NATURAL RESOURCE DATA MANAGEMENT SYSTEMS

Zilla Panchayath Kolar

Quadrimester Technical Report DECEMBER 2025- MARCH 2026

By:

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District NRDMS Centre

Zilla Panchayath Kolar-563101

District Name: Kolar

Division: Bengaluru

District Establishment year: 1835

Headquarters: Kolar

Current CPO: Ravichandra N ***(In charge)***

Current CEO: Dr.Praveen P Bagevadi IAS

To,

Karnataka State Council for Science and Technology

IISc Campus, Bangalore- 560012

MAP SHOWING KOLAR DISTRICT TALUK'S

MAP SHOWING INDIA & STATE'S

KARNATAKA STATE & DISTRICT'S

CHIKKABALLAPURA

ANDRA PRADESH

BANGALORE RURAL

ANDRA PRADESH

TAMILNADU

RAYALPAD
NELAVANKI
SRINIVASAPURA
RONUR
KASABA
YELDUR
HOLER
DUGGASANDRA
BYRAKUR
SUGATUR
VEMAGAL
KOLAR
MULABAGILU
KASABA
NARASAPURA
KASABA
HUTHUR
AVANI
VOKKALERI
TAYALUR
KASABA
KASABA
TEKAL
KGF
ROBERTSONPET
KAIVARALLI
MALUR
LAKKUR
HUDIKOTE
BANGARAPET
MASTHI
KAMASANDRA

Legend
KOLAR
TALUK HQ
HOBLI HQ
HOBLI BOUNDARY
KOLAR TOWNS
NATIONAL HIGHWAY
STATE HIGHWAY
TALUK NAMES
BANGARAPET
KGF
KOLAR
MALUR
MULABAGILU
SRINIVASAPURA

0 5 10 20 30 40 Kilometers

PREPARED BY:
DISTRICT NRDMS CENTRE
ZILLA PANCHAYATH KOLAR

3. NRDMS Background:

The Karnataka Natural Resources Data Management System (NRDMS) program, initiated in 1992 by the Council with support from DST, Government of India and Government of Karnataka, aims to strengthen decentralized planning through the use of spatial data and geospatial technologies. Recognizing the limitations of macro-level resource assessment, NRDMS introduced micro-level spatial planning supported by digital databases on natural resources, socio-economic and agro-economic parameters. Through a network of District NRDMS Centers, the program integrates multi-sectoral data to provide analyzed, location-specific information and decision-support tools to planners, administrators, and local governance bodies, facilitating informed and integrated development planning.

Background of Kolar District (Elaborated)

Kolar is a prominent district located in the south-eastern part of **Karnataka**, India. It holds a unique place in Indian history and geography due to its rich natural resources, cultural heritage, and strategic location. The district is famously known as the **"Land of Gold"** because of the **Kolar Gold Fields (KGF)**, which were once among the **deepest, oldest, and most productive gold mines** in the world. These mines were operational for more than a century under British colonial rule and later managed by the Indian government before being closed due to declining production and rising operational costs.

The legacy of gold mining has deeply influenced the region's identity, economy, and settlement patterns. KGF also attracted workers and engineers from across India and abroad, creating a unique multi-cultural environment in the area.

Apart from its mining legacy, Kolar has a **rich historical and cultural background**. It was once part of ancient kingdoms such as the **Ganga dynasty**, the **Cholas**, the **Hoysalas**, and the **Vijayanagara Empire**, all of which left their imprint in the form of temples, inscriptions, and traditional art. The district is dotted with historical temples, such as the **Kolaramma Temple** and **Someshwara Temple**, which reflect its architectural heritage.

Kolar is part of the **Bengaluru Division** and is situated in a region that is important for its **connectivity and proximity to other southern states**. The district **shares its borders with Andhra Pradesh to the east and Tamil Nadu to the south**, making it a **tri-junction of cultural exchange, trade, and**

migration. This strategic location enhances its importance in regional development and cultural diversity.

In the present day, although the gold mines are no longer operational, Kolar continues to thrive through **agriculture**, **silk production**, and **horticulture**. It is particularly known for the cultivation of **tomatoes, mangoes, and flowers**, making it one of the leading horticultural districts in Karnataka.

Thus, Kolar district represents a blend of **historical richness, geographical significance, and cultural diversity**, rooted in its golden past and growing through modern development.

Description of Kolar District:

Kolar is a district in the **south-eastern part of Karnataka**, India. It is known for its historical significance, especially due to the **Kolar Gold Fields (KGF)**, once famous for gold mining. The district is also recognized for its **agriculture**, **silk production**, and **horticulture**, particularly tomatoes and mangoes. Kolar has a mix of rural and semi-urban areas and plays a key role in Karnataka's economy and history.

Location:

- **State**: Karnataka
- **Region**: Southern Karnataka (Bengaluru Division)
- **Geographical Coordinates**: Between **12°46′ N to 13°58′ N latitude** and **77°21′ E to 78°35′ E longitude**
- **Elevation**: Around **850–950 meters** above sea level

Neighbouring Districts and States:

Direction	Neighbouring Region
North	**:Chikkaballapur District** (Karnataka)
West	**:Bengaluru Rural District** (Karnataka)
East	**:Chittoor District** (Andhra Pradesh)
South	**:Krishnagiri District** (Tamil Nadu)
Southeast	**:Vellore District** (Tamil Nadu)

Topography of Kolar District

Kolar district, located in the southeastern part of **Karnataka**, has a **diverse topography** but is primarily characterized by **undulating plains**, **rocky hills**, and **scattered plateaus**. It is **not a coastal region** and lies in the **interior part** of South India.

1. Terrain and Landforms

- The district features a mix of **gently sloping plains** and **rugged terrain**.
- The **elevation** ranges between **850 to 950 meters above sea level**, giving it a **moderate altitude**.
- The land is mostly **dry and semi-arid**, suited for **dryland agriculture**.
- **Rocky outcrops** and **granite hills** are common across the landscape.

2. Hills and Plateaus

- Kolar has several **isolated hills** and **hill ranges**, mainly composed of **granite and gneiss rocks**.
- Notable hill areas include:
  - ✓ **Antara Gange Hills** near Kolar – known for caves, springs, and religious significance.
  - ✓ **Shathashrunga Hills** – located near Mulbagal.
- These hills are **not part of the Western or Eastern Ghats** but are local hill formations.
- The terrain transitions into the **Deccan Plateau**, making Kolar a part of the **Southern Plateau region**.

3. Rivers and Water Bodies

- **Kolar is not a coastal district** and does **not** have access to the sea.
- It has **no major perennial rivers**, but several small rivers **originate here**.
- Major rivers:
  - ✓ **Palar River** – originates in Kolar and flows into Tamil Nadu.
  - ✓ **South Pennar (Dakshina Pinakini)** – also flows through the district.
- Due to lack of consistent surface water, the region depends on **tanks (lakes)** and **groundwater**.

- ✓ Examples: **Bethamangala Lake**, **Kolaramma Tank**, **Narsapura Tank**.

4. Soil and Agriculture

- Dominated by **red sandy loam** and **red clay soils**, which are **well-drained** but low in fertility.
- The terrain and soil support crops like **ragi**, **groundnut**, **pulses**, and **horticultural crops** like **mangoes**, **tomatoes**, and **flowers**.

Summary

- **Region**: Interior plateau (not coastal)
- **Terrain**: Undulating plains with rocky hills and plateaus
- **Hills**: Local granite hills (e.g., Antara Gange)
- **Rivers**: Palar, South Pennar (seasonal and rain-fed)
- **Elevation**: 850–950 meters
- **Soil**: Red soils, suitable for dryland farming
- **Climate**: Semi-arid

Climate of Kolar District

Kolar district experiences a **semi-arid to dry tropical climate**, typical of the interior regions of South India. The climate is generally **hot and dry**, with **moderate rainfall** and **distinct seasonal variations**.

1. Temperature

- **Summer (March to May)**:
  - ✓ Hot and dry
  - ✓ Average temperatures: **28°C to 35°C**
  - ✓ Occasionally crosses **38°C** during peak summer

- **Monsoon (June to September)**:
  - ✓ Slight drop in temperature
  - ✓ Humid during rainy days
- **Winter (November to February)**:
  - ✓ Mild and pleasant
  - ✓ Average temperatures: **15°C to 28°C**
  - ✓ Night temperatures can drop below **12°C** in some areas

2. Rainfall

Kolar receives **moderate rainfall**, mostly from the **Southwest Monsoon**.

- **Average annual rainfall**: **750 to 900 mm**
- Rainfall is **uneven and irregular**, often leading to **water scarcity**.
- Some rain also occurs during the **Northeast Monsoon** (October–November).

3. Humidity and Winds

- **Humidity** is generally low except during the monsoon season.
- **Winds** are dry and strong in summer, contributing to evaporation and soil dryness.

4. Climate Challenges

- The district is prone to **droughts** due to irregular rainfall.
- **Groundwater depletion** is a major issue because of overuse and limited recharge.
- Agriculture heavily depends on **rainwater and tank irrigation**.

Season	Months	Temperature Range	Rainfall
Summer	March to May	28°C – 35°C	Very low
Monsoon	June to September	25°C – 30°C	Moderate (SW Monsoon)
Post-Monsoon	October to November	22°C – 28°C	Some (NE Monsoon)
Winter	November to February	15°C – 28°C	Very low

Natural Resources of Kolar District

1. 🌳 Forests and Their Locations

Kolar has **limited forest cover**, mainly consisting of **dry deciduous** and **scrub-type forests**. These forests are found on hill slopes and in less cultivated areas.

Common Trees: Neem, Honge, Tamarind, Acacia, Eucalyptus

Forest Area	Location	Type
Antara Gange Hills	Near Kolar town	Dry deciduous, rocky forests
Shathashrunga Hills	Near Mulbagal	Scrub forests, scattered trees
Devarabetta Forest Range	Near Malur and Bangarpet	Thorny shrubs and small trees
Kaiwara Hills (partly)	Bordering Chikkaballapur	Rocky and dry forest cover

2. ⛏ Minerals and Their Locations

Kolar is historically rich in **minerals**, especially **gold** and **granite**.

