TECHNICAL REPORT

Geospatial Technologies for Informed Decision-making

(Karnataka NRDMS Program)

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Natural Resources Data Management System – Karnataka Project

Background: With the constitution of Indian Planning Commission in March, 1950, planning experiment in India started in 1951 with the objectives of 1) Removal of poverty, 2) Building of a modern society making maximum possible use of Science and Technology and 3) Attainment of self-reliance (Planning Commission,). Key to national prosperity was identified in effective combination of three factors, technology, raw materials and capital (Scientific Policy Resolution, 1958). The initial approach of planning based on macro level assessment of resources did not yield the desired results. The inequities amongst people and disparities between regions persisted. Also, there was evidence of general environmental degradation and mounting stress on land and water resources.

In order to overcome the situation, conceptual changes in the practice of planning was brought in, around late 70s, by adopting the decentralized or local level planning to ensure that the development is sustainable, area-specific and take into account the felt needs of the local people. The objectives of decentralized planning are; 1) Increase in Productivity of land, 2) Employment generation. Keeping in mind assets development, 3) Poverty alleviation and 4) Provisions of minimum amenities and infrastructure facilities. Towards this end, the Constitution (73rd and 74th Amendments, 1992 & 1993) was amended to empower the State Governments to form the institutions of local self - governance i.e. rural local bodies (Panchayaths) and municipalities in rural and urban areas respectively.

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. India has a long tradition of systematic collection of spatial and non-spatial data at National level.

At the district level, history of non-spatial data collection date backs to the eighteenth century, when a District Gazetteer used to be there for each district. There is a strong tradition of non-spatial data collection at the local level (district) by different departments. The development of database technologies, entry of computers in India in the late 70's and first Indian Remote sensing Experiment in 1977, triggered the possibility of introduction and integration of geo spatial information in the planning.

Considering the emphasis on technological self-reliance and development and adaptation of suitable technologies for local needs to make an impact on the lives of ordinary citizens (Technology Policy statement, 1983), the Government of India initiated a number of technology-based programmes to support the Local level planning in1980s viz. Natural Resources Data Management System (NRDMS) of the Department of Science & Technology, National Natural Resources Management System (NNRMS) of the Department of Space and Geographical Information System (GISNIC) and District Information System (DISNIC) of the National Informatics Centre (Ministry of Communication and Information Technology).

Initiated in the year 1982, as a mission mode project by the Department of Science and Technology (DST), Government of India strived to demonstrate the efficiency of computer based technologies for management of data on natural resources that is responsive to the needs of the modern management of data on natural resources that is responsive to the needs of the, modern management practices for holistic planning at the district level. The program launched to catalyse 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.

Vision: Enabling people, communities and institutions of local-self Governance with requisite databases and S & T tools for informed participation in local level planning.

Goals: Strengthen S&T inputs in developing tools and techniques for integrated resource management and for capacity building at various levels of planning and implementation in a spatio-temporal context in a multi-level framework.

Objectives: The objectives of the Programme are to

- Demonstrate and promote the use of spatial data technologies for local level planning under diverse terrain conditions
- Provide software support for data management, modelling and operation research
- Promote R & D in spatial data technologies
- Technology transfer & capacity building of potential users
- Forge linkage with users at different levels
- Provide S & T inputs for framing policies related to spatial data technologies
- Develop & demonstrate pilot scale geo-spatial data infrastructure and provide research support to the National Spatial Data Infrastructure (NSDI)

About Karnataka NRDMS program:

Karnataka State Council for Science & Technology (KSCST) recognizing the need for both spatial and non-spatial data to local level planning across Karnataka established Karnataka Natural Resources Data Management System (NRDMS) program in 1992 to develop a comprehensive spatial data management system for easy access of data and information. 73rd and 74th Amendments to the Constitution also emphasized the need for geospatial data for development planning to local level governments or Panchayaths. NRDMS is a joint project of Natural Resources Data Management System (NRDMS) of Department of Science & Technology, Government of India, and the Government of Karnataka.

District NRDMS centers were established in each district, tasked with empowering local communities to make informed decisions in local-level planning initiatives using geospatial technologies. The utilization of geospatial data and services for a wide range of uses has seen steady growth in the requests for both data and services by planners and administrators. The NRDMS program is continuously updating its datasets in diverse fields with an increasing set of application requirements. Application domains include, for example, public health and education, environmental analysis and mapping, transportation, water quality/quantity, watersheds, elections, disaster planning and management, and administration and planning. NRDMS centers provide value-added information, spatial decision support systems, training and support to planners and administrators in local governments. The NRDMS program now has been institutionalized in the state through RDPR and Karnataka is the first State to institutionalize spatial data for decision-making.

Activities:

- Established NRDMS centers in all Zilla Panchayaths (30) for providing geo-spatial data for planning, development and administration
- NRDMS centers are providing custom applications, value-added information, training and support to planners and administrators in Panchayath Raj Institutions, State/District level line departments and Deputy Commissioner’s office since inception.
- Developed a standardized seamless spatial data for storing and sharing through Karnataka Geo-portal to facilitate data access and discovery on Survey of India framework data.
- The administrative and derived boundaries information of spatial data for entire state of Karnataka is available and the data has been updated as of 2011.

- Development of web based geospatial applications/decision support system to support informed decision-making.
- Initiated mapping of urban local bodies as well as resource mapping for Panchayath Raj Institutions using latest geospatial technologies.
- NRDMS centers have been continuously updating information (spatial and non-spatial) for the benefit of user departments.
- Conducted District level workshops in all the districts to create awareness among end users.

Major achievements

1. Demonstrating and promoting the use of Spatial Data Technologies at micro level to support decentralized planning process.
2. Collate and organise spatial database in digital form at district level to enable planners and administrators for easy access of data/information.
3. Provide S & T inputs for framing Policies related to geospatial technologies.
4. Provide value addition to spatial database generated at various organisation.
5. Develop & Demonstrate Karnataka GeoPortal to support Karnataka NRDMS program.
6. Organised training programs and workshops in all the districts to create awareness among end-users.

Typical applications

- Election information and management system.
- Rural Health facilities-Allocation/Location and its jurisdiction.
- Impact of stone crushers on environment.
- Crime mapping.
- Education Management Information system.
- Rural water supply and water quality for PRI’s.
- Resource, Infrastructure and Habitation mapping for Gram Panchayaths.
- Prioritization of MI tanks.
- Watershed and related applications.
- Digital Tourism ATLAS.
- Planning ATLAS of Karnataka.
- Urban mapping.

SI. No.	NRDMS Centre	Year of Establishment
1.	Dakshina Kannada (Mangalore)	1992-93
2.	Dharwad	1992-93
3.	Mysore	1992-93
4.	Bijapur	1993-94
5.	Gulbarga	1993-94
6.	Uttara Kannada (Karwar)	1993-94
7.	Belgaum	1994-95
8.	Hassan	1994-95
9.	Kolar	1994-95
10.	Shimoga	1994-95
11.	Bangalore Rural	1996-97
12.	Raichur	1997-98
13.	Tumkur	1997-98
14.	Bellary	2001-2002
15.	Mandya	2001-2002
16.	Coorg	2001-2002
17.	Bangalore Urban	2006-2007
18.	Bidar	2006-2007
19.	Chikkamaglur	2006-2007
20.	Chitradurga	2006-2007
21.	Bagalkot	2007-2008
22.	Chamrajnagar	2007-2008
23.	Davangere	2007-2008
24.	Gadag	2007-2008
25.	Haveri	2007-2008
26.	Koppal	2007-2008
27.	Udupi	2007-2008
28	Ramanagara	2008
29	Chikkaballapura	2008
30	Yadgir	2008

Karnataka State Spatial Data Infrastructure (KSSDI)

Title of the project: Karnataka State Spatial Data Infrastructure (KSSDI)

Budget: Rs. 2.53 crores (75%:25% share, Government of India share – Rs. 1.92 Crores and Government of Karnataka share Rs. 61 lakhs)

Date of commencement: October, 2007

Duration: Three years

Objective of the Project:

- To develop a web based Geo Portal to acquire, process, store, distribute and improve the utilization of geo spatial data.
- Data clearing house which would be a gateway of spatial data being generated by various agencies in the State.

Background:

Under a joint project of Natural Resources Data Management System (NRDMS) of Department of Science & Technology, Government of India, and the Government of Karnataka, Karnataka State Council for Science & Technology (KSCST), Bangalore has developed district level GIS databases to support the process of Local Level Planning at the levels of district, taluk and village. Each District Database contains spatial and attribute data sets useful in local level planning processes in the sectors of Natural Resources, Demography, Agro-economy, Socio-economy and Infrastructure facilities. Respective Zilla Panchayaths and Line Departments have been depending upon the databases for meeting their data requirements.

Over the past one and a half decade all the twenty nine districts of Karnataka State have been covered under NRDMS. With increasing dependence of the Zilla Panchayaths/Urban local bodies, Line Departments and other stake-holders of local level planning on spatial datasets, a need has been felt to speed up the process of discovery of and access to up-to-date spatial datasets.

Introduction:

The Karnataka state has a rich “base” of map information in digital format at district level generated/created by various national/state government organizations through topographic surveys, geological surveys, soil surveys, cadastral surveys, various natural resources inventory programmes and the use of the remote sensing images. Now, with the availability of precision, high resolution satellite images, data enabling the organization of GIS, combined with the Global Positioning System (GPS), the accuracy and information content of these spatial datasets or maps is extremely high.

Encapsulating these maps and acquired images and provided by various organizations including government, academic and private sectors in Karnataka into a organized repository and provide access to all users for various developmental needs is the need of the hour. There are new innovative ways of technological innovation in allowing us to capture, store, process and display an unprecedented amount of valuable geographical and spatial information about Society and a wide variety of environmental and cultural phenomena. It is the vision of National Spatial Data Infrastructure (NSDI) that current and accurate spatial data must be readily available to contribute to local, state and national development and contribute to economic growth, environmental quality and stability, and social progress.

The emphasis is made on information transparency and sharing, with the recognition that spatial information is a national resource and citizens, society, private enterprise and government have a right to access it, appropriately. Only through common conventions and technical agreements, standards, metadata definitions, network and access protocols will be easily possible for this vision to come into existence. In realizing the vision of NSDI and requirements of various state government agencies, Karnataka state through Karnataka State Council of Science and Technology (KSCST) has decided to establish the state level spatial data infrastructure. The Council with the support DST-GoI and DST – GoK initiated to develop a Geoportal and Data Clearing House to discover/ access spatial data sets useful in the local level planning process through Karnataka State Spatial Data Infrastructure (KSSDI) Project. The geo-portal is expected to serve as a centralized hub for other spatial data generating agencies in the State. Web-enabled centralized database of various existing spatial, attribute or statistical data has been generated at KSCST, Bangalore.

About Karnataka Geoportal

Karnataka State level Spatial Data Infrastructure (KSSDI) called **Karnataka Geoportal** is a centralized single window access mechanism for all the spatial data acquired by various agencies in Government of Karnataka using State's resources primarily to support planning activities of the Panchayath Raj Institutions (PRIs), district/state line departments, Urban Local Bodies (ULBs) and civil society organizations in the State. KSSDI is an Internet based GIS Directory for the state that eventually will be extended for the use of the society in exploring the information related to state geography, demography, agro and socio economy, and infrastructure facilities.

Spatial datasets generated, maintained and provided by various concerned Line Departments of the State Government, academia, private or civil society organizations of Karnataka are proposed to be made accessible through the project data clearinghouse mechanism. In the future the site can also be extended to cater to sale and purchase of data online. All the data would be shared through the Open GIS Consortium (OGC) recommended standards.

The available data would be catalogued and the search for availability of any particular dataset would be made available through specially customized metadata (data about the data) utility. In this architecture, KSSDI Gateway and its user interface allow a user to query distributed collections of spatial information through their metadata descriptions. This spatial information may take the form of "data" or of services available to interact with spatial data on the different data server, described with complementary forms of metadata. A user interested in locating spatial information uses a search user interface, fills out a search form, specifying queries for data with certain properties. The search request is passed to the database Server, which shall search the Metadata repository on its end. The datasets fulfilling the search criteria will be displayed to the user, on users request the same can be accessed from the Agency Server.

The KSSDI Data clearing house and geo-portal would act gateway for various data generating agencies to share the information across various government departments, NGOs, academies, industries and scientific organisation. It will be a Single window system for discovery, view and access state geo-spatial data sets along with attributes. The individual departments and KSCST would be able to add and update the state geo-spatial data sets thereby providing the up-to-date spatial data dictionary and map directory for the state and facilitate decision support system and helps in local level planning. Thus, KSSDI would provide scientific approach to the decision makers, planners and administrators to facilitate common man usage of valuable Geo-spatial data. Also, the proprietary data prepared by department can also be used for the data sale and purchase, which can be part of the state revenue generation.

The complete KSSDI portal is developed using the ERDAS Apollo Software, an OGC compliant with facilities to share the vector and raster datasets through WMS, WFS and WRS web services along with the solutions and products from IBM for server hardware, storage, backup and retrieval systems, CISCO for the Networking components and Oracle for RDBMS requirements, respectively.

KSSDI – Service Oriented Architecture

There are a large number of users interested in the visualisation and analysis of the data organized and maintained by different sources, without having to install the specific applications or data on their terminals. They want to be able to connect to data services in real time and create different data combinations, and ultimately publish/share the contents and services to third parties and application developers.

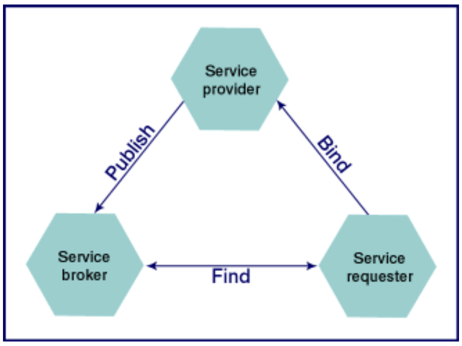
This goal is possible with the help of Service Oriented Architecture **(SOA)** applied to spatial information. An SOA can be implemented with Web services. Web services consist of XML based transport protocols and open standards designed to exchange data between different applications. Software developed and written in different programming languages for different platforms can all use Web services to exchange data using the Internet and HTTP protocol. This interoperability is made possible by the use of open standards.

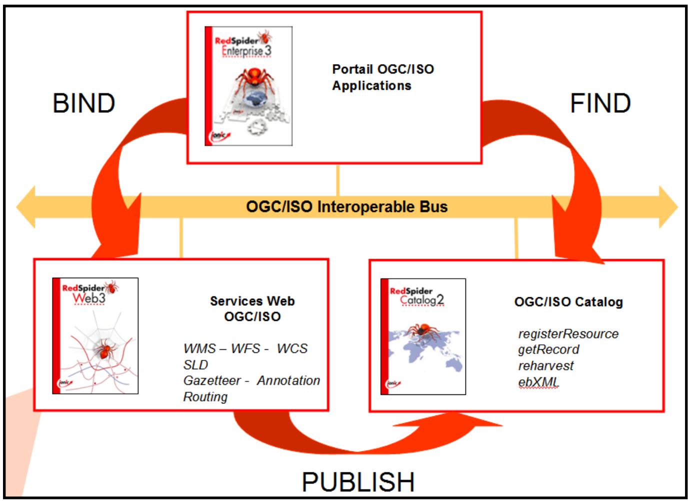
One of the key elements of an SOA is the Service Registry: a record and description of all available services. It allows users not only to find and discover which services could be useful in providing solutions to their needs but also to integrate them into their business applications.

The methodology can thus be described as follows:

- « service providers» set up Web Services;
- they then publish these Web Services in the service registry: « publish »;
- « Consumers/users» then discover these services by means of queries… « find »;
- … and integrate them into their applications « bind »;

Service Oriented Architecture, implemented by means of Web Services is particularly useful for setting up spatial data infrastructures for geographic information systems.   *The SDI* provide the means for regulators, planning committees, managers, individuals and their organisations to discover, access and use spatial data.





The basic components of KSSDI are:

- Content storage: geographic data, i.e. Local alphanumeric data, data models and associated documentation, metadata ;
- Geographic data Library ;
- Business processing services : « geo-services » for the purpose of, for example:
    - accessing data ;
    - finding both data and services ;
    - sharing toponymic indexes ;
    - webmapping queries ;
    - coordinate transformation services ;
    - finding the quickest path ;etc.

Users of Karnataka Geoportal

In line with the SOA, the users of the KSSDI Geo Portal are classified into three main categories:

a) **General User:** Any internet user/General public wanting to access the portal must register (sign up) online to access the map services.

b) **Data Provider:** User or representatives from the State or District level Line Departments, and District NRDMS centres participating in the data sharing with KSCST or members within KSCST itself. This user group based on the roles and privileges is sub-categorized further into two: Data Provider and Data Manager.

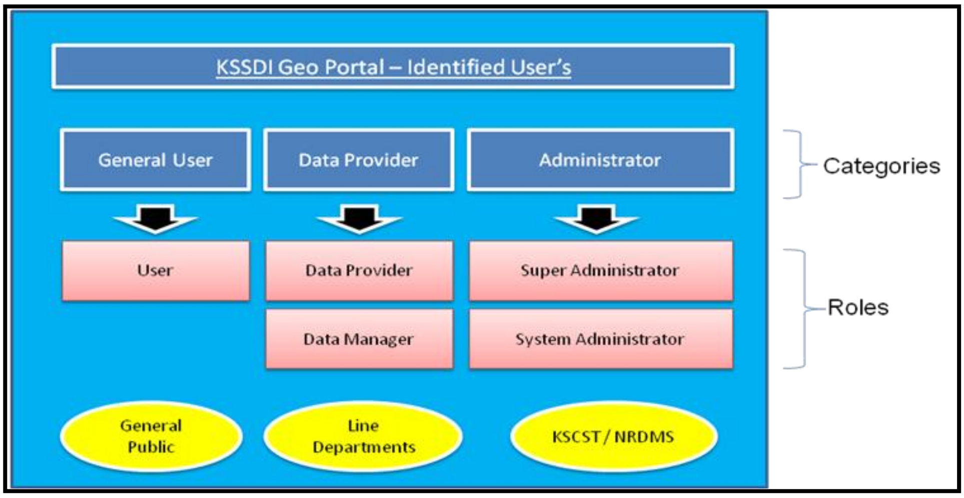
Data Provider: Will be representing their respective line departments and are authorised to make changes to the data pertaining to their department only.
Data Manager: Will be a member of the KSCST staff who is authorised to perform overall data operation across all departments under the guidance of the Administrator of the KSSDI system.

c) **Administrator:** The administrator is considered as the super user of the system with the sole privileges to administer the complete system. They are further sub categorised as: System Administrator and Super Administrator.

System Administrator – who is an authorised KSCST staff to perform administrative operations of the system that includes Managing Users, Roles and Privileges, application resources, system auditing and reports.

Super Administrator: who has the sole authority over the system setup and its resources.He would be responsible for the data uploaded/update, modification of data format, define/modify and managing privileges for all user groups, administrative user profile, login, IP, security etc.

The overview of the user categorisation is given below:



Functions of KSSDI Geoportal:

KSSDI Geo Portal provides an OGC framework for accessing spatial data across organizations or group of users in an efficient and flexible manner. This has the following components

I. **Map Viewer** is an internet based interactive map viewing applications, which allow a user to view the spatial data. Map Viewer also facilitates map discovery, querying, analysing and update.

II. **Map Catalogue** is list of map services available as a map directory. It allows the user to browse the directory of spatial datasets that are available as map layers. It facilitates an authorized data provider to publish map data as service that can be accessed remotely.
Metadata is information about spatial data. This would enable a user ton view the descriptions of the metadata before actually accessing/working with the data. The authorised users would be able to Create, Update, Remove and Export Metadata is provided.

III. **Product Catalogue**: facilitate spatial datasets as maps to be listed as products and hosted for online sale and purchase with the payment details. Registered users can search for map products, select and download by making online transaction.

IV. **Service Request:** allows users to post their requests via the portal to publish data as map services or make available as a product. The request can be made to the KSSDI Administrator or to a specific Line Department.

V. **KSSDI Applications:** KSSDI Applications are prepared based on the currently identified needs of the line departments.

