TUMKUR DISTRICT

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QUADRIMESTRAL REPORT

December to March.

SUBMITTED BY

Chathura H Gowda

District NRDMS Centre

Zilla Panchayath Tumkur.

ADMINISTRATIVE YEAR

2025-26.

DATE OF SUBMISSION

26/03/2026.

Geospatial Database for Sustainable Development.

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BASIC INFORMATION OF THE DISTRICT.

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District Name: Tumkur.

Division: Bengaluru.

Establishment Year:1997-1998.

Headquarter: Zilla Panchayath, Ward No-18 Tumkur.

Chief Executive Officer: Smt Ashwija B. V (I.A.S).

Chief Planning Officer: Sri Sannamasiyappa (K.A.S).

NRDMS BACKGROUND OF THE DISTRICT.

Natural Resources Data Management System (NRDMS) program started in 1992. Since then established in Tumkur District 1997-98 with active support and funding from Department of Science & Technology (DST) Government of India and Government of Karnataka. NRDMS program is a multi-disciplinary and multi-institutional program of the Council aimed at developing methodologies for building and promoting the use of spatial data management and analysis technologies in local area planning. The initial approach of planning based on macro level assessment of resources did not yield the desired results. The introduction of the concept of spatial planning to micro-levels by the Planning commission paved the way for evolution of NRDMS program. The vision of the NRDMS program during its inception was to provide S&T inputs for operationalising the concept of decentralized planning of the country by developing computer compatible spatial databases on natural resources, socio and agro-economic parameters to further the concept of area specific decentralized planning.

Resource knowledge and resource inventory is crucial to spatial planning. At the core of this concept lies an integrated approach to planning in contrast to

the sectoral method. This requires a detailed knowledge of the interrelations and interdependencies between various sectors to resolve often-conflicting demands. This leads to a requirement for appropriate data management and analyzing tools and techniques and a large matrix of sectoral data, in digital format, on natural resources, demography, socio-economy etc. and integrating them to generate appropriate information/applications required for plan preparation.

The district NRDMS centers since inception have created an exhaustive database of natural resources, socio-economic parameters, infrastructure etc. The NRDMS centres are providing analyzed/value

added information to planners and administrators besides developing applications using geo-spatial technologies suitable for local level planning. The NRDMS centers are providing need-based information to users such as elected bodies, district administration and planners through maps, charts, tables, and reports etc., on spatial and non-spatial data.

Vision

Enabling people, communities and institutions of local-self-governance with requisite databases and S&T tools for informed participation in local self-governance.

The corresponding goals of the Programme to realize the above vision could be the following:

To strengthen the S&T inputs in developing tools and techniques for integrated resource and infrastructure capacity building at various levels for planning and implementation in a spatio-temporal context in a multi-level framework below the district.

Need of NRDMS

- Large diversity of spatial data.
- Many types of data are used for more than one purpose by more than one user.
- Utility of data set may be greatly enhanced by merging or linking it with other data sets.
- Reliability / consistency can be enhanced by correlating different parameters.
- Many organisations are involved in data collection and updating.
- Need for standardisation / compatibility of procedures of data collection and adoption.
- Need to improve the utilisation of data for decision making.

Objectives

- To develop, demonstrate methods/techniques and tools for operationalsing the concept of "Decentralized (Local level) Planning" using geospatial technologies.

- To provide value added information for district level planning using geospatial database.
- Development of integrated digital database for generating

1. Resource profiles
2. Query-based information
3. Static and dynamic outputs based on Spatial Decision Support System (SDSS).

- Interaction through workshops with line department officials and stakeholders at multi-level to assess their information needs in implementing the schemes and capacity building.
- To develop local specific applications using GIS tools.
- To create awareness among end-users about the utility of GIS technologies by conducting regular training programs and workshops.
- Documentation and dissemination.
- To establish district NRDMS centers in all the districts to develop database and applications that are relevant to planning and administration.

