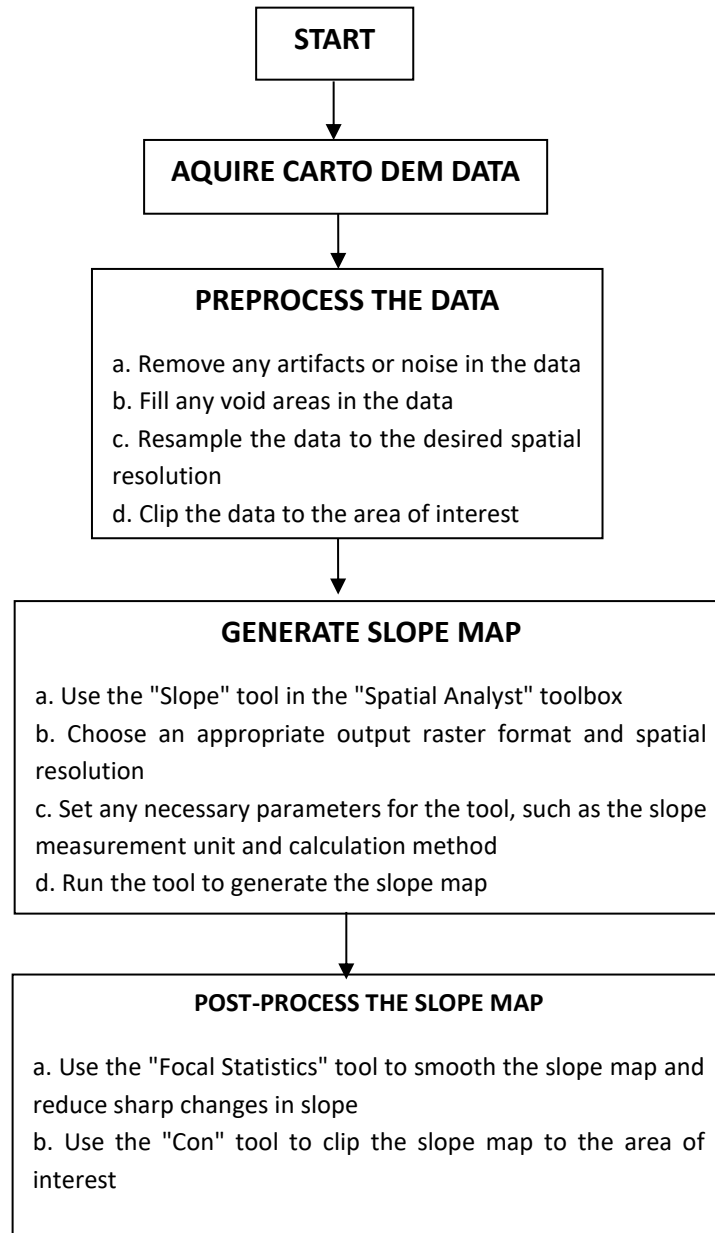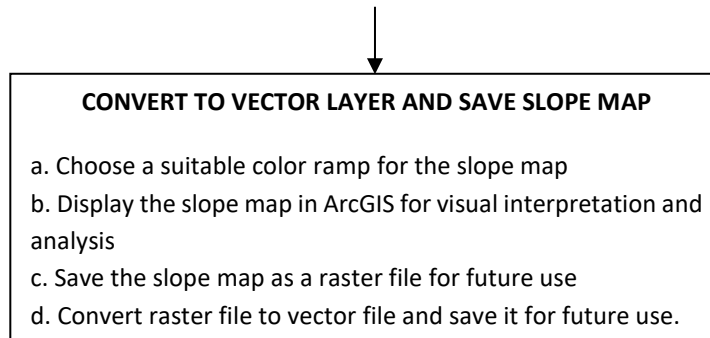
Image: Carto Dem acquired from Bhuvan portal

```
┌─────────────────┐
│      START      │
└─────────────────┘
         │
         ▼
┌─────────────────────────┐
│  AQUIRE CARTO DEM DATA  │
└─────────────────────────┘
         │
         ▼
┌──────────────────────────────────────────┐
│           PREPROCESS THE DATA            │
│                                          │
│  a. Remove any artifacts or noise in the │
│     data                                 │
│  b. Fill any void areas in the data      │
│  c. Resample the data to the desired     │
│     spatial resolution                   │
│  d. Clip the data to the area of interest│
└──────────────────────────────────────────┘
         │
         ▼
┌──────────────────────────────────────────────────┐
│              GENERATE SLOPE MAP                  │
│                                                  │
│  a. Use the "Slope" tool in the "Spatial Analyst"│
│     toolbox                                      │
│  b. Choose an appropriate output raster format   │
│     and spatial resolution                       │
│  c. Set any necessary parameters for the tool,   │
│     such as the slope measurement unit and       │
│     calculation method                           │
│  d. Run the tool to generate the slope map       │
└──────────────────────────────────────────────────┘
         │
         ▼
┌──────────────────────────────────────────────────┐
│           POST-PROCESS THE SLOPE MAP             │
│                                                  │
│  a. Use the "Focal Statistics" tool to smooth    │
│     the slope map and reduce sharp changes in    │
│     slope                                        │
│  b. Use the "Con" tool to clip the slope map to  │
│     the area of interest                         │
└──────────────────────────────────────────────────┘
```

**CONVERT TO VECTOR LAYER AND SAVE SLOPE MAP**

a. Choose a suitable color ramp for the slope map
b. Display the slope map in ArcGIS for visual interpretation and analysis
c. Save the slope map as a raster file for future use
d. Convert raster file to vector file and save it for future use.

**Flowchart:** flowchart for generating slope ma

## PREPROCESS THE DATA
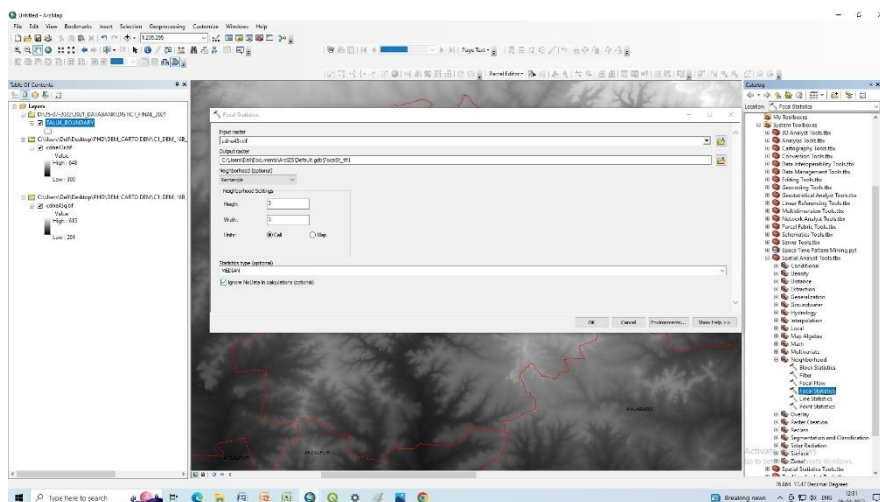


This may involve removing any artifacts or noise in the data, filling void areas, resampling the data to the desired spatial resolution, and clipping the data to the area of interest.utilized the **median filter** to remove noise from the CartoDEM, By applying the median filter to the CartoDEM, we have effectively removed salt-and-pepper noise and other types of random noise, resulting in a cleaner and more accurate elevation model.
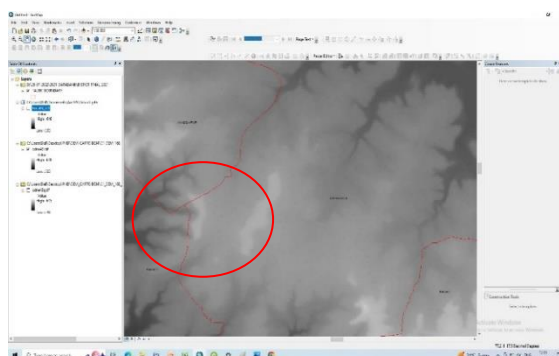