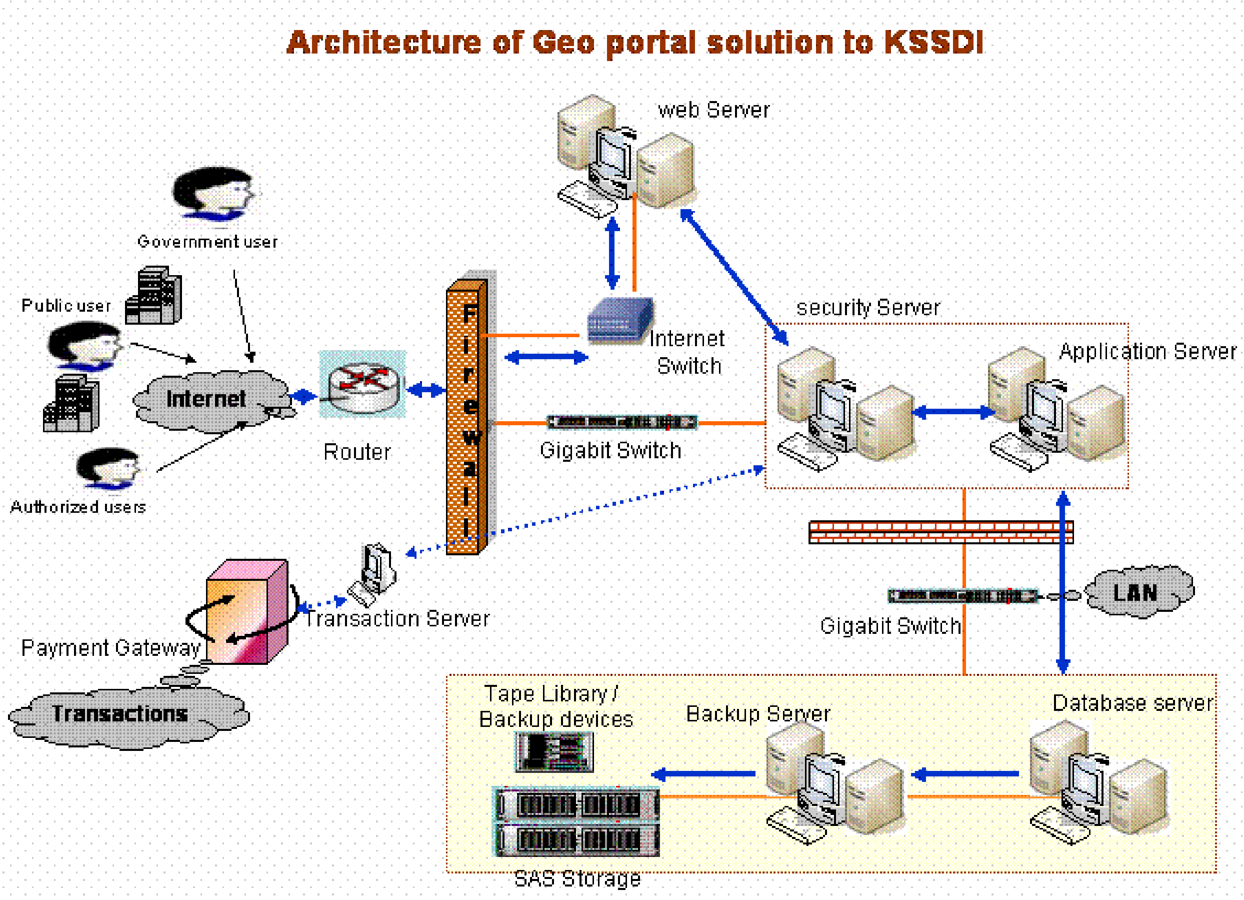
The applications are categorized based on the department name or a search keyword. These applications will help the Users in taking decision making process. A indicative list of application requirements are given below which would be available as part of KSSDI Geoportal for various users

Department	Application Requirement	Application Query
Department of Education (Akshaya Yojana Programme)	Opening of new Primary School	Distance of a school from a village doesn't exceed 1.5 kms
(District Primary Education Programme)	Opening of new Primary School	1. Population exceed 300 2. Village with Adult Education Centre
(Akshaya Yojana Programme)	Construction of new school rooms	Select Schools for which additional rooms were constructed Population is in excess of 600 Number of students in excess
(Akshaya Yojana Programme)	Repair to school rooms	Select Schools for which rooms were repaired
	Location of School	Select School in Private land Select School in Govt. Land Select School in Adult Education Centre
Health Services Programme)	1. Identification of High Risk Areas	Select Districts prone to Malaria high risk areas
	Villages with Primary health centre	Select Villages within a given Taluk that has PHC
	Constituency wise watershed 1000 ha each	Select Constituency within a district that has watershed area 1000ha
	Taluk wise location of M.I tanks having fishing activities	Select Taluk with MI Tank that has fishing activities
	Minor irrigation tank taluk wise	Select Taluk with Minor irrigation tank
	Schools with implementation of Rain water harvesting method	Select Village with schools that has Rain water harvesting
	Schools with drinking water and toilet facilities	Select Village with schools that has drinking water and toilet facilities
	Village with fluoride distribution	Select fluoride distribution map at village level
	Village with adult education	Select Villages with Adult Education facility available
	Village with continuing education centre	Select Villages with Continuing Education Centres (CEC) facility available
	Village with veterinary facility	Select villages with Veterinary facility available
	Village with live stock distribution	Select Villages with liver stock distribution available
	SC/ST percentage distribution taluk wise	Select Taluk wise SC/ST percentage Distribution
	Village with population greater than 600	Select villages with population > 600
	Village with number of borewells	Select villages that has borewells and the count
	Village with Primary health centre	Select villages with PHC facility available
	Village with Community Health	Select village with CH facility available
	8 kms Buffer around the	Select villages with PHCs with 8 Kms

	village locations with PHCs	Buffer polygon
	Villages without PHCs	Select villages having PHCs facility
	12 kms buffer around village locations with CHCs	Select villages having CHCs with 12 kms buffer polygon
	Village location with population 3000 and with SHC	Select villages with population >= 3000 and SHC facility
	Villages without Sub centres	Select Villages that do not have (<>) Sub centres

Karnataka Geoportal System Architecture

The diagram provides a schematic representation of the infrastructure and network requirements to host the Geo Portal and the clearing house and provide the system performance as stated in the requirements. The diagram also show required number of servers, and server types, and how these servers will communicate with existing infrastructure and partner systems



IBM provides the HS21 blade servers for the 5 servers viz, web, security, backup, database and applications servers. The industry-leading flexibility, performance, and investment protection you've come to expect from the IBM servers has been extended even further with the introduction of a new generation of 2 processors, which run at clock speeds as high as 3.3 GHz and are available with a Level 2 cache as large as 6MB.

The Oracle 11g Enterprise Edition along with the Spatial Option gives the industries best RDBMS solution. Oracle Database server with spatial option is an OGC compliant product for storing Spatial and metadata. The unique features of Oracle in storing, retrieval adds value to our solution to KSSDI. The Virtual private database and data encryption adds more to the existing security features.

The Geo-portal solution as per the requirements of KSSDI/KSCST would have a total of 5 servers as shown in the architecture. The LDAP- active directory would be housed in the security server, along with the security module developed for the web portal. Security features will be compatible with LDAP (Light Directory Access Protocol) and Microsoft's Active Directory, and would enable the establishment of a single sign-on security and authentication scheme. The application server would be housing the web portal solution, OGC certified WMS, WFS, WRS web services. The portal would also be housing the data conversion software / utilities. The Geo-Portal is also expected to have an transaction module which keeps account of the various transactions. The transaction services is later planned to be connected to a payment gateway of any of the nationalized bank like State Bank of India for payment transactions.

The KSSDI portal passed preliminary stage of development and was released to users during October, 2009 for portal functionality testing. The release allowed the testing of the portal to undergo usability testing with selected users who provided feedback to the project team. Identified malfunctions were rectified. The Council officially launched Karnataka Geo-Portal during December, 2009 at the 9th annual event of National Spatial Data infrastructure by the Honourable Minister of State for Science & technology, GOI, Sri. Prithviraj Chavan. The Council is initiating to set up state level committee to sensitize various departments/agencies of the government of Karnataka on the concept of SDI and the utility of Geo-portal and clearing house in order to secure their cooperation in the utilization/development of portal.

The complete Karnataka Geo Portal is developed using the ERDAS Apollo Software, an OGC compliant with facilities to share the vector and raster datasets through WMS, WFS and WRS web services along with the solutions and products from IBM for server hardware, storage, backup and retrieval systems, CISCO for the Networking components and Oracle for RDBMS requirements, respectively. It is a centralized single window access mechanism for all spatial data acquired by various agencies of the state.
The Karnataka Geoportal has been continuously being fine tuned for some of the issues like search feature enhancement, usability issues, application queries rectification and functionalities. The portal also has long list of pre canned queries for different type of users as well as the facility for user defined queries. Training of the project staff as well as district project personnel has been completed.

Cataloguing of various data/metadata services available in Karnataka Geoportal has already been taken up and with increasing user awareness, the State will have to frame a policy/ guideline for dealing with user requests for getting access to feature or map data. An open approach at this stage with governmental stakeholders will facilitate better user awareness and promotion of the use of the standardised data sets/services in governance-related activities. This in turn will help upgrade value of the data/services for their better marketability amongst stakeholder agencies.

Participation of state level departments/directorates has facilitated in arriving suitable modalities for the data/metadata using the geospatial tool developed under the project. The KSSDI Steering Committee has also triggered the issue of data sharing as well as data updation process. Under this project a meeting of the stakeholders from the Government sector at State level was held to deliberate on issues related to**:**

1. Online data sharing/updation mechanism
2. Metadata/Catalogue of services of participating agencies
3. Data standardisation for interoperability
4. Data sharing policy

Karnataka Geoportal Services:

Karnataka Geo-Portal is envisaged to be a centralized single window access mechanism for all spatial data held and acquired by various agencies/line departments of the state. The modules in the Karnataka Geoportal are categorized into

- Map viewer - Web Map Service (WMS)
- Product catalogue/metadata - Catalogue Service on Web (CS-W)
- Services specific service/feature data sets - Web Feature Service (WFS)
- Simple Applications (Query based decision support)
- Coverage services/images - Web Coverage Service (WCS)
- Help/support

Karnataka Geoportal URL: www.karnatakageoportal.in

Proposed future activities:

1. Development of web based geospatial applications for Karnataka Watershed Development Department for monitoring and evaluation of IWMP projects and health sector.
2. Institutional mechanism for Karnataka Geoportal to facilitate spatial datasets from concerned Line Departments to the monitoring, evaluation and formulation of developmental programmes/ schemes in watershed and health sectors.
3. Data sharing by data generating agencies through Karnataka Geoportal
4. Development of multi-lingual search facility
5. Integration of Ortho-images on geospatial applications for visualization
6. Map comparison tool for assessing the quality of crowd-sourced data
7. Crowd sourcing of points of interest in Karnataka Geoportal

Karnataka Geoportal - Login Page

Welcome to Karnataka GeoPortal

KSSDI is an Internet based Geo Spatial Data Directory for the state that allow the users of the system to share and explore the information related to political and administrative boundaries, state geography, demography, agro and socio economy, resources, infrastructure facilities with attributes. In the future the site can also be extended to cater to sale and purchase of data online.

Spatial datasets generated, maintained and provided by various concerned Departments of the State Government, academia, private or civil society organizations of Karnataka are proposed to be made accessible through the project data clearinghouse mechanism.

The Portal will essentially be used for the following objectives:

- Bringing together geo spatial knowledge and information under a common platform, which till date has existed as a disparate system and unknown to quite a wider section of the society, institutions, scientific community and government departments.
- Gateway for various data generating agencies to share the information across various government departments, NGOs, academies, industries and scientific organisation.
- Provides spatial data dictionary and map directory for the state
- Analysing the needs of various government programmes
- Facilitate decision support system and helps in local level planning
- Eventually can be used for the data sale and purchase, which can be part of the state revenue generation

» Karnataka GeoPortal(Beta) Version has been released.

» Karnataka GeoPortal's Photo Gallary has been updated.

Best Viewed in Firefox 3.5 and IE 7: 1024 X 768 Resolution.

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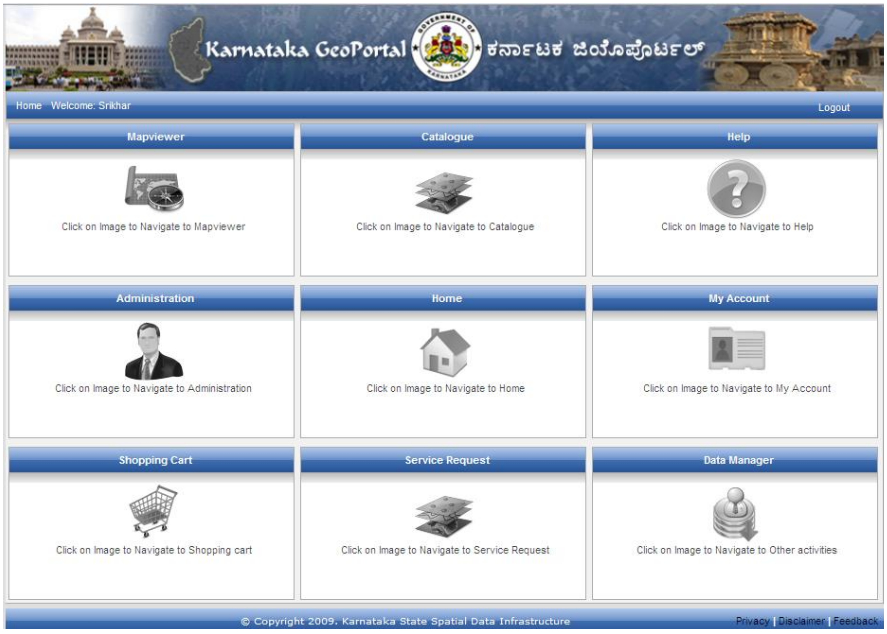
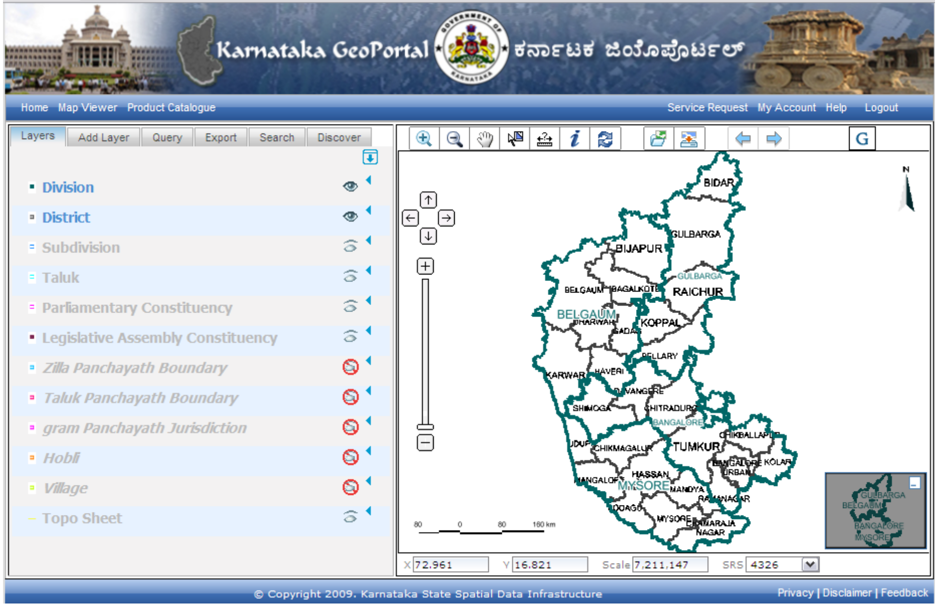
Karnataka GeoPortal's – Home Page



- On Login into the Geo Portal, the user have access to the various modules of the SDI.

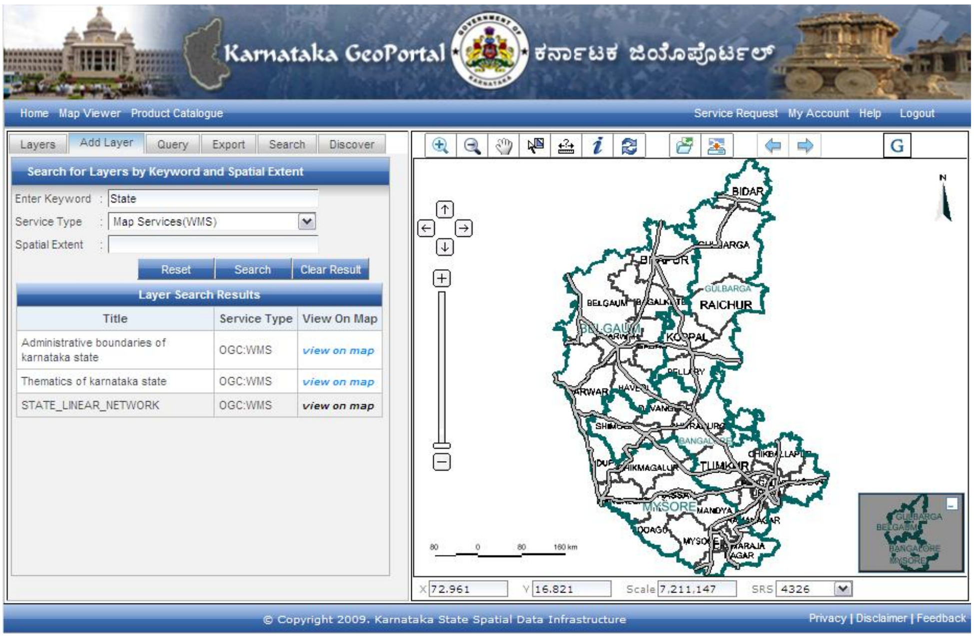
Karnataka GeoPortal’s – Map Viewer



X 72.961 Y 16.821 Scale 7,211,147 SRS 4326

- Geo Portal Map Viewer module by default displays State Division and District Boundaries
- The Layer Tab on the left pane displays the list of layers that can be made visible at various map scales.
- User also have the ability to switch ON or OFF layers by using the Eye icon against each layer.
- The General Map Viewing tools available are: Zoom, Pan, Full view, Previous and next view, Identify, Measure, Refresh and Load context. It also provides the scale bar, X Y coordinates, SRS (Spatial Reference System) and Over View Map display along with Google Map layer display.

Karnataka GeoPortal’s – Map Viewer



Enter Keyword : State
Service Type : Map Services(WMS)
Spatial Extent :

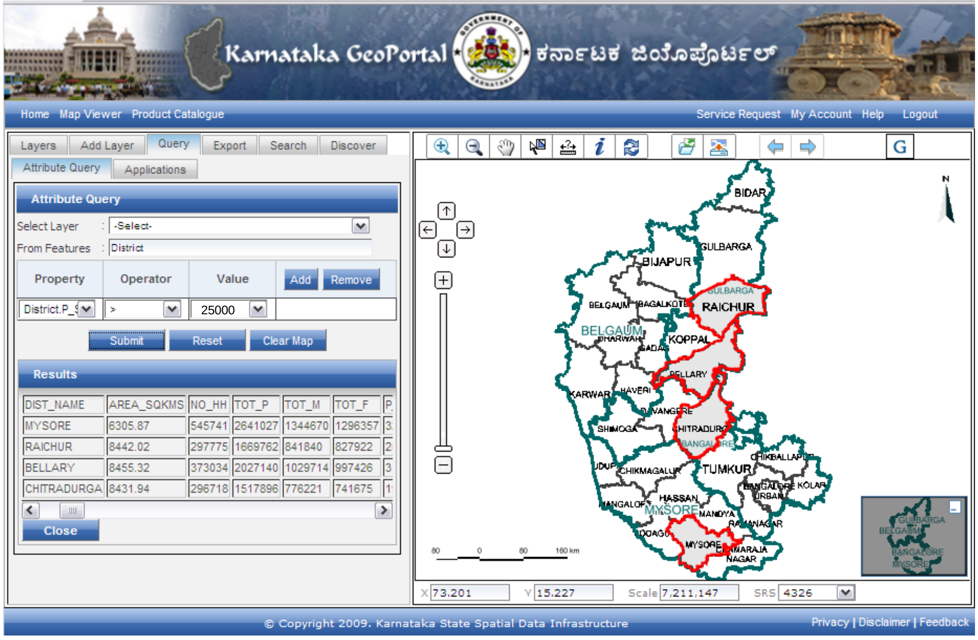
Title	Service Type	View On Map
Administrative boundaries of karnataka state	OGC:WMS	view on map
Thematics of karnataka state	OGC:WMS	view on map
STATE_LINEAR_NETWORK	OGC:WMS	view on map

X 72.961 Y 16.821 Scale 7,211,147 SRS 4326

- Add Layer Tab allows user to search for the available services through “Key Word Search” or “Spatial Extent ” using the Select Tool from the Toolbar.
- The Resulted services will be displayed and by clicking “View on Map”, the selected layer gets displayed on the current Map Viewer.

Note: The current map displays the Division & District boundary with the State National Highway Layer resulted in the search above.

Karnataka GeoPortal's – Map Viewer



Attribute Query

Select Layer : -Select-
From Features : District

Property	Operator	Value
District.P_S	>	25000

Results

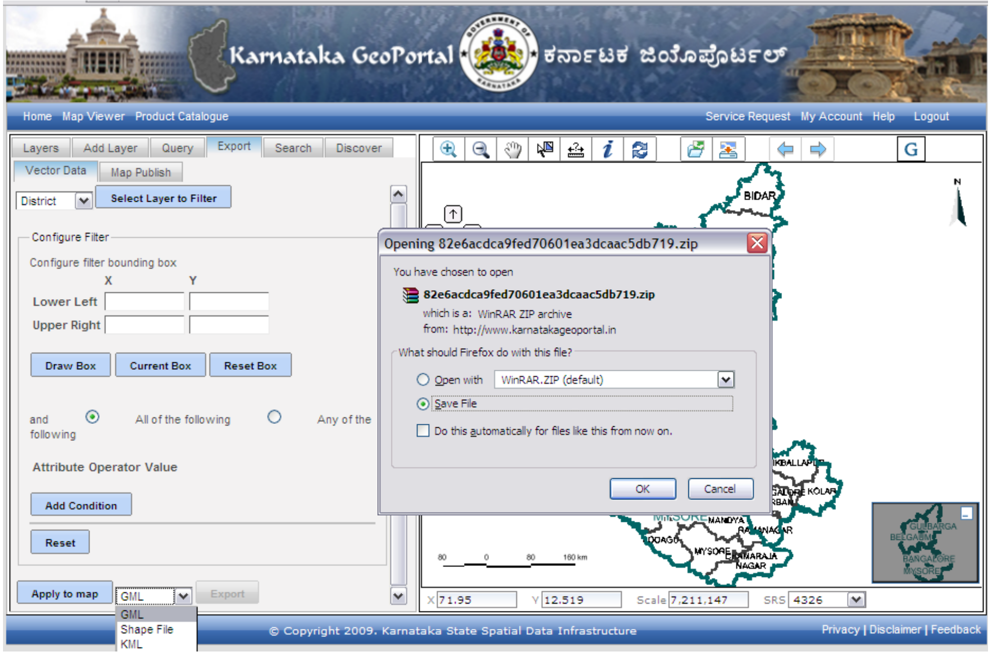
DIST_NAME	AREA_SQKMS	NO_HH	TOT_P	TOT_M	TOT_F
MYSORE	6305.87	545741	2641027	1344670	1296357
RAICHUR	8442.02	297775	1669762	841840	827922
BELLARY	8455.32	373034	2027140	1029714	997426
CHITRADURGA	8431.94	296718	1517896	776221	741675

X 73.201 Y 15.227 Scale 7,211,147 SRS 4326

1. The Attribute Query Sub Module provides the ability to select multiple layers with or without spatial join and operators with input values to generate results and view them too on map.

Note: The current map viewer shows the Query on District Layer, Highlighting the Districts with TOTAL ST POPULATION > 25000.

Karnataka GeoPortal's – Map Viewer



District

Configure Filter

Configure filter bounding box

Lower Left X Y
Upper Right X Y

and following ● All of the following ○ Any of the

Attribute Operator Value

GML

Opening 82e6acdca9fed70601ea3dcaac5db719.zip

You have chosen to open

82e6acdca9fed70601ea3dcaac5db719.zip
which is a: WinRAR ZIP archive
from: http://www.karnatakageoportal.in

What should Firefox do with this file?