Mineral	Location in Kolar District	Details
Gold	**Kolar Gold Fields (KGF)** – near Bangarpet	Deepest and oldest gold mine (closed now)
Granite	Mulbagal, Malur, KGF area, and Kolar Taluk	Used in construction, monuments
Quartz	Found near Bangarpet and KGF	Industrial use
Feldspar & Mica	Scattered across Mulbagal & Malur	Limited extraction

3. 💧 Water Bodies and Their Locations

Kolar lacks perennial rivers and relies on **seasonal rivers** and **man-made tanks** (lakes) for water storage and irrigation.

Sector / Subsector	Scale	Source	Survey / Publn. Year	Area covered	Status Code	File Format	File path
1. Natural Resources							
Land							
1. Topography							
Contour Map	1:50,000	KSRSAC		District	CC	.shp	E:\Kolar\Natural Resources
Slope Map	1:50,000	KSRSAC				.shp	E:\Kolar\Natural Resources
2. Geology – A							
Rock features	1:50,000	MGD		District	CC	.shp	E:\Kolar\Natural Resources
Structural features	1:50,000	MGD		District	CC	.shp	E:\Kolar\Natural Resources
3. Geology – B							
Rock features	1:50,000	MGD		District	CC	.shp	E:\Kolar\Natural Resources
Structural features	1:50,000			District	CC	.shp	E:\Kolar\Natural Resources
4. Mineral Resources		MGD		District	NA		
5. Geomorphology	1:50,000	MGD		District	CC	.shp	E:\Kolar\Natural Resources
6. Land use	1:50,000	KSRSAC		District	CC	.shp	E:\Kolar\Natural Resources
7. Waste Lands		KSRSAC		District			
8. Soils	1:50,000	NBSS & LUP		District	CC	.shp	E:\Kolar\Natural Resources
9. Forest & Wildlife							
Forest type		KFD			NA		
Crown Density					NA		
Forest Category					NA		
Forest admn.		SOI			NA		
Wild Life					NA		
Water							
1.Ground water							
Hydro Geology		MGD			NA		
Hydro chemistry		ZP			NA		
Ground water budget					NA		

2.Surface water							
Drainage	1:50,000	MGD		District	CC	.shp	E:\Kolar\Natural Resources
Surface water bodies	1:50,000	SOI & KSRSAC		District	CC	.shp	E:\Kolar\Natural Resources
3.Climate							

Rivers (mostly seasonal):

River	Origin / Flow Through
Palar River	Originates near Nandi Hills, flows through Kolar Taluk
South Pennar	Flows through southern parts of Malur and Bangarpet
Markandeya River	Near KGF region and joins Palar later

Major Tanks and Lakes:

Water Body	Location
Bethamangala Lake	Near Bangarpet
Kolaramma Tank	Near Kolar Town
Narsapura Tank	Near Malur
Doddur Tank	Near Mulbagal

4. Soil Types and Their Distribution

Soil Type	Location in Kolar District	Features
Red Sandy Loam	Widespread – Mulbagal, Kolar, Malur Taluks	Well-drained, suitable for millets
Red Clay Soil	Valleys and semi-irrigated areas	Moisture-retentive, good for ragi, pulses
Lateritic Soil	Hilly areas – Antara Gange, Bangarpet Hills	Less fertile, needs treatment
Black Soil	Patches near Malur and Mulbagal	Suitable for cotton and oilseeds

Natural Resource	Type / Name	Location
Forests	Dry deciduous, scrub forests	Antara Gange, Shathashrunga Hills, Malur
Gold	Kolar Gold Fields (KGF)	Near Bangarpet
Granite	Granite quarries	Mulbagal, Malur, KGF
Rivers	Palar, South Pennar	Kolar, Bangarpet, Malur
Lakes/Tanks	Bethamangala, Kolaramma Tank	Bangarpet, Kolar
Red Soils	Red sandy and clay loam	Across district, especially Kolar & Malur
Black Soil	Fertile black soil patches	Parts of Mulbagal and Malur

5. Status of database–Spatial and non-spatial

SPATIAL DATABASE

Sector / Subsector	Scale	Source	Survey / Publn. Year	Area covered	Status Code	File Format	File path
2.Demography							
Population							
Tehsil boundary	1:50,000	KSRSAC		District	CC	.shp	E:\Kolar\Natural Resources
District boundary	1:50,000	KSRSAC		District	CC	.shp	E:\Kolar\Natural Resources
Current popln. distbn.				District	CC	.Xcel	E:\Kolar\Natural Resources
Literacy							
Levels of education					CC	.Xcel	E:\Kolar
Occupation							
Village boundary	1:50,000	KSRSAC		District	CC	.shp	E:\Kolar
Employment							
District scenario					NA		
Employment exchange					NA		
Assets & Expenditure					NA		
Migration					NA		
Destitutes					NA		

3.Socio Economy						**File Format**	**File path**
Industry	1:50,000	ZP		District	CC	.shp	E:\INDUSTRIES
Developmental activity					NA		
4.**Agro Economy**							
Land Utilisation							
Private Land					NA		
Common property					NA		
Land Ownership pattern							
General scenario					NA		

Farmer's holdings					NA		
Principal crops					NA		
Irrigation							
Minor irrigation							
Canals		DLR & SS					
Tube wells		DLR & SS					
Dug wells		DLR & SS					
Tanks	1:50,000	DLR & SS (KSRSAC)		District	CC	.shp	E:\Kolar\Natural Resources
Lift irrigation		DLR & SS					
Major irrigation							
Reservoirs		DLR & SS					
Anicuts		DLR & SS					
Agricultural implements							
Animal husbandry		AHVS					
Pisciculture							
Plantation							

Sector / Subsector	Scale	Source	Survey / Publn. Year	Area covered	Status Code	File Format	File path
5.Infrastructure							
Communications							
Post offices		DLR & SS					
Telecommunication		DLR & SS					
Drinking water		DLR & SS					
Educational facilities	1:50,000	DDPI		District	CC	.shp	E:\EDUCATIONAL BLOCKS
Electricity		Land Records					
Financial institutions		DLR & SS					
Markets		DLR & SS					
Health	1:50,000	DHO		District	CC	.shp	E:\Health department
NGO's		DLR & SS					
Tourism	1:50,000	KSTDC		District	CC	.shp	E:\Kolar
Transport	1" = …miles	PWD		District	CC	.shp	E:\Kolar
6.Miscellaneous							
District map with taluks	1" =… miles	DLR & SS		District	CC	.shp	E:\Kolar
District & taluk boundaries	1:50,000	SOI		District	CC	.shp	E:\Kolar

District map with hoblies	1: =.. miles	DLR & SS		District	CC	.shp	E:\Kolar
Village boundary with settlement	1:50,000	SOI/KSRAC		District	CC	.shp	E:\Kolar
Police station details	1:50,000	SP		District	CC	.shp	E:\POLICE STATION
Details on Assembly constituencies	1:50,000	DC		District	CC	.shp	E:\Kolar
Gram Panchayhs & Zilla Panchayaths, its jurisdiction for all taluks	1:50,000	DC		District	CC	.shp	E:\Kolar

Non-Spatial Database

Sector / Subsector	Source	Survey / Publn. Year	Area covered	Status Code	File Format	File path
1. Natural Resources						
Land						
1. Topography						
Contour				NR		
Slope				NR		
2. Geology – A						
Rock Features	MGD			CC		
Structural features						
3. Geology – B						
Rock features						
Structural features						
4. Mineral Resources	MGD					
5. Geomorphology						
6. Land use						
7. Waste Lands						
8. Soils	NBSS & LUP					
9. Forest & Wildlife						
Forest type						
Crown Density						
Forest Category						
Forest admn.						
Wild Life						
Water						
Ground water						
Hydro Geology	MGD					
Hydro chemistry	CGWB					
Ground water budget	MGD					
Surface water						
Drainage						
Surface water bodies						
Climate	IMD					

2. Demography					File Format	File path
Population						
Tehsil boundary	DLR & SS					
District boundary						

Current popln. distbn.	DES			CC	.Xls	E:\Kolar
Literacy					**File Format**	**File path**
Levels of education				CC	.Xls	E:\Kolar
Occupation						
Village boundary	DES			CC	.Xls	E:\Kolar
Employment						
District scenatio	EO			CC	.Xls	E:\Kolar
Employment exchange	EO			CC	.Xls	E:\Kolar
Assets & Expenditure				NA		
Migration				NA		
Destitutes				NA		

3. Socio Economy					**File Format**	**File path**
Industry	DIC			CC	.Xls	E:\Kolar
Developmental activity	DIC					

4. Agro Economy					**File Format**	**File path**
Land Utilisation						
Private Land	DSO		VILLAGE	NA		
Common property	DSO			NA		
Land Ownership pattern						
General scenario	DSO			NA		
Farmer's holdings	Rev. Dept			NA		
Principal crops	JDA		Taluk	NA		
Irrigation						
Minor irrigation						
Canals	CADA			NA		
Tube wells	DSO			NA		
Dug wells	DSO			NA		
Tanks	MIC/ ZPE			NA		
Lift irrigation	MID			NA		
Major irrigation						
Reservoirs	CE (N)			NA		
Anicuts	CE (N)			NA		
Agricultural implements	Ag Census			NA		

Animal husbandry	AH&VS			NA		
Pisciculture	Fisheries			NA		
Plantation				NA		
Horticulture	HD			NA		
Sericulture	SD			NA		

Sector / Subsector	Source	Survey / Publn. Year	Area covered	Status Code	File Format	File path
5. Infrastructure						
Communications						
Post offices	SSPO/ DES		Village	NA		
Telecommunication	TDM / DES			NA		
Drinking water	ZPE			CC	.Xls	E:\Kolar
Educational facilities	DDPI			CC	.Xls	E:\Kolar
Electricity	Census			NA		
Financial institutions	LEAD bank			NA		
Markets	FACS			CC	.Xls	E:\Kolar
Health	DHO			CC	.Xls	E:\Kolar
NGO's	DRS			NA		
Tourism	KSTDC			CC	.Xls	E:\Kolar
Transport						
Roads	PWD			NA		
Rail network	ZPED			NA		
Air transport/HELIPAD	PWD			NA		
Vehicle census	RTO			NA		
Inland & coastal waterways				NA		
Veterinary services						
Veterinary facilities	AHVS			NA		
Other veterinary serv.	AHVS			NA		
Incidence of diseases	AHVS			NA		
	D W&C			CC	.Xls	E:\WOMEN & CHILD WELFARE DEPARTMENT