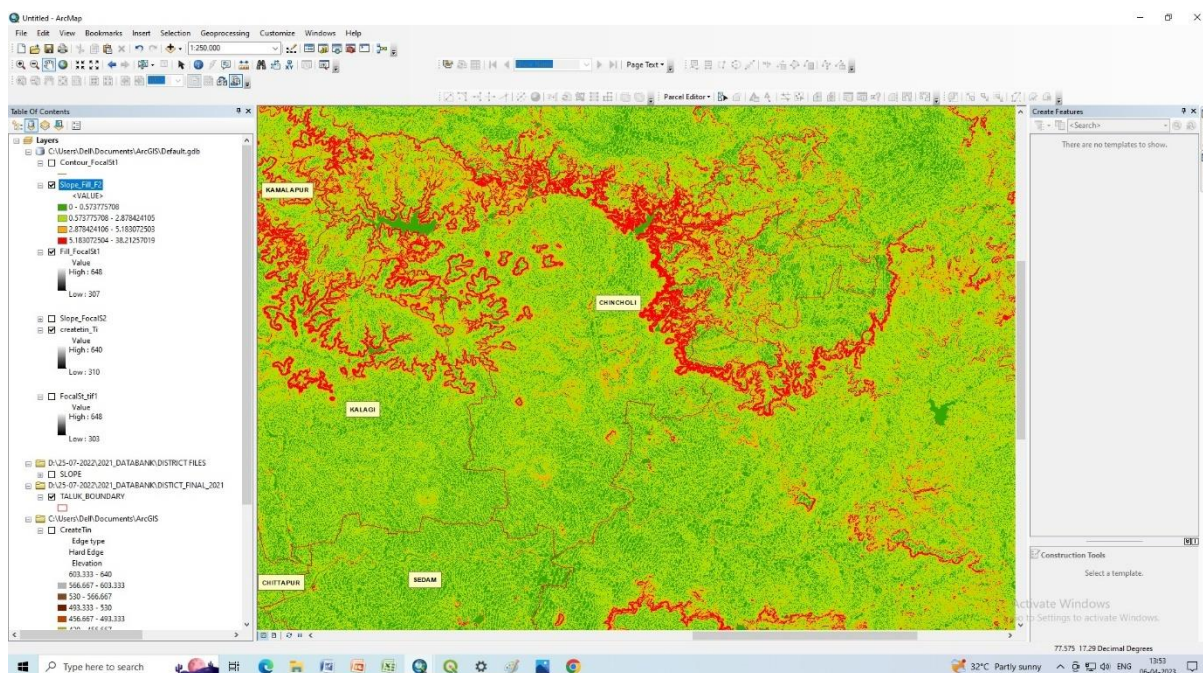Before removing noise from the CartoDEM
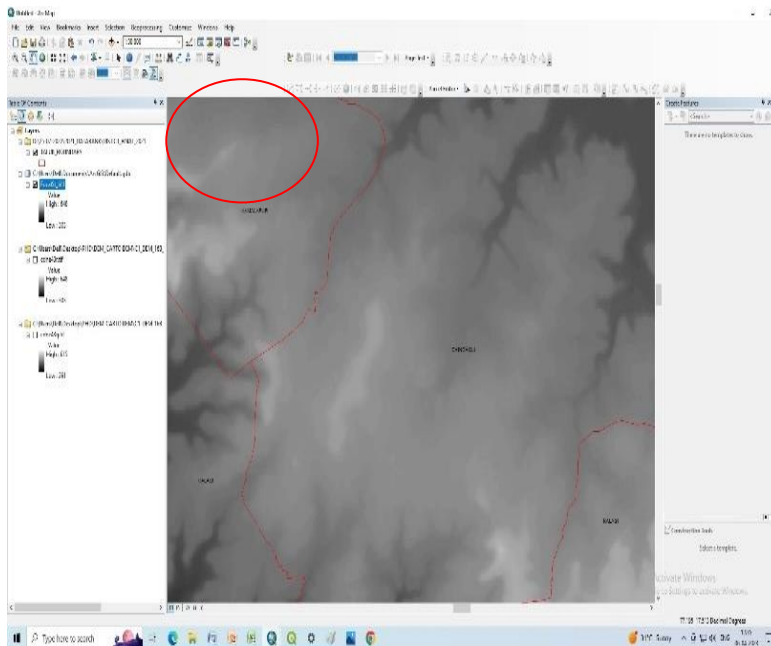
After removing noise from the CartoDEM

**GENERATE SLOPE MAP**: Use the "Slope" tool in the "Spatial Analyst" toolbox to calculate the slope values for each cell in the CartoDEM data. This may involve choosing an appropriate output raster format and spatial resolution, setting any necessary parameters for the tool, such as the slope measurement unit and calculation method, and running the tool to generate the slope map.

General steps on how to calculate slope in ArcGIS using CartoDEM data:

- Load the Pre-processed CartoDEM data into ArcGIS and make sure it is in the correct projection.
- Convert the CartoDEM data into a raster format if it is not already in that format.
- Generate a slope raster using the "Slope" tool in the "Spatial Analyst" toolbox.
- Set the input raster as the CartoDEM raster.
- Set the output measurement units for the slope as either degrees or percent, depending on your preference.
- Run the tool and wait for it to complete.
- The output slope raster will have values ranging from 0 to 90 (degrees) or 0 to 100 (percent), where higher values indicate steeper slopes.

**Map:** Generated the slope from pre-processed Carto Dem.

| | |
|---|---|
| **Title of work** | GIS-based jurisdiction map for newly proposed Kotnur D Police Station. |
| **Department Name** | Traffic department kalaburagi |
| **Objectives** | To update and define the jurisdiction boundaries of the newly proposed Kotnur Police Station by modifying existing police limits and reallocating areas accordingly. This involves calculating area changes using QGIS, presenting a comparative 'Before' and 'After' analysis, and producing detailed maps with key annotations. The goal is to ensure precise boundary demarcation to improve administrative efficiency, law enforcement effectiveness, and resource allocation within the jurisdiction. |
| **Data Used** | 1. Base Map of Kalaburagi City – for reference and spatial alignment.<br>2. Existing Police Station Jurisdiction Boundaries – to identify areas being restructured.<br>3. Proposed Boundary Data of Kotnur D PS – as provided by the police department or planning authority.<br>4. Ward/Revenue Village Boundaries – to match administrative divisions.<br>5. Road Network Data – for spatial referencing and connectivity analysis. |

| | |
|---|---|
| | 6. Key Landmarks & Infrastructure – such as schools, hospitals, bus stands for ground validation.<br>7. Satellite Imagery/Google Maps (optional) – for visual confirmation and digitization accuracy. |
| **Data Process** | 1. Collected base maps and jurisdiction boundaries.<br>2. Digitized the proposed Kotnur D Police Station boundary.<br>3. Extracted areas from existing police station limits to form the new boundary.<br>4. Overlaid relevant administrative layers (wards, roads, landmarks) for accuracy.<br>5. Validated the new boundary with official inputs.<br>6. Generated the final GIS map and exported it as JPEG |
| **Type of Data Provided** | PDF & JPEG File. |