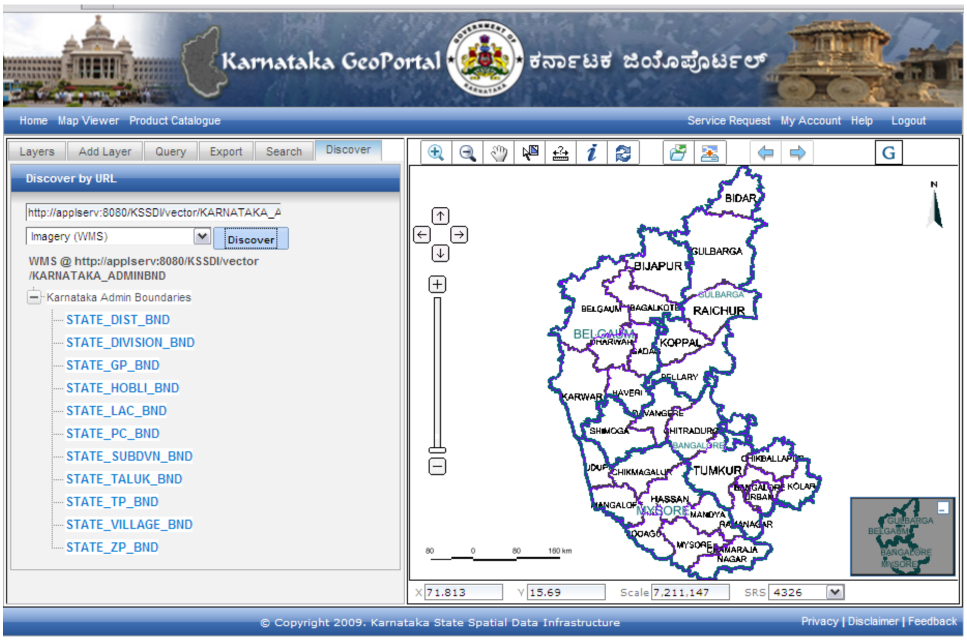
○ Open with WinRAR.ZIP (default)
● Save File
☐ Do this automatically for files like this from now on.

X 71.95 Y 12.519 Scale 7,211,147 SRS 4326

1. The Export module allows the user to select a specific layer for export to GML and SHAPE file format.

Note: The above screen shot shows Export of District layer to GML.

Karnataka GeoPortal's – Map Viewer



http://applserv:8080/KSSDI/vector/KARNATAKA_A

Imagery (WMS)

WMS @ http://applserv:8080/KSSDI/vector /KARNATAKA_ADMINBND

Karnataka Admin Boundaries
- STATE_DIST_BND
- STATE_DIVISION_BND
- STATE_GP_BND
- STATE_HOBLI_BND
- STATE_LAC_BND
- STATE_PC_BND
- STATE_SUBDVN_BND
- STATE_TALUK_BND
- STATE_TP_BND
- STATE_VILLAGE_BND
- STATE_ZP_BND

X 71.813 Y 15.69 Scale 7,211,147 SRS 4326

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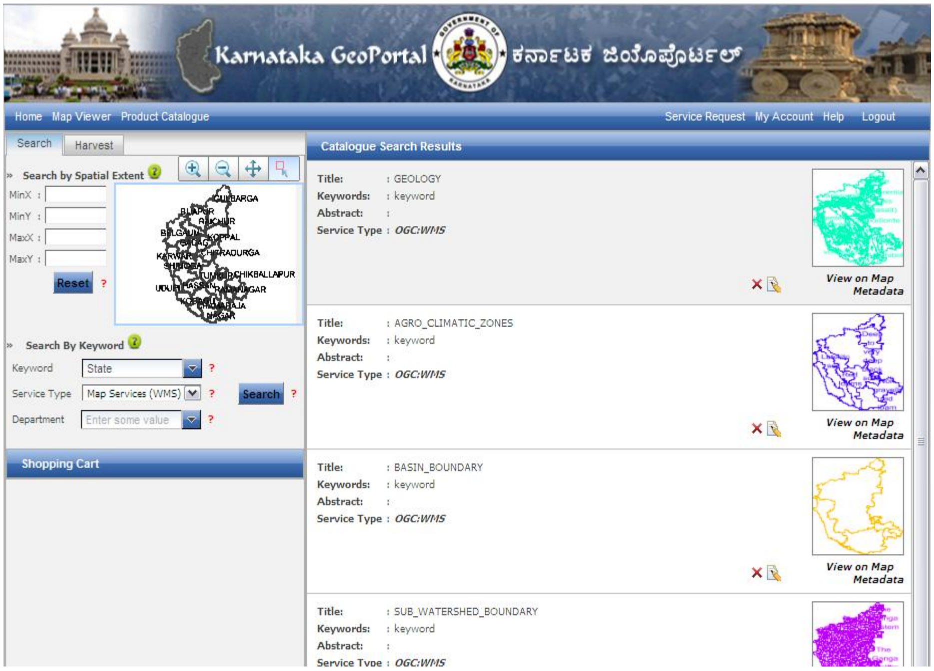
1. The Discover Module allows users to discover map services hosted at remote locations for viewing within the current map viewer as an overlay.

Note: The current map viewer shows the discovery of WMS Services from the local server. (Same way can be used to discover services on Remote Servers).

Karnataka GeoPortal's – Catalog



Catalogue Search Results

Title: : GEOLOGY
Keywords: : keyword
Abstract: :
Service Type : OGC:WMS

Title: : AGRO_CLIMATIC_ZONES
Keywords: : keyword
Abstract: :
Service Type : OGC:WMS

Title: : BASIN_BOUNDARY
Keywords: : keyword
Abstract: :
Service Type : OGC:WMS

Title: : SUB_WATERSHED_BOUNDARY
Keywords: : keyword
Abstract: :
Service Type : OGC:WMS

Keyword: State
Service Type: Map Services (WMS)
Department: Enter some value

1. Product Catalogue allows user to search the Published Web Services (WMS/WFS/WCS) in the KSSDI Data Repository.
2. It presents the Metadata of the selected Layer (NSDI Metadata Standard 2.0).
3. Also allows a user to all the layers to cart.

Crowd sourcing (Authoritative) of Geographic Information on Public Assets and Amenities

Abstract — The 73rd and 74th amendment of Indian constitution passed in 1992 empowered local bodies of self governance, paved way for planning and decision-making from macro to micro level. Recognizing the need of both spatial and non-spatial data for local level planning, district spatial data centers have been established in Karnataka State in 1992, to provide geospatial services to planners and administrators. The utilization of geospatial data and services for a wide range of uses has seen a steady growth in recent decade. Recently planners and administrators have indicated that the available spatial data do not suffice the needs of planning at micro level. Based on the felt need, the Council took up a study to assess the capability of crowd sourcing concepts to capture Geospatial Information authorities on public assets and community resources, to enrich and augment the spatial content of the data. Crowd sourcing through authorized sources enable authoritative data availability at micro level in a short span of time at nominal cost. Mobile application developed on android platform was assessed on two local governments to check spatial accuracy and data capture format. The results are within the acceptable limits.

Keywords—Crowd sourcing, Android apps, GPS (Global Positioning System).

INTRODUCTION

Capturing of geographic information based on crowd sourcing concepts is a participative online activity in which generally citizens voluntarily involve in capturing GI sought by crowd sourcer for mutual benefit. The Council under the project funded by Karnataka Knowledge Commission, Government of Karnataka planned to initially capture crowd sourced Geographic Information (GI) on public assets and community resources by training department officials and local youths. Crowd sourcing of GI in the proposed context is contributed by authoritative sources i.e., government departments. This is to encourage availability of authoritative data at micro level in a short span of time. Recent developments in web mapping applications also provide a venue for citizens to become active contributors to geodatabases. These capabilities will allow everyone from authoritative source to citizens to contribute content to the geodatabase. The crowd sourced data is expected to enrich the spatial content and provide access to new types of data to use, manage, interpret, and incorporate in planning apart from significantly augmenting authoritative datasets. Crowd sourcing also gives ordinary citizens the opportunity to provide feedback directly to the government. The GIS organisations in the state shall ensure the usability of this data in a GIS workflow or to turn this crowd sourced data into readily available useful geographic knowledge to concerned departments.

GPS enabled mobile devices or smart phones used to capture GI to build a spatial digital data register of the state is expected to promote efficiency, transparency and ownership among line departments. Initially the proposed crowd sourcing application will be built on a free and open source android platform to capture GI. The attribute data crucial to planning will also be tagged along with time stamped geo-tagged images. Providing this inherent spatial information in a spatial context can connect Government with citizens and optimize the use of resources. The crowd sourcing concepts was tried in few Gram Panchayaths to demonstrate its feasibility and proof of technology. Once the proof of technology is realised, it is planned in future to develop software applications which shall work on several mobile operating system to cater to the heterogeneous mobile devices available in the market.

The following Gram Panchayaths were identified for implementing this project in Karnataka state, India.

1. Bangalore Rural District – Doddabelavangala Gram Panchayath, Doddaballapur Taluk.
2. Gulbarga District - Kadaganchi Gram Panchayath, Aland Taluk.

The project also ascertained the spatial accuracy of content sourced from remote locations, taking into consideration the type of network and devices used to understand the quality of spatial information contributed. The crowd sourced information in future could be either from authorized source i.e., government departments or volunteered information from citizens. In Karnataka, several departments are already involved in capturing GI and such information in future could be integrated with spatial layers for managing resources and infrastructure. The GI sourced from mobile devices is expected to produce actionable information.

STUDY AREA

A. Bangalore Rural District – Doddabelavangala Gram Panchayath, Doddaballapur Taluk.

Bangalore Rural district in Karnataka lies between Northern latitudes 12^0 51’9.69”and 13^0 30’ 26.3”and between Eastern longitudes 77^0 9’ 46.5”and 77^0 58’ 43.8”.Bangalore Rural district has 2 divisions, 4 Taluks, 35 Hoblis (cluster of villages), 1,713 inhabited and 177 uninhabited villages, 9 towns and 229 Gram Panchayaths. Doddabelavangala Gram Panchayath is located in Dodballapur Taluk of Bangalore Rural District. Doddabelavangala is 12 km from its Taluk Main Town Dodballapur, 50 km from its main city Bangalore and located along NH 207 Highway. Doddabelavangala Gram Panchayath has 8 revenue villages and 2 habitations. In 2001, Doddabelavangala Gram Panchayath had population of 6,876 of which male and female was 3,469 and 3,407 respectively and total numbers of households were 1,444. Scheduled Caste Population was 1,812 out of which male and female were 891 and 921 respectively. Average literacy rate of Doddabelavangala in 2001 was 66.71%. The density was 22.02 Sq.kms.

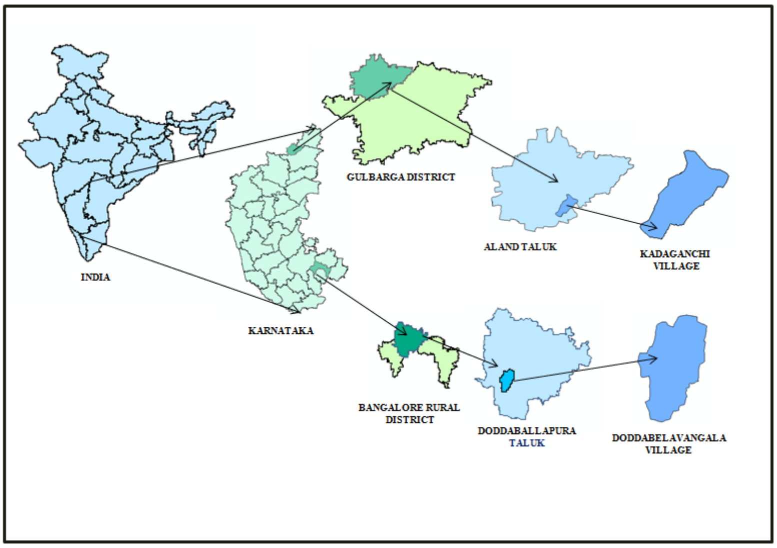


Fig 1. Study area

B. Gulbarga District - Kadaganchi Gram Panchayath, Aland Taluk.

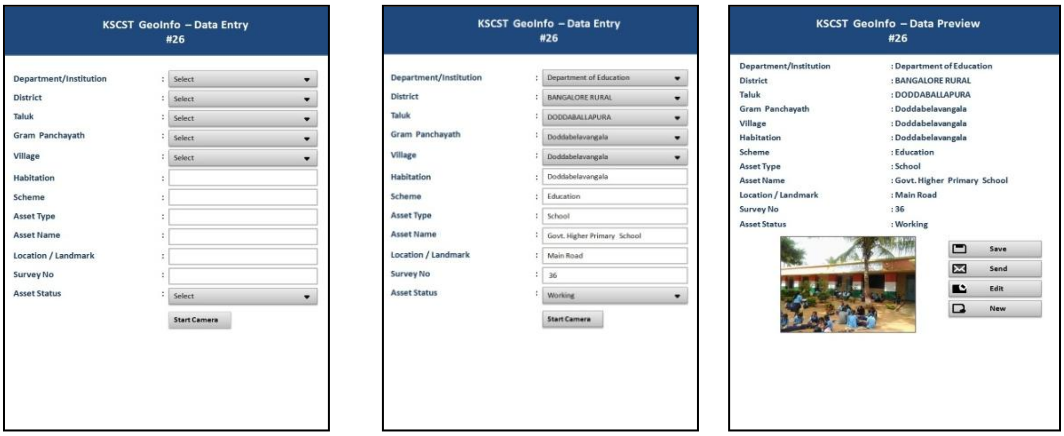
Gulbarga district in Karnataka lies between Northern latitudes $16^0$41’ 8.2” and $17^0$46’ 36.0” and between Eastern longitudes $76^0$3’10.4” and $77^0$42’ 13.3” covering 8.49% of the area and 5.9 present of population of the state. Kadaganchi is a Village in Aland Taluk of Gulbarga District. Kadaganchi is 17 km from its Taluk Main Town Aland, 22 km from its District Main City Gulbarga and located along SH10 highway with frequent service of buses, trucks and other transports. Kadaganchi is 507 km from its State Main City Bangalore. Kadaganchi Gram Panchayath has 1 revenue village and 3 habitations. In 2001, Kadaganchi Gram Panchayath had population of 6,899, out of which male and female was 3,538 and 3,361 respectively and total number of households were 1,148. Scheduled Caste Population was 1,334 out of which male and female were 688 and 646 respectively. Average literacy rate of Doddabelavangala in 2001 was 43.02%. The density was 44.58 Sq.kms.

METHODOLOGY

The council developed a mobile application to capture GI of public assets and infrastructure on android based mobile operating system christened as GeoInfo. Generally android phones and android tablets, use a 2.x release. The app was developed on Android version 4.0. Android releases are nicknamed after sweets or dessert items like Cupcake (1.5), Frozen Yogurt (2.2), Honeycomb (3.0) and Ice Cream Sandwich (4.0). Crowd sourcing encourages citizens to be active volunteers of the community to improve GPS routing. Android app allows user to capture feature/assets along with attributes. Samsung Galaxy tab and Handheld Garmin GPS were used concurrently to capture the information of all the features and the results of android app was compared with Handheld Garmin GPS to ascertain quality and accuracy of the coordinates. In the study area about 160 and 178 assets were identified for capturing information by both the devices. Asset information was captured as per the guidelines mentioned below. Graphs were plotted between against the latitude and longitude values captured by Samsung Galaxy Tab and Handheld Garmin GPS.

Steps involved in operating mobile apps.

1. Enable the GPS and Mobile data from android based Operating system mobile.
2. Click on the GeoInfo mobile Apps to see (this application support only Android OS) GeoInfo – Data Entry form as shown in Fig 2.
3. Enter all the credentials starting from Department/Institution name to Asset Status as it appears in Fig 2.
4. After completing the form, click start camera. (All credential should be entered for camera to operate).
5. Wait for three minutes to capture the required image (feature/asset). Minimum three minutes wait period is necessary to get better accuracy.
6. After capturing the image, the screen will appear as shown in Fig 4.


KSCST GeoInfo – Data Entry
#26

Department/Institution : Select
District : Select
Taluk : Select
Gram Panchayath : Select
Village : Select
Habitation :
Scheme :
Asset Type :
Asset Name :
Location / Landmark :
Survey No :
Asset Status : Select

KSCST GeoInfo – Data Entry
#26

Department/Institution : Department of Education
District : BANGALORE RURAL
Taluk : DODDABALLAPURA
Gram Panchayath : Doddabelavangala
Village : Doddabelavangala
Habitation : Doddabelavangala
Scheme : Education
Asset Type : School
Asset Name : Govt. Higher Primary School
Location / Landmark : Main Road
Survey No : 36
Asset Status : Working

KSCST GeoInfo – Data Preview
#26

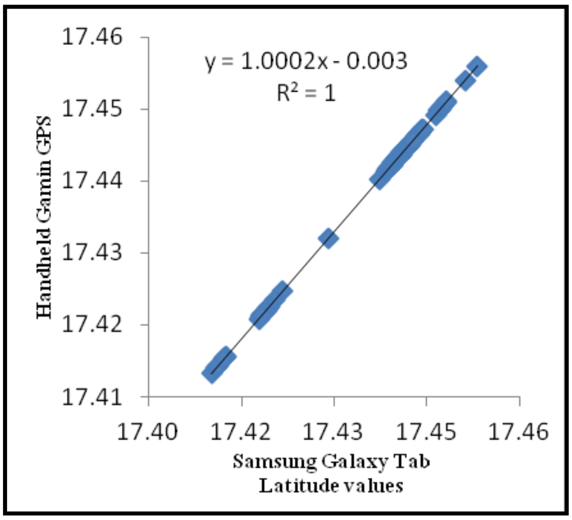
Department/Institution : Department of Education
District : BANGALORE RURAL
Taluk : DODDABALLAPURA
Gram Panchayath : Doddabelavangala
Village : Doddabelavangala
Habitation : Doddabelavangala
Scheme : Education
Asset Type : School
Asset Name : Govt. Higher Primary School
Location / Landmark : Main Road
Survey No : 36
Asset Status : Working

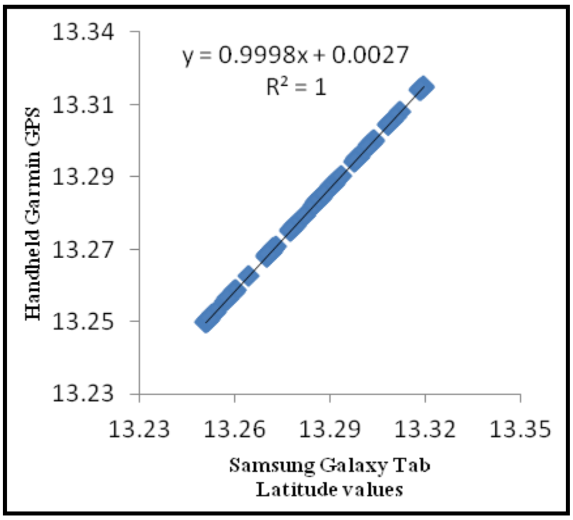
Fig 2, 3& 4 Geo info data entry form, Filled asset information data entry form and Data preview of Geo info application

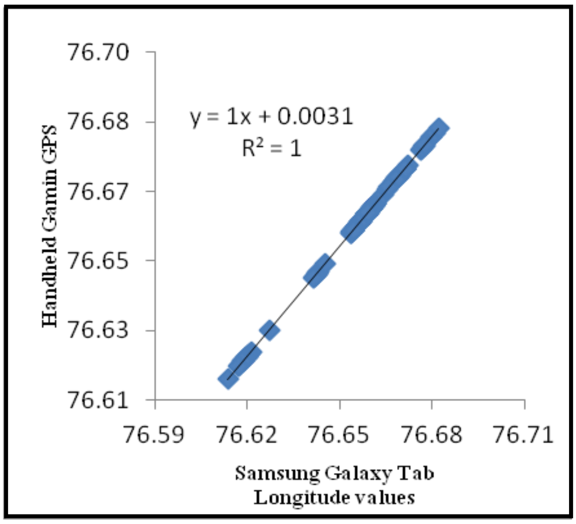
7. Fig 4 represents the data preview section and provides the asset information and the options for further process such as Save, Send, Edit and New.
    a. Save – The information with captured image will save in the given output folder
    b. Send – This option will provide users to send the information with image to any authenticated e–mail id. (To send this you need GPRS or Wi-Fi connection)
    c. Edit – This option is used to edit all the credentials except the image.
    d. New – This will provide the new data entry form and this option will not save the previously recorded information and captured image.)
8. The saved excel sheet contains all the credentials available in GeoInfo – Data Entry sheet with Time stamp, IMEI number, Latitude and Longitude.

RESULTS AND DISCUSSION

The primary aim of the project is to capture GI of public assets through authoritative sources and to involve citizens later in managing public assets and infrastructure. Another key factor is to check mobile device accuracy and the possibility of utilizing it in remote locations. The features were captured by both the devices for comparison. ArcGIS version 9.3 was used to process the GPS points from both the devices. The first survey was carried out in Gulbarga District - Kadaganchi Gram Panchayath, Aland taluk. The second survey was carried out in Bangalore Rural District – Doddabelavangala Gram Panchayath, Doddaballapur taluk. About 160 assets information in the 1st survey and 178 assets information in the 2nd survey were collected. The resource and infrastructure facilities such as water facilities (hand pump, cistern, overhead tank, mini water supply, pump house, open well and bore well), Education (anganwadi, higher and lower primary school, high school, colleges.etc…,), Government buildings (Gram panchayath office, library, police station, bus stand, Milk dairy, primary health centre..,), Power supply, Towers, Banks, provision stores, petrol bunks were mapped during the survey.







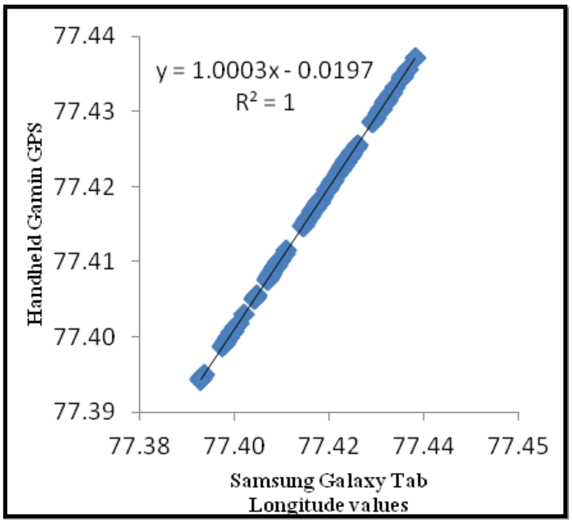


Fig.5 Latitude values between Samsung Galaxy Tab v/s Handheld Garmin GPS of Kadaganchi Gram Panchayath. Fig.6 Latitude values between Samsung Galaxy Tab v/s Handheld Garmin GPS of Doddabelavangala Gram Panchayath. Fig.7 Longitude values between Samsung Galaxy Tab v/s Handheld Garmin GPS of Kadaganchi Gram Panchayath. Fig.8 Longitude values between Samsung Galaxy Tab v/s Handheld Garmin GPS of Doddabelavangala Gram panchayath.

Coefficient of determination (R^2) indicates the strength of the linear relationship between two variables, is used to evaluate the performance of Samsung Galaxy tab in comparison with the Handheld Garmin GPS device. Statistical analysis such as standard deviation, mean, mode, standard error and sample variance etc., was determined for latitude and longitude values of both the devices. Fig 5 and 6 represents the Coefficient of determination (R^2) between the latitude values of Samsung Galaxy Tab and Handheld Garmin GPS. R^2 near 1.0 indicates that a regression line fits the data well, while R^2 closer to 0 indicates that a regression line does not fit the data very well. Similarly Coefficient of determination (R^2) for the Fig 7 and 8 are 1 for longitude values between the Samsung Galaxy Tab and Handheld Garmin GPS, indicating a perfect fit between the readings.