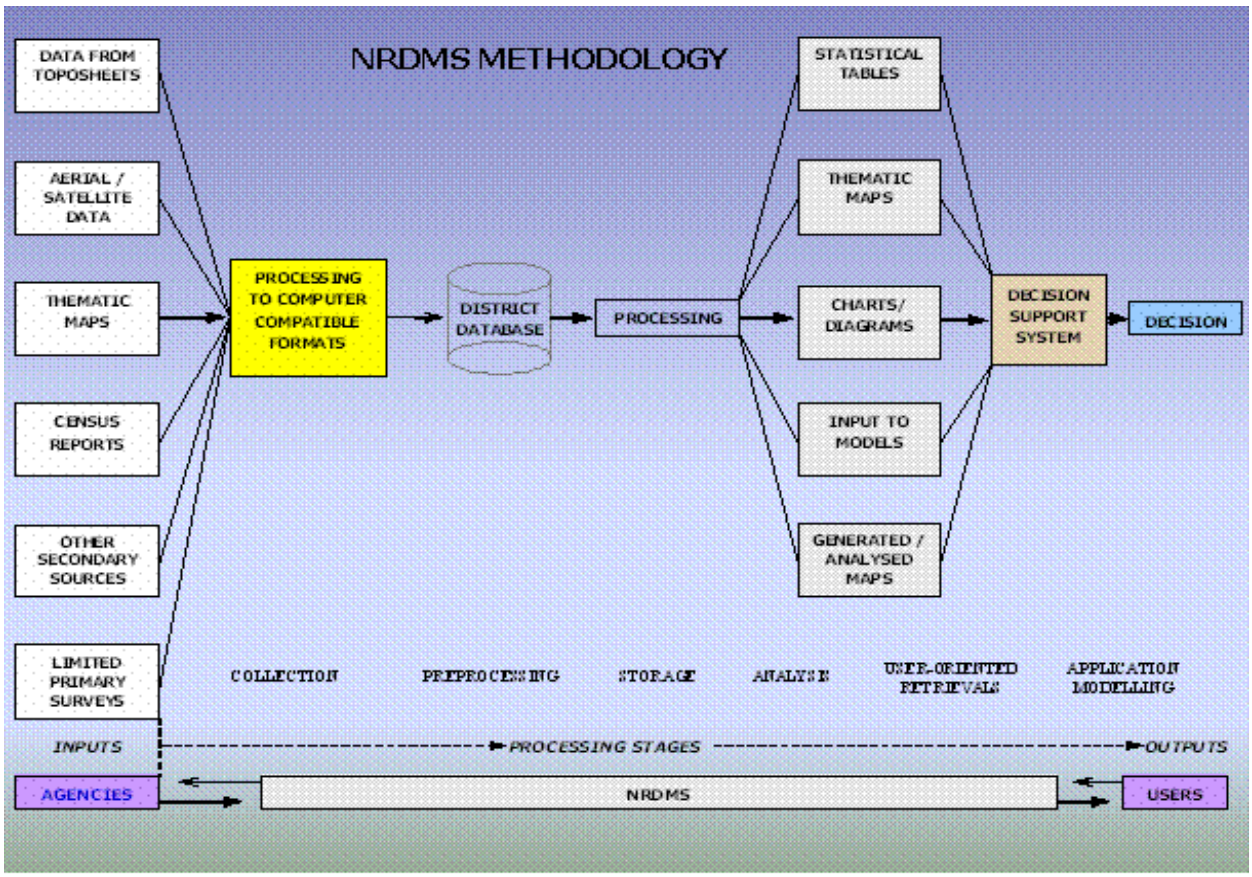
NRDMS Methodology

NRDMS programme aims to analyze the evolution of methodologies and techniques for formulating development strategies. In a scenario of large diversity of data sets, data users and data generating agencies, the programme aims at developing and demonstrating the use of spatial decision support tools for integrated planning and management of resources at the local level. The NRDMS programme uses both maps and textual data collected from various data generating agencies and remote sensing sources. Maps are digitized and stored on a computer as a series of thematic data layers. Depending on the real unit of planning, maps on 1:250,000, 1:50,000 and cadastral scales are utilized.

Data on natural resources, demography, agro & socio-economy and infrastructural facilities for a district form the core database.

Those pertaining to specific problems of an area constitute the sectoral database. Textual data obtained from secondary sources are normally stored with village as a unit. Data gaps are filled in by limited primary surveys. Various decision support systems\ modules built into the system help process the data and generate alternative scenarios for making optimal planning decisions. Outputs in the form of thematic maps, tables and reports based on spatial analysis are obtained from the database as per the user requirements.

The below diagram indicates broadly the methodology adopted in the NRDMS project.



Geographical Information System [GIS]

A geographic information system (GIS), captures, stores, analyzes, manages, and presents data that is linked to location. Technically, GIS is geographic information systems which includes mapping software and its application with remote sensing, land surveying, aerial photography, geo-positioning system, mathematics, photogrammetry, geography, and tools that can be implemented with GIS software.

GIS applications are tools that allow users to create interactive queries (user created searches), analyze spatial information, edit data, maps, and present the results of all these operations.

GIS have taken advantage of rapid developments in Information technology over the past several decades to address the spatial challenges of storing and analyzing spatial data. GIS belongs to the class of computer systems that require the building of large databases before they actually become useful. Actually, the use of a GIS requires that large spatial database be created, appropriate hardware / software be procured and installed, applications be developed, installed, integrated and tested before users can use the GIS and realize the benefit.

The role of a GIS in a government setup is more than simply automating a few obvious tasks for the sake of efficiency. A local government or zilla panchayath should view the GIS project as an opportunity to introduce fundamental change into the way its business is conducted. Just as MIS / EIS in corporate business world, the adoption of GIS effectively reorganises the data and information that the government collects, maintains and uses to conduct its affairs. This will lead to major changes in the institution both effectiveness and efficiency of operations. NRDMS uses corporate database concept to integrate GIS data for all units of Zilla Panchayath participating in a co-operative GIS program. Establishing the corporate database is much more a question of policy, management co-operation and co-ordination.

An effective corporate database does require co-operation on the part of all users, both for collection and entry of data in the database and in developing applications in a shared data context. This may result in some individual applications or uses being less efficient, however the overall benefits to the organization can easily outweigh these inefficiencies. Greater emphasis must be placed on maintaining a high quality of data and services to users.