**ACTIVITY 3 : Prepared and updated GIS-based jurisdiction map for newly proposed Kotnur D Police Station.**

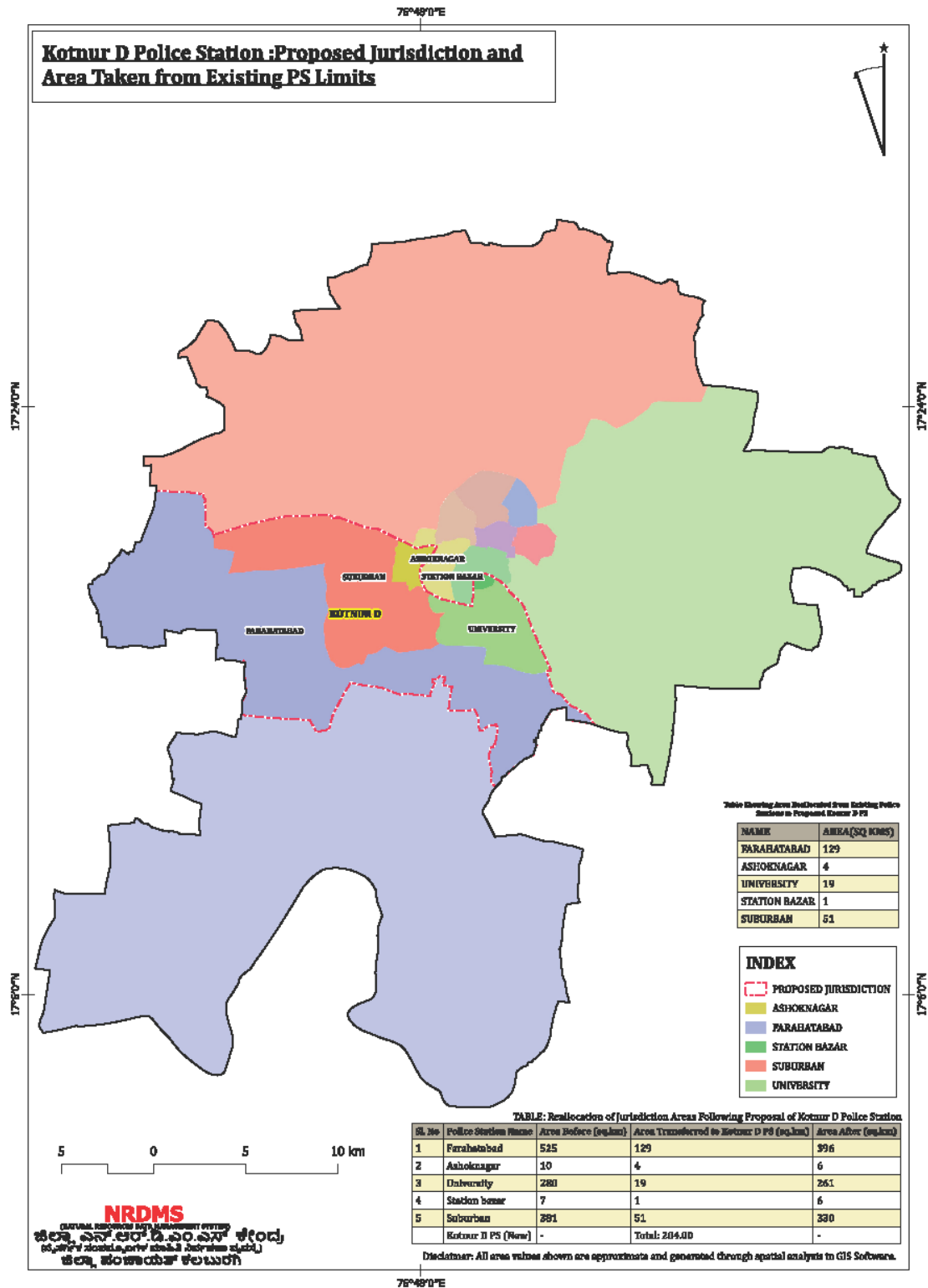| Sl.No | Police Station Name | Area Before (sq.km) | Area Transferred to Kotnur D PS (sq.km) | Area After (sq.km) |
|---|---|---|---|---|
| 1 | Farahatabad | 525 | 129 | 396 |
| 2 | Ashoknagar | 10 | 4 | 6 |
| 3 | University | 280 | 19 | 261 |
| 4 | Station Bazar | 7 | 1 | 6 |
| 5 | Suburban | 381 | 51 | 330 |
| — | Kotnur D PS (New) | — | Total: 204.00 | — |

**Table 3:** Reallocation of jurisdiction area following proposal of kotnur D ps

**Map :** proposed kotnur D PS jurisdiction
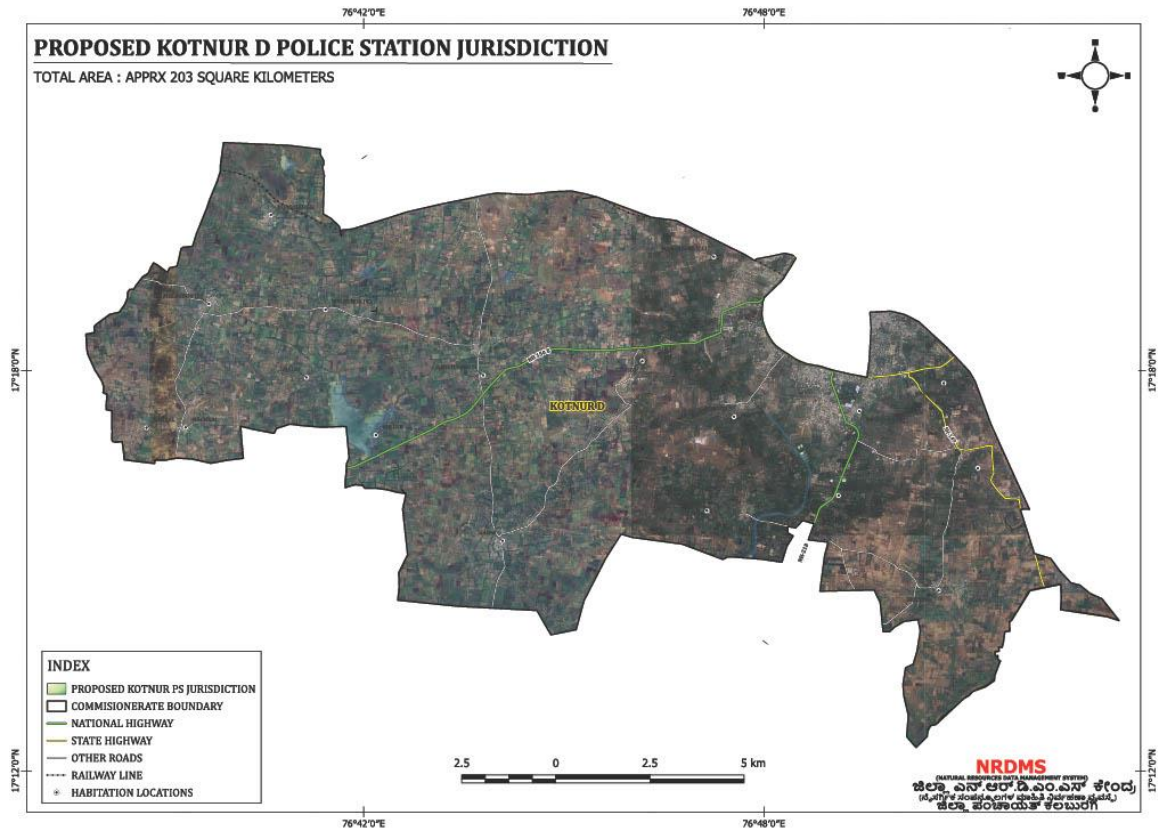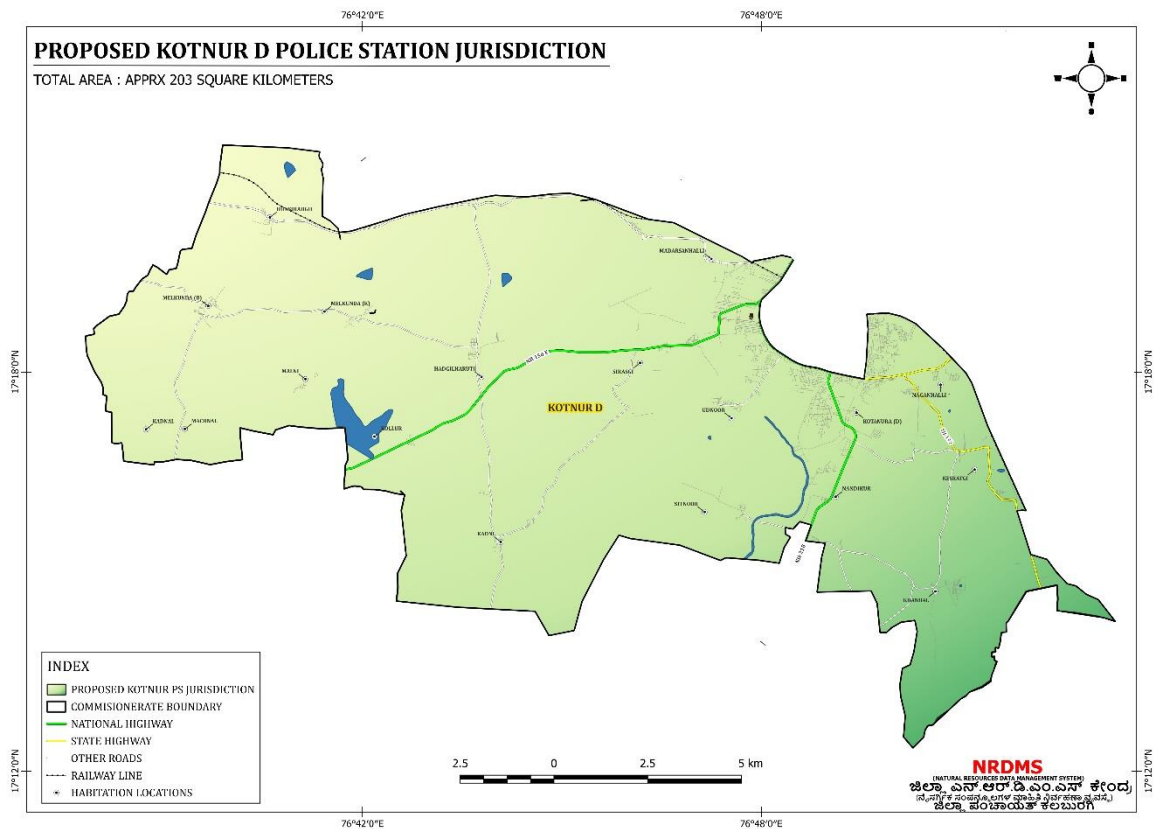