Table 1 provides a statistical result of the distance between latitude and longitude values of Samsung Galaxy Tab and Handheld Garmin GPS. GPS readings of about 160 in Kadaganchi Gram Panchayath and 178 in Doddabelavangala Gram Panchayath were used for the analysis. The standard deviation is 2.05 for Kadaganchi Gram Panchayath and 2.83 for Doddabelavangala Gram Panchayath. The minimum and maximum distance varies from 0.16 to 9.36 and 0.28 to 14.68 meters respectively for each Gram Panchayaths as shown in Table 1. The average value is 3.51m for Kadaganchi Gram Panchayath and 3.74m for Doddabelavangala Gram Panchayath.

Table 1. Statistical results of distance between latitude and longitude values from Samsung Galaxy Tab and Handheld Garmin GPS of Kadaganchi and Doddabelavangala Gram Panchayaths.

STATISTICAL RESULTS		
GRAM PANCHAYATHS	**KADAGANCHI**	**DODDABELAVANGALA**
Mean	3.511696174	3.745596223
Standard Error	0.16277562	0.212356669
Median	3.142199874	2.926098753
Mode	4.956677278	2.921478586
Standard Deviation	2.058966832	2.833191343
Sample Variance	4.239344416	8.026973186
Kurtosis	0.018505152	2.420571753
Skewness	0.652090531	1.513063845
Range	9.198613643	14.39889529
Minimum	0.164432759	0.284805894
Maximum	9.363046402	14.68370118
Sum	561.8713878	666.7161277
Count	160	178

CONCLUSION

The spatial accuracy of the content sourced from remote locations, taking into consideration the type of mobile network/devices when compared to Garmin GPS is well within the acceptable limits for this specific purpose and application. The state can source information of public assets in future by using smart phones by the authorized officials of urban and rural local bodies. The mobile application demonstrated in this project needs to be extended to other mobile operating platforms as well to become vendor neutral and to allow all the OEM's to participate in the authoritative crowd sourcing process. The mobile application also needs to be fine tuned to capture attribute information of all the line departments at village and ward level. The capturing of GI of public assets by the government machinery is simple, economical and less time consuming. The capturing of GI by authorities also leads to ownership and accountability. The GI sourced through this process when overlaid with other spatial layers available within the state up to cadastral level produces actionable information enabling planners and decision-makers to practice geospatial governance. This method is proposed for adoption on a wider scale to cover large number of such micro administrative units.

ACKNOWLEDGMENT

The authors would like to express their sincere gratitude to Karnataka State Council for Science and Technology, Bangalore for permitting to take up proof of technology project to ascertain the feasibility of crowd of sourcing concepts.

Further the authors are also highly indebted to Karnataka Knowledge commission for funding this project.

The authors would also like to thank the officials of Doddabelavangala and Kadaganchi Gram Panchayaths for assisting the project team in capturing the village assets and natural resources.

REFERENCES

[1] http://en.wikipedia.org/wiki/Kadaganchi

[2] http://www.gulbarga.nic.in/

[3] http://panchamitra.kar.nic.in/

Revival and Restoration of Minor Irrigation Tanks in Karnataka State

Abstract

Minor irrigation tanks are rainwater harvesting structures which serves multi-purpose from irrigation the agricultural area to possessing of construction materials. Decline in water storage capacity of minor irrigation tanks, due to silting, encroachment and inappropriate maintenance procedures, affects the production and economic returns from tank based livelihoods. An effort to restore the minor irrigation tanks has been envisaged by all the State governments with due emphasis on revitalization of irrigation potential in a decentralized mode to stabilize the reformation in irrigation sector. About 36672 minor irrigation tanks of Karnataka are considered for the present study. Prioritization of tanks for restoration and rejuvenation is based on available information with Government of Karnataka.

Keywords: Restoration/Rejuvenation of Tanks, Prioritization of Tanks, Minor Irrigation, GIS.

Introduction

Irrigation is the artificial means of water supplying to the roots in the soil. Since olden days, management of water bodies is predominantly done in the form of irrigation tanks. Tanks are earthen banked structures to store surface run-off. Tanks are the most predominant water resource used for agriculture in Southern India since olden days. Water stored in shallow valleys as tanks in villages are favorable to the system of decentralized village administration. Tanks play a multi-purpose role i.e. not only as irrigation source and also as a structure to recharge the groundwater of the region, procurement place of silt for fertilization and construction material, common place where runoff from the catchment area is stored, fishery and drinking water for livestock.

Study Area

Karnataka is the eighth largest state in India, covering about 191,976 km2 i.e. 5.83% of the total geographical area of India. Karnataka state is located in southern India, bounded by 740 05’-780 35’E longitudes and 110 35’-180 25’ latitudes. Karnataka is surrounded by the Arabian Sea in west, Maharashtra in north, Kerala in southwest, Goa in northwest, Tamil Nadu in southeast and Andhra Pradesh in east. It is spread over an area of 191,791sq.km. June and September are the monsoon months, when southwest monsoons bring rain. Something related to crops in post monsoon. Karnataka shows a variation in climate from very humid rainy monsoons in West coast, the ghats and malnad areas to semiarid warm dry climate on the east. Rainfall is highest in Western Ghats of 4000 mm and reduces towards eastern plains to about 500-600mm in the less rainfall districts of Bijapur, Raichur, and Bellary etc. Minor irrigation tanks in Karnataka are about 36,672 as per records, possessing a potential command area of 6,85,000 ha. Highest irrigation command area served by these tanks is less than 2000 ha, with 90% having command area of less than 40 ha. Irrigation potential of these tanks has gradually declined to 35%, covering 2,40,000 ha. Percentage distribution of minor irrigation tanks in Karnataka as per the Command area specification under the various Government authorities is given in Table 1. Soil types depending on the agricultural productivity are divided as red, lateritic, black, alluvio-colluvial, forest and coastal soils. Important crops grown in Karnataka are Rice, Jowar. Maize, Pulses, Oilseeds, Cashew nuts, Coconut, Arecanut, Cardamom, Chilies, Cotton, Sugarcane, Coffee, Tobacco etc.

Materials and Methodology

The Council identified tanks having a water spread area above 2 hectares for rejuvenation and restoration in the state of Karnataka. Available data for analysis is sourced from various State government departments including Karnataka State Remote Sensing Applications Centre (KSRSAC). Geospatial analysis is conducted under ArcGIS 9.3 and MapInfo environment. The earlier studies and survey both spatial and non-spatial made by the state government provides information of minor irrigation tanks such as bund condition, turbidity, aquatic weed, status of tank, qualitative silt deposition and independent/intercept catchment areas. These are broadly classified as follows:

a) Catchment area and the feeder channel.
b) Extent of command area.
c) Existing cropping pattern in the Command Area.
d) Water spread area in the tank and depth of water including extent of silt formation.
e) Encroachments in the catchment area and the command area.

Table 1: Distribution of Tanks in Karnataka according to Command Area

Sl No	Command Area	% of Tanks	Managing Authority
1	Below 4 hectares	41%	Taluk Panchayat
2	4 to 20 hectares	42%	Zilla Panchayat
3	20 to 40 hectares	9%	Zilla Panchayat
4	40 to 2000 hectares	7%	Dept. Of minor Irrigation
5	Above 2000 hectares	1%	Dept. Of minor Irrigation

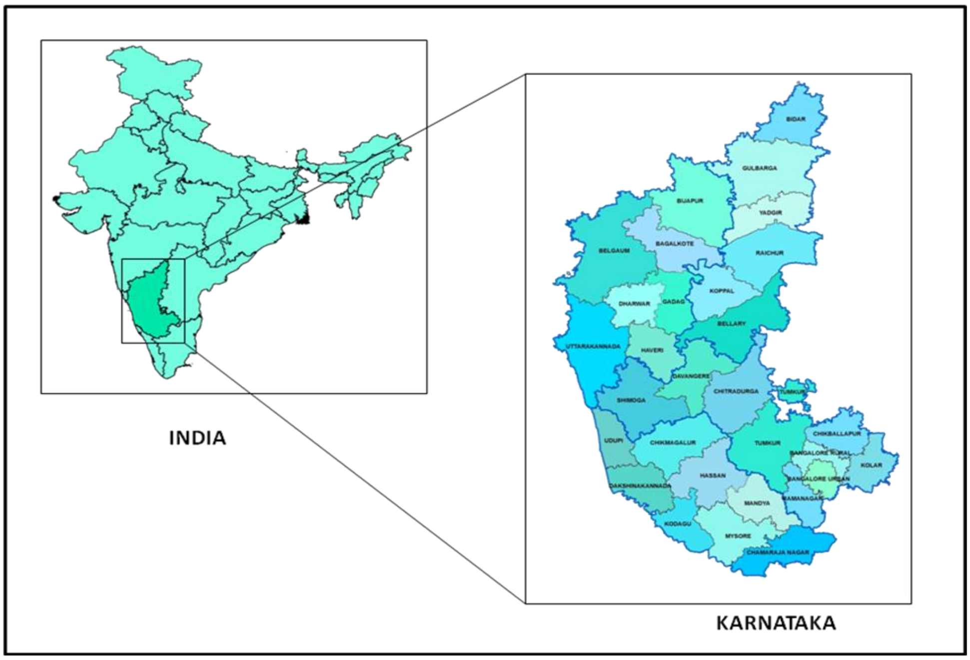


Fig.1 Location map of Study area

Minor irrigation Tanks of 177 Taluks were prioritized by studying the available parameters and were ranked accordingly. Tanks were ranked from 1 to 10. Rank 1 for dry tanks with poor bund condition and rank 10 for low to moderate turbidity, poor bund and high siltation. Ranking of the tanks based on the available parameters criteria is given in the Table 2.Minor irrigation Tanks of the state were classified based on the available criteria and are depicted in Table 2.

Table2. Ranking of the tanks based on the available parameters criteria.

Rank	Criteria
1	Poor Bund condition & Dry Tank,
2	Bund Medium to good, Low to medium turbidity, low siltation
3	Poor Bund & High turbidity
4	High Turbidity & bund condition Moderate to good
5	High Siltation -Bund Medium to good & Low to medium turbidity
6	Dry land
7	Information relating to aqua weeds & encroachment
8	High turbidity, High Siltation, Poor bund
9	High turbidity, moderate to good bund, High siltation
10	Low to moderate turbidity, poor bund, High Siltation

Results and Discussion

About 36676 minor irrigation tanks are studied for restoration and rejuvenation program. The spatial and attribute data acquired from the departments provided a base for prioritizing the tanks. Each tank were prioritized based on the available parameters criteria such as, bund condition, turbidity, aquatic weed, status of tank, qualitative silt deposition and independent/intercept catchment areas. After studying the status of the each tank, relevant restoration activity was envisioned. The restoration activities are put to force only in places where tank irrigation is predominant and the dependency is high, to give justification for the investment on restoration activity. Restoration activity planned to be undertaken are desilting, catchment area treatment, strengthening of bund, raising bund/waste weir etc. Table 3 shows the relevant restoration activity to be undertaken for each additional information of ranked tanks already treated by other departments/agencies is not available. This information will be updated by contacting the agencies involved in managing of tanks. Ranking of the tanks will be modified accordingly by conferring with the concerned agencies.

Table3. Relevant restoration activity for each specific ranked tank

Rank	Criteria	Classification Type
1	Poor Bund condition & Dry Tank	Strengthening of Bund (Dry Tank)
2	Bund Medium to good, Low to medium turbidity, low siltation	Tank Status (Moderate to good & Presently requiring no treatment)
3	Poor Bund & High turbidity	Strengthening of Bund & Catchment area treatment
4	High Turbidity & bund condition Moderate to good	Catchment area treatment
5	High Siltation -Bund Medium to good & Low to medium turbidity	Desilting
6	Not being used	Dry Land
7	Information relating to aqua weeds & encroachment	Inadequate information
8	High turbidity, High Siltation, Poor bund	Desilting, Strengthening of bund & Catchment treatment
9	High turbidity, moderate to good bund, High siltation	Desilting & Catchment area treatment
10	Low to moderate turbidity, poor bund, High Siltation	Desilting & Strengthening of bund

Tanks were classified into 10 types. Each classification is a combination of the tanks restoration activities to be carried out and it is presented in the form Table 4 & bar chart in Figure 2.

About 11,970 tanks require restoration in the form of strengthening of bund, 8359 tanks status are moderate to good, 816 tanks require both strengthen-ing of bund and catchment area treatment, 3515 tanks require catchment area treatment only, 5316 tanks are to be restored by desilting, 28 tanks are not used by the people, information of about regarding 2639 tanks are inadequate, 670 tanks require desilting, strengthening of bund and catchment area treatment, 2629 tanks require both desilting and catchment area treatment, 734 tanks require strengthening of bund and desilting. Tanks are further classified into selected classes to serve.

Table 4. Classification type for each tank

Rank	Tanks	Classification Type	Tanks (%)
1	11970	Strengthening of Bund	33
2	8359	Tank Status Moderate To Good	23
3	816	Strengthening of Bund & Catchment Area Treatment	2
4	3515	Catchment Area Treatment	10
5	5316	Desilting	14
6	28	Not Being Used	0.1
7	2639	Inadequate Information	7
8	670	Desilting, Strengthening of Bund & Catchment area treatment	2
9	2629	Desilting & Catchment Area Treatment	7
10	734	Desilting & Strengthening of Bund	2

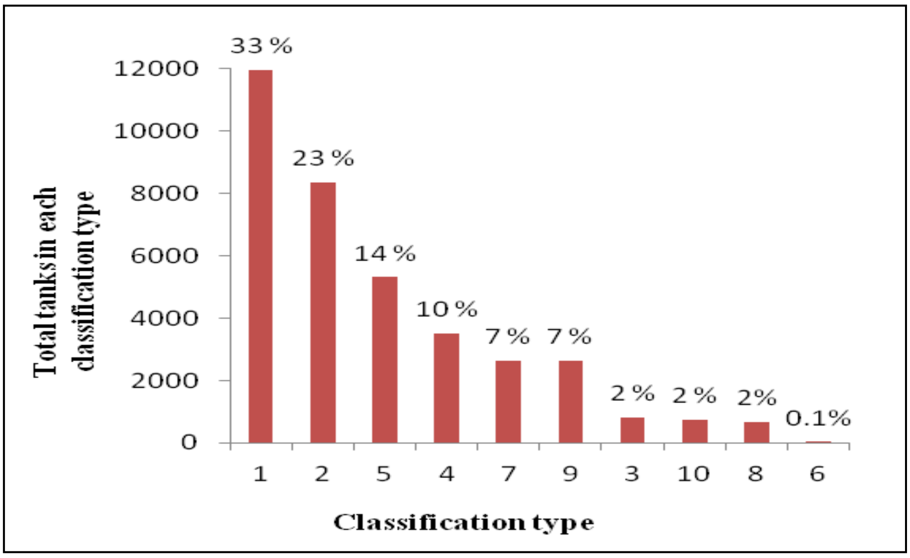


Fig.2 Total tanks in each classification type

the purpose of restoring the tanks which are of high priority and represented in the form of Table 5 and bar chart in Figure 3. Highest priority is given to tanks which require strengthening of bund and are ranked as 1, tanks which are having status moderate to good are ranked 2, tanks requiring catchment area treatment are ranked as 3, tanks requiring desilting are ranked as 4, tanks which are not used are ranked as 5 and tanks having inadequate information are ranked as 6. About 39% of tanks counting to 14190 require strengthening of bund, 23% of tanks covering 8359 are of moderate to good status. Catchment area treatment is required by 7630 tanks accounting to 21%. Desilting is to be carried out for 9349 tanks covering 25%. 7% of tanks accounting to 2667 fall under the class of inadequate information and remaining 0.1% cover 28 tanks which are not being used.

Table 5. Selected classes for each tank

Ranks	Tanks	Classification Type	Tanks (%)
1	14190	Strengthening of Bund	39
2	8359	Tank Status Moderate to Good	23
3	7630	Catchment Area Treatment	21
4	9349	Desilting	25
5	28	Not Being Used	0.1
6	2667	Inadequate Information	7

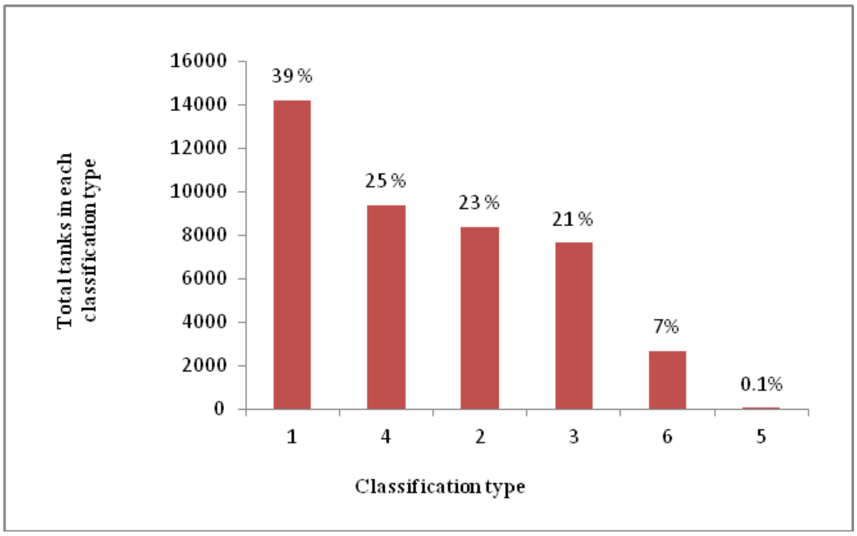


Fig.3 Total tanks in selected classification type

Agro-climatic Zones: Karnataka has 10 Agro-climatic zones namely, North-Eastern Dry Zone(NEDZ), North-Eastern Transition Zone(NETZ), Northern Dry Zone(NDZ), Central Dry Zone(CDZ), Hilly Zone(HZ), Northern Transition Zone(NTZ), Southern Transition Zone(STZ), Southern Dry Zone(SDZ), Eastern Dry Zone(EDZ) and Coastal Zone(CZ). Number of Desilting tanks in each Agro-climatic zone is represented in the form of pie chart and bar graph in Figure 4 and 5.

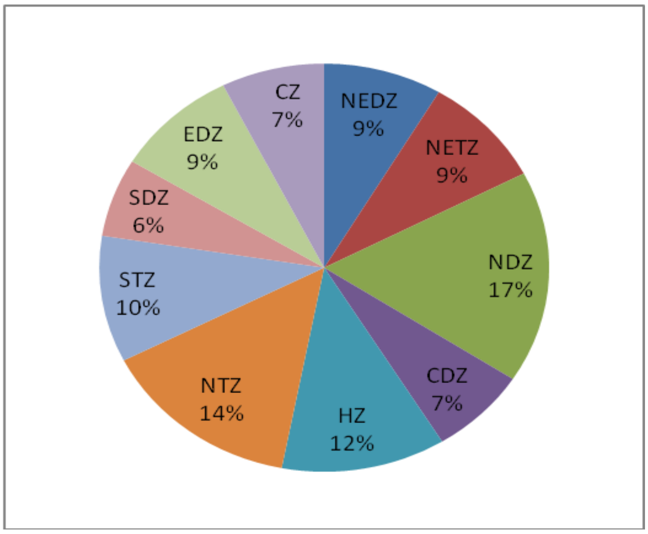


Fig.4 Desilting tanks in each Agroclimatic zones

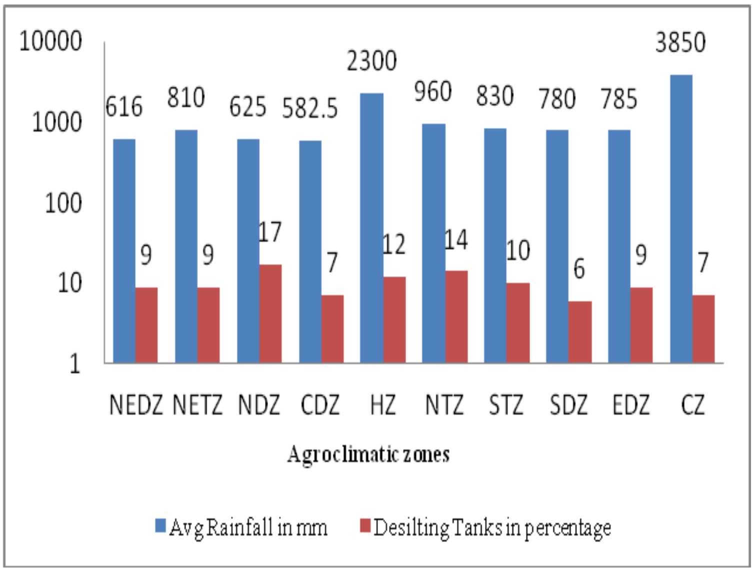


Fig.5 Average rainfall & desilting tanks in the each Agro climatic zones

Northern Dry Zone has the highest percentage of tanks to be desilted i.e.17% and about 14% of desilting tanks come under Northern Transition Zone; 12% of desilting tanks come under Hilly Zone; on an average 10% of desilting tanks come under Southern Transition Zone; 9% of desilting tanks come under each North- Eastern Dry Zone, North-Eastern Transition Zone and Eastern dry zone;7% of desilting tanks come under Central Dry Zone and Coastal Zone; and lowest percentage of desilting tanks of about 6% are found in Southern Dry Zone. The Bar chart also represents the average rainfall in each Agro-climatic zone. Highest average rainfall is in Central Zone of 3850mm and lowest average rainfall of about 582.5mm is in Central Dry Zone.