GEOGRAPHICAL FEATURES.

Location & Boundaries

Location: 13.340, 77.112.

Kneighboring districts: Chitradurga, Chikkaballapura, Bangalore Rural, Ramanagara, Mandya, Hassan & Chikkamagaluru.

Kneighboring states: Andhra Pradesh.

Number of Taluks:10

Number of Hoblis: 50

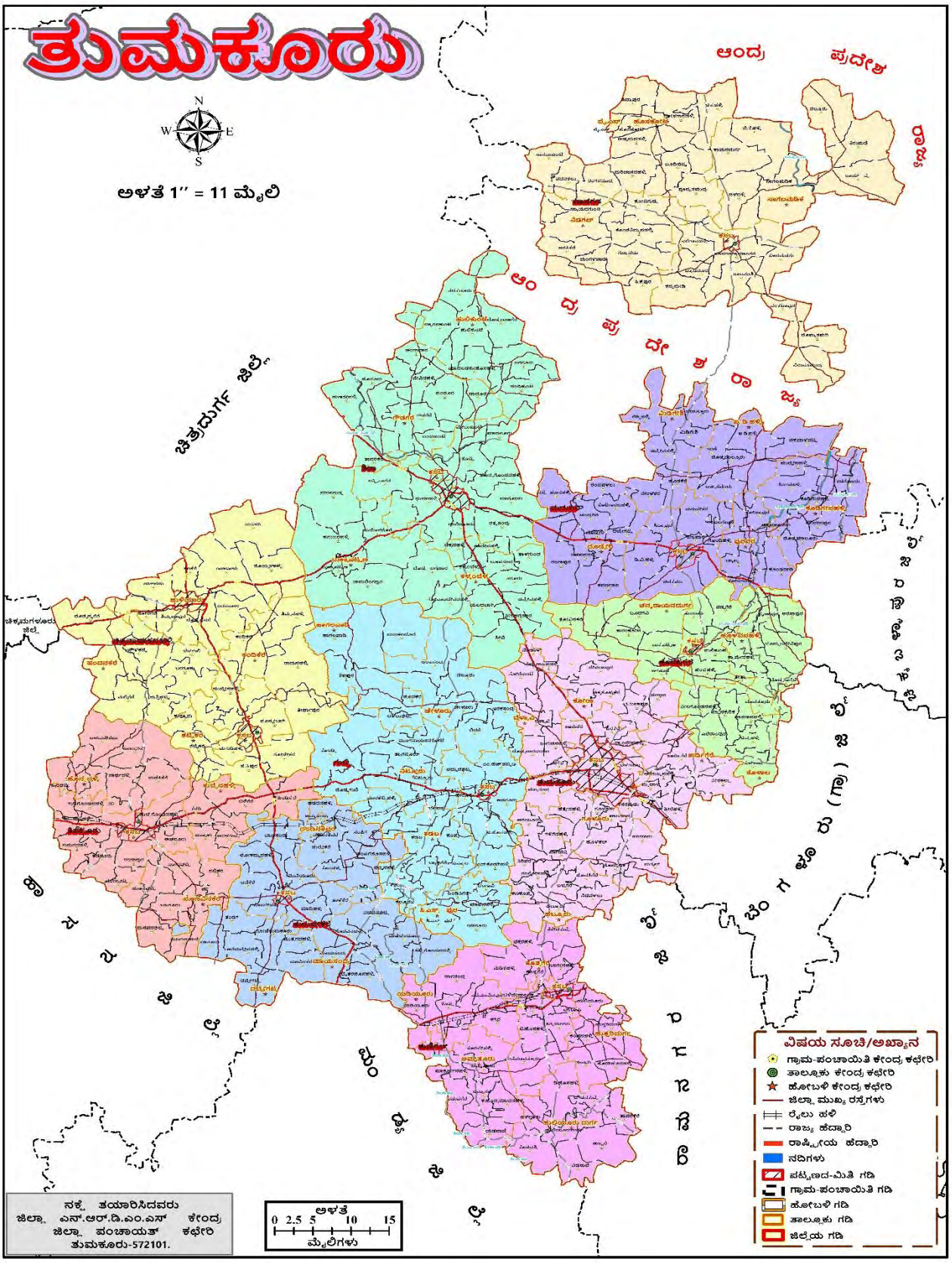
Number of Gram Panchayaths: 331

Number of Villages: 2715

Number of Urban Local Bodies (ULBs): 11

- **Tumakuru (CC) -** City Corporation
- **Tiptur (CMC) -** City Municipal Council
- **Sira (CMC) -** City Municipal Council
- **Chikkanayakanahalli (TMC) -** Town Municipal Council
- **Madhugiri (TMC) -** Town Municipal Council
- **Pavagada (TMC) -** Town Municipal Council
- **Kunigal (TMC) -** Town Municipal Council
- **Koratagere (TMC) -** Town Municipal Council
- **Gubbi (TP) -** Town Panchayat
- **Turuvekere (TP) -** Town Panchayat
- **Huliyar (TP) -** Town Panchayat.