Sector / Subsector	Source	Survey / Publn. Year	Area covered	Status Code	File Format	File path
6. Miscellaneous						
Administration	DC office					

Dt. & Subdivsns.						
Dt., with tehsils						
Dt., with panchayat						
Tq., with census vil.						
Prices & wages						
Environment						
Anganwadi						

MAP SHOWING KOLAR DISTRICT TALUK'S

MAP SHOWING INDIA & STATE'S

KARNATAKA STATE & DISTRICT'S

CHIKKABALLAPURA

ANDRA PRADESH

BANGALORE RURAL

TAMILNADU

ANDRA PRADESH

SRINIVASAPURA

RAYALPAD

NELAVANKI

RONUR

KASABA

TULDUR

HOLUR

DUGGASANDRA

BYRAKUR

SIGATUR

VEMAGAL

KOLAR

KASABA

MULABAGILU

KASABA

NARASAPURA

KASABA

HUTHUR

JUSNI

VOKKALERI

TAYALUR

KASABA

KASABA

TEKAL

KGF

ROBERTSONPET

KYASAMBALLI

MALUR

LAKKUR

BUDIKOTE

BANGARAPET

MASTHI

KAMASANDRA

N

W

E

S

0 5 10 20 30 40 Kilometers

Legend

KOLAR

TALUK HQ

HOBL HQ

HOBL BOUNDARY

KOLAR TOWNS

NATIONAL HIGHWAY

STATE HIGHWAY

TALUK NAMES

BANGARAPET

KGF

KOLAR

MALUR

MULABAGILU

SRINIVASAPURA

PREPPARED BY:
DITRICT NRDMS CENTRE
ZILLA PANCHAYATH KOLAR

1. Abstract

High Risk Area (HRA) sites significantly influence public health, environmental sustainability, and epidemiological patterns. This study presents a comprehensive GIS and Remote Sensing (RS)-based spatial analysis of HRA sites across Kolar District for the period 2025–26. Various categories of HRAs—including poultry farms, brick kilns, stone crushers, slum settlements, cow sheds, construction sites, and outbreak-prone zones—were mapped and analyzed.

Using satellite imagery, GPS-based field surveys, and PHC-level datasets, the study evaluates spatial distribution, density patterns, and clustering tendencies. The results reveal a strong association between HRA concentration and urban-industrial expansion, particularly in taluks such as Kolar, Malur, Bangarpet, and Mulbagal.

The study demonstrates the effectiveness of geospatial technologies as decision-support tools for disease surveillance, environmental monitoring, and targeted public health interventions.

2. Introduction

Rapid urbanization and industrialization have significantly altered land-use patterns, leading to the emergence of environmentally sensitive and epidemiologically vulnerable locations known as High Risk Areas (HRAs). These areas act as potential hotspots for:

- Vector breeding (mosquitoes, flies)
- Environmental pollution (air, water, soil)
- Disease outbreaks (dengue, malaria, respiratory illnesses)

Traditional monitoring systems lack the spatial precision needed to track these dynamic and dispersed sites. Therefore, modern tools such as **Geographic Information Systems (GIS)** and **Remote Sensing (RS)** provide an efficient framework for:

- Mapping spatial distribution
- Identifying clustering patterns
- Supporting public health planning

Kolar District, with its diverse land-use system combining agriculture, mining, industries, and urban settlements, presents a complex environment for HRA analysis.

3. Background of the Study

Historically, public health surveillance relied on manual reporting and field inspections. However, increasing population density and industrial expansion have made such approaches insufficient.

Key background aspects include:

- Rise in zoonotic and vector-borne diseases
- Expansion of informal settlements (slums)
- Growth of poultry and livestock farming
- Increase in industrial activities like brick kilns and crushers

Previous studies have shown that:

- HRAs are unevenly distributed
- Urban fringes are more vulnerable
- Agricultural intensification contributes to risk zones

Despite these insights, there has been limited PHC-level spatial analysis in Kolar District, which this study addresses.

4. Objectives of the Study

Primary Objective

To analyze the spatial distribution and density of High Risk Area (HRA) sites using GIS and Remote Sensing techniques.

Specific Objectives

1. To map HRA sites across PHC boundaries

2. To classify HRAs into thematic categories
3. To identify high-density clusters
4. To analyze taluk-wise variation
5. To support public health planning and intervention strategies

5. Study Area: Kolar District

5.1 Location and Extent

Kolar District is located in southeastern Karnataka.

- Bounded by:
  - ✓ Chikkaballapura District (North)
  - ✓ Bengaluru Rural District (West)
  - ✓ Tamil Nadu (South)
  - ✓ Andhra Pradesh (East)

5.2 Physiography

- Semi-arid plateau region
- Undulating terrain
- Red soil dominant

5.3 Administrative Divisions

The district consists of five taluks:

- Kolar
- Malur
- Bangarpet
- Mulbagal
- Srinivaspura

5.4 Climate

- Semi-arid climate
- Moderate rainfall
- High temperature variability

5.5 Land Use Pattern

- Agriculture (millets, vegetables, horticulture)
- Floriculture (rose gardens)
- Mining and quarrying
- Industrial units
- Expanding urban settlements

6. Research Methodology

6.1 Data Collection

Primary Data

- GPS-based field survey of HRA locations
- PHC-wise HRA inventory from Health Department

Secondary Data

- Satellite imagery (Google Earth, Sentinel)
- Administrative boundary maps
- Census and land-use datasets

6.2 Data Preparation

Steps involved:

1. Data cleaning and validation
2. Georeferencing of satellite imagery
3. Conversion into GIS-compatible formats

4. Attribute table creation for HRA categories

6.3 GIS Analysis and Mapping

Key GIS operations:

- Digitization of HRA points
- Overlay analysis with PHC boundaries
- Spatial clustering identification
- Density analysis using kernel methods

6.4 Map Output

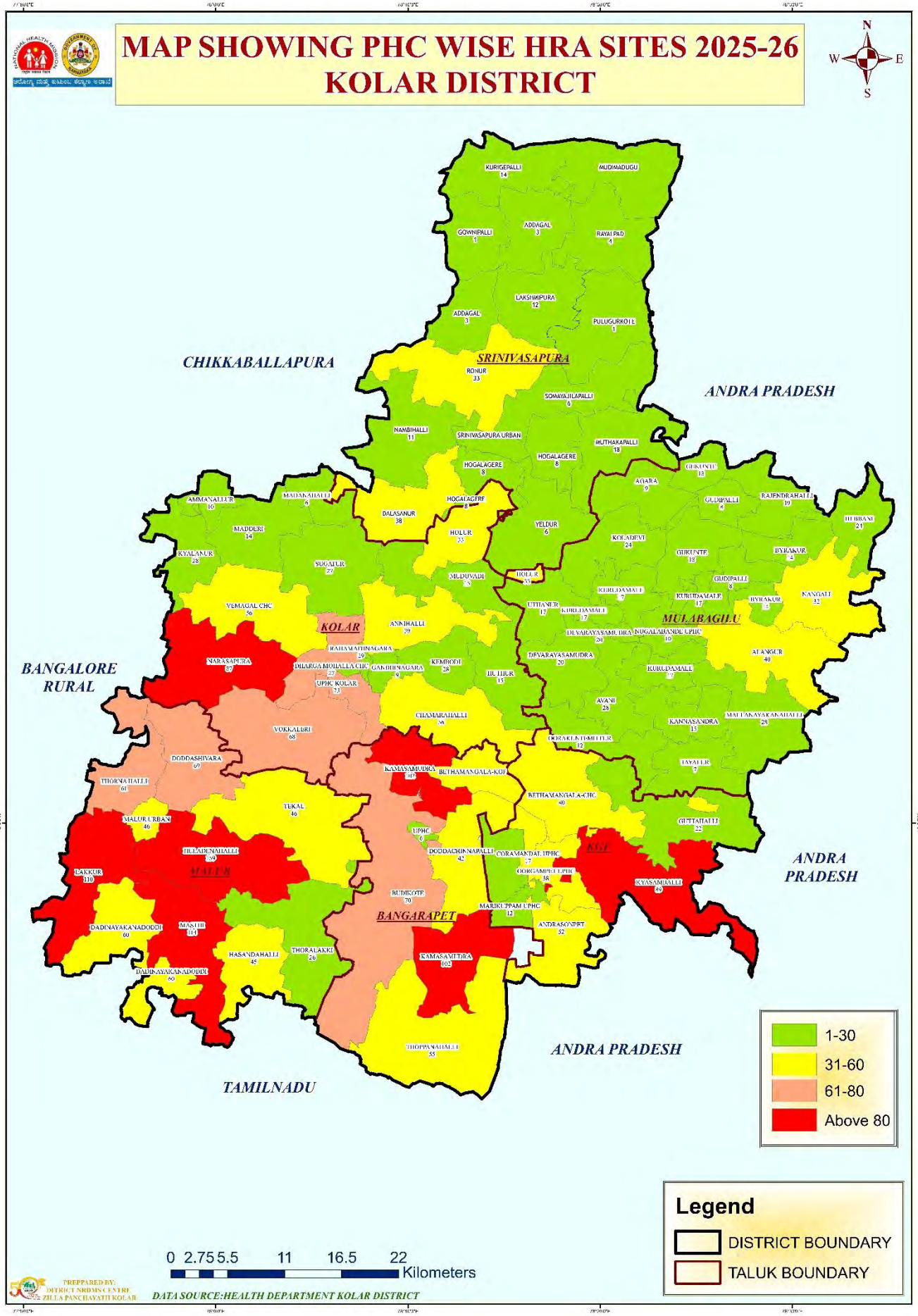
Map characteristics:

- Projection: WGS 84
- Scale: District level
- Symbology:
  - ✓ Low (1–30)
  - ✓ Moderate (31–60)
  - ✓ High (61–80)
  - ✓ Very High (>80)

Outputs include:

- PHC-wise HRA distribution maps
- Taluk-wise density maps
- Thematic risk classification maps

MAP SHOWING PHC WISE HRA SITES 2025-26
KOLAR DISTRICT




MAP SHOWING HRA SITES OF KOLAR TALUK
KOLAR DISTRICT
SRINIVASAPURA
BANGALORE RURAL
MULABAGILU
MALUR
BANGARAPET
KGF
AMMANALLUR
MADANAHALLI
THIPPENAHALLI
BELLAHALLI
CHANNASANDRA
KYALANUR
MADDERI
CHANJIMALE
KADAGATTUR
MANCHANDAHALLI
PURAHALLI
KURUGAL
VEMAGAL
VEMAGAL CHC
SETTIHALLI
MEDIHALA
KOLAR
BELAMARNAHALLI
CHOWDADENAHALLI
CHAKARASANAHALLINARASAPURA
NARASAPURA
RAMASANDRA
ARABIKOTHANUR
THYAVANAHALLI
MARKANDAPURA
VOKKALERI
SETTIKOTHANUR
VOKKALERI
KONDARAJANAHALLI
UPHC KOLAR
RAJAKALLAHALLI
SETTIMADAMANGALA
THOTLI
MATNAHALLI
SUGATUR
CHITNAHALLI
JANNAGHATTA
BYAPPANAHALLI
THIMMADEVANDAHALLI
MARJENAHALLI
TALAGUNDA
ARAHALLI
AMMERAHALLI
KADIRIPURA
VIBHUTIPURA
UPHC URBAN
DHARGA MOHALLA CHC
GANDHINAGARA
RAHAMATHNAGARA
KOLAR (CMC)
PEDDAMANAHALLI
BETTA BINAJANAHALLI
CHATRAKODIHALLI
BEGLI MOSAHALLI
MUDUVATHI
JADERI
GHATTA HALLI
HOLUR
MUDUVADI
ITHARASANAHALLI
ANNIHALLI
MANIGHATTA
GADDEKANNUR
KEMBODI
VITTAPPANAHALLI
HUTHUR
HONNENAHALLI
VADAGUR
SHILLANGERE
DODDAHASALA
CHAMARAHALLI
HARATI
SHAPUR
CHAMARAHALLI
PREPPARED BY:
DITRICT NRDMS CENTRE
ZILLA PANCHAYATH KOLAR
DATA SOURCE:HEALTH DEPARTMENT KOLAR DISTRICT
0 1.5 3 6 9 12
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TALUK BOUNDARY
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AGRO FOOD
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FARM HOUSE
HUTS
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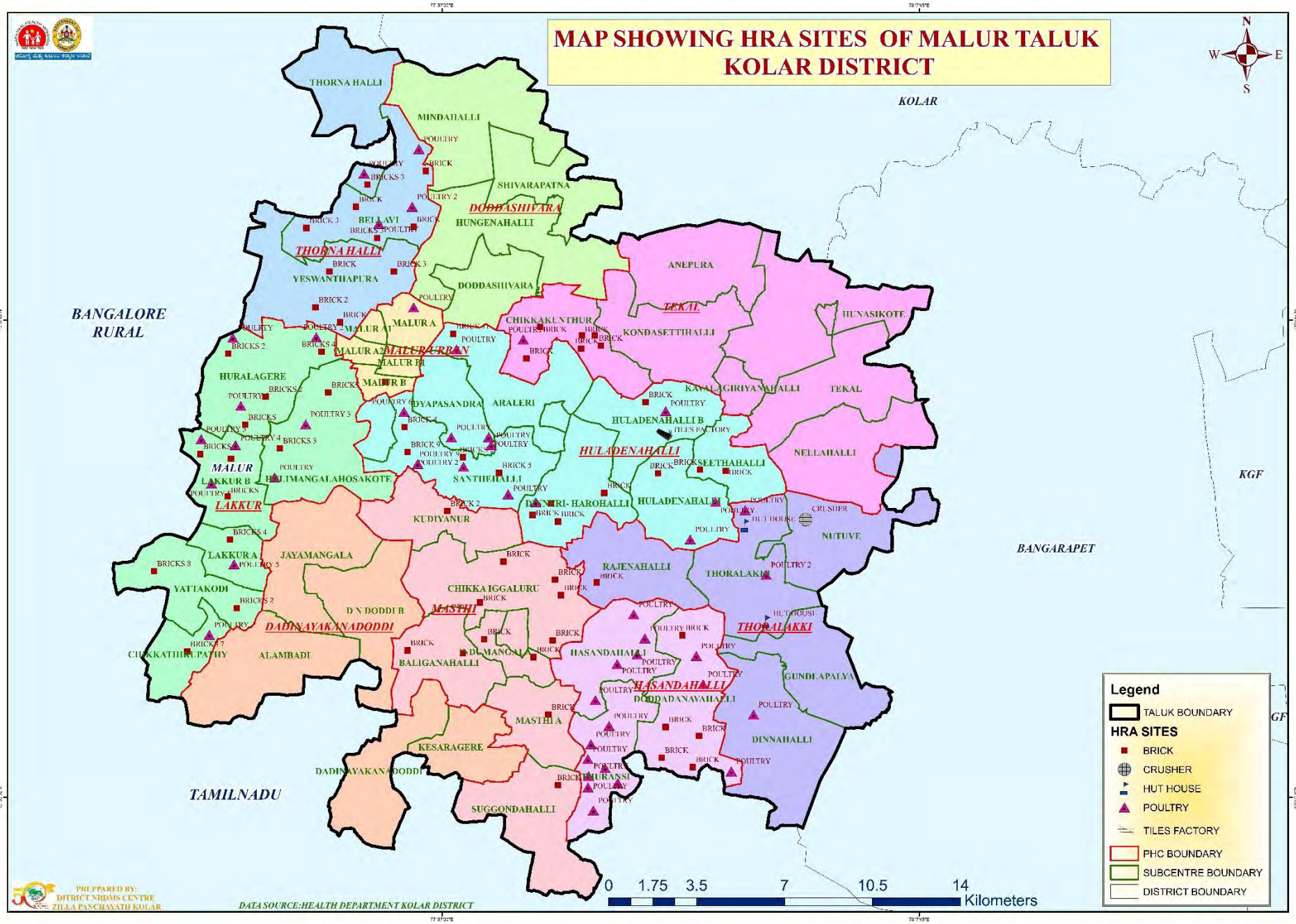
PHC BOUNDARY
SUBCENTRE BOUNDARY


MAP SHOWING HRA SITES OF MALUR TALUK
KOLAR DISTRICT
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KOLAR
BANGALORE RURAL
TAMILNADU
BANGARAPET
KGF
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MINDAHALLI
SHIVARAPATNA
DODDASHIVARA
HUNGENAHALLI
BELLAVI
YESWANTHAPURA
DODDASHIVARA
MALUR A
MALUR A1
MALUR A2
MALUR URBAN
MALUR B1
MALUR B
HURALAGERE
MALUR
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HULIMANGALAHOSAKOTE
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DADINAYAKANADODDI
KUDIYANUR
SANTHEHALLI
ARALERI
DYAPASANDRA
CHIKKAKUNTHUR
KONDASETTIHALLI
ANEPURA
TEKAL
HUNASIKOTE
KAVALAGIRIYANAHALLI
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HULADENAHALLI B
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NELLAHALLI
SEETHAHALLI
HULADENAHALLI
NUTUVE
CRUSHER
HUT HOUSE
THORALAKKI
RAJENAHALLI
CHIKKA IGGALURU
MASTHI
BALIGANAHALLI
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GUNDLAPALYA
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TALUK BOUNDARY
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CRUSHER
HUT HOUSE
POULTRY
TILES FACTORY
PHC BOUNDARY
SUBCENTRE BOUNDARY
DISTRICT BOUNDARY
PREPPARED BY:
DITRICT NRDMS CENTRE
ZILLA PANCHAYATH KOLAR
DATA SOURCE:HEALTH DEPARTMENT KOLAR DISTRICT