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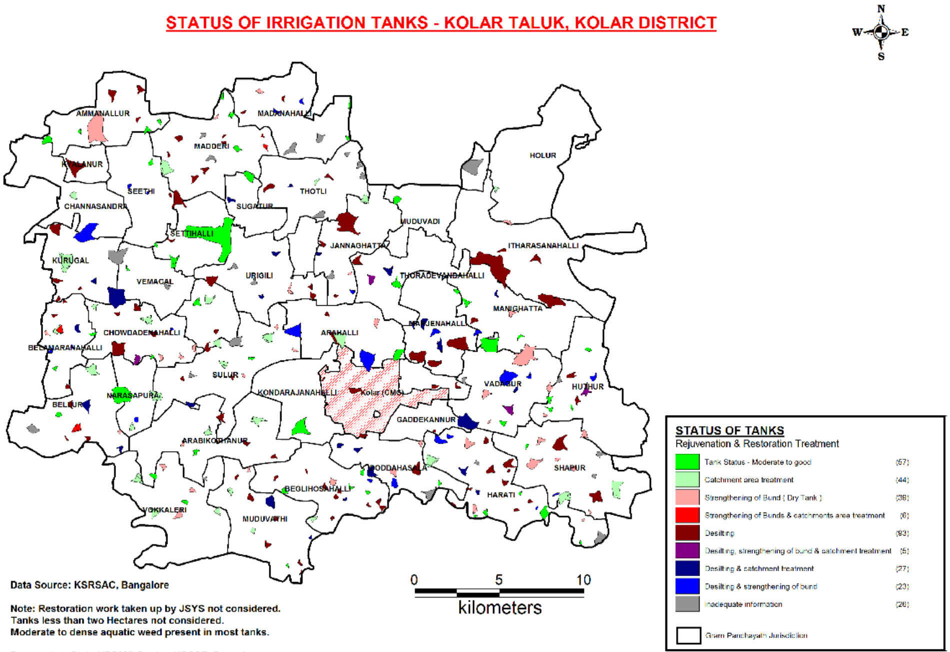
(http://nptel.iitm.ac.in/courses/Webcoursecontents/IIT%20Kharagpur/Water%20Resource%20Engg/pdf/m3l10.pdf)

WEB LINKS:

6. http://karunadu.gov.in/minorirrigation/index.html.

STATUS OF IRRIGATION TANKS - KOLAR TALUK, KOLAR DISTRICT



Data Source: KSRSAC, Bangalore

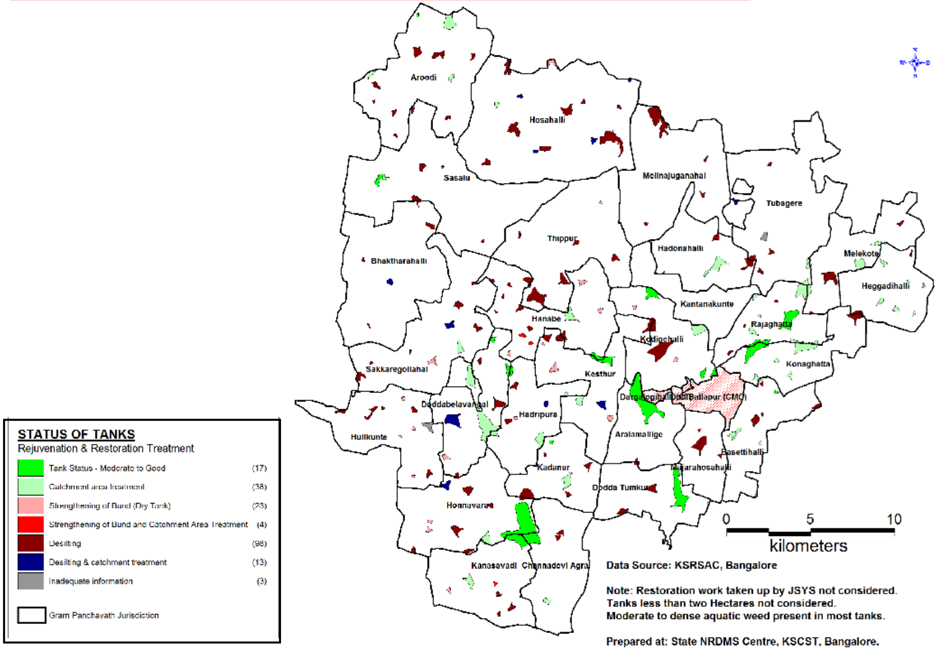
Note: Restoration work taken up by JSYS not considered.
Tanks less than two Hectares not considered.
Moderate to dense aquatic weed present in most tanks.

Prepared at: State NRDMS Centre, KSCST, Bangalore.

STATUS OF TANKS
Rejuvenation & Restoration Treatment

🟩	Tank Status - Moderate to good	(57)
🟩	Catchment area treatment	(44)
🟥	Strengthening of Bund (Dry Tank)	(38)
🟥	Strengthening of Bunds & catchments area treatment	(6)
🟫	Desilting	(93)
🟪	Desilting, strengthening of bund & catchment treatment	(5)
🟦	Desilting & catchment treatment	(27)
🟦	Desilting & strengthening of bund	(23)
⬜	Inadequate information	(26)
☐	Gram Panchayath Jurisdiction	

STATUS OF IRRIGATION TANKS - DODDABALLAPURA TALUK, BANGALORE RURAL DISTRICT



Data Source: KSRSAC, Bangalore

Note: Restoration work taken up by JSYS not considered.
Tanks less than two Hectares not considered.
Moderate to dense aquatic weed present in most tanks.

Prepared at: State NRDMS Centre, KSCST, Bangalore.

STATUS OF TANKS
Rejuvenation & Restoration Treatment

🟩	Tank Status - Moderate to Good	(17)
🟩	Catchment area treatment	(38)
🟥	Strengthening of Bund (Dry Tank)	(23)
🟥	Strengthening of Bund and Catchment Area Treatment	(4)
🟫	Desilting	(98)
🟦	Desilting & catchment treatment	(13)
⬜	Inadequate information	(3)
☐	Gram Panchayath Jurisdiction	

List of tanks selected for verification to undertake repair and restoration in Bangalore Division

SL NO	NAME OF THE DISTRICT	NAME OF THE CONSTITUENCY	NO. OF WORKS TAKEN UP AS PER WORKSOFT			NO. OF TANKS REQUIRING JOINT INSPECTION (INCLUDING TANKS HAVING NO INFORMATION)			TOTAL	NA (INFORMATION NOT AVAILABLE IN GIS DATA)			TOTAL	TANK STATUS (MODERATE TO GOOD)			TOTAL	TOTAL NA	TOTAL TANK STATUS (MODERATE TO GOOD)
			MI	PRED	ULB	MI	PRED	ULB		MI	PRED	ULB		MI	PRED	ULB			
1	RAMANAGARA	CHANNAPATNA	6	27	0	4	14	0	18	3	6	0	9	1	8	0	9	9	9
		KANAKPURA	9	35	0	2	24	0	26	2	18	0	20	0	6	0	6	20	6
		MAGADI	0	50	0	0	18	0	18	0	7	0	7	0	11	0	11	7	11
		RAMANAGARA	12	28	0	7	18	0	25	6	11	0	17	1	7	0	8	17	8
2	SHIMOGA	BHADRAVATHI	1	24	0	1	4	0	5	0	0	0	0	1	4	0	5	0	5
		SAGAR	4	24	0	0	4	0	4	0	2	0	2	0	2	0	2	2	2
		SHIKARIPURA	6	12	0	1	2	0	3	0	0	0	0	1	2	0	3	0	3
		SHIMOGA	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		SHIMOGA RURAL	4	38	0	0	12	0	12	0	0	0	0	0	12	0	12	0	12
		SORABA	7	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		THIRTHAHALLI	1	35	0	0	7	0	7	0	0	0	0	0	7	0	7	0	7
3	TUMKUR	CHIKNAYAKANAHALLI	5	23	0	2	12	0	14	1	2	0	3	1	10	0	11	3	11
		GUBBI	6	21	0	2	6	0	8	1	2	0	3	1	4	0	5	3	5
		KORATAGERE	8	11	0	1	4	0	5	0	3	0	3	1	1	0	2	3	2
		KUNIGAL	4	17	0	1	4	0	5	0	1	0	1	1	3	0	4	1	4
		MADHUGIRI	3	27	0	1	7	0	8	1	5	0	6	0	2	0	2	6	2
		PAVAGADA	10	2	0	0	2	0	2	0	2	0	2	0	0	0	0	2	0
		SIRA	8	12	0	2	5	0	7	1	2	0	3	1	3	0	4	3	4

SL NO	NAME OF THE DISTRICT	NAME OF THE CONSTITUENCY	NO. OF WORKS TAKEN UP AS PER WORKSOFT			NO. OF TANKS REQUIRING JOINT INSPECTION (INCLUDING TANKS HAVING NO INFORMATION)			TOTAL	NA (INFORMATION NOT AVAILABLE IN GIS DATA)			TOTAL	TANK STATUS (MODERATE TO GOOD)			TOTAL	TOTAL NA	TOTAL TANK STATUS (MODERATE TO GOOD)
		TIPTUR	5	24	0	3	11	0	14	1	3	0	4	2	8	0	10	4	10
		TUMKUR CITY	1	7	0	1	1	0	2	1	1	0	2	0	0		0	2	0
		TUMKUR RURAL	7	24	0	3	8	0	11	3	4	0	7	0	4	0	4	7	4
		TURUVEKERE	5	11	0	1	6	0	7	1	2	0	3	0	4	0	4	3	4
4	**BANGALORE-RURAL**	**DEVENAHALLI**	6	22	0	1	6	0	7	1	5	0	6	0	1	0	1	6	1
		DODDABALLAPURA	5	29	0	3	1	0	4	3	0	0	3	0	1	0	1	3	1
		HOSKOTE	10	18	0	5	4	0	9	4	3	0	7	1	1	0	2	7	2
		NELAMANGALA	5	20	0	4	5	0	9	3	5	0	8	1	0	0	1	8	1
5	**BANGALORE-URBAN**	**ANEKAL**	7	17	0	4	5	0	9	3	3	0	6	1	2	0	3	6	3
		BANGALORE-SOUTH	4	24	0	4	18	0	22	4	12	0	16	0	6	0	6	16	6
		BYATARAYANAPURA	4	15	0	3	11	0	14	2	8	0	10	1	3	0	4	10	4
		MAHADEVAPURA	1	17	0	0	8	0	8	0	4	0	4	0	4	0	4	4	4
		YELAHANKA	1	26	0	0	12	0	12	0	4	0	4	1	7	0	8	4	8
		YESHVANTHPURA	3	38	0	2	27	0	29	2	12	0	14	0	15	0	15	14	15
6	**CHIKKBALLAPUR**	**BAGEPALLI**	0	24	0	0	8	0	8	0	8	0	8	0	0	0	0	8	0
		CHIKKBALLAPUR	5	16	0	2	11	0	13	2	10	0	12	0	1	0	1	12	1
		CHINTAMANI	0	17	0	0	2	0	2	0	1	0	1	0	1	0	1	1	1
		GAURIBIDANUR	4	12	0	2	3	0	5	2	1	0	3	0	2	0	2	3	2

SL NO	NAME OF THE DISTRICT	NAME OF THE CONSTITUENCY	NO. OF WORKS TAKEN UP AS PER WORKSOFT			NO. OF TANKS REQUIRING JOINT INSPECTION (INCLUDING TANKS HAVING NO INFORMATION)			TOTAL	NA (INFORMATION NOT AVAILABLE IN GIS DATA)			TOTAL	TANK STATUS (MODERATE TO GOOD)			TOTAL	TOTAL NA	TOTAL TANK STATUS (MODERATE TO GOOD)
		SIDLAGHATTA	0	21	0	0	9	0	9	0	2	0	2	0	7	0	7	2	7
7	CHITRADURGA	CHALLAKERE	4	9	0	4	5	0	9	4	3	0	7	0	2	0	2	7	2
		CHITRADURGA	3	6	0	1	4	0	5	1	2	0	3	0	2	0	2	3	2
		HIRIYUR	4	11	0	4	5	0	9	2	3	0	5	2	2	0	4	5	4
		HOLALKERE	5	17	0	1	9	0	10	0	5	0	5	1	4	0	5	5	5
		HOSADURGA	2	16	0	2	4	0	6	0	1	0	1	2	3	0	5	1	5
		MOLKALMUR	4	9	0	2	4	0	6	2	4	0	6	0	0	0	0	6	0
8	DAVANGERE	CHANNAGIRI	2	20	0	1	4	0	5	0	2	0	2	1	2	0	3	2	3
		HARAPANAHALLI	6	11	0	2	3	0	5	2	2	0	4	0	1	0	1	4	1
		HARIHAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		DAVANAGERE NORTH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		DAVANAGERE SOUTH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		HONNALI	1	33	0	0	9	0	9	0	3	0	3	0	6	0	6	3	6
		JAGALUR	5	14	0	3	6	0	9	3	4	0	7	0	2	0	2	7	2
		MAYAKONDA	9	11	0	5	4	0	9	4	3	0	7	1	1		2	7	2
9	KOLAR	BANGARPET	2	25	0	1	7	0	8	1	5	0	6	0	2	0	2	6	2
		KGF	0	26	0	0	11	0	11	0	8	0	8	0	3	0	3	8	3
		KOLAR	1	23	0	0	6	0	6	0	1	0	1	0	5	0	5	1	5
		MALUR	1	24	0	0	11	0	11	0	11	0	11	0	0	0	0	11	0

SL NO	NAME OF THE DISTRICT	NAME OF THE CONSTITUENCY	NO. OF WORKS TAKEN UP AS PER WORKSOFT			NO. OF TANKS REQUIRING JOINT INSPECTION (INCLUDING TANKS HAVING NO INFORMATION)			TOTAL	NA (INFORMATION NOT AVAILABLE IN GIS DATA)			TOTAL	TANK STATUS (MODERATE TO GOOD)			TOTAL	TOTAL NA	TOTAL TANK STATUS (MODERATE TO GOOD)
		MULBAGAL	1	27	0	0	6	0	6	0	4	0	4	0	2	0	2	4	2
		SRINIVASPUR	3	25	0	2	13	0	15	2	11	0	13	0	2	0	2	13	2

Note:

- ✓ Tanks classified based on GIS data like catchment area treatment (high turbidity leads to silting), strengthening of bunds, desilting etc., have not been considered for joint inspection.
- ✓ The treatment proposed by the departments is not clear from the worksoft package.
- ✓ For documentation purpose, we may also inspect all the tanks taken up for repair and restoration by the department.






Identification of suitable locations for stone crushing units

Abstract:

Housing is a basic need of the society. Hence it is receiving increased focus. All the building construction whether it is housing or industrial construction activities require crushed stone. Crushed stone is also required for cement based products like RCC pipes, PSC poles, cement concrete hollow blocks, pre-cast cement concrete slabs, well rings, window & door frames and road laying. The demand for crushed stone will continue to grow with the growth of its user industry. The unit can be set up depending on the availability of raw materials and major commercial centers.

There has been an awareness regarding environmental issues and its management amongst many developed countries. By looking to their system of work, an attempt has been made in this regard using the technology of remote sensing and Geographic Information System. Geographical Information System (GIS) is one of the new technologies which have contributed a lot in very less time span to the environmental management. “The Geographic Information System (GIS) helps to manipulate data in the computer to simulate alternatives and to take the most effective decisions

Objectives:

The main objectives of the project are:

- ✓ Analysis & integration of thematic information using Geographic Information System(GIS)
- ✓ Identification of suitable sites for stone crushing units in Karnataka State using the set guidelines

Background:

Stone Crushing Industry is an important industrial sector in the country engaged in producing crushed stone of various sizes depending upon the requirement which acts as raw material for various construction activities such as construction of Roads, Highways, Bridges, Buildings and Canals etc. It is estimated that there are over 12,000 stone crusher units in India. The number is expected to grow further keeping in view the future plans for development of infrastructure of roads, canals and buildings that are required for overall development of the country. In India, the Stone Crushing Industry sector is estimated to have an annual turnover of Rs. 5000 crore and is therefore an economically important sector. The sector is estimated to be providing direct employment to over 500,000 people engaged in various activities such as mining, crushing plant, transportation of mined stones and crushed products etc. Most of these personnel are from rural and economically backward areas where employment opportunities are limited and therefore it carries greater significance in terms of social importance in rural areas. It is a source of earning for uneducated poor unskilled rural people.

The stone crusher is one such industry that exists in the vicinity of almost all major cities/towns throughout the country in all the states because the construction activities go on throughout the country. As transportation of stone over long distances adds to cost of the crushed stone products, the crushers need to be necessarily located nearer to the demand centers such as Cities, Bridges and Canals etc. Stone Crushers also need electricity supply and large number of man power for its operation. It also needs access roads for the movement of mined stone as well as crushed stone products. It is for this reason that most Stone Crushers are located along the periphery of Cities or in the vicinity of major construction projects. In most cases the Stone Crushers come up in clusters of number of units ranging from five to fifty in one cluster. The crushers are located nearer to the source of raw material such as Stone mines, River Beds etc.

These stone crushers though socio-economically an important sector, gives rise to substantial quantity of fine fugitive dust emissions which create health hazards to the workers as well as surrounding population by way of causing respiratory diseases. The dust also adversely affects visibility, reduces growth of vegetation and hampers aesthetics of the area. In order to prevent/control these emissions, CPCB has already evolved Emission Standards and guidelines in 1989, which has been notified under Environment (Protection) Act, 1986 by Ministry of Environment & Forests vide Notification No. G.S.R. 742(E) dated 30th August 1990 & S.O. 8(E) dated December 31, 1990 based on techno-economic feasibility to achieve the standards. But over the years, as the need for more effective control and enforcement has been felt and to provide more specific guidelines to the stone crushers to enable them control emissions satisfactorily, CPCB has signed a Memorandum of Undertaking (MoU) with National Productivity Council (NPC) and commissioned the study with the work of reviewing the existing standards, guidelines and siting criteria and to evolve a Comprehensive Industry Document (COINDS) for Stone Crushers. This report is an outcome of the in-depth studies carried out by NPC jointly with CPCB on representative's cross section of Stone Crushers throughout the country and a series of meeting held with State Pollution Control Boards, Stone Crushers Associations/Stone Crushers unit representatives etc.

Spatial data used:

Location of Stone Crushers – collected by using GPS instrument the data pertaining to stone crushers such as ID, Stone crusher name, Owner, Year of starting, etc. Administrative boundaries – Administrative boundaries in village level is digitized captured from toposheets.

Forest Boundaries map: Digitized from Forest Department Map and SOI toposheets.

Land use/Land Cover Map: Land use and land cover of 2005.
Slope Map: Prepared using Contour levels.
Transport networks, Schools, River and Streams Map: Digitized using SOI Toposheets.

Non spatial data: Non Spatial data pertaining to the Stone crushers are collected from the Karnataka Pollution Control board and Geology Department Norms to Making of Safer zones for Stone Crushers in Shimoga District as per High Court the distance guidelines given in WP No 17078/1997 to set up the Safer Zones for Stone Crushers are as below:

1. That the two safer zones shall not be located within a radius of 50 kms.

2. Such safer zones shall not be located within the limits of:-
    a) Two kms, from the national highways, Habitats, Temples, Schools and Rivers.
    b) One and a half kms from the State Highway. (c) Five hundred meters from the link roads.
    c) Eight kms from the boundary of Municipal Corporations.
    d) Four kms from the District Headquarters.
    e) Two kms from the boundary limits of a Taluk HQ.
    f) One kms from an inhabited village or any land recorded as forest in Government records or any private land which is shown as cultivable in the revenue records.

3. Each stone crusher unit shall be located in a minimum area of one acre owned by the stone crusher, State or the Panchayath.

4. Each unit shall abide by the pollution control measures as approved by the Board in its meeting held on 22-10-1990 and the decision of the Board in Item No. 78.4 or such other safeguards as may be prescribed by the Board.

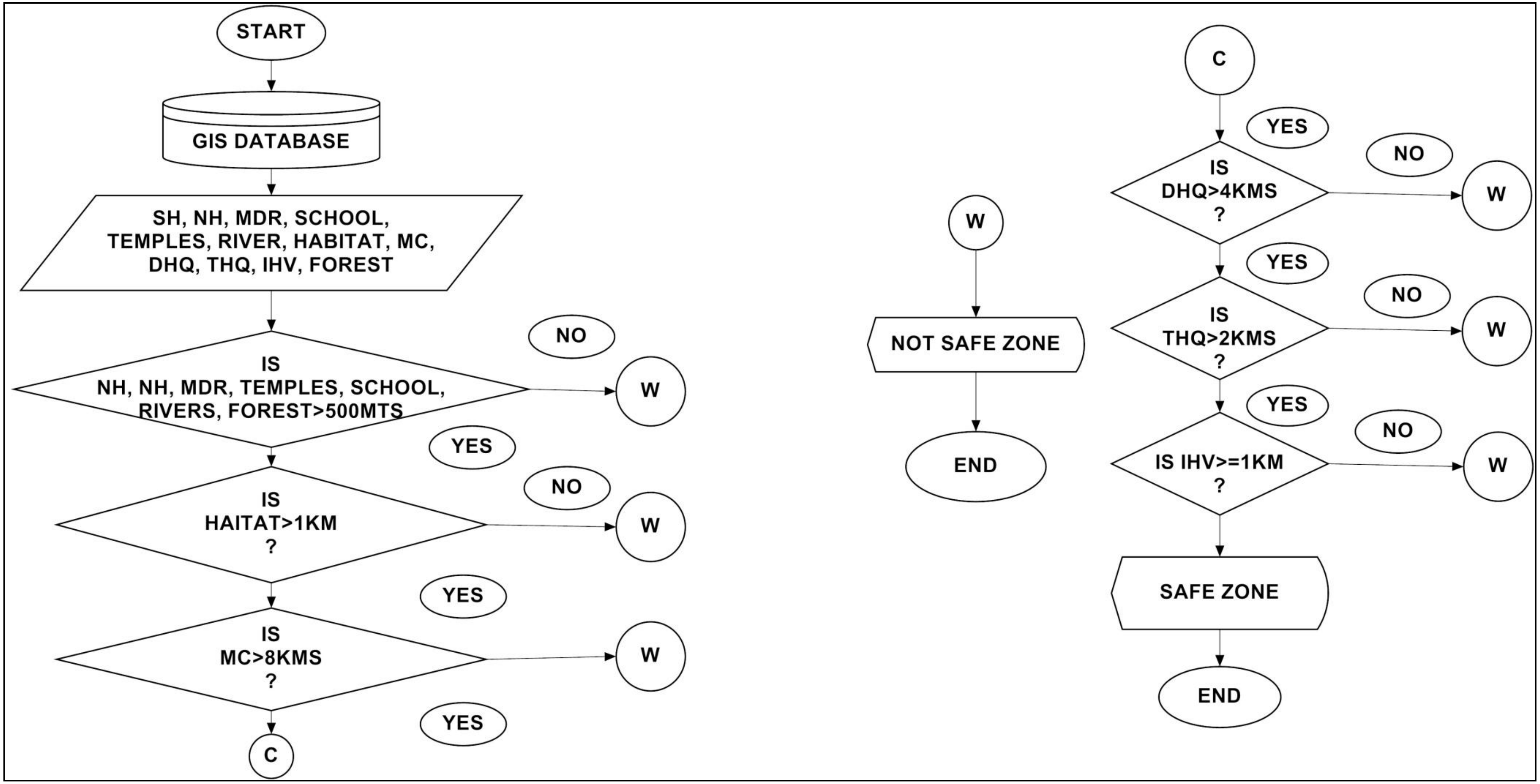
5. All stone crushers shall be granted license initially for a period of one year to be renewed every year on payment of such license fee as may be prescribed.