District Map



Geographical Coordinates

Latitude: 13.3710° N

Longitude: 76.6413° E

Topography

District's topography is characterized by elevated land, rolling hills, and valleys, with an average elevation of around 750-800 meters above sea level. A significant north-south trending range of hills divides the district, acting as a watershed between the Krishna and Kaveri rivers. Major rivers like the Jayamangala and Shimsha flow through valleys. Prominent hills include Channarayanadurga and Koratagiri.

- **Elevated Land and Rolling Hills**

The district is primarily elevated, with a rolling topography consisting of hills and cultivated valleys.

- **Hill Range**

A prominent range of hills runs from north to south, reaching elevations of nearly 4,000 feet (1,200 meters).

- **Watershed**

This hill range forms the crucial watershed between the Krishna River and Kaveri River basins.

- **Major Rivers**

The Jayamangala and Shimsha are the principal streams flowing through the district.

- **Prominent Hills**

Specific hills like Channarayanadurga (3,734 feet) and Koratagiri are notable topographical features.

- **Elevation**

The district's average elevation is approximately 750-800 meters above mean sea level.

- **Slope**

Topography includes low-lying areas to moderately sloping hills, with slopes ranging from 0-1% to 5-10%

Climate

Average Rainfall: 687.9mm

Temperature Range: Varies from 14°C to 34°C.

Climatic Zones: Agro-Climatic Zones

- **Central Dry Zone**

  This is the primary agro-climatic zone for Tumkur.

  - **Climate:** Semi-arid with moderate temperatures and rainfall.
  - **Soil:** A mix of black, red, and laterite soils.

- **Eastern Dry Zone**

Some areas of the district may also be considered within this zone.

  - **Climate:** Also, semi-arid, similar to the CDZ.

Natural Resources

Forests: The primary natural resource from Tumkur's forests is medicinal plants, particularly found in the Devarayanadurga and Siddarabetta hill ranges. The forests themselves provide vital ecosystem services like providing fresh air and water resources, contributing to biodiversity, and supporting climate change mitigation. The district has dry and moist deciduous forest types, including wildlife habitats and protected areas such as the Jayamangali Blackbuck Conservation Reserve.

Specific Forest Resources

- **Medicinal Plants:**

The hill ranges of Devarayanadurga and Siddarabetta are known for harboring diverse varieties of medicinal plants.

- **Wildlife**

The forests are home to various wildlife, including sloth bears in the Madhugiri State Forest.

- **Forest Types**

Forests are characterized by a mix of dry deciduous forests, with some patches of moist deciduous woods along streams.

Ecosystem Services

- **Climate Regulation**

Forests play a crucial role in mitigating climate change by absorbing carbon dioxide and releasing oxygen, as noted by Karnataka Forest Department.

- **Water and Soil**

Forest ecosystems contribute to the provision of clean water resources and the maintenance of fertile soil, which supports local agriculture.

- **Biodiversity**

The forests are vital habitats supporting a rich variety of plant and animal life.

Minerals: Significant mineral resources, including iron ore, granite, manganese, and silica sand. The district also has occurrences of other minerals such as chromite, corundum, and graphite.

Water bodies: Important rivers Jayamangali, Shimsha, and Suvarnamukhi, along with numerous smaller tanks, Kalyanis (stepwells), and the significant Amanikere lake.

Rivers

- **Jayamangali River:** One of the principal streams in the district.
- **Shimsha River:** A tributary of the Kaveri river, it originates in the Tumkur district's Devarayanadurga hills.
- **Suvarnamukhi River:** Another important river system within the district.

Lakes & Reservoirs

- **Amanikere Lake:** A well-known lake with a historical and cultural significance, serving as a water source and an eco-tourism spot.
- **Marconahalli Reservoir:** A medium irrigation project located in the Kunigal taluk.

Other Water Bodies

- **Kalyanis (Stepwells)**

There are approximately 450 Kalyanis in Tumkur district, serving as traditional water harvesting structures.

- **Minor Irrigation Tanks**

The district is home to a vast number of minor irrigation tanks, with 1642 recorded tanks providing irrigation to a significant portion of the land.

- **Groundwater**

Groundwater resources, with aquifer systems in areas like Sira taluk.

Soil: Soils in the district include creaceous red loamy soils, red sandy loam soils, sandy clay loam, and loamy soils. These soils, which range from moderately acidic to slightly alkaline, are characterized by low to medium nitrogen, but varying phosphorus and potassium levels. Nutrients like iron, manganese, and copper are often deficient or excessive, requiring careful management for sustainable agriculture, especially given the widespread overexploitation of the region's soil resources.

Soil types by formation

- Red loamy soils: Common throughout the district.
- Red sandy loam soils: Also found in the region.
- Sandy clay loam soils: Another type identified in Tumkur.
- Loamy soils: Present in various areas.
- Sandy soils: Also encountered in Tumkur.

Soil Characteristics

- Acidity: Soils generally range from moderately acidic to slightly alkaline.
- Organic Carbon: Typically low, with some exceptions.
- Nutrient Levels: Available nitrogen and phosphorus are low to medium, while potassium varies.
- Micronutrients: Iron, manganese, zinc, and copper levels are also variable.