MAP SHOWING HRA SITES OF MULBAGAL TALUK
KOLAR DISTRICT
N
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SRINIVASAPURA
KOLAR
BANGARAPET
KGF
ANDRA PRADESH
AGARA
GUKUNTE
G.VADDAHALLI
RAJENDRAHALLI
GUDIPALLI
HEBBANI
PUNYAHALLI
PEDDURU
KOLADEVI
BYRAKUR
PETHANDAHALLI
KUNIBANDE
VOMMASANDRA
HARAPANAYAKANAHALLI
AMBLIKAL
MUSTOOR
MUDIYANUR
UTHANUR
KUTHANDAHALLI
KURUDAMALE
NANGALI
UPPARAHALLI
POMBARAHALLI
DODDAGURKI
ANEHALLI
N.VADDAHALLI
PATRAHALLI
THIPPADODDI
MULABAGILU
HANAMANAHALLI
KOTHAMANGALA
NUGALABANDE UPHC
GUTAGANTIPALYA
KURUBARPETE
MUTHYALPETE
MARUTHI NAGARA
SOMESHWARAPALYA
ALANGUR
GREEN HOUSE
GUMMAKAL
CHAMAREDDIHALLI
VARADAGANAHALLI
ROSE FACTORY
LANCO TOLL
DEVARAYASAMUDRA
CRUSHER
ATTIKUNTE
MELAGANI
NAGAMANGALA
K.BYAPPALLI
KEELUHOLALI
AVANI
COW SHED
EMMENATHA
DOMMASANDRA
MALLANAYAKANAHALLI
BALLA
TREE GROVE
GANJIGUNTE
KANNASANDRA
YALAGONDAHALLI
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TAYALUR
VEGAMADAGU
THIMMARAYATHANAHALLI
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PREPPARED BY:
DISTRICT NRDMS CENTRE
ZILLA PANCHAYATH KOLAR
DATA SOURCE:HEALTH DEPARTMENT KOLAR DISTRICT
Legend
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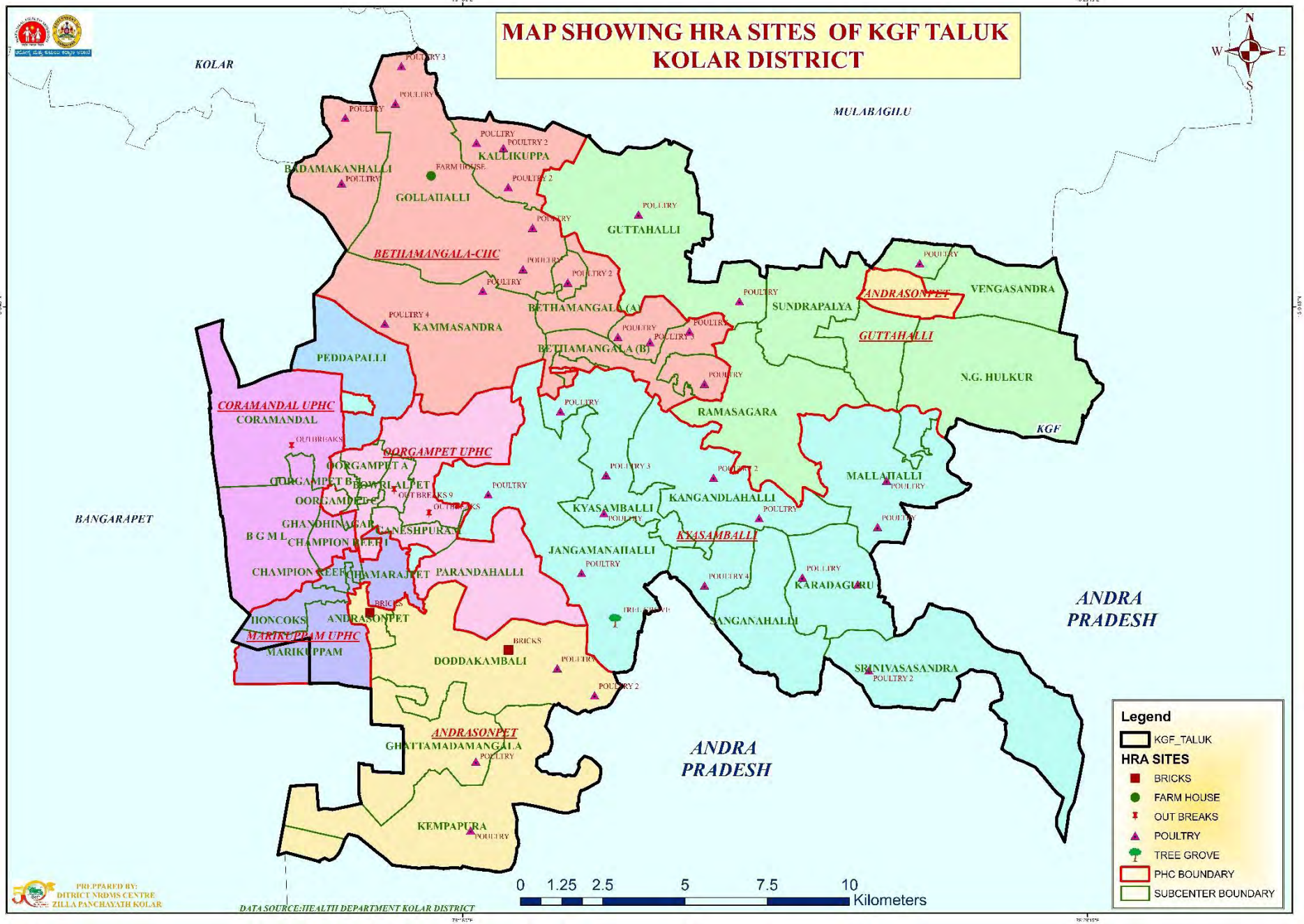
HRA SITES
BRICKS
COW SHED
CRUSHER
GREEN HOUSE
LANCO TOLL
POULTRY
ROSE FACTORY
ROSE GARDEN
TREE GROVE
POULTRY
PHC_BOUNDARY_VERIFIED
SUBCENTRE_BOUNDARY


MAP SHOWING HRA SITES OF KGF TALUK
KOLAR DISTRICT
KOLAR
MULABAGILU
BANGARAPET
ANDRA PRADESH
ANDRA PRADESH
KGF
BADAMAKANHALLI
GOLLAHALLI
FARM HOUSE
KALLIKUPPA
GUTTAHALLI
BETHAMANGALA-CHC
BETHAMANGALA (A)
BETHAMANGALA (B)
KAMMASANDRA
PEDDAPALLI
SUNDRAPALYA
ANDRASONPET
VENGASANDRA
GUTTAHALLI
N.G. HULKUR
RAMASAGARA
MALLAHALLI
KANGANDLAHALLI
KYASAMBALLI
KYASAMBALLI
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KARADAGURU
JANGANAHALLI
SRINIVASASANDRA
CORAMANDAL UPHC
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THAMARAJPET
PARANDAHALLI
HONCOKS
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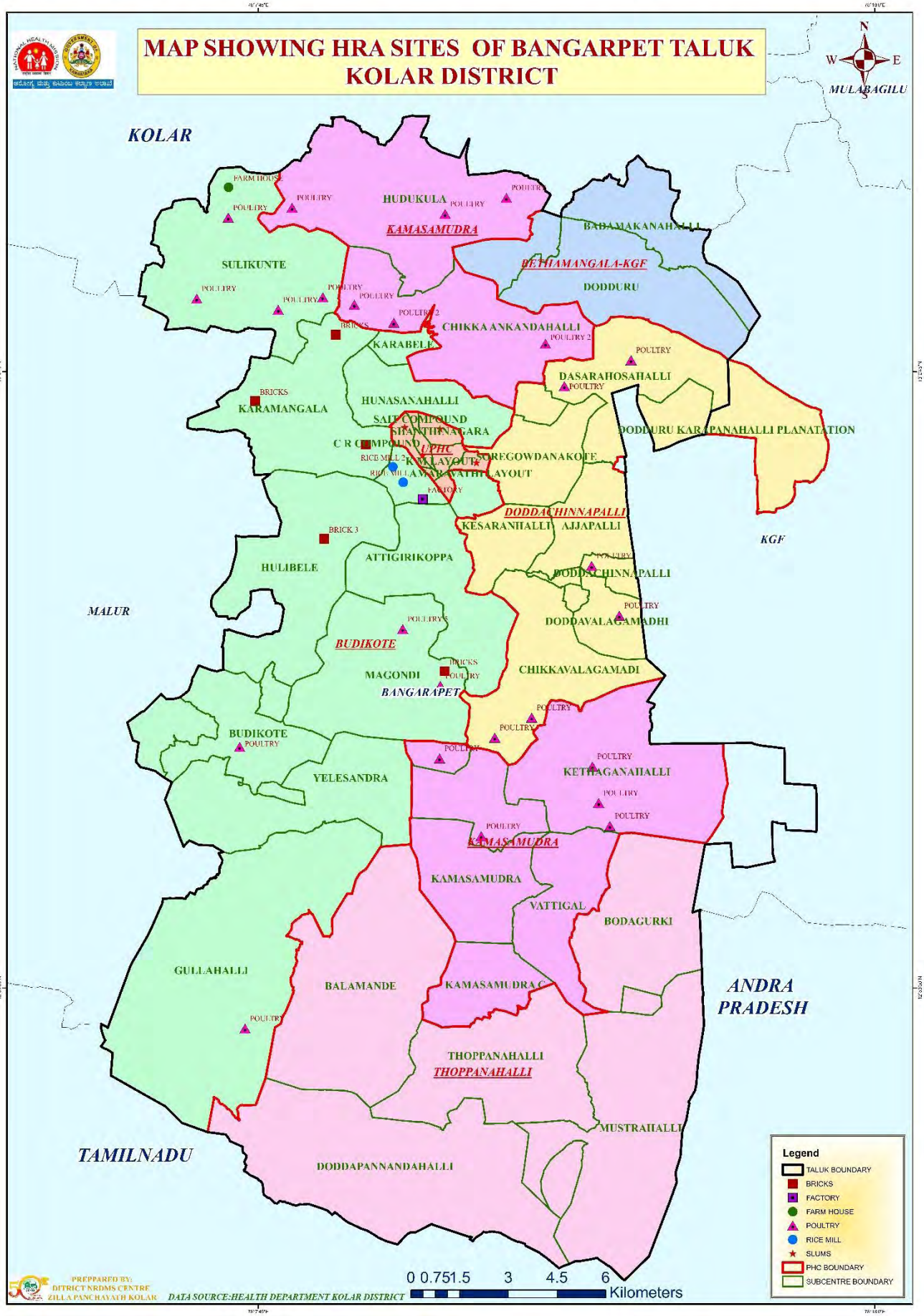
PHC BOUNDARY
SUBCENTER BOUNDARY
PREPARED BY:
DISTRICT NRDMS CENTRE
ZILLA PANCHAYATH KOLAR
DATA SOURCE:HEALTH DEPARTMENT KOLAR DISTRICT


MAP SHOWING HRA SITES OF BANGARPET TALUK
KOLAR DISTRICT
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MULABAGILU
KOLAR
MALUR
KGF
TAMILNADU
ANDRA PRADESH
HUDUKULA
KAMASAMUDRA
BETHAMANGALA-KGF
BABAMAKANAHALLI
DODDURU
SULIKUNTE
CHIKKA ANKANDAHALLI
KARABELE
DASARAHOSAHALLI
DODDURU KARAPANAHALLI PLANTATION
KARAMANGALA
HUNASANAHALLI
SAIT COMPOUND
SHANTHINAGARA
C R COMPOUND
UPHC
SOREGOWDANAKOTE
K M LAYOUT
RICE MILL 2
RICE MILL
AVARAVATHI LAYOUT
FACTORY
DODDACHINNAPALLI
KESARANHALLI
AJJAPALLI
HULIBELE
ATTIGIRIKOPPA
BRICK 3
DODDACHINNAPALLI
DODDAVALAGAMADHI
BUDIKOTE
MAGONDI
BANGARAPET
CHIKKAVALAGAMADI
BUDIKOTE
YELESANDRA
KETHAGANAHALLI
KAMASAMUDRA
KAMASAMUDRA
VATTIGAL
BODAGURKI
GULLAHALLI
BALAMANDE
KAMASAMUDRA C
THOPPANAHALLI
THOPPANAHALLI
MUSTRAHALLI
DODDAPANNANDAHALLI
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FACTORY
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POULTRY
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SUBCENTRE BOUNDARY
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Kilometers
PREPPARED BY:
DITRICT NRDMS CENTRE
ZILLA PANCHAYATH KOLAR
DATA SOURCE:HEALTH DEPARTMENT KOLAR DISTRICT