6. The licensing authority shall be the Deputy Commissioner of each District who shall issue and regulate license only after obtaining No Objection Certificate from the concerned departments including the Pollution Control Board, the Forest and the Revenue Departments.

7. The licensing authority shall be under a legal obligation to inspect or get the inspection done of each stone crusher at least once a year.

8. That all stone crushing units located at present locations shall be deemed to have been directed to be closed after a period of one year, unless their units fall in the declared 'safer zones' and shall not be permitted to carry on their business of stone crushing on any ground or pretext whatsoever.

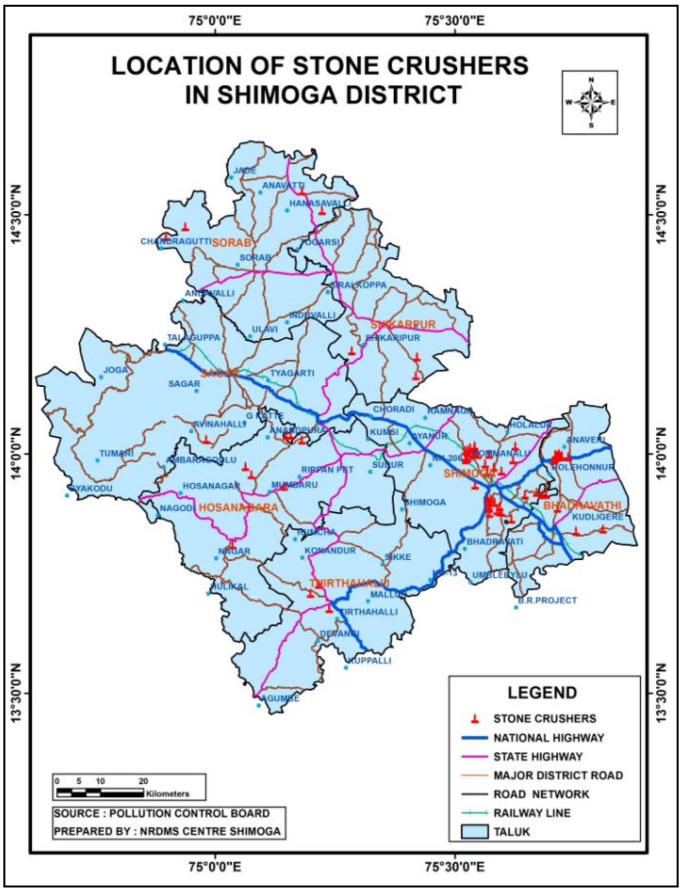
9. That the respondent-State shall submit the proposals of safer zones in the Registry of this Court on or before 31-12-1998.


START
GIS DATABASE
SH, NH, MDR, SCHOOL, TEMPLES, RIVER, HABITAT, MC, DHQ, THQ, IHV, FOREST
IS NH, NH, MDR, TEMPLES, SCHOOL, RIVERS, FOREST>500MTS
NO
W
YES
IS HAITAT>1KM ?
NO
W
YES
IS MC>8KMS ?
W
YES
C
W
NOT SAFE ZONE
END
C
YES
IS DHQ>4KMS ?
NO
W
YES
IS THQ>2KMS ?
NO
W
YES
IS IHV>=1KM ?
NO
W
SAFE ZONE
END

Results and Conclusions

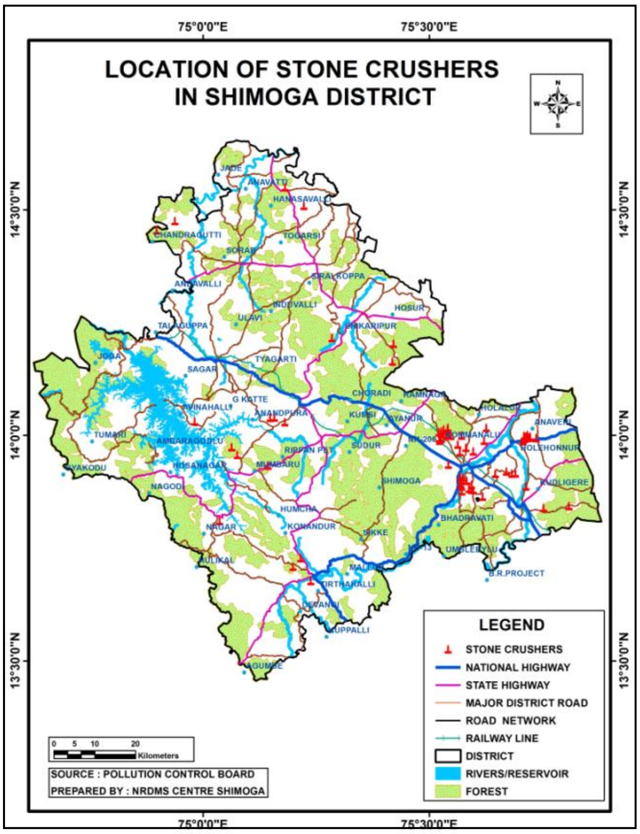
Based on the guidelines, it is very difficult to identify safe zones in coastal and malnad areas. This made the district administration to realx few criteria to make sure that each district has some land specifically meant for locating stone crushing units. The relaxed criteria provided by district authorities are as follows.

a. Road to 250 Mtrs (Actual 1 Km).
b. Rivers to 250 Mtrs (Actual -2 Kms).
c. Forest to 250 Mtrs (Actual -1 Km).
d. Habitat to 1 Km (Actual -2 Kms).
e. Agricultural lands - Completely relaxed.

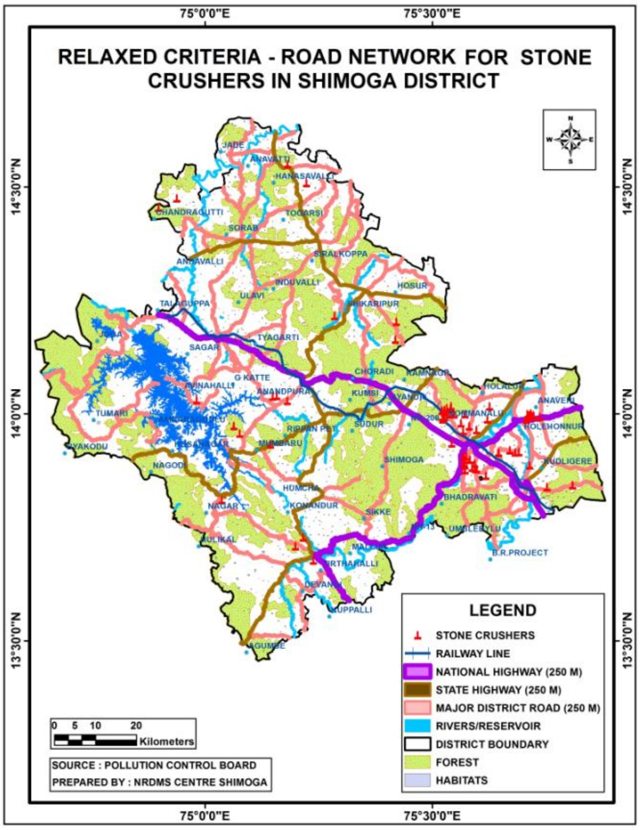


SOURCE : POLLUTION CONTROL BOARD
PREPARED BY : NRDMS CENTRE SHIMOGA

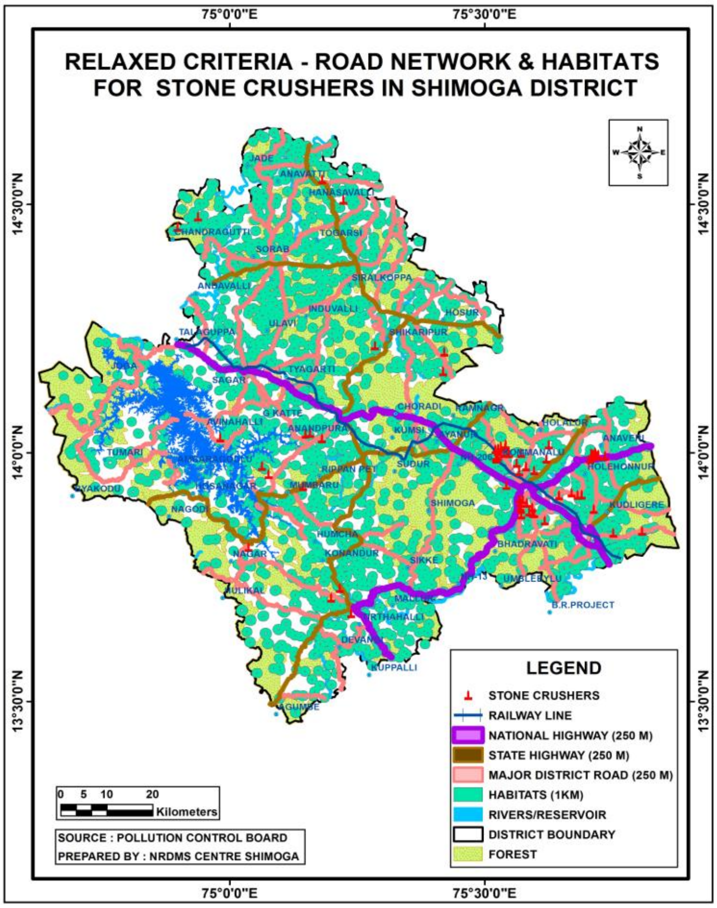
Inhabited Village	Forest land	Any other cultivable land
22	23	24
400mtr	1km	adjacent
100mtr	1km	adjacent
500mtr	1km	adjacent
500mtr	1.1km	adjacent
4.5km	1km	adjacent
450mtr	1km	adjacent
60mtr	1km	adjacent
100mtr	1km	adjacent
0.5km	1.5km	adjacent
70mtr	1km	adjacent
1.5km	0.73km	adjacent
1km	100mtr	adjacent
1.5km	0.7km	adjacent
1km	1km	adjacent
1km	6.5km	adjacent
1km	5km	adjacent
1km	5km	adjacent
0.5km	1km	adjacent
400mtr	1km	adjacent
2.08km	adjacent	180mtr
1.7km	adjacent	adjacent
2km	15mtr	100mtr
2.05km	adjacent	150mtr
1.65km	adjacent	adjacent
2km	70mtr	100mtr
2km	100mtr	adjacent
2km	100mtr	adjacent
300mtr	3.5km	adjacent
1km	4.5km	adjacent
1km	4km	adjacent
50mtr	4.5km	adjacent
100mtr	3.5km	adjacent
1km	4.5km	adjacent
1.5km	3.5km	adjacent
within city limit	5.25km	adjacent
within city limit	5.25km	150mtr
within city limit	5.5km	50mtr
within city limit	5.4km	adjacent
within city limit	5.5km	adjacent


LOCATION OF STONE CRUSHERS IN SHIMOGA DISTRICT

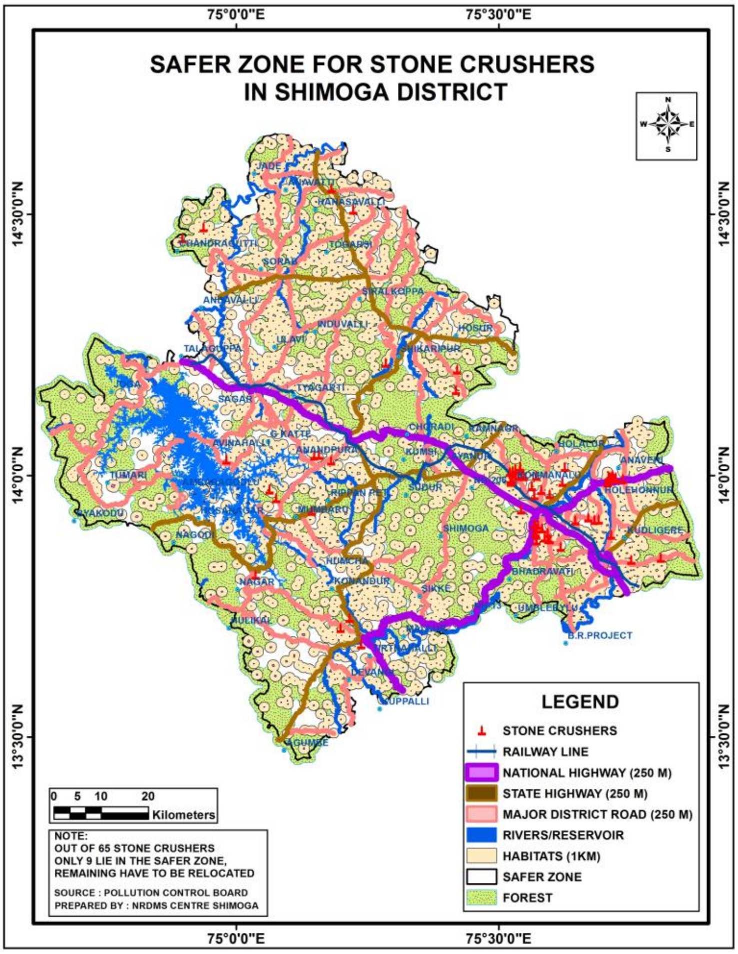
SOURCE : POLLUTION CONTROL BOARD
PREPARED BY : NRDMS CENTRE SHIMOGA

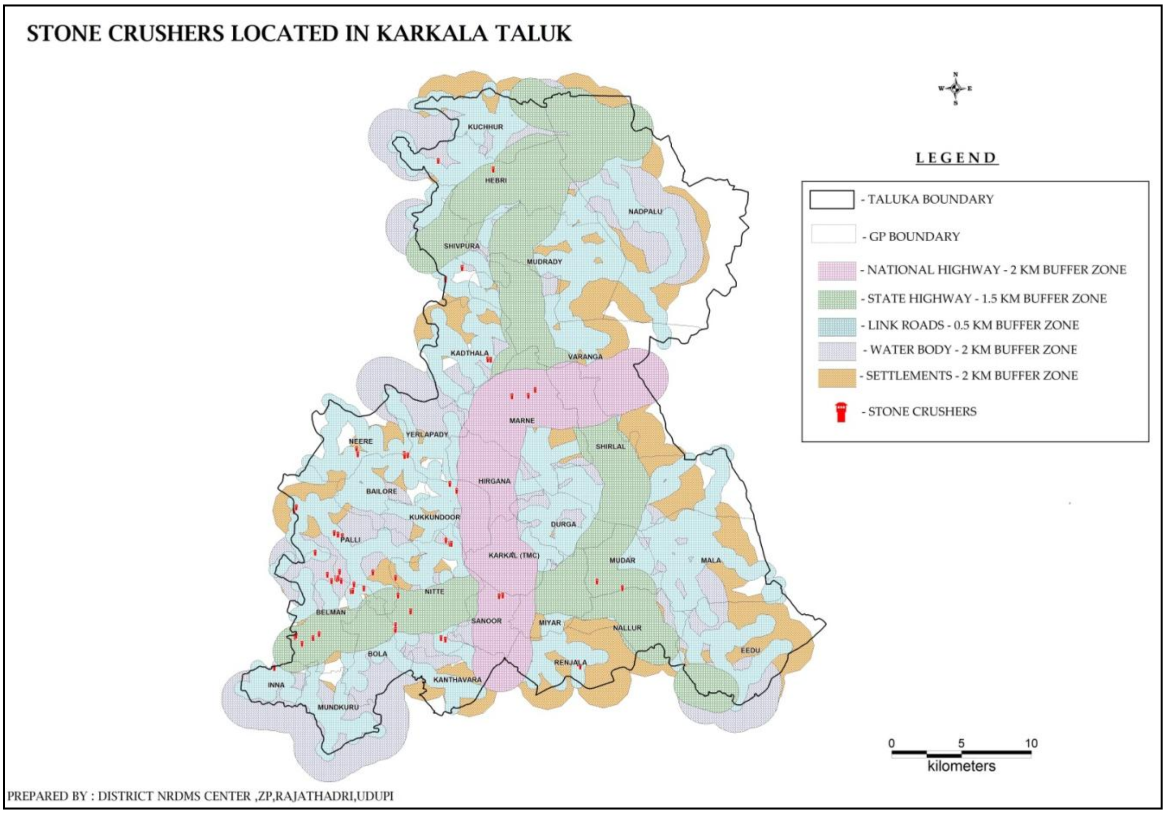

RELAXED CRITERIA - ROAD NETWORK FOR STONE CRUSHERS IN SHIMOGA DISTRICT

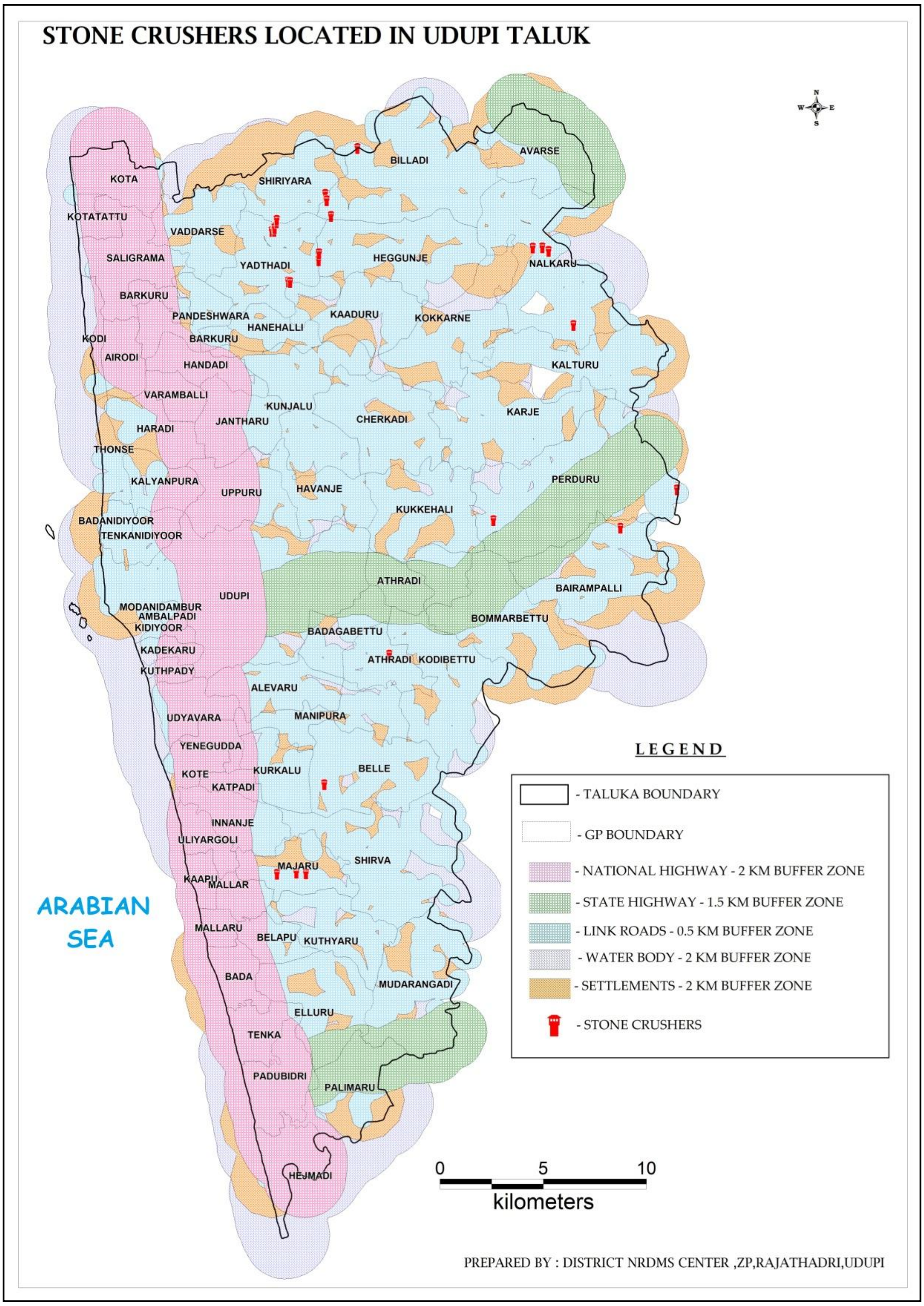
SOURCE : POLLUTION CONTROL BOARD
PREPARED BY : NRDMS CENTRE SHIMOGA


RELAXED CRITERIA - ROAD NETWORK & HABITATS FOR STONE CRUSHERS IN SHIMOGA DISTRICT

SOURCE : POLLUTION CONTROL BOARD
PREPARED BY : NRDMS CENTRE SHIMOGA


SAFER ZONE FOR STONE CRUSHERS
IN SHIMOGA DISTRICT
75°0'0"E
75°30'0"E
14°30'0"N
14°0'0"N
13°30'0"N
N
S
E
W
JADE
HANASAVALLI
CHANDRAGUTTI
TOGARSI
SORAB
ANAVALLI
SIRALKOPPA
ULAVI
INDUVALLI
HOSUR
SHIKARIPUR
TALAGUPPA
TYAGARTI
SAGAR
CHORADI
RAMNAGAR
HOLALUR
G.KATTE
AVINAHALLI
ANANDPURA
KUMSI
ANAVERI
HOLEHONNUR
TUMARI
RIPPAN PET
AYANUR
KODUR
SHIMOGA
VAKODU
MUDUGERE
NAGODI
HUMCHA
BHADRAVATI
NAGAR
KONANDUR
SIKKE
UMBLEBYLU
HULIKAL
TIRTHAHALLI
B.R.PROJECT
DEVANGI
KUPPALLI
AGUMBE
0 5 10 20
Kilometers
NOTE:
OUT OF 65 STONE CRUSHERS
ONLY 9 LIE IN THE SAFER ZONE,
REMAINING HAVE TO BE RELOCATED
SOURCE : POLLUTION CONTROL BOARD
PREPARED BY : NRDMS CENTRE SHIMOGA
LEGEND
STONE CRUSHERS
RAILWAY LINE
NATIONAL HIGHWAY (250 M)
STATE HIGHWAY (250 M)
MAJOR DISTRICT ROAD (250 M)
RIVERS/RESERVOIR
HABITATS (1KM)
SAFER ZONE
FOREST


STONE CRUSHERS LOCATED IN KARKALA TALUK
N
S
E
W
KUCHHUR
HEBRI
NADPALU
SHIVPURA
MUDRADY
KADTHALA
VARANGA
MARNE
NEERE
YERLAPADY
SHIRLAL
BAILORE
HIRGANA
KUKKUNDOOR
PALLI
DURGA
KARKAL (TMC)
MUDAR
MALA
NITTE
BELMAN
SANOOR
MIYAR
NALLUR
BOLA
EEDU
RENJALA
KANTHAVARA
INNA
MUNDKURU
LEGEND
- TALUKA BOUNDARY
- GP BOUNDARY
- NATIONAL HIGHWAY - 2 KM BUFFER ZONE
- STATE HIGHWAY - 1.5 KM BUFFER ZONE
- LINK ROADS - 0.5 KM BUFFER ZONE
- WATER BODY - 2 KM BUFFER ZONE
- SETTLEMENTS - 2 KM BUFFER ZONE
- STONE CRUSHERS
0 5 10
kilometers
PREPARED BY : DISTRICT NRDMS CENTER ,ZP,RAJATHADRI,UDUPI


STONE CRUSHERS LOCATED IN UDUPI TALUK

PREPARED BY : DISTRICT NRDMS CENTER ,ZP,RAJATHADRI,UDUPI

GIS-based Decision-support for the Administration of Primary and Secondary Schools under State Government

Abstract

Government offices day-to-day operations require a continuous information processing and decision-making that involve policy formulation, transfer of staff, monitoring and control of different projects and enforcement of policy decisions. Time for decision-making and response to various queries is very limited. Therefore, in the current Education System run by state governments, it is evident that there is an urgent need for GIS coupled MIS based decision-support system. Data presented in tabular format alone fails to express the depth of its nature. Looking at the same data in spatial context conveys the essence of data in self-explanatory manner. As the information needed consists of spatial (location, accessibility, etc.) and non- spatial (population, infrastructure, etc.) data, the use of GIS technology is provided in this report.