Management & Fertility

- **Overexploitation**

Soil resources are being overexploited, necessitating sustainable management.

- **Nutrient Management**

Intensive soil nutrient management is needed.

- **Fertility**

Studies reveal a need for improved management, particularly in coconut-growing areas.

- **Soil Depth**

Soils range from deep to very deep, with many areas affected by moderate erosion.

Major Rivers/Water Sources

District includes the major rivers Jayamangali, Shimsha, and Suvarnamukhi, along with numerous smaller tanks, Kalyanis (stepwells), and the significant Amanikere lake.

NRDMS SPATIAL AND NON-SPATIAL DATA AVAILABLE IN DISTRICT NRDMS CENTRE.

Spatial data

Taluk Level Data

1. Boundaries

- Gram Panchayath Boundary
- Hobli Boundary
- Taluk Panchayath Boundary
- Zilla Panchayath Boundary
- Village Boundary.

2. Headquarters

- Gram Panchayath Headquarters
- Hobli Headquarters
- Taluk Panchayath Headquarters.

3. Settlements

- Village Settlement's.

4. Facilities

- Bank Facilities
- Communication Facilities
- Credit Societies Facilities
- Drinking Water Facilities
- Educational Facilities
- Medical Facilities
- Post And Telegraph Facilities
- Recreational And Cultural Facilities etc.

District Level Data

5. Boundaries

- Gram Panchayath Boundary
- Hobli Boundary
- Taluk Panchayath Boundary
- Zilla Panchayath Boundary
- Village Boundary.

6. Headquarters

- Gram Panchayath Headquarters
- Hobli Headquarters.

7. Settlements

- Line department building assets etc.

8. Facilities

- Communication Facilities
- Credit Societies Facilities
- Drinking Water Facilities
- Educational Facilities
- Medical Facilities
- Post And Telegraph Facilities
- Recreational And Cultural Facilities, etc.

Non-spatial data

- 2001 & 2011 Census Data
- District Line department Statistical data
- Bhuvan data
- Ground Water data (CGWB & KGWA)
- MGNREGA
- Etc.

NRDMS CENTRE ACTIVITIES (DECEMBER - MARCH).

Activities and Data collection

- **Planning dept**-Draft plan, ISDDP, DHDR & GP-HDI reports
- **Swaccha Bharat Mission (Rural)**-SBMG IHHL report
- **Statistics-** Avalokana web Portal
- **Mgnrega-**Gram panchayaths KML/KMZ file creation
- **Election-**Koratagere ZP & TP constituencies delimitation
- **GIS-Project-**Creating a 1:1000 scale village settlements database
- **Etc.**

TRAINING PROGRAMMES ATTENDED.

- **Census of India-2027 Training & Wokshop on 09-03-2026 to 11-03-2026.**

TRAINING IMPARTED TO LINE DEPARTMENTS.

Not imparted.

SCIENCE OUTREACH ACTIVITIES.

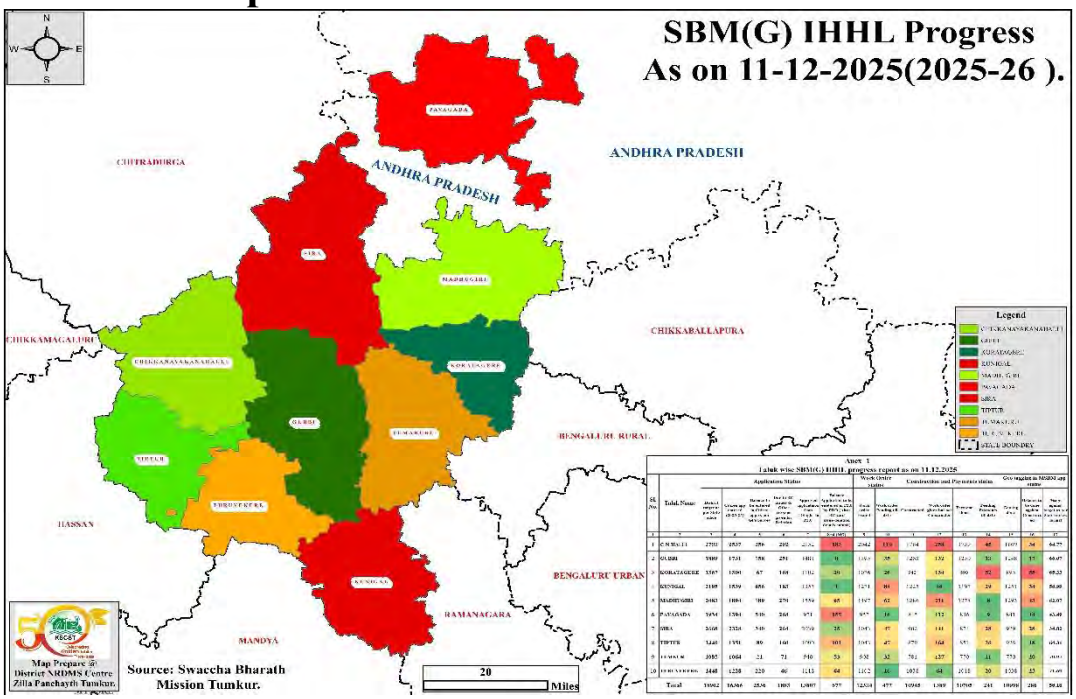
No.