MAP SHOWING HRA SITES OF SRINIVASAPURA TALUK
KOLAR DISTRICT
N
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S
CHIKKABALLAPUR DISTRICT
ANDRA PRADESH
KOLAR
KURIGEPALLI
BYRAGANAPALLI
K PATHUR
BALTHMARI
MUDIMADUGU
G BYAPALLI
ADDAGAL
VEMPALLI
GOWNIPALLI
NAKKALAGADDA
RAYALPAD
JINKALAVARIPALLI
NELAVANKI
LAKSHMIPURA
KOTHAPET
KONDAMARI
MANCHINEELLAKOTE
PULUGURKOTE
KOTABALLAPALLI
SRINIVASAPURA
RONUR
DIMBALA
KIRUVARA
MANIGANAHALLI
BRICKS
ALAVATTA
KORNAHALLI
SOMAYAJILAPALLI
HODALI
KALLUR
NAMBIHALLI
DWARASANDRA
ZAKEER HUSEEN MOHALLA
GAFARKHAN MOHALLA
VALMABAI ROAD
SRINIVASAPURA URBAN
M G ROAD
HOGALAGERE
MUTHAKAPALLI
MATAKANSANDRA
COTTON INDUSTRY
HEBBATA
HOSAHALLI
PALYA
GHALDIGANAHALLI
YELDUR
DALASANUR
THERNAHALLI
PLASTIC FACTORY
LAKSHMISAGARA
POULTRY
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COTTON INDUSTRY
HAKKI-PIKKI
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POULTRY
PHC BOUNDARY
SUBCENTRE BOUNDARY
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Kilometers
PREPPARED BY:
DISTRICT NRDMS CENTRE
ZILLA PANCHAYATH KOLAR
DATA SOURCE:HEALTH DEPARTMENT KOLAR DISTRICT

7. Importance, Impacts, and Uses

7.1 Importance

- Helps identify vulnerable populations
- Supports evidence-based decision making
- Enables efficient resource allocation

7.2 Public Health Impacts

- Early detection of outbreak-prone areas
- Improved vector control planning
- Reduced disease transmission

7.3 Environmental Impacts

- Monitoring pollution sources
- Identifying ecological stress zones
- Supporting sustainable land use

7.4 Practical Uses

- Health department planning
- Disaster preparedness
- Urban development regulation

8. Results and Analysis

8.1 Spatial Distribution

The study reveals uneven distribution:

Very High Risk Zones (>80 HRAs)

- Concentrated in urban-industrial belts
- Found in:

- ✓ Malur
- ✓ Bangarpet
- ✓ Kolar

Dominant features:

- Slums
- Poultry farms
- Construction sites

High Risk Zones (61–80 HRAs)

- Urban fringes
- Industrial clusters

Activities include:

- Brick kilns
- Stone crushers
- Rice mills

Moderate Risk Zones (31–60 HRAs)

- Mixed land-use areas
- Agricultural + residential

Includes:

- Greenhouses
- Rose gardens

Low Risk Zones (1–30 HRAs)

- Rural interiors

- Sparse settlements

Includes:

- Tree groves
- Ashrams

8.2 Taluk-wise Analysis

Kolar Taluk

- High urban density
- Slums and construction dominate

Malur Taluk

- Livestock and poultry concentration
- High outbreak vulnerability

Bangarpet Taluk

- Industrial clusters
- Labor settlements

Mulbagal Taluk

- Agriculture-based HRAs
- Floriculture dominance

Srinivaspura Taluk

- Low density
- Scattered risk sites

9. Discussion

The findings indicate:

- Strong correlation between urbanization and HRA density
- Industrial zones act as major risk contributors
- Agricultural intensification also plays a role

GIS proved effective in:

- Visualizing spatial patterns
- Identifying hotspots
- Supporting targeted interventions

10. Summary and Conclusion

This study provides a comprehensive spatial understanding of High Risk Areas in Kolar District using GIS and Remote Sensing.

Key Findings

- HRAs are unevenly distributed
- Urban and industrial areas show higher density
- PHC-level mapping improves decision-making

Conclusions

- GIS is a powerful tool for public health planning
- Regular updates of spatial data are essential
- Integration with health surveillance systems is recommended

Preparation of Narasapura New Proposal Map Using GIS and Remote Sensing Applications

1. Abstract

Geographic Information Systems (GIS) and Remote Sensing (RS) have emerged as essential tools in modern spatial planning and land management. This report focuses on the preparation of a new proposal map for Narasapura region in Kolar District using GIS and remote sensing techniques. The study integrates satellite imagery, spatial data analysis, and geoprocessing methods to develop an accurate and efficient land-use proposal plan.

The methodology includes data acquisition from satellite sources, preprocessing, digitization, spatial analysis, and map generation. The study aims to support planning authorities in decision-making related to land allocation, infrastructure development, and environmental sustainability.

The results demonstrate that GIS and remote sensing significantly improve mapping accuracy, reduce time, and enable better visualization of spatial data. The proposed map highlights optimized land-use planning considering natural and man-made features.

2. Introduction

Urban and regional planning requires precise spatial data and analysis. Traditional surveying methods are often time-consuming and less efficient for large-scale mapping. GIS and remote sensing technologies provide powerful alternatives for analyzing geographical data and preparing proposal maps.

Narasapura, located in Kolar District of Karnataka, has seen rapid industrial and infrastructural growth. This necessitates updated planning maps to manage land resources effectively. The integration of GIS and remote sensing enables planners to visualize current land use, detect changes, and propose future development strategies.

This report presents a systematic approach to preparing a new proposal map for Narasapura using modern geospatial technologies.

3. Background of the Study

Kolar District has experienced significant transformation due to industrialization, especially in areas like Narasapura. The establishment of industrial zones has increased the demand for proper land-use planning.

Traditional planning approaches lack real-time data and spatial accuracy. Remote sensing provides up-to-date satellite imagery, while GIS enables spatial analysis and mapping.

Previous studies have shown that GIS-based planning:

- Enhances decision-making
- Reduces planning errors
- Supports sustainable development

This study builds upon these advancements to develop a proposal map tailored to Narasapura's developmental needs.

4. Objectives of the Study

The main objectives of this study are:

1. To collect and analyze spatial data of Narasapura region.
2. To use remote sensing data for land-use and land-cover mapping.
3. To develop a GIS-based proposal map for future planning.
4. To identify suitable zones for residential, industrial, agricultural, and commercial use.
5. To support sustainable and efficient land management.
6. To demonstrate the application of GIS and remote sensing in regional planning.

5. Study Area: Kolar District

Location

Kolar District is located in the southeastern part of Karnataka, India. Narasapura lies within this district and is a rapidly developing industrial area.

Geographical Features

- Latitude: Approximately 13°N
- Longitude: Approximately 78°E
- Terrain: Undulating plains
- Climate: Semi-arid

Key Characteristics

- Industrial growth (Narasapura Industrial Area)
- Agricultural activities
- Increasing urbanization
- Proximity to Bengaluru

Importance of Study Area

Narasapura is strategically important due to:

- Industrial corridors
- Connectivity to major cities
- Availability of land resources

6. Research Methodology

The methodology adopted for this study involves several stages:

6.1 Data Collection

- Satellite imagery (Landsat, Sentinel)
- Topographic maps

- Administrative boundaries
- Field survey data (if available)

6.2 Data Pre-processing

- Image correction (geometric and radiometric)
- Projection and coordinate system alignment
- Image enhancement for clarity

6.3 GIS Database Creation

- Digitization of features:
  - ✓ Roads
  - ✓ Water bodies
  - ✓ Land parcels
- Attribute data entry

6.4 Land Use/Land Cover (LULC) Analysis

- Classification of satellite imagery:
  - ✓ Built-up areas
  - ✓ Vegetation
  - ✓ Water bodies
  - ✓ Open land

6.5 Spatial Analysis

- Buffer analysis (roads, water bodies)
- Overlay analysis
- Suitability analysis for land use

6.6 Proposal Map Preparation

- Allocation of zones:
  - ✓ Residential
  - ✓ Industrial
  - ✓ Commercial

- ✓ Agricultural
- ✓ Green spaces

- Map layout design

6.7 Validation

- Cross-checking with ground data
- Accuracy assessment

7. Importance, Impacts, and Uses

7.1 Importance

- Provides accurate spatial planning
- Supports infrastructure development
- Enhances decision-making

7.2 Impacts

Positive Impacts:

- Efficient land utilization
- Reduced environmental degradation
- Improved urban planning

Negative Impacts (if misused):