**Map :** Proposed kotnur D PS jurisdiction Satellite view

**Map :** Proposed kotnur D PS jurisdiction



Kotnur D Police Station :Proposed Jurisdiction and
Area Taken from Existing PS Limits

Table Showing Area Reallocated from Existing Police
Stations to Proposed Kotnur D PS

| NAME | AREA(SQ KMS) |
|---|---|
| FARAHATABAD | 129 |
| ASHOKNAGAR | 4 |
| UNIVERSITY | 19 |
| STATION BAZAR | 1 |
| SUBURBAN | 51 |

**INDEX**

- PROPOSED JURISDICTION
- ASHOKNAGAR
- FARAHATABAD
- STATION BAZAR
- SUBURBAN
- UNIVERSITY

TABLE: Reallocation of Jurisdiction Areas Following Proposal of Kotnur D Police Station

| Sl. No | Police Station Name | Area Before (sq.km) | Area Transferred to Kotnur D PS (sq.km) | Area After (sq.km) |
|---|---|---|---|---|
| 1 | Farahatabad | 525 | 129 | 396 |
| 2 | Ashoknagar | 10 | 4 | 6 |
| 3 | University | 280 | 19 | 261 |
| 4 | Station bazar | 7 | 1 | 6 |
| 5 | Suburban | 381 | 51 | 330 |
| | Kotnur D PS (New) | - | Total: 204.00 | - |

Disclaimer: All area values shown are approximate and generated through spatial analysis in GIS Software.

5   0   5   10 km

**ACTIVITY 4 : Digitization of urban roads of Kalaburagi city**

| | |
|---|---|
| **Title of work** | GIS-Based Digitization of Inner Road Network in Kalaburagi City Using Google Earth Imagery |
| **Department Name** | Municipal Corporation kalaburagi |
| **Objectives** | To digitize the inner road network of Kalaburagi city using Google Earth imagery in order to create an updated and accurate spatial layer. This road data will support traffic planning, navigation, infrastructure development, and integration into GIS-based urban management systems. |
| **Data Used** | 1. Google Earth satellite imagery – for visual reference and tracing<br>2. Existing road network data – for cross-verification<br>3. Base map of Kalaburagi city – to align spatial features<br>4. Ward/village boundaries – for administrative context<br>5. Key landmarks – for positional accuracy |
| **Data Process** | Inner roads were manually digitized using high-resolution satellite imagery available on Google Earth. The digitization involved tracing visible road alignments, assigning attributes where applicable, and aligning with the city's administrative boundaries. The extracted road network was verified against existing data and ground references for accuracy. The final road map was exported in GIS-compatible formats. |
| **Type of Data Provided** | PDF & JPEG File. |

**Map : Digitization of urban roads in QGIS software.**
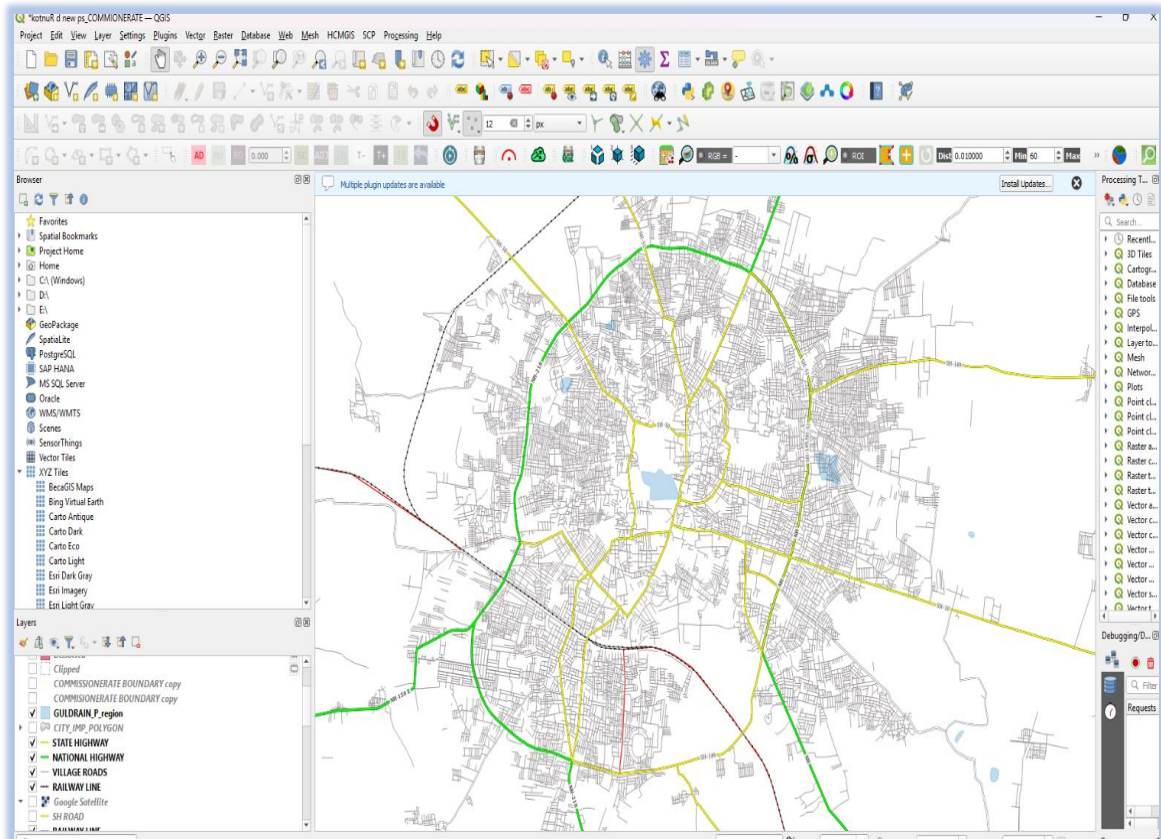


**Road Layer Database Schema**

| Field Name | Description | Data Type | Example Value | Remarks |
|---|---|---|---|---|
| road_id | Unique identifier for each road segment | Integer | 10234 | Updated |
| road_name | Official or local name of the road | Text | SB. Road | Updated |
| road_type | Classification (e.g., highway, residential, alley) | Text | Residential | Updated |
| surface_type | Material used (e.g., asphalt, concrete, gravel) | Text | Asphalt | updated |
| width_m | Width of the road in meters | Float | 6.5 | updated |
| lanes | Number of lanes | Integer | 2 | updated |
| traffic_volume | Average daily traffic count | Integer | 12,000 | No |

| Field Name | Description | Data Type | Example Value | Remarks |
|---|---|---|---|---|
| condition | Road condition (e.g., good, fair, poor) | Text | Fair | No |
| last_maintenance | Date of last maintenance or resurfacing | Date | 2024-11-15 | No |
| geometry | Spatial line geometry representing the road segment | LineString (GIS) | (stored in GIS format) | Shp file |