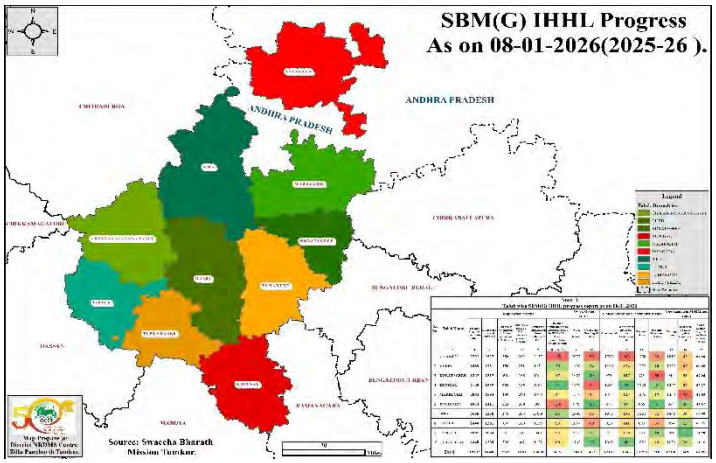
CONCLUSION.

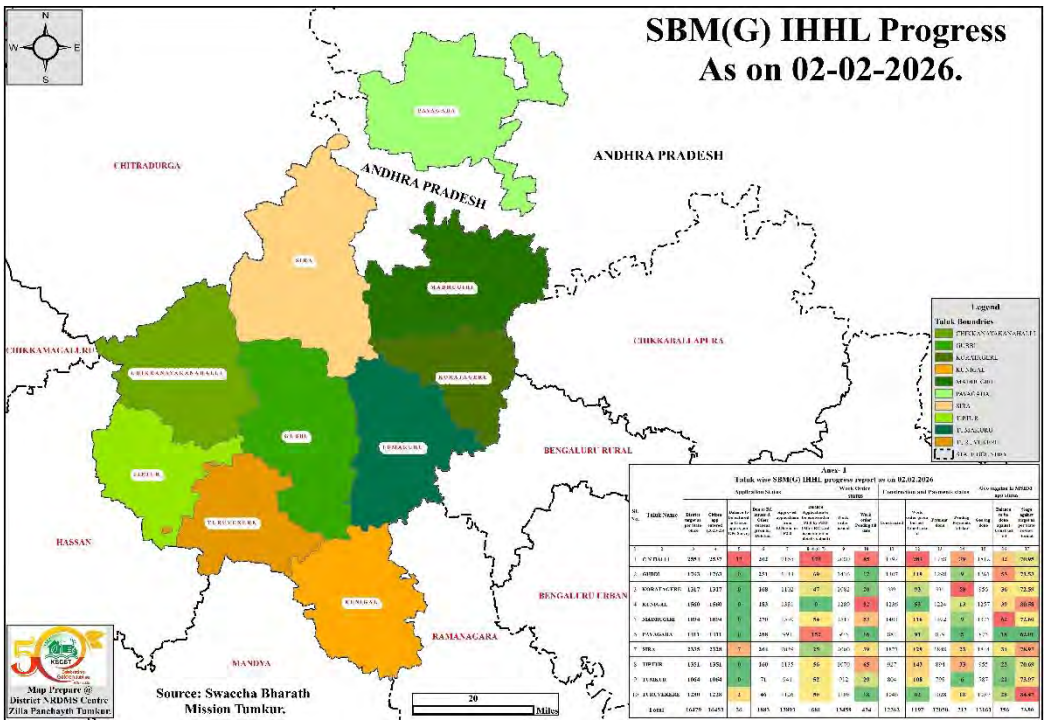
- IHHL report collection is a vast activity, but took a longer period of time to collect the data by teams/personals, finally Nodal officer with couragiously manipulate the circulars & instructions, to get the data by time to time during busy schedule.
- **Potential areas for improvement or focus: -** Health, Education, Food and Agriculture.
- Today mapping is a large and growing sector of the economy as well as an important social, cultural, and political phenomenon. Mapping is also important for lifelong learning. Spatial thinking skills are used in many fields, careers, and pastimes.

ANNEXURES-MAPS.