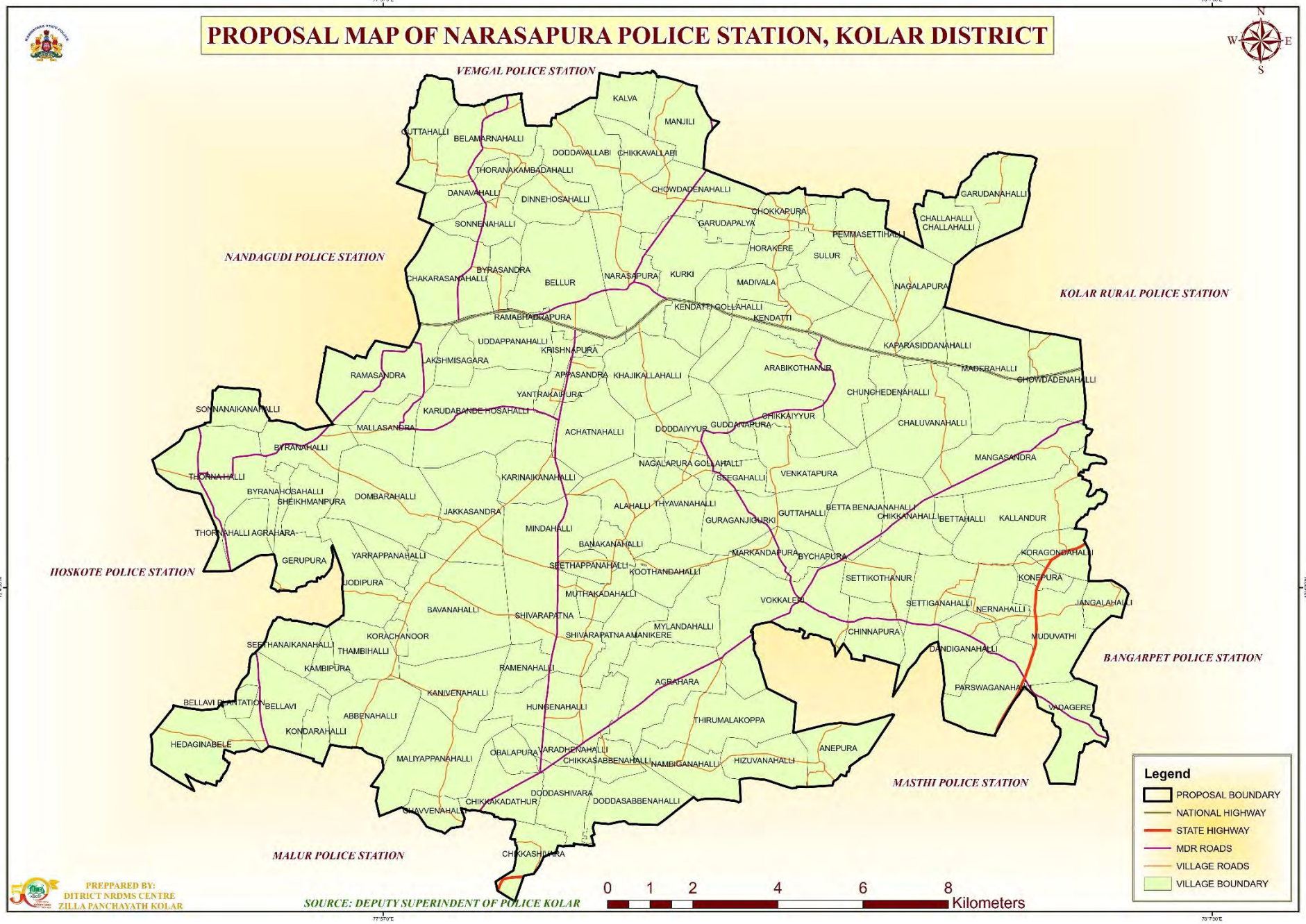
- Over-industrialization
- Loss of agricultural land
- Environmental imbalance

7.3 Uses

- Urban planning
- Industrial zoning
- Transportation planning

- Environmental management
- Disaster management

PROPOSAL MAP OF NARASAPURA POLICE STATION, KOLAR DISTRICT



PREPPARED BY:
DITRICT NRDMS CENTRE
ZILLA PANCHAYATH KOLAR

SOURCE: DEPUTY SUPERINDENT OF POLICE KOLAR

8. Results and Analysis

8.1 Land Use/Land Cover Results

The classification shows:

- Built-up area increasing due to industrial growth
- Reduction in agricultural land
- Limited water bodies

8.2 Spatial Analysis Results

- Suitable industrial zones identified near highways
- Residential zones allocated away from industrial areas
- Green buffers planned around sensitive areas

8.3 Proposal Map Features

The final proposal map includes:

- Road network planning
- Zoning divisions
- Open spaces and parks
- Drainage and water systems

8.4 Accuracy Assessment

- High accuracy achieved due to satellite data
- Minor errors corrected through GIS editing

8.5 Interpretation

The analysis indicates:

- Rapid urban expansion
- Need for sustainable planning
- Importance of environmental conservation

9. Summary and Conclusion

Summary

This study demonstrates the use of GIS and remote sensing in preparing a proposal map for Narasapura. The integration of spatial data and analytical tools provides a comprehensive understanding of land use and helps in efficient planning.

The methodology includes data collection, preprocessing, analysis, and map preparation. The results highlight the changing land-use patterns and the need for structured development.

Conclusion

GIS and remote sensing are powerful tools for modern planning. The proposed map for Narasapura ensures:

- Balanced land use
- Sustainable development
- Efficient resource management

The study concludes that adopting geospatial technologies is essential for future urban and regional planning.

Title

GIS AND REMOTE SENSING APPLICATIONS FOR PREPARATION OF TOURISM LOCATION MAP OF KOLAR DISTRICT, KARNATAKA, INDIA

Abstract

Tourism mapping plays an important role in regional planning, navigation, and heritage conservation. Geographic Information Systems (GIS) and Remote Sensing (RS) technologies provide efficient tools for spatial data collection, analysis, and visualization of tourism resources. This study focuses on the preparation of a tourism location map for major tourist destinations in **Kolar District** using GIS and remote sensing techniques. Eighteen important tourist locations including temples, hills, lakes, dams, and historical sites were identified and mapped using their geographic coordinates (latitude and longitude). Satellite imagery and spatial datasets were processed to generate a geospatial database of tourist locations. GIS tools were used to plot and visualize these sites on a digital map, which can assist tourists, planners, and administrators in tourism management and infrastructure development. The study demonstrates that GIS and remote sensing provide accurate and effective methods for mapping and analysing tourism resources. The resulting tourism location map can support sustainable tourism development in Kolar district.

1. Introduction

Tourism is one of the fastest-growing sectors contributing significantly to economic development, employment generation, and cultural exchange. Mapping tourism resources helps identify tourist attractions and facilitates better planning and promotion of tourism activities. Traditional mapping techniques are often time-consuming and less accurate compared to modern geospatial technologies.

Geographic Information Systems (GIS) and Remote Sensing (RS) have become essential tools in spatial planning, environmental monitoring, and tourism management. GIS allows storage,

manipulation, and visualization of spatial data, while remote sensing provides satellite imagery and geographic information about land surface features.

The district of **Kolar District** is known for its historical temples, hills, lakes, and mining heritage. Several tourist attractions are distributed across the district, making it important to develop a location map for easy identification and navigation.

This study uses GIS and remote sensing techniques to map important tourism locations in Kolar district using geographic coordinates. The resulting map provides a spatial overview of tourist sites and supports tourism development and resource management.

2. Study Area

2.1 Location of the Study Area

The study area is **Kolar District**, located in the south-eastern part of the state of **Karnataka**. The district lies between approximately **12°46′ N to 13°58′ N latitude** and **77°21′ E to 78°35′ E longitude**.

It is bordered by:

- **Bangalore Rural District** to the west
- **Chikkaballapur District** to the north
- **Andhra Pradesh** to the east and northeast
- **Krishnagiri District** to the south

The district headquarters is **Kolar**.

2.2 Demography

According to census data, Kolar district has a population of approximately 1.5 million people. The population is distributed across rural and urban areas, with agriculture being the primary

occupation. The district has a mix of Kannada, Telugu, and Tamil speaking communities. Tourism and mining activities also contribute to the local economy.

2.3 Geographical Features

Kolar district is characterized by undulating terrain, rocky hills, and plains. Several small hill ranges and isolated hills exist throughout the district. Important geographical features include hills such as **Antaragange Hills** and **Siti Hill**.

The region also contains water bodies such as **Bethamangala Lake**, which serves as an important water source.

2.4 Climate

Kolar district experiences a **semi-arid climate**. Summers are hot and dry, while winters are moderate and pleasant. The district receives moderate rainfall mainly from the southwest monsoon.

Average climate characteristics:

- Annual rainfall: ~700–800 mm
- Average temperature: 18°C to 35°C

2.5 Geological Features

Kolar district is geologically significant due to the presence of the famous **Kolar Gold Fields**, which was once one of the deepest gold mines in the world. The region consists mainly of **granite and gneiss rock formations** belonging to the Dharwar craton.

3. Methodology

The methodology adopted for preparing the tourism location map includes the following steps:

1. **Data Collection**
   - Collection of geographic coordinates (latitude and longitude) for tourism sites.
   - Acquisition of satellite imagery and district boundary shapefiles.
2. **Data Preparation**
   - Preparing spatial data in GIS format.
   - Creating attribute tables for tourism sites.
3. **GIS Mapping**
   - Importing coordinate data into GIS software.
   - Creating point features representing tourism locations.
4. **Spatial Visualization**
   - Overlaying tourism points on district base maps.
   - Labeling tourist locations.
5. **Map Layout Preparation**
   - Adding map elements such as legend, scale bar, north arrow, and title.

The final map displays all tourism sites in Kolar district with their geographic distribution.

4. GIS and Remote Sensing Techniques Applied

GIS and Remote Sensing technologies were used to prepare the tourism location map through the following techniques:

4.1 Satellite Data Utilization

Satellite imagery from sources such as **Landsat Program** was used as a base layer to visualize terrain and land cover.

4.2 Georeferencing

Georeferencing ensures that spatial data aligns with real-world geographic coordinates. The collected tourism coordinates were referenced using the **WGS-84 coordinate system**.

4.3 GIS Software Application

GIS software such as **ArcGIS** and **QGIS** were used for spatial data processing, point plotting, and map visualization.