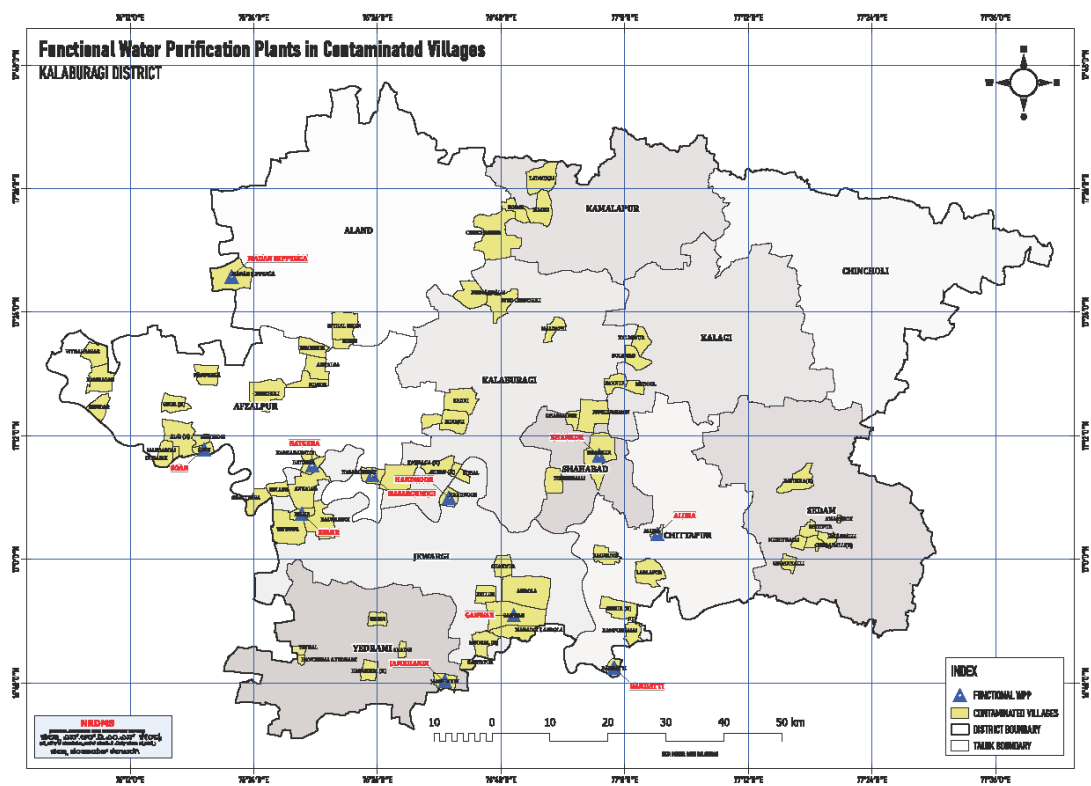**Map :** Digitization of urban roads in QGIS software.



**ACTIVITY 5 : Groundwater Contamination Mapping Using Water Quality Indicators**

| | |
|---|---|
| **Title of work** | Preparation of Non-Potable Drinking Water Maps |
| **Department Name** | Zilla panchayat kalaburagi |
| **Objectives** | To prepare detailed maps showing the distribution and availability of non-potable drinking water sources. These maps will help in planning water resource management, identifying contamination zones, and supporting public health initiatives. These maps are provided to Respected CEO Zill Panchayat kalabuargi |

| Data Used | - Water source locations (wells, tanks, etc.)<br>- Water quality testing reports<br>- Base maps and administrative boundaries<br>- Satellite imagery |
|---|---|
| Data Process | Collected water source data and water quality information were georeferenced and digitized. The non-potable water sources were mapped and analyzed to highlight affected areas. The final maps were validated with field data and exported in GIS-compatible formats. |
| Type of Data Provided | PDF & JPEG File. |



**Map 3:** Groundwater Sample Collection Locations for Water Quality Testing

**Map :** Concentration Map of Non-Potable Groundwater Samples



**Map :** Functional & nonfunctional WPP's in contaminated villages
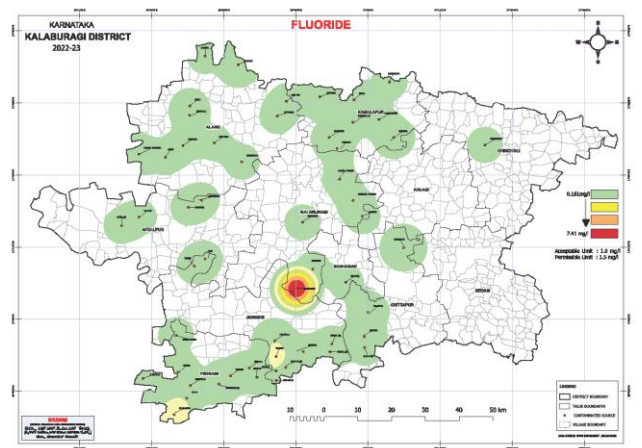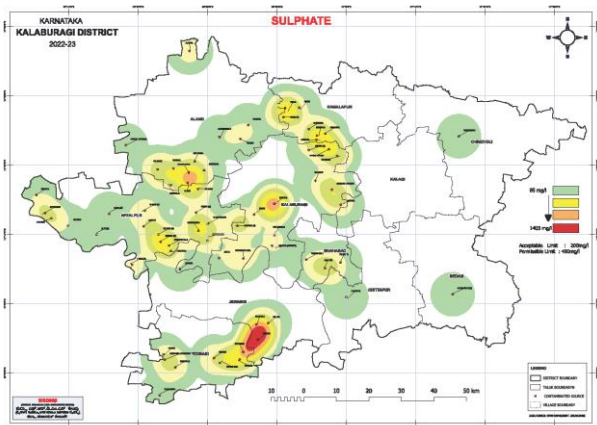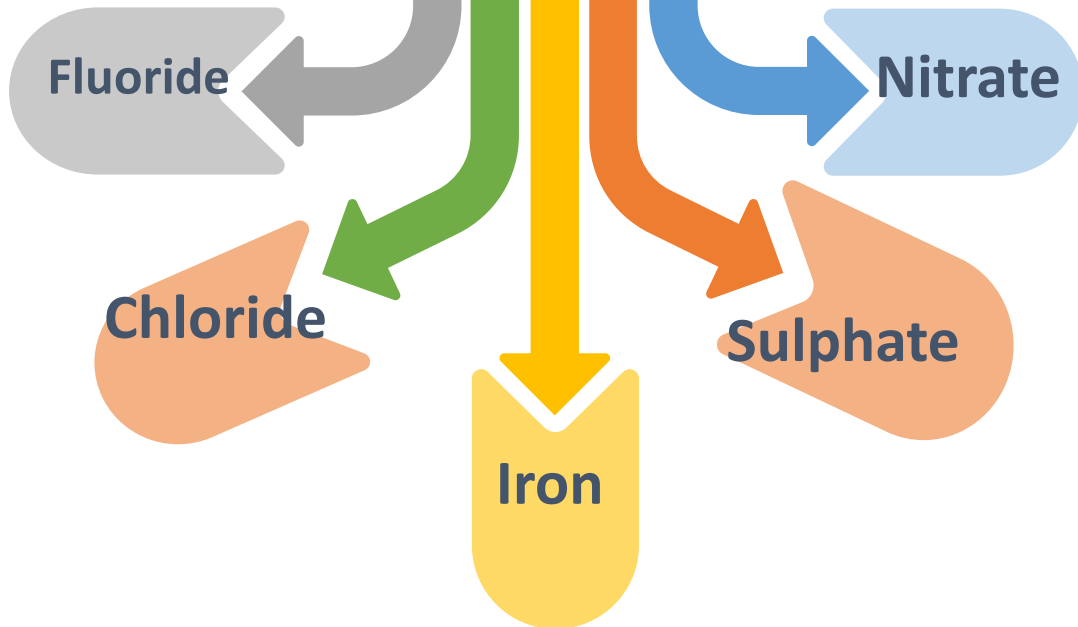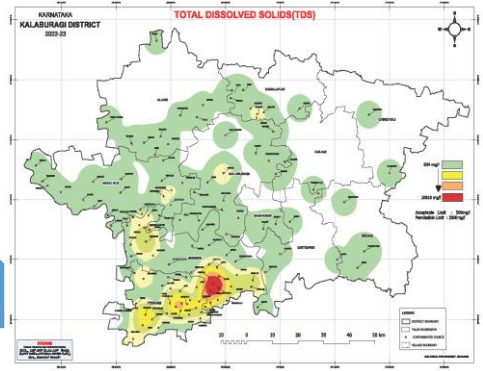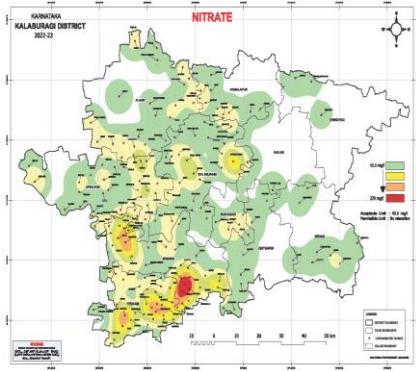
**Map:**Prepared Fluoride and Nitrate affected maps and submitted to CEO sir on 28-April-2025
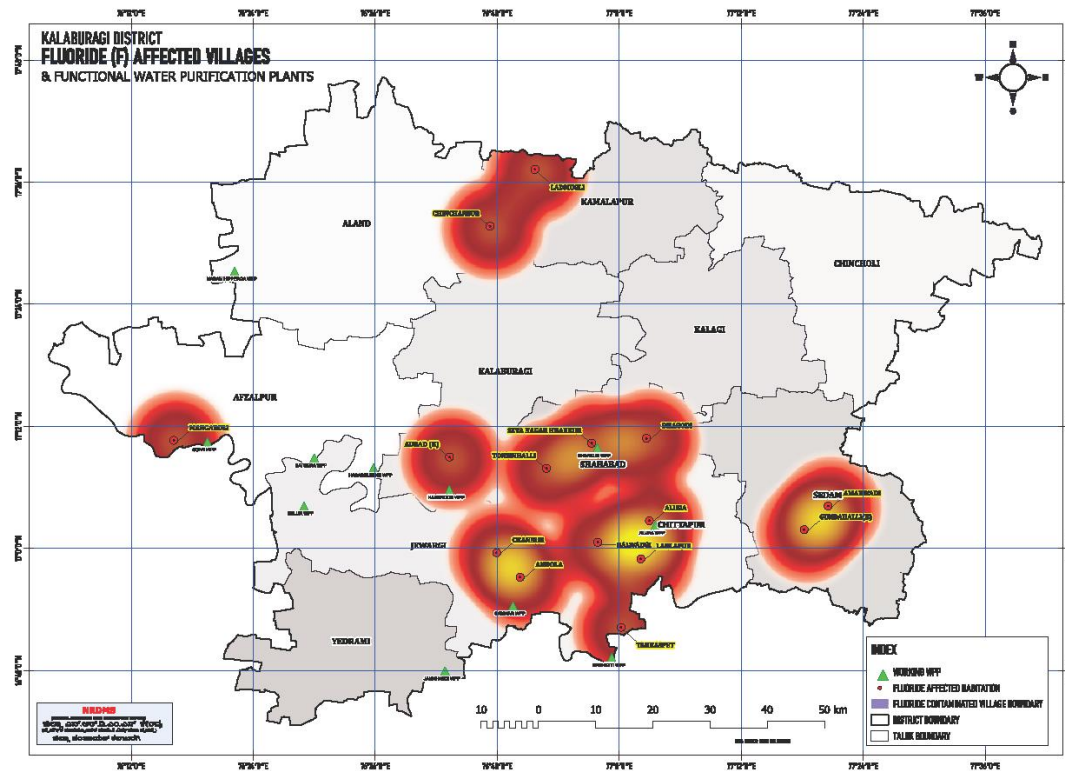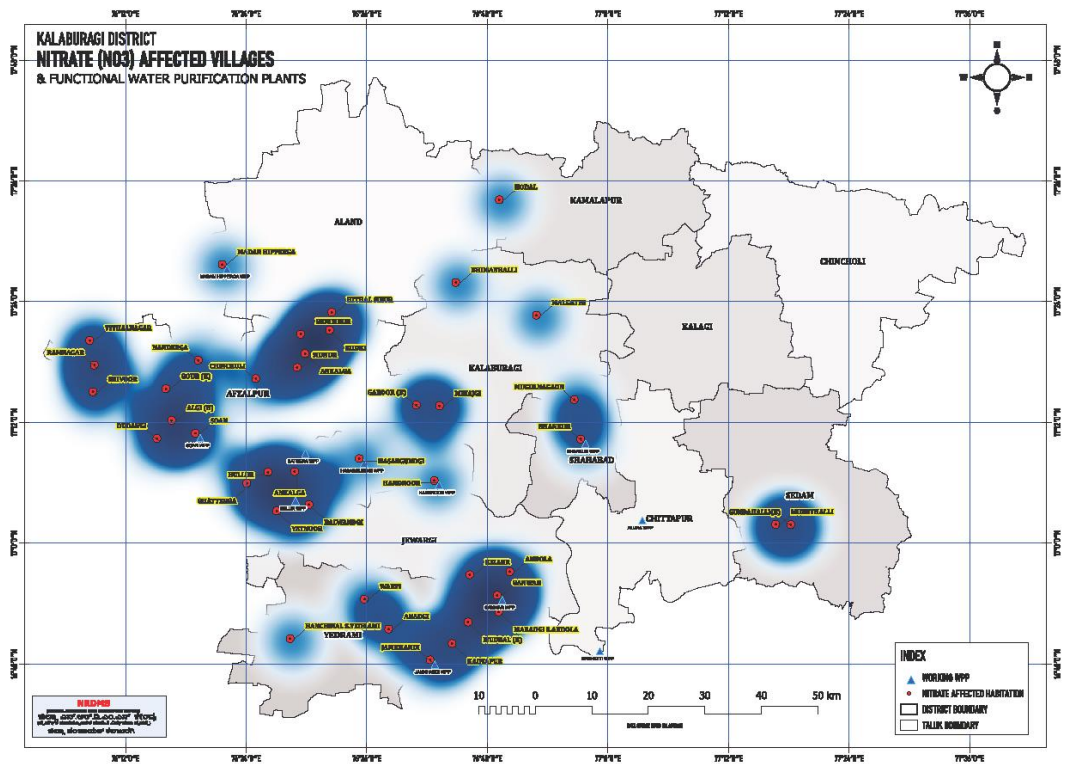
| FLOW CHART |
| :---: |