SBM-IHHL maps

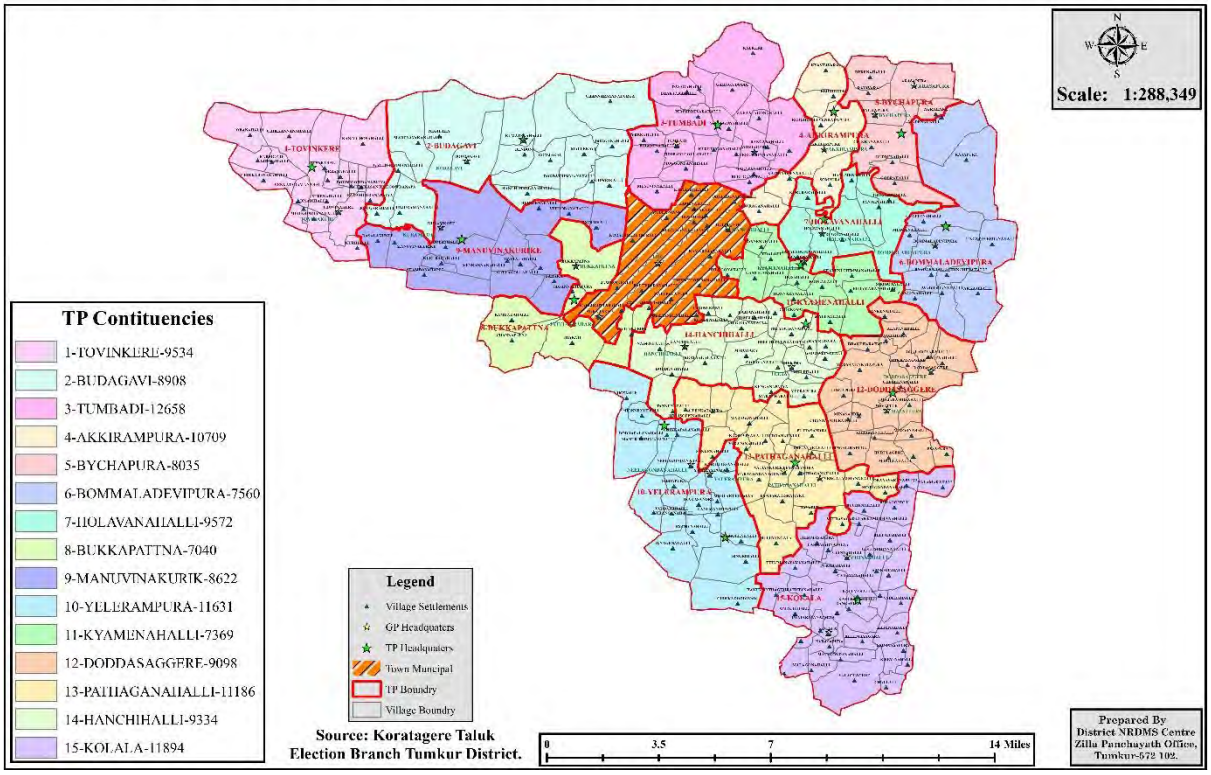




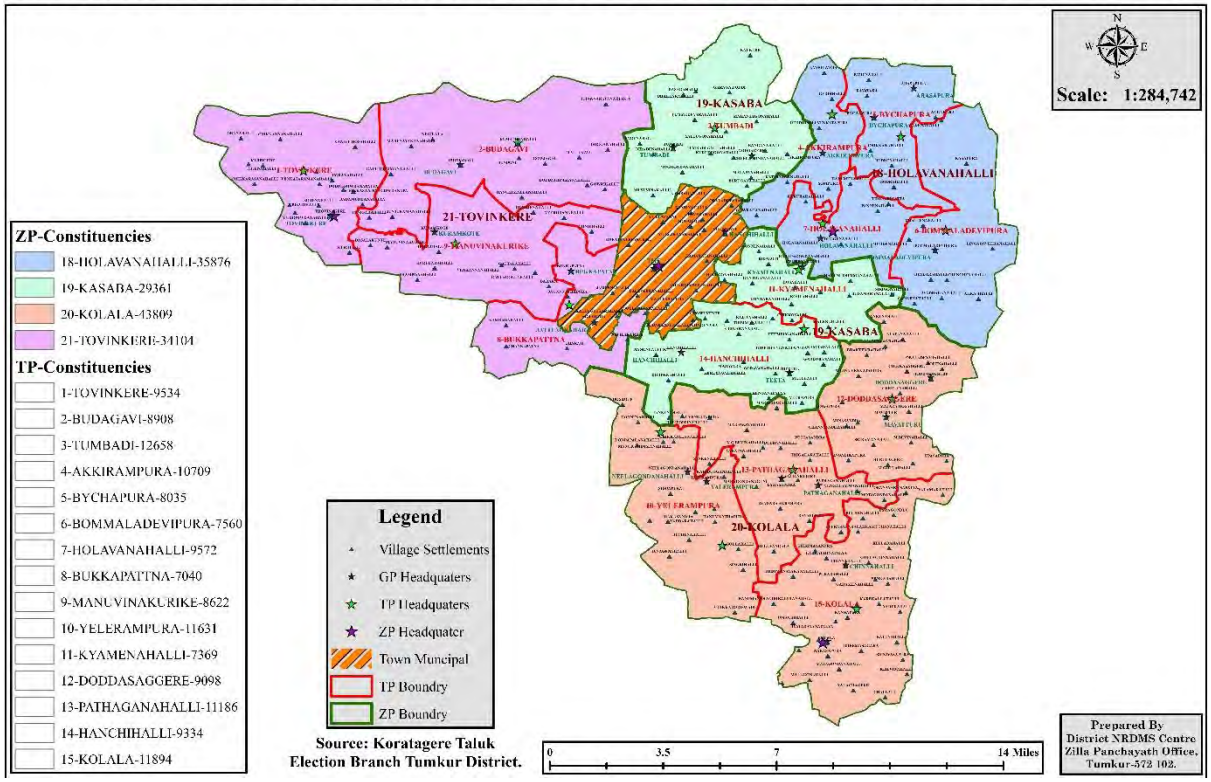


ZP TP Delimitation

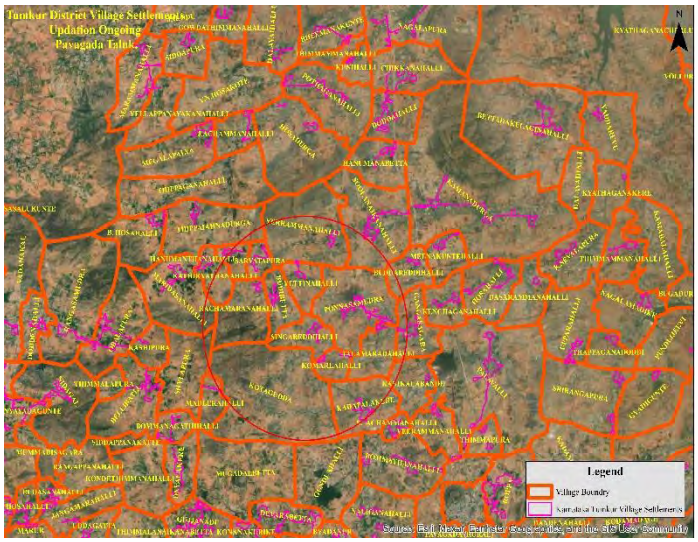
TALUK PANCHAYATH DELIMITATION-2026
KORATAGERE TALUK, TP CONSTITUENCIES, TUMKUR DISTRICT.