Introduction

There is increase in the use of geospatial data information in several organizations as an effective decision support system. Many Government agencies have now realized that this technology can provide them much-needed tool to address the ever-increasing demand for more precise analysis. Data presented in tabular format alone fails to express the depth of its nature. Looking at the same data in spatial context conveys the essence of data in self-explanatory manner. Hence, strong need is felt to convert this spatial information into a Decision Support System (DSS), as this information will improve the accuracy of decision-making by adding the third dimension of information in the form of spatial data. This study is conducted to explore the possibility of using spatial component in various analyses, part of decision-making process, to perform in effective operation of school's administration. The accuracy of decision-making is very much depending on quality of data, type of data and adequacy of data. It is expected that the GIS based maps will assist decision makers on different tiers of administrative hierarchy to deliver instantaneous decision with more accuracy.

Objectives

To achieve full literacy, more focus is required on rural areas. It is observed that different offices of Educational Departments do not dispose the necessary data, which can be viewed in spatial context. Hence, emphasis is given to explain the role of GIS in the following analysis in relation to School's administration and policy making rather than just providing geographic position of schools –

- Decision-support for planning and conceptualize school's development at all levels.
- Visualize and analyze the school, students and teachers data with Geospatial components for effective and efficient management.
- Analysis for school infrastructure and basics facilities augmentation and funding.

Study area and its profile

The district is one among the 30 districts of Karnataka State. It is located in the Northern part of the state and lies between Northern latitudes $17^0$10' and $17^0$45' and between eastern longitudes $76^0$10' and $77^0$45'. It is bounded on the west by Bijapur district of Karnataka and Solapur district of Maharastra, on the north by Bidar district of Karnataka and Zaheerabad district of Andhra Pradesh and on the south by Yadgir, a newly formed district of Karnataka. The district constitutes 7 revenue blocks and 8 educational blocks, they are Afzalpur, Aland, Chincholi, Chittapur, Gulbarga (North), Gulbarga (South), Jewargi and Sedam. Gulbarga district occupies 16,224 square kilometers area. It is the largest district in the state in Geographical area, which constitute 8.46 percent area of the state.

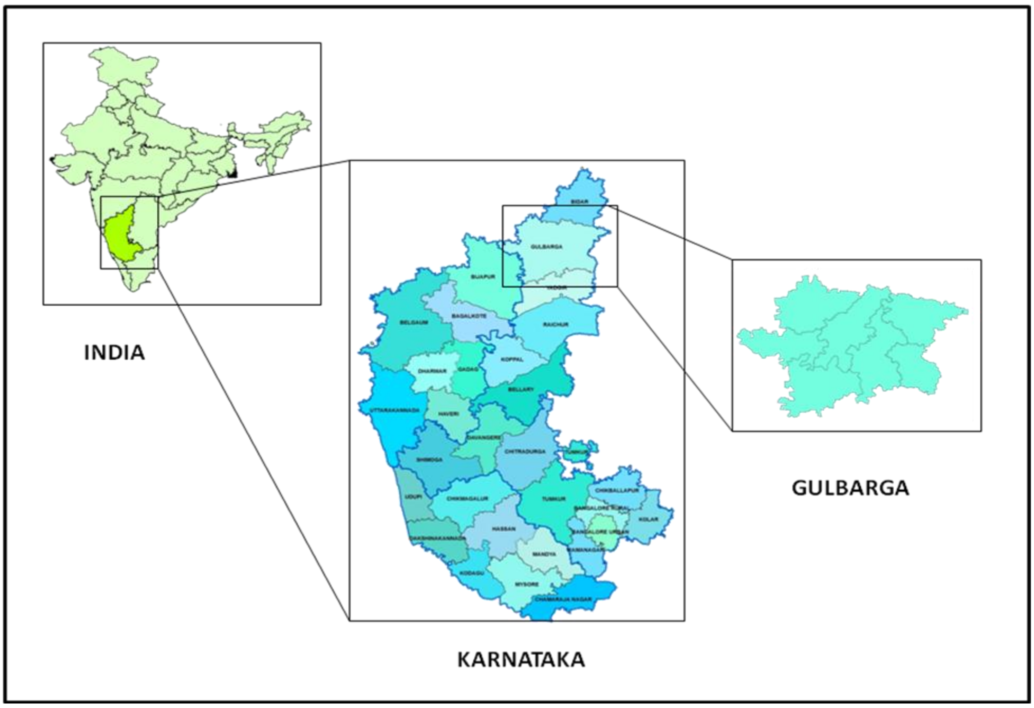


Fig.1 Study Area

Data Creation and Methodology

Spatial information is extracted from the toposheet and updated with the available data at the centre. Digitization and map attribution is performed in standard GIS software Map info

Map can be classified in following layers:

Location of Schools: Location of schools is digitized at the approximate location in the settlement and the data pertaining to school such as school name, code, enrolment, basic facilities. Etc. is attached to respective school location.

Administrative boundaries: Administrative boundaries in village level, Tehsil level and district level is captured from Toposheets or updated and incorporated from already available digital data.

Landmarks: Landmarks are collected from Toposheets and later on, additional Information near school location is incorporated with available data from the centre.

Annotation: Annotations include, village name, tehsil name, district name, nearest commutation point viz., bus stop, railway station, landmark information or any other type of transport.

Collection of Non spatial data: Non Spatial data pertaining to the schools in the district is collected from the office of district administrator of education.

Data parameter of schools:

- School Infrastructure
- Management
- Number of rooms
- Availability of playing field
- Hand pumps or other drinking water facility
- Number of toilets
- Existence of electricity connection
- Total strength of teachers
- Total Sanctioned Teacher
- Strength of students
- Teacher Student Ratio or PTR (Pupil Teacher Ratio)
- Computerization of Account Office
- Library

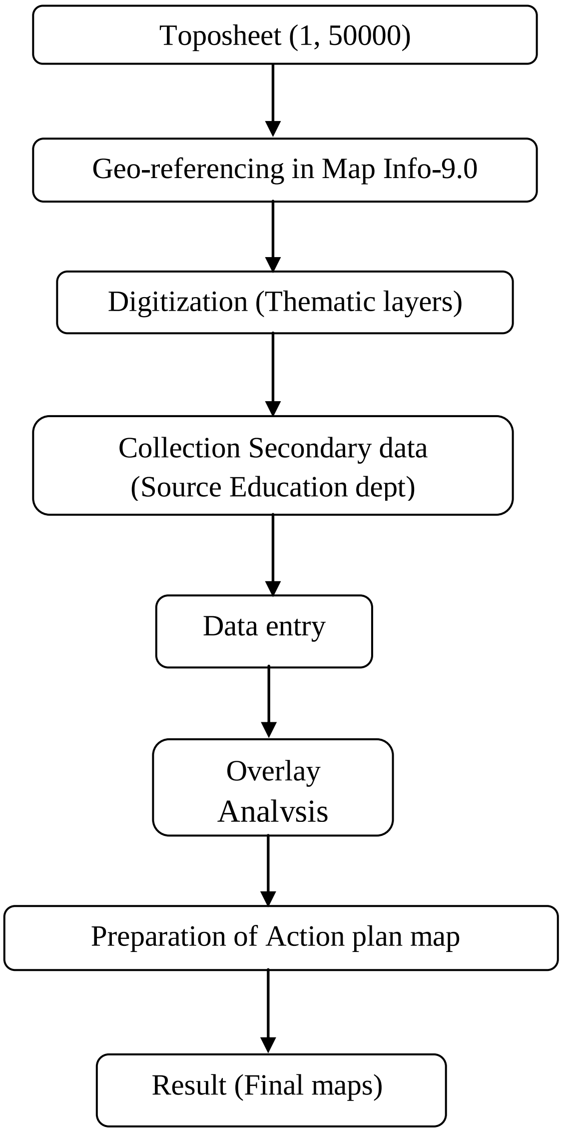
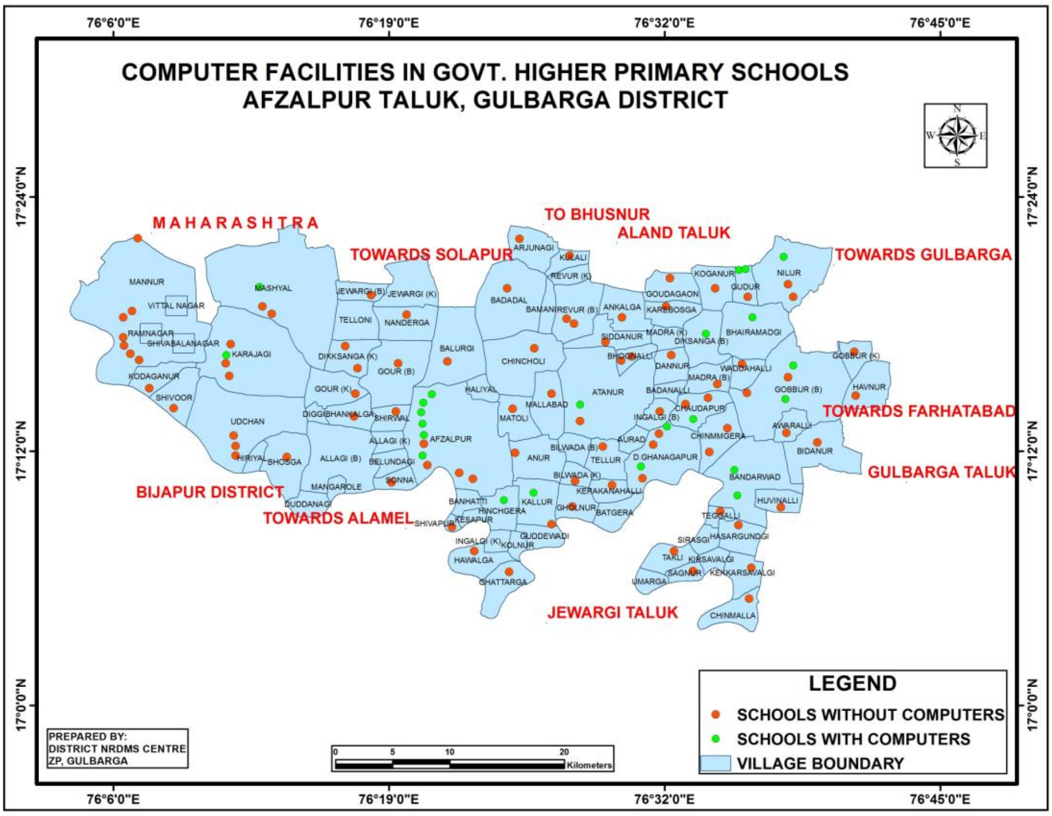
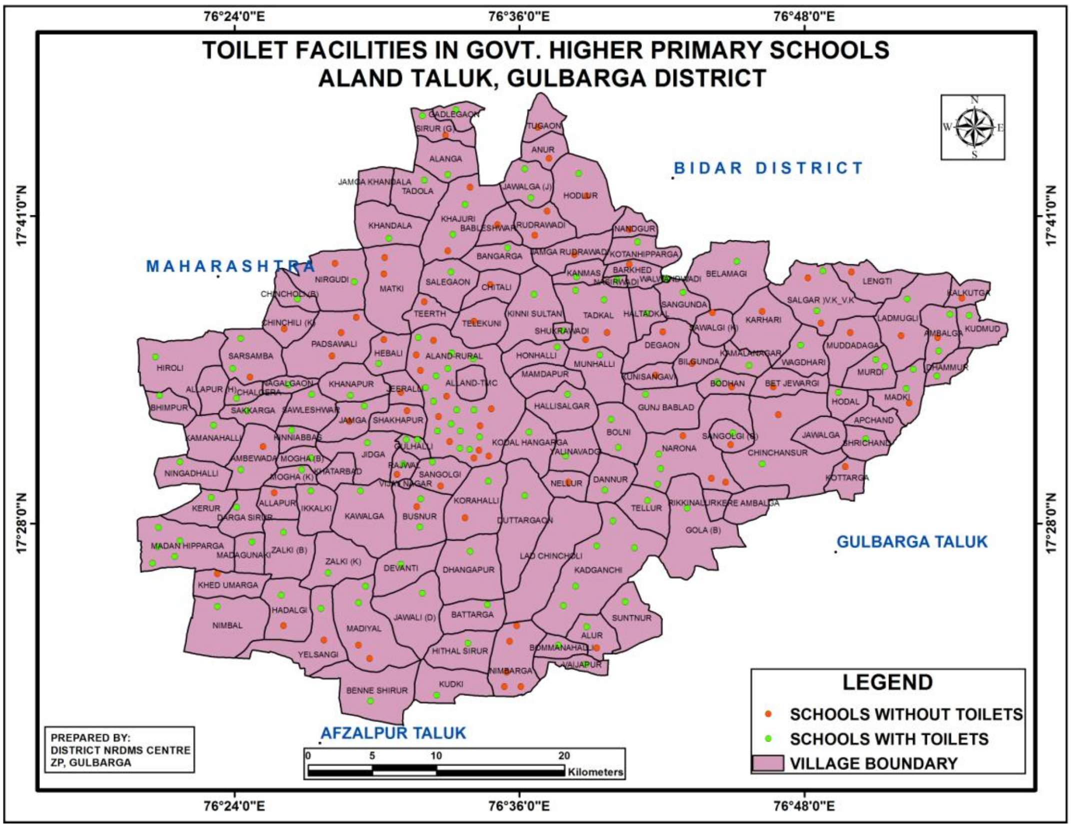
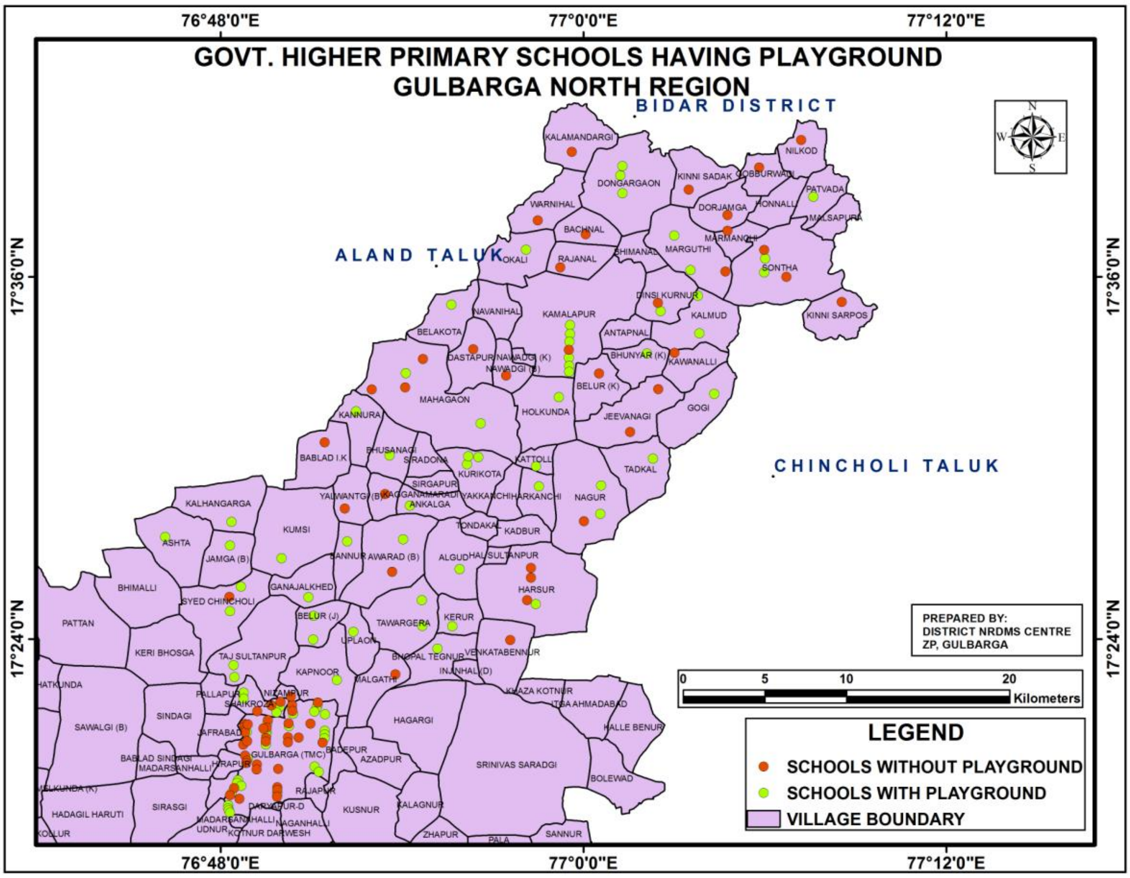


Fig.1 Flow chart showing methodology involved in the study

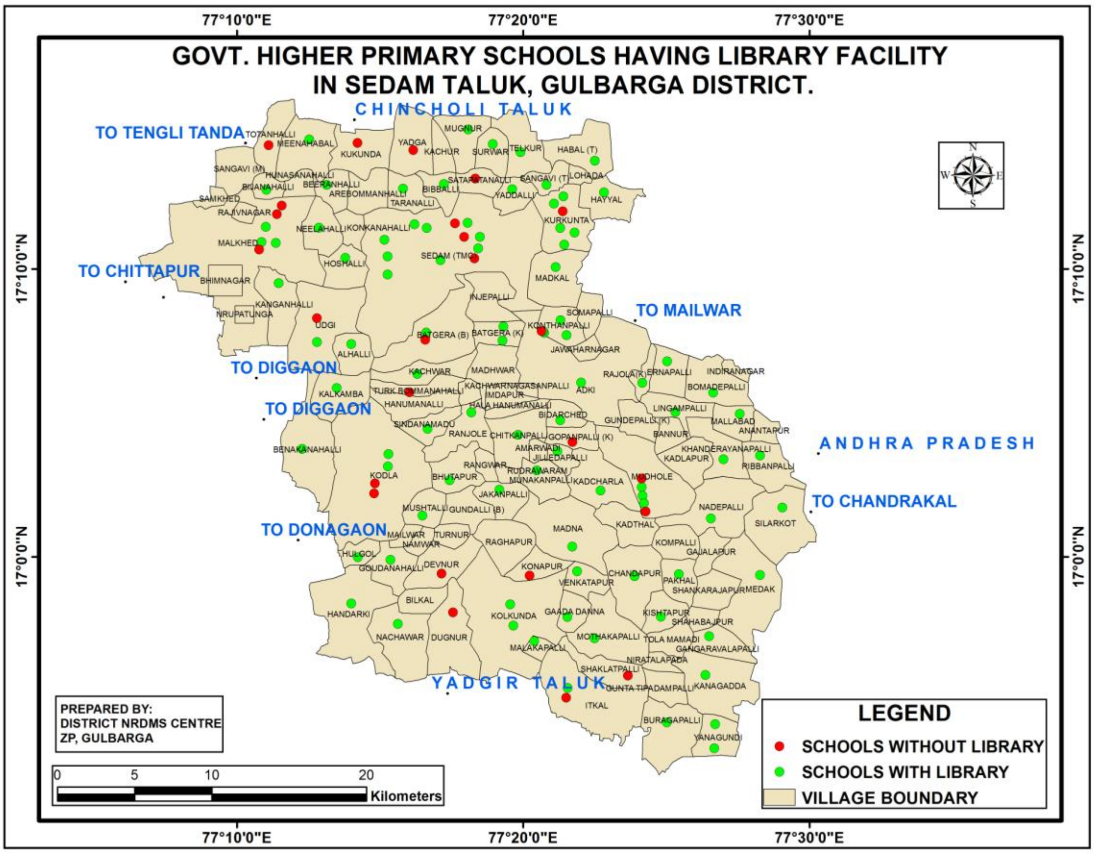
Results/Maps







GOVT. HIGHER PRIMARY SCHOOLS HAVING PLAYGROUND
GULBARGA NORTH REGION



GOVT. HIGHER PRIMARY SCHOOLS HAVING LIBRARY FACILITY
IN SEDAM TALUK, GULBARGA DISTRICT.

Conclusion

With this approach it is possible to combine the existing data with spatial data and display results for district or state level and also to have a synoptic view on major issues like

- Distribution of Infrastructure of schools
- Distribution of Teachers ratio village wise
- Distribution of Basic Facilities provided to Schools
- Distribution of student's strength in school

The use of Decision Making (DM) tool and GIS generated maps in the policy formulation of Primary and Secondary Education System run by State Governments will open the paths for disseminating, displaying and processing continuous information to the Decision Makers. This approach will increase precision and transparency in decision-making, which will be beneficial to all departments. Utilization of DM Tool and Maps generated will encourage the organization to come up with their need for implementation of such type of GIS system to be integrated with e-governance in future. The last but not the least, the entire system will help the department in a big way.

References:

1. Elementary Education in India: DISE Flash Statistics 2008 - 09, Jan 2010.
2. Suman Sachdeva, Education Scenario and needs in India.
3. IBM, Improving India Education System through Information Technology.
4. Data Provided: HKADB (Hyderabad Karnataka Area Development Board) & District Education Department.

GIS for Telecommunication

Abstract:

The use of wireless systems is a very attractive option in the design and development of communication networks, especially with the expansion of cellular telephony and wireless computer networks as their industries seek to increase the number of services and speedy transmission available to their customers. For this transmission needs towers and the location of these towers is very important factor in network coverage. In this regard the study has been taken up in Shimoga Taluk and network coverage of all networking companies using GIS and GPS technologies. It's found that network coverage in some part of the taluk is deficit and need of towers for their better communications.

Objectives:

This study is aimed to know the locations of all towers of different companies such as BSNL, Airtel, Vodapone, Tata Indicom, Reliance, Idea towers etc., with elevation pattern of the taluk and to understand the availability of network coverage of all the service providers and to suggest the construction of new towers for the further improvement of the network coverage.