**1. Data Collection**

↓

**2. Selection of Water Quality Parameters**

**(Chloride, Nitrate, Hardness, Alkalinity, TDS, Sulphate, Iron, Fluoride, Turbidity)**

↓

**3. Assigning Weights to Parameters (Based on Impact on Health)**

↓

**4. Standardization of Data Layers**

**(Reclassify parameter ranges into risk categories: Low–High)**

↓

**5. Weighted Overlay Analysis in GIS**

**(Combine all layers using assigned weights)**

↓

**6. Generation of Risk Zones**

**(Safe, Minimal, Moderate, Significant, Severe)**

↓

**7. Map Layout Preparation**

**(Add title, legend, boundaries, north arrow, and scale)**

↓

**8. Final Output Map (PDF/JPEG)**

**Map:** Final Water Contamination risk assessment map



SEVERE

MODERATE
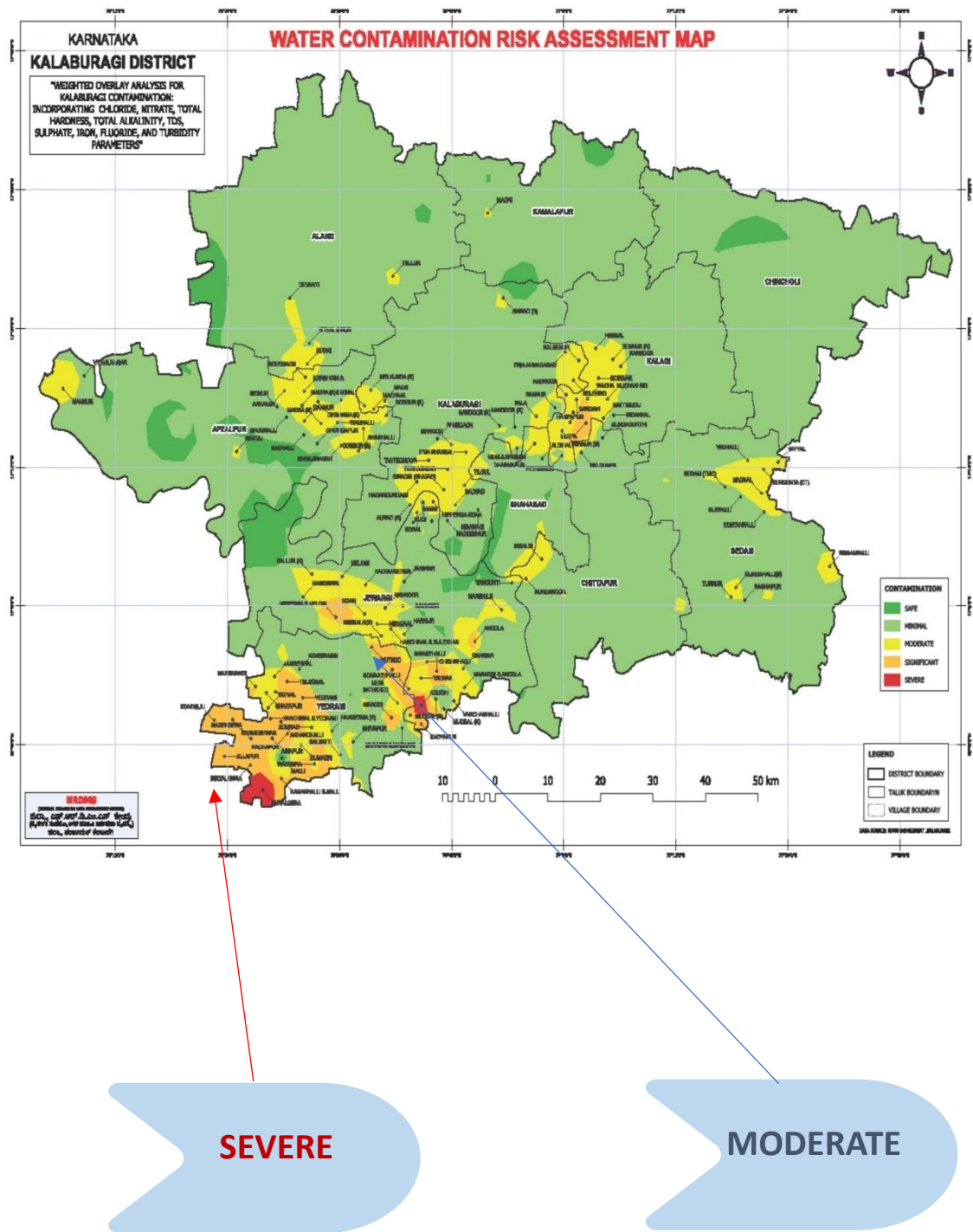
**ACTIVITY 6: Prepared proposed sites for new Zilla Panchayat office building at Daddapur, Survey Nos. 37, 38 & 39 and submitted to CEO ZP.**