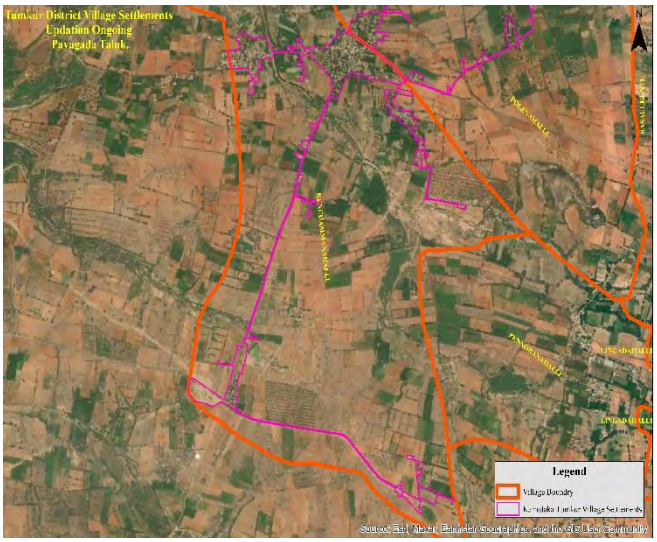


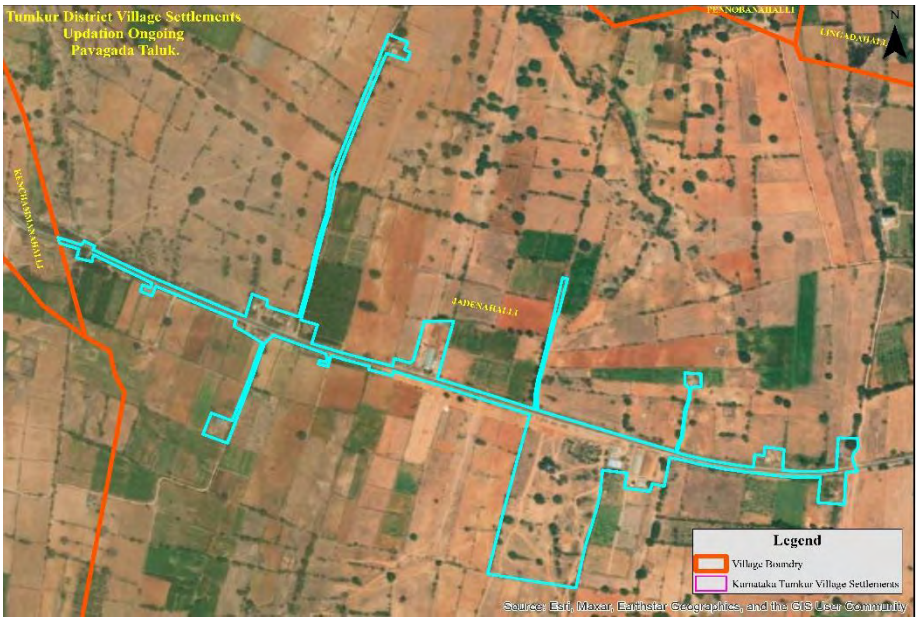
TALUK PANCHAYATH DELIMITATION-2026
KORATAGERE TALUK, ZP CONSTITUENCIES, TUMKUR DISTRICT.



Village settlements Maps







Datasets

DHDR & ISDDP Indicators Received Dept as on 25-03-2026.zip

Tumkur ward map