Study area

Shimoga taluk has been taken for the detailed study. Shimoga taluk lies in the central part of Karnataka State, in the south east corner of the Shimoga District over an area of 1113 Km^2 and has 214 villages with an average literacy rate of 77%, higher than the nation average of 60%.

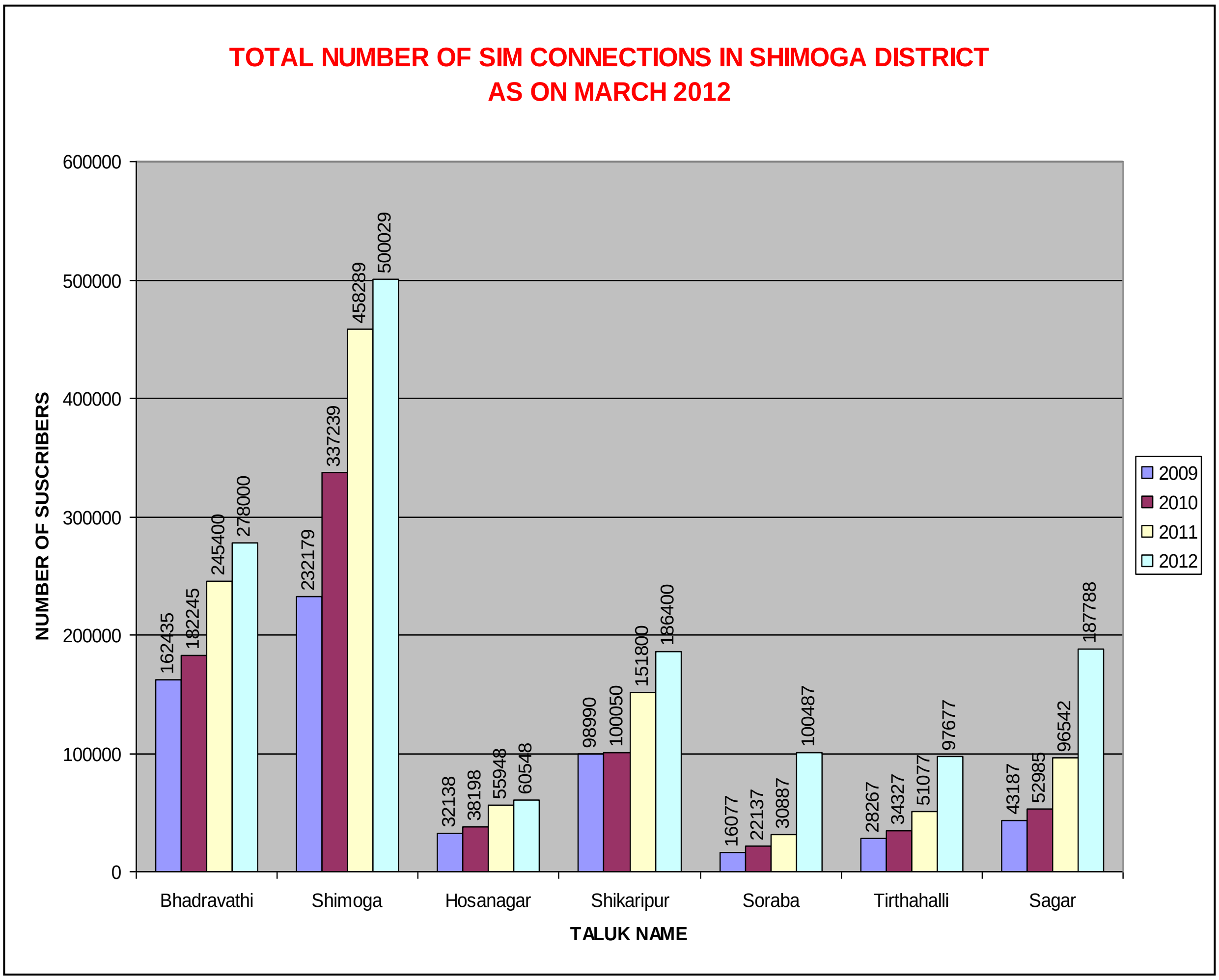
Spatial Data used

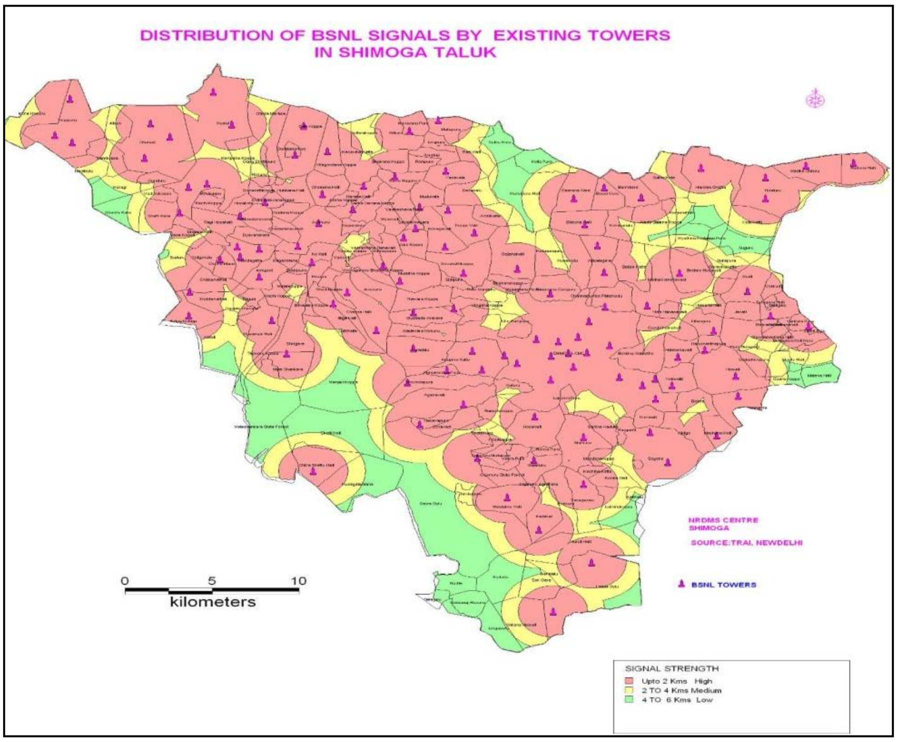
Survey of India (SOI) toposheet of scale 1:50,000 is used a base map.
GPS used for locating the position of towers.

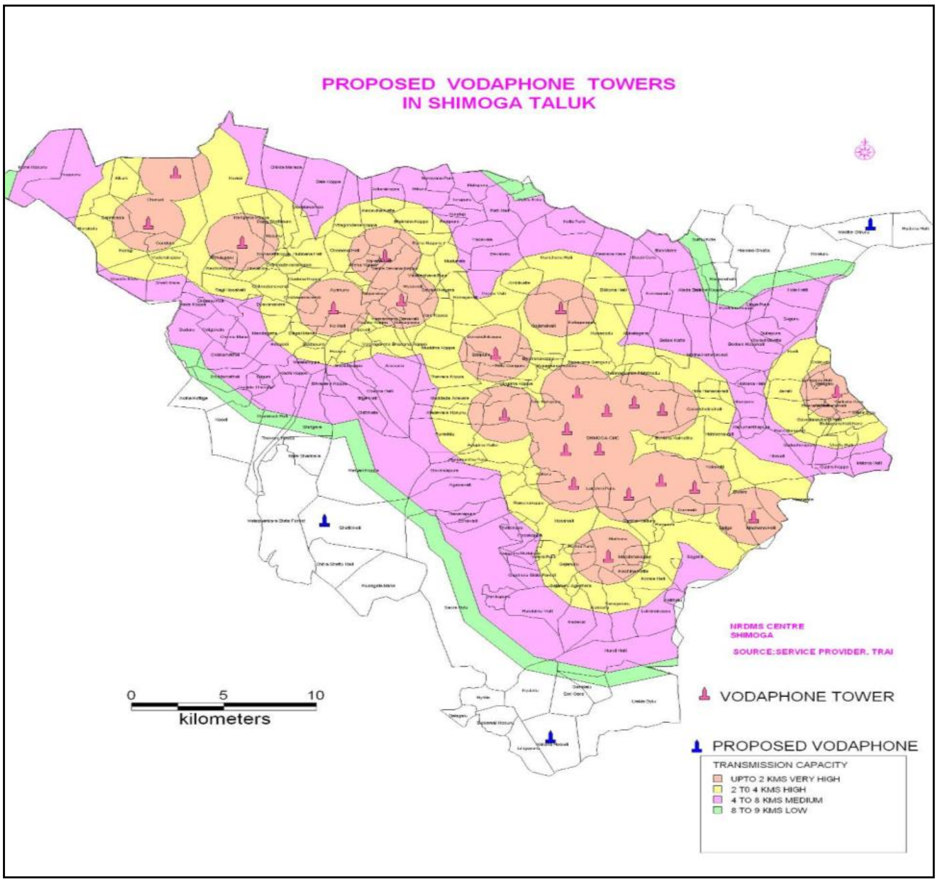
Results and Discussion

Wireless communications requires efficient network planning of cellular mobile communication. The primary operations in the telecommunication network industry include network site identification and planning, signal strength measurements with coverage estimation for expansion of system. Table 1 shows service provider wise existing towers and proposed tower for better communication system. Their area of influence and coverage area of each tower has been mapped.

SL NO	SERVICE PROVIDER	EXISTING TOWERS	PROPOSED TOWER
1	BSNL	110	0
2	AIRTEL	20	2
3	VODAPHONE	23	3
4	IDEA	16	5
5	TATA INDICOM/DOCOMA	17	3
6	UNINOR	11	0
7	RELIANCE	10	0
8	MTS	9	2
9	AIRCEL	13	0


TOTAL NUMBER OF SIM CONNECTIONS IN SHIMOGA DISTRICT
AS ON MARCH 2012
NUMBER OF SUSCRIBERS
600000
500000
400000
300000
200000
100000
0
TALUK NAME
Bhadravathi
162435
182245
245400
278000
Shimoga
232179
337239
458239
500029
Hosanagar
32138
38198
55948
60548
Shikaripur
98990
100050
151800
186400
Soraba
16077
22137
30887
100487
Tirthahalli
28267
34327
51077
97677
Sagar
43187
52985
96542
187788
2009
2010
2011
2012


DISTRIBUTION OF BSNL SIGNALS BY EXISTING TOWERS
IN SHIMOGA TALUK
0
5
10
kilometers
NRDMS CENTRE
SHIMOGA
SOURCE:TRAI, NEWDELHI
BSNL TOWERS
SIGNAL STRENGTH
Upto 2 Kms High
2 TO 4 Kms Medium
4 TO 6 Kms Low



Conclusions:

Mobile towers constructed without much considering the elevation factors have left a shadow zone in some part of the Taluk. The terrain information ensures service provider in identification of optimal location to increase the network coverage.

Spatial analysis of Ground Water level and quality using GIS techniques

Introduction:

Groundwater level is a term that is used in a relatively loose way, normally referring to the level, either below ground or above ordnance datum, at which soil or rock is saturated. This is also referred to as the water table and represents the top of the saturated zone. Above the water table lies the unsaturated zone. Groundwater Quality Data provide information on existing groundwater quality conditions and water quality trends within the District's groundwater resources, including springs. They also improve the District's understanding of groundwater quality concerns, support development of watershed management priorities and plans, and assist in measuring the success of implemented projects, programs and co-operatively funded initiatives. Groundwater level, as measured in an observation borehole, reflects the amount of water in storage in the monitored aquifer. When recharge exceeds natural discharge plus abstraction, groundwater level rises.When recharge is less than natural discharge plus abstraction, groundwater level falls. Comparisons of measured groundwater levels with long-term averages provide an indication of the state of groundwater resources within an aquifer. Observation over several years allows the prediction of aquifer response to current climatic and hydrological conditions. The data from the archive are used to prepare archive products such as the monthly hydrological summaries, annual summaries and the statistics volume. The data are used for quantitative analyses, for instance of annual recharge and provide a valuable source of data for the calibration of groundwater models.

Data used:

Observation wells (OW), spatial location (Latitude, Longitude). Observation wells (OW) location (Lat, Long). Monthly observation bore wells static water level in meter for a period of ten years. Nearest rain gauge station recorded rainfall in mm for the same observation wells. Water quality parameters analysis report for the same observation wells.

Study Area:

Chitradurga District, covering an expanse of 8,440 sq. km derives its nomenclature from Chitrakaldurga, which is an etymological representation of an umbrella-shaped lofty hill located in the district. The district lies in the heart of the Vedavati River valley and finds mention in the chronicles of the epic Ramayana and the Mahabharata. Tumkur, Chikmagalur, Davanagere and Bellary District of Karnataka and Anantapur District of Andhra Pradesh state form Chitradurga's geographic barriers. With a population size of 1,517,896, Chitradurga has a distinctly agrarian economy complemented by a strong industrial backbone owing to its rich mineral deposits.

Methodology:

GIS was used in this study to visually and spatially analyse water level and quality data Groundwater level area maps are developed by overlaying two individual Groundwater contour maps and subtracting the most recent values from older ones within the intersected. Using this data, a change in volume can be calculated. This was done for Chitradurga District on a seasonal and annual basis. The point features were plotted for the location of observation wells in GIS Platform. Contours were created using the spatial analyst tool, considering the Annual average Static water level as elevation. The closed polygon features have been created by considering District Boundary and

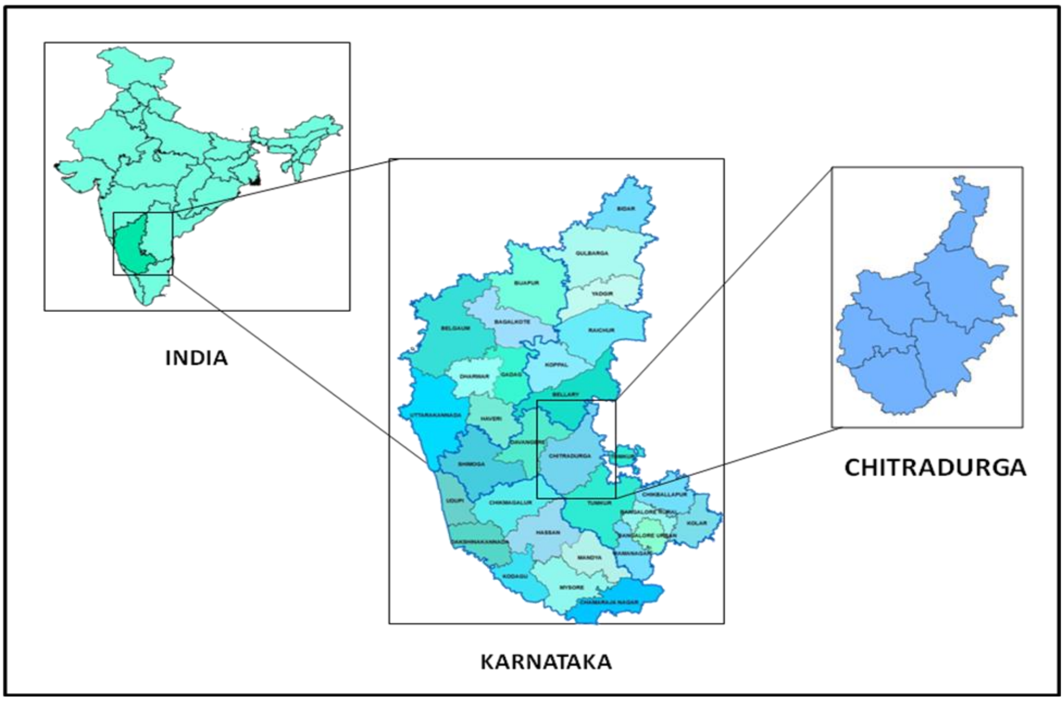


Fig.1 Location map of the study area

contours at a regular interval. Spatial interpolation is done using Water level and quality data to find spatial variations. By overlaying the Observation wells on the water level, the fluctuation of observation wells falling at different levels was estimated. Comparison of different annual water level is carried out for more perspective analysis. The analytical data must be accompanied by appropriate QC/QA data, was cross-checked using standard water quality checks and relationships, and correlated with information on regional and site-specific geology and hydrology, environmental chemistry and potential anthropogenic influences.

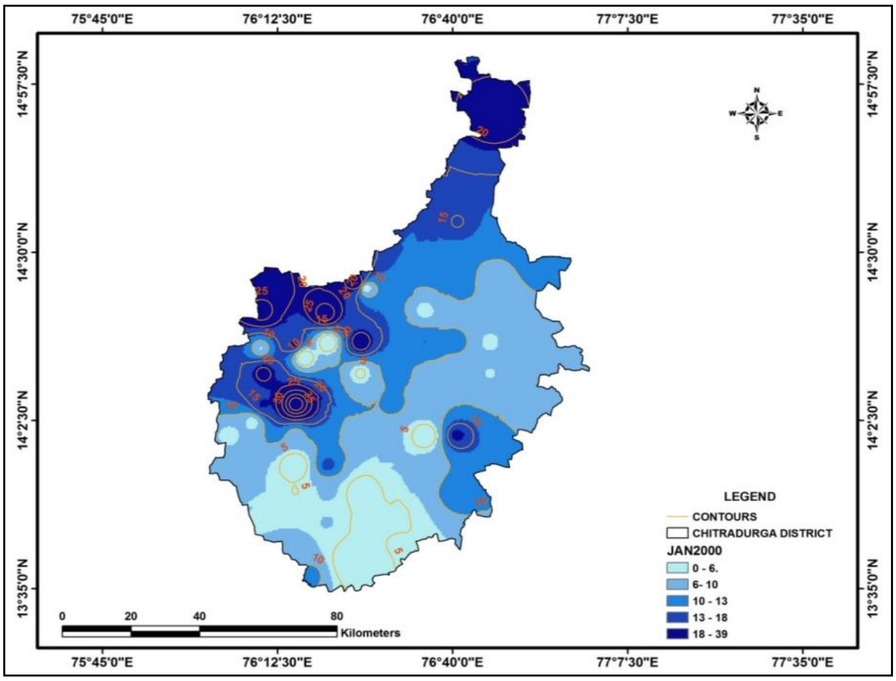
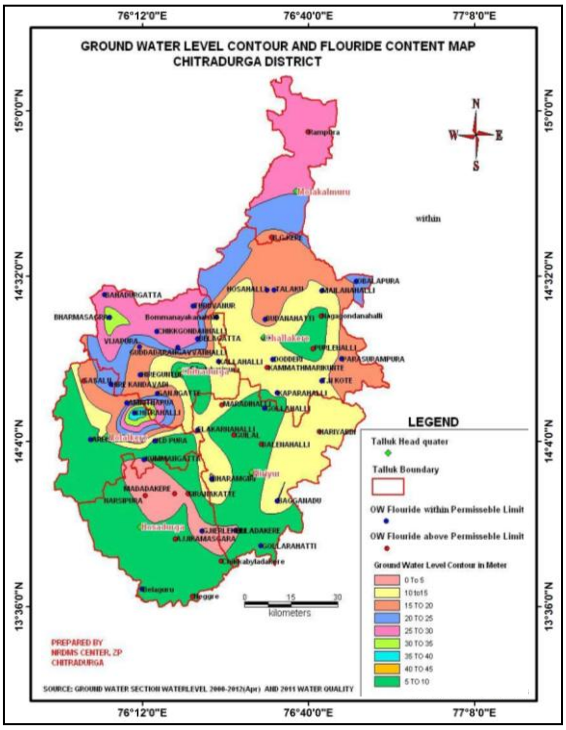
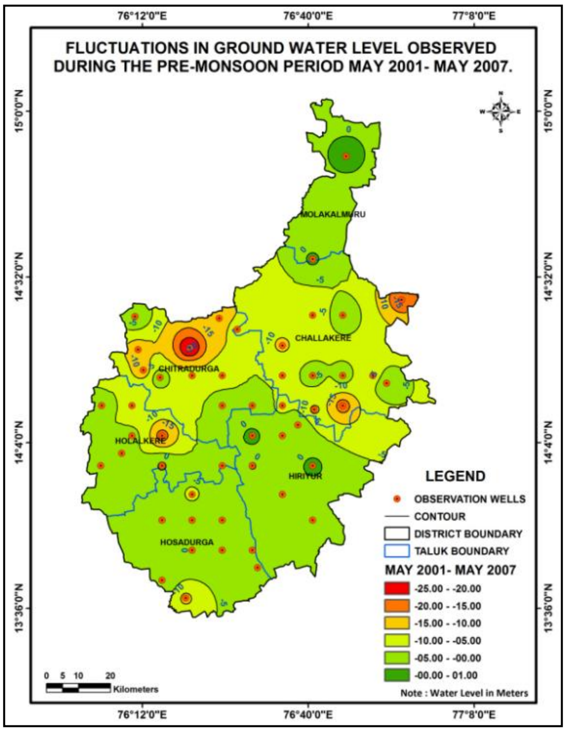


Fig. 2 Spatial distribution of Ground water level with contour.



(3)



(4)

Fig. 3 Fluoride content map of Chitradurga District, Fig.4 Fluctuations in Ground water level observed during the pre-monsoon period May- 2001 and May-2002.

Conclusions:

Depletion of water table due to the maximum number of irrigation bore wells exploitation of ground water for the agricultural and horticultural crops like Cotton, Onion, Areca Nut, Pomegranate, Plantain and Flowers. The raising trend observed in some parts of district is due to the construction of recharge structures like Check Dams, Percolation Ponds, Infiltration Wells and Rejuvenation, Desiltaion of Tanks.

References:

Web links:

- ✓ http://www.bgs.ac.uk/research/groundwater/datainfo/levels/home.html
- ✓ http://www.env.gov.nl.ca/env/waterres/quality/index.html
- ✓ http://www.swfwmd.state.fl.us/data/water-quality/

GIS-based Election Maps of Gulbarga Division for State Election Commission office

Introduction

The implementation of a computer based mapping system whose outputs were the production of Computer-generated electoral constituency maps showing the location of all polling stations and major physical features. The activity is to map out polling stations and other physical features and produce electoral constituency maps useful for planning, providing direction during election observation and updating constituency profiles. It is expected that through the GIS database and Maps, It will be able to provide critical data and information on the electoral processes at the glance.

Objectives

- Delineation of Parliamentary and Assembly constituency boundaries and preparation of location specific GIS Maps containing information of polling stations, villages, Taluk Head quarters, Districts, Police Setup Etc. showing connectivity and accessibility with road networks.

- Query based map out-put showing Normal, Sensitive, Hyper Sensitive Polling Stations with buffer and proximity analysis for respective polling stations.

Study area: Gulbarga Division

Methodology