| Title of work | Identify and map suitable sites for the construction of the new Zilla Panchayat |
|---|---|
| Department Name | Chief Executive Officer, Zilla Panchayat |
| Objectives | To identify and map suitable sites for the construction of the new Zilla Panchayat office building at Daddapur, specifically in Survey Nos. 37, 38, and 39. The aim is to assist in informed decision-making by providing accurate spatial data and visual representation of the proposed locations for submission to the Chief Executive Officer, Zilla Panchayat. |
| Data Used | Cadastral information<br>Village layers<br>Road layers<br>Government land and waste land layers<br>Satellite imagery (Google Earth)<br>Base map and road network |
| Data Process | Survey numbers 37, 38, and 39 were geo-referenced using village maps. Satellite imagery was used to visually assess site conditions. Road network to existing infrastructure were analyzed to evaluate accessibility. Based on these criteria, the most feasible location was identified and mapped. |
| Type of Data Provided | PDF & JPEG File. |

**ACTIVITY 7 : Prepared village base maps of Muttaga and Hulandagera villages in Chittapur taluk.**

| Title of work | GIS-Based Asset Mapping of Muttaga and Hulandgera Villages, Chittapur Taluk |
|---|---|
| Department Name | Chief Executive Officer, Zilla Panchayat |
| Objectives | To identify, digitize, and map physical and social assets in Muttaga and Hulandgera villages using GIS tools. This mapping aims to support rural planning, infrastructure development, and efficient delivery of government schemes through spatial visualization and data-driven decision-making.. |
| Data Used | 1. Village cadastral maps (RTC / Survey maps)<br>2. Base map of Chittapur Taluk<br>3. Satellite imagery (Google Earth)<br>4. Field-collected GPS coordinates of assets |

| | |
|---|---|
| | 5. Government records (schools, anganwadis, health centers, roads, etc.)<br>6. Road and drainage network data<br>7. QGIS software for digitization and analysis |
| **Data Process** | - Collected village boundary and survey map data<br>- Overlaid satellite imagery to validate features<br>- Conducted field visits to record GPS points of physical and social assets<br>- Digitized all mapped features in QGIS (roads, water tanks, schools, etc.)<br>- Categorized assets by type and importance<br>- Generated final asset maps with legends and labels for planning use |
| **Type of Data Provided** | PDF & JPEG File. |