4.4 Creation of Spatial Database

A spatial database was created containing attributes such as:

- Name of tourist place
- Latitude
- Longitude

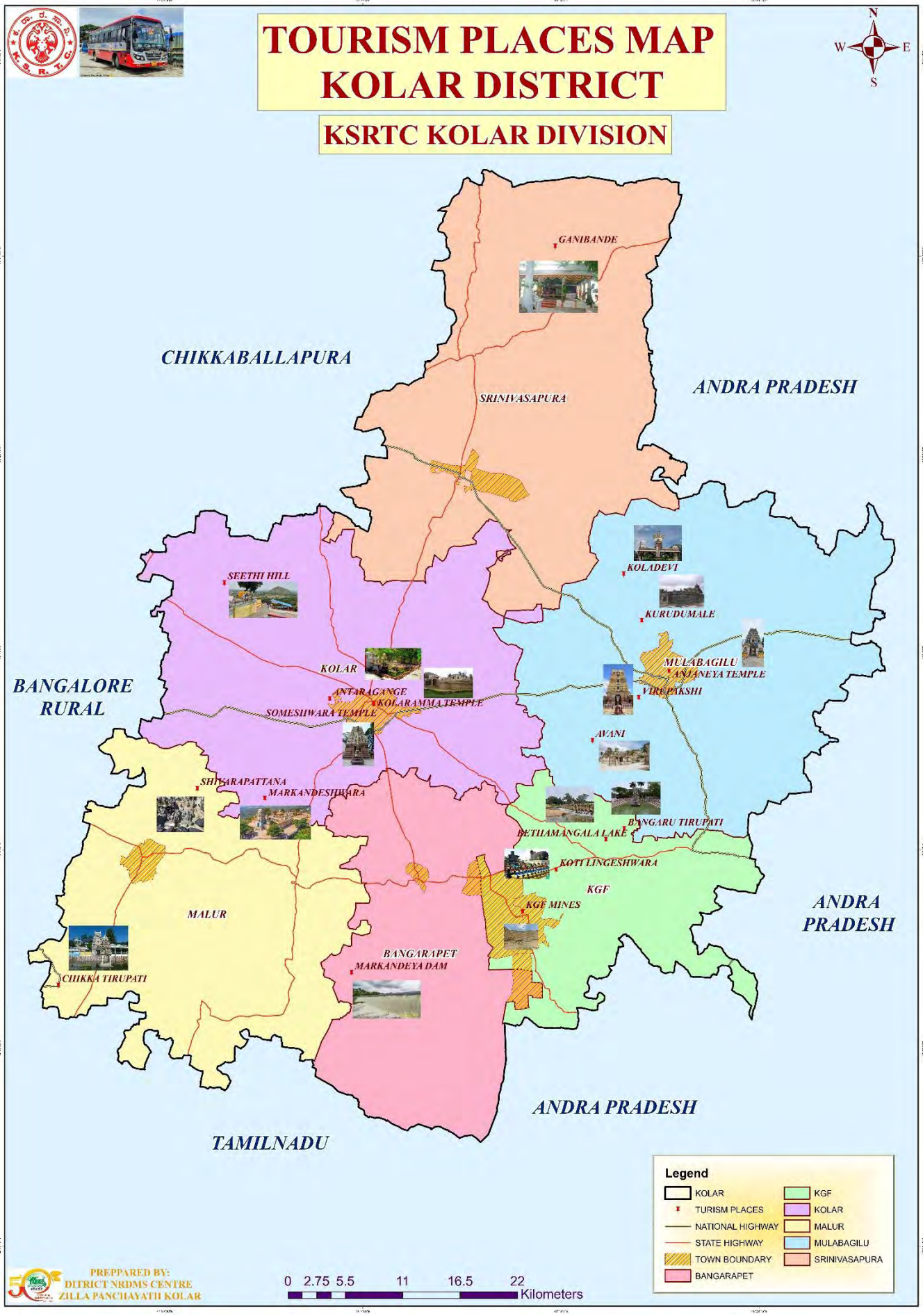
This database allows easy retrieval and updating of tourism information.

4.5 Map Visualization

Tourism locations were symbolized using point markers. Labels were added to identify the sites clearly. The final map provides a clear spatial representation of tourist destinations in Kolar district.

5. Tourism Places Map

The following tourism locations were mapped using GIS


TOURISM PLACES MAP
KOLAR DISTRICT
KSRTC KOLAR DIVISION
N
W
E
S
GANIBANDE
CHIKKABALLAPURA
SRINIVASAPURA
ANDRA PRADESH
KOLADEVI
KURUDUMALE
SEETHI HILL
KOLAR
ANTARAGANGE
KOLARAMMA TEMPLE
SOMESHWARA TEMPLE
MULABAGILU
ANJANEYA TEMPLE
VIRUPAKSHI
BANGALORE RURAL
AVANI
SHIVARAPATTANA
MARKANDESHWARA
BANGARU TIRUPATI
BETHAMANGALA LAKE
KOTI LINGESHWARA
KGF
KGF MINES
ANDRA PRADESH
MALUR
BANGARAPET
MARKANDEYA DAM
CHIKKA TIRUPATI
ANDRA PRADESH
TAMILNADU
Legend
KOLAR
TURISM PLACES
NATIONAL HIGHWAY
STATE HIGHWAY
TOWN BOUNDARY
BANGARAPET
KGF
KOLAR
MALUR
MULABAGILU
SRINIVASAPURA
PREPPARED BY:
DITRICT NRDMS CENTRE
ZILLA PANCHAYATH KOLAR
0 2.75 5.5 11 16.5 22
Kilometers

6. Results

The GIS-based tourism location map successfully identified and displayed all 18 tourist locations in Kolar district. The map shows the spatial distribution of tourism resources across different taluks of the district.

Key observations include:

- Many tourism sites are concentrated around **Kolar and Mulbagal regions**.
- Historical temples form the majority of tourist attractions.
- Natural features such as hills and lakes also contribute to tourism potential.

The generated map provides an easy reference for tourists and planners.

7. Conclusion

This study demonstrates the importance of GIS and remote sensing technologies in mapping tourism resources. By using geographic coordinates and satellite imagery, a tourism location map was prepared for **Kolar District**.

The use of GIS enables accurate visualization and management of tourism sites. The developed map can help tourists identify attractions and assist local authorities in tourism planning, infrastructure development, and promotion of heritage sites.

Future studies can incorporate additional spatial analysis such as accessibility mapping, tourist route planning, and tourism potential assessment using advanced GIS techniques.

3. Training Programmes Attended (August 2025-November 2025)

The NRDMS team participated in various trainings aimed at capacity building and the application of geospatial tools:

1. Attended one day workshop conducted by central ground water board on aquifer recharge plan.
2. Attended the **"Jala shakthi "** Training Programme at kolar District.

Improvements in NRDMS Activities – Kolar District

The NRDMS (Natural Resources Data Management System) Centre in Kolar has significantly enhanced its role in district-level planning and governance through the expanded application of **geospatial technologies**.

1. Strengthening Geospatial Integration in Line Departments

- Geospatial tools are now being actively used by **line departments** such as Census monitoring and management system, KOMUL, Revenue department election branch, police department, and Health department, Agriculture, Horticulture, Social Forestry, and Panchayat Raj Engineering.
- This has improved **decision-making, infrastructure planning, and resource management**.

NRDMS-Committed Map Deliverables Kolar District

1. Introduction

The **Natural Resources Data Management System (NRDMS)** initiative for **Kolar District** aims to support evidence-based planning, governance, and emergency response through the development and dissemination of **thematic GIS-based maps**. Under this commitment, spatial datasets and decision-support maps have been prepared and delivered to multiple line departments to enhance operational efficiency, inter-departmental coordination, and public service delivery.

This report summarizes the **maps delivered, maps proposed, and future mapping requirements** for various departments in Kolar District.

2. Census monitoring and management system

Creation of census demarcation block in census monitoring and management portal of kolar district

The Census Monitoring and Management Portal (CMMP) is an essential digital platform used for planning, execution, and monitoring of census activities. One of the primary preparatory tasks in this system is the creation of **Census Demarcation Blocks (CDBs)**, which form the basic units for enumeration.

In Kolar District, the creation of these blocks has been carried out systematically using digital tools to ensure accurate coverage of all households across rural and urban areas.

2. Objective

The main objective of creating Census Demarcation Blocks is to divide the district into manageable geographic units for efficient data collection. It ensures:

- Complete coverage of all households
- Clear identification of enumeration areas
- Better monitoring and supervision through CMMP

3. Methodology

3.1 Data Preparation

Relevant base maps such as village maps, ward maps, and satellite imagery were collected and verified. Administrative boundaries of taluks, villages, and urban areas were confirmed before initiating the process.

3.2 Block Creation in CMMP

The following steps were followed in the portal:

- Selection of district, taluk, and village/ward
- Digital drawing of block boundaries using GIS tools
- Allocation of households within each block as per standard norms
- Assignment of unique identification numbers to each block

3.3 Validation and Approval

Each created block was carefully checked to ensure:

- No overlap between adjacent blocks
- No omission of any area
- Logical and identifiable boundaries

After validation, the blocks were submitted for approval by higher authorities through the portal workflow.

3.4 Field Verification

Field staff conducted ground-level verification to confirm the accuracy of boundaries and household counts. Necessary corrections were updated in the system.

5. Measures Taken

To address these challenges:

- Updated satellite imagery was used for better accuracy
- Training programs were conducted for staff
- Data was regularly synchronized and reviewed
- Coordination between departments was strengthened

6. Outcomes

The creation of Census Demarcation Blocks in Kolar District resulted in:

- Accurate and well-defined enumeration areas
- Improved efficiency in census planning
- Reduction in duplication and missing households
- Better monitoring through the CMMP platform

6. Census-Related Maps (Future and Ongoing Requirements)

1. Block Maps
2. Cencus boundary maps
3. Ward Boundary maps
4. Village accountant circle maps

6. Conclusion

The NRDMS mapping initiative for Kolar District has significantly strengthened **data-driven governance** by providing accurate, standardized, and department-specific GIS maps. These deliverables support:

- Improved service delivery
- Efficient resource allocation
- Better planning and emergency response
- Enhanced transparency and inter-departmental coordination

Future efforts will focus on **regular data updates**, **integration with real-time systems**, and **capacity building of departmental staff** to maximize the utility of NRDMS outputs.

List of Maps Prepared

1. District Map
2. Kolar District PHC wise HRA sites map
3. **Kolar HRA sites map**
4. **Malur HRA sites map**
5. **Mulbagal HRA sites Map**
6. **Bangarpet HRA sites map**
7. **Srinivasapura HRA sites Map**
8. **Narasapura New Police station Proposal map**
9. **Kolar District Tourism Places location map.**