**Map:** Prepared Fluoride and Nitrate affected maps and submitted to CEO sir on 28-April-2025
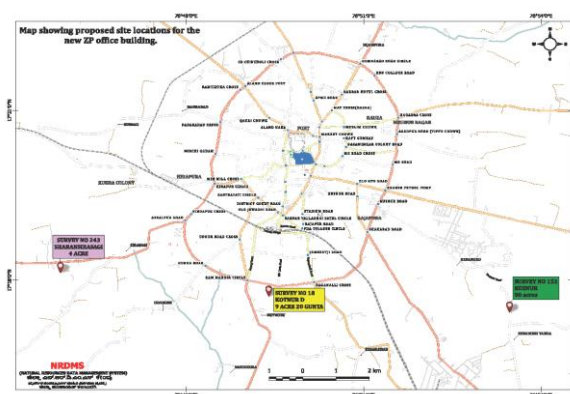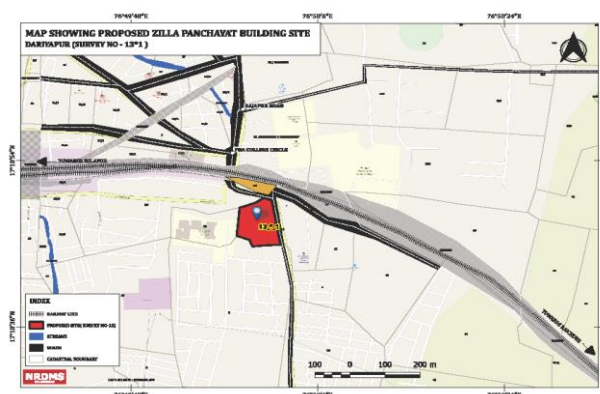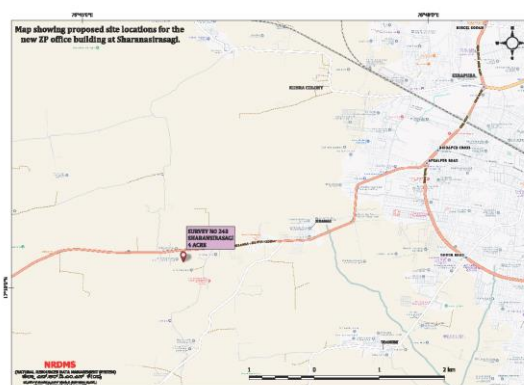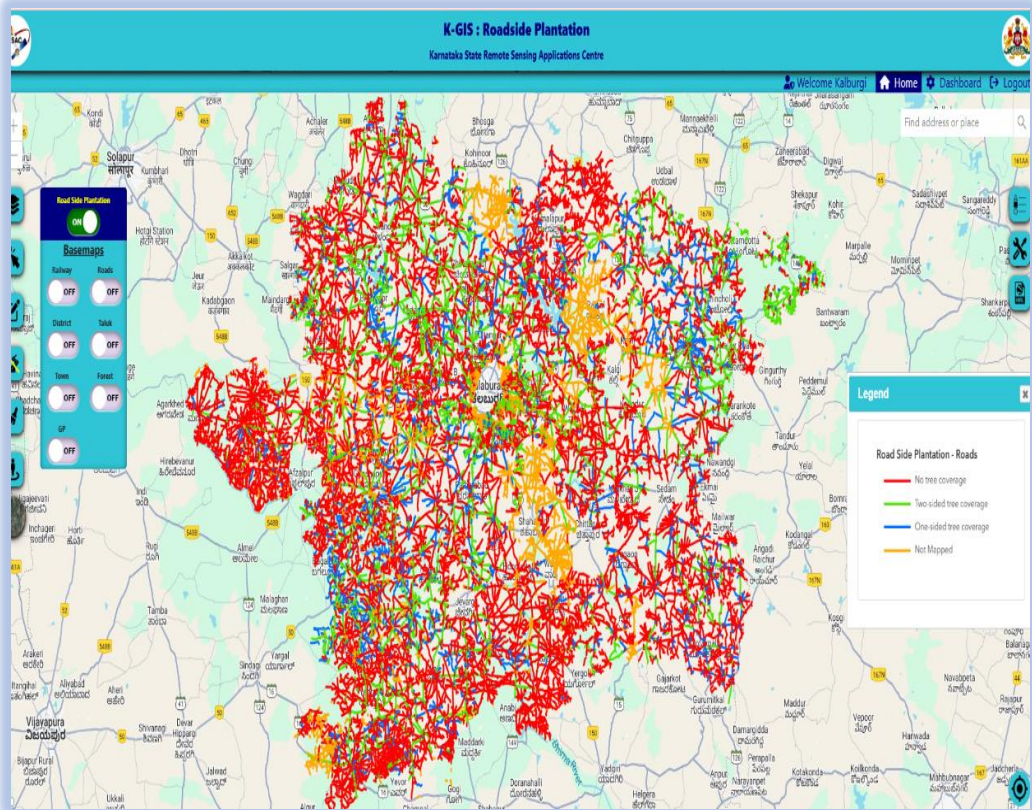
**Map:** Asset map of Muttaga village of chittapur taluk
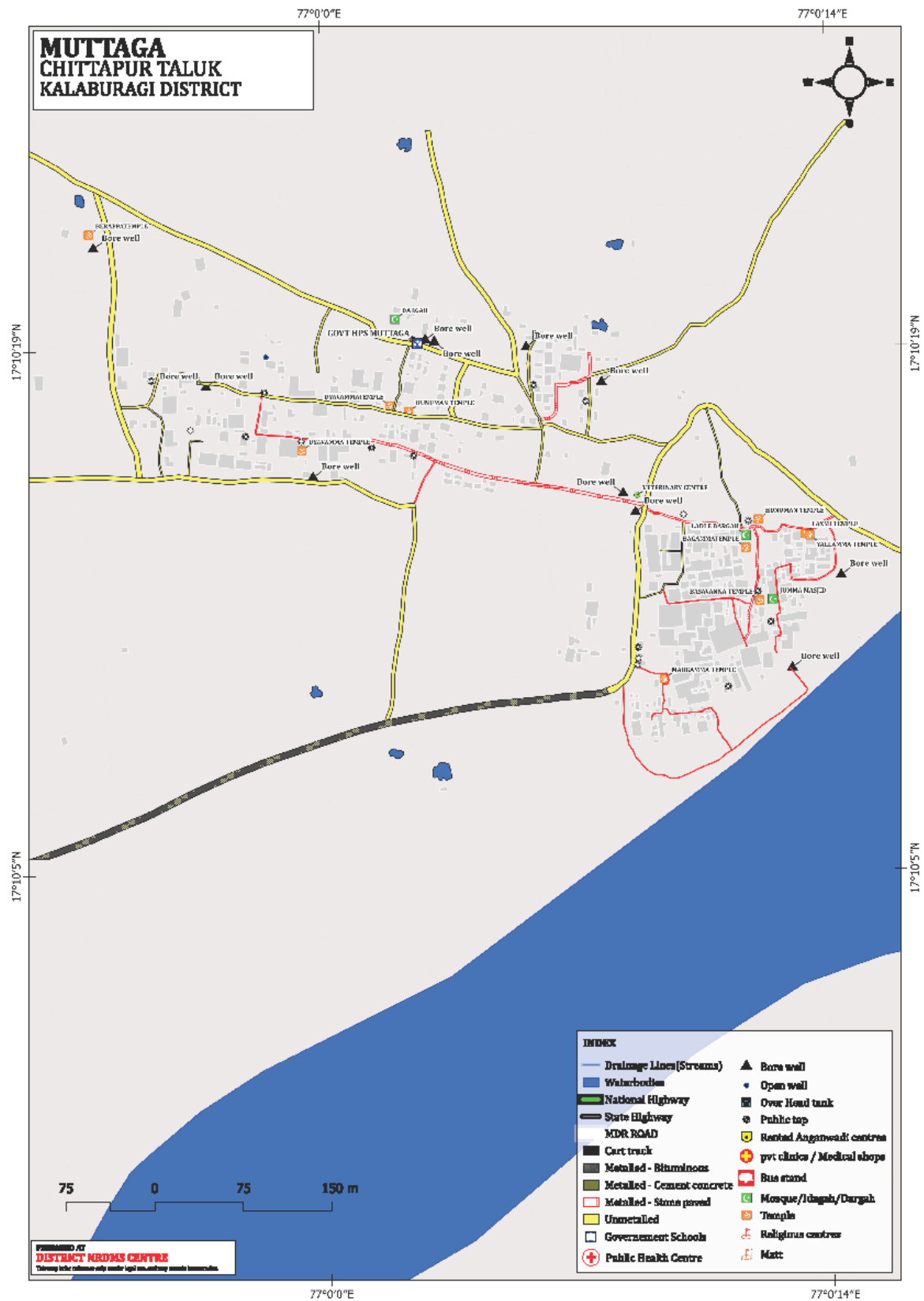
**Map:** Asset map of Hulandgera village of chittapur taluk
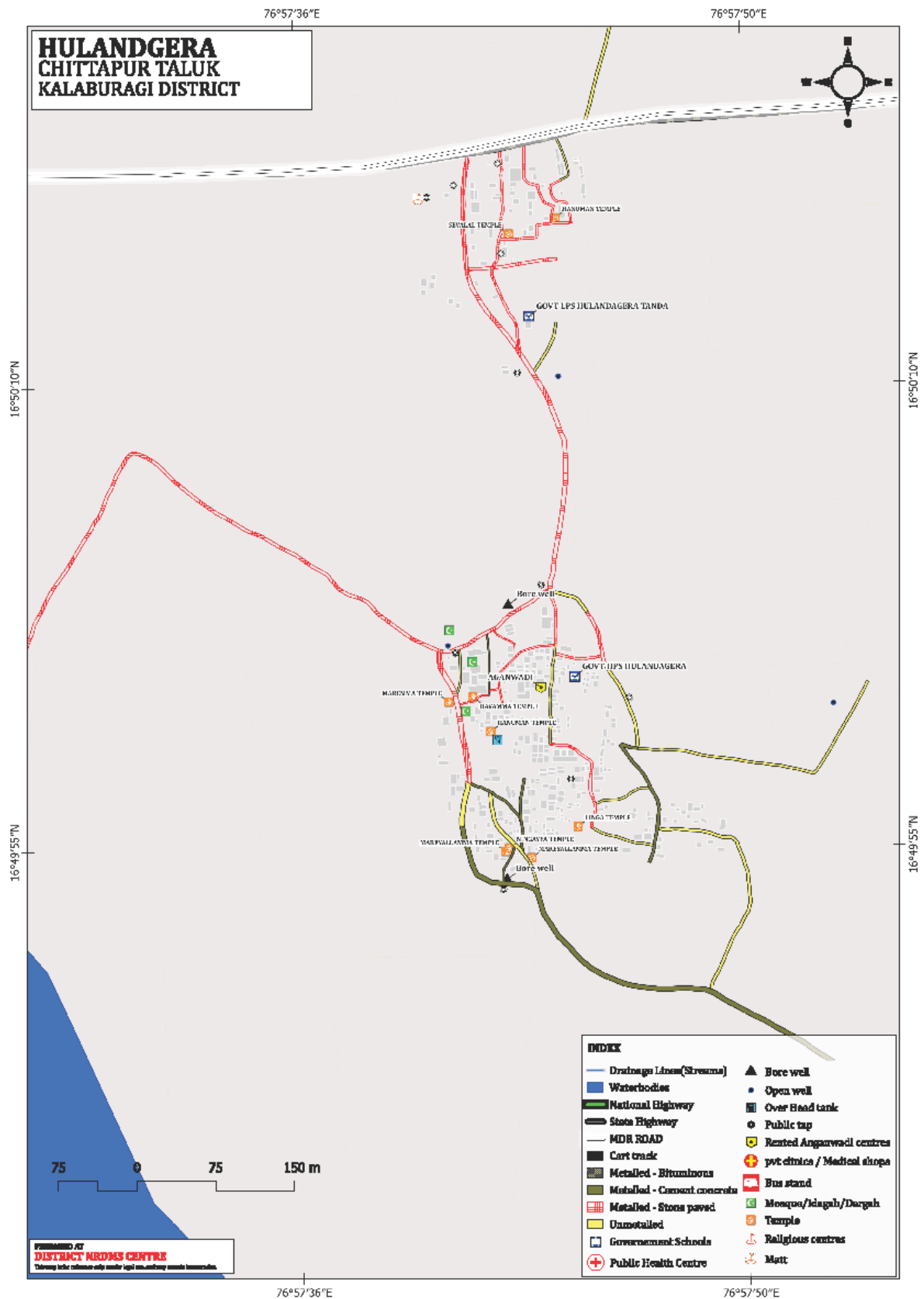
**Activity 8:** Assisted in Roadside Plantation data feed in GIS portal by forest department officials.

5. Training Programmes Attended:

1. Attended 1 day workshop conducted by EMPRI on 08/05/2025 at Kalaburagi regarding Climate Change.

2. Attended 1 day training program conducted by MGNREGA & KSRSAC on 09/05/2025 at KSRSAC, Bengaluru regarding KGIS Portal for Road Side Plantation.

6. Training Imparted to Line Department:

1. Provided training to Forest department staff regarding KGIS Portal for Road Side Plantation in Kalabureagi district

7. Science Outreach Activities:

No Science Outreach Activities were conducted during this period.

**\*\*\*\*\*\*\*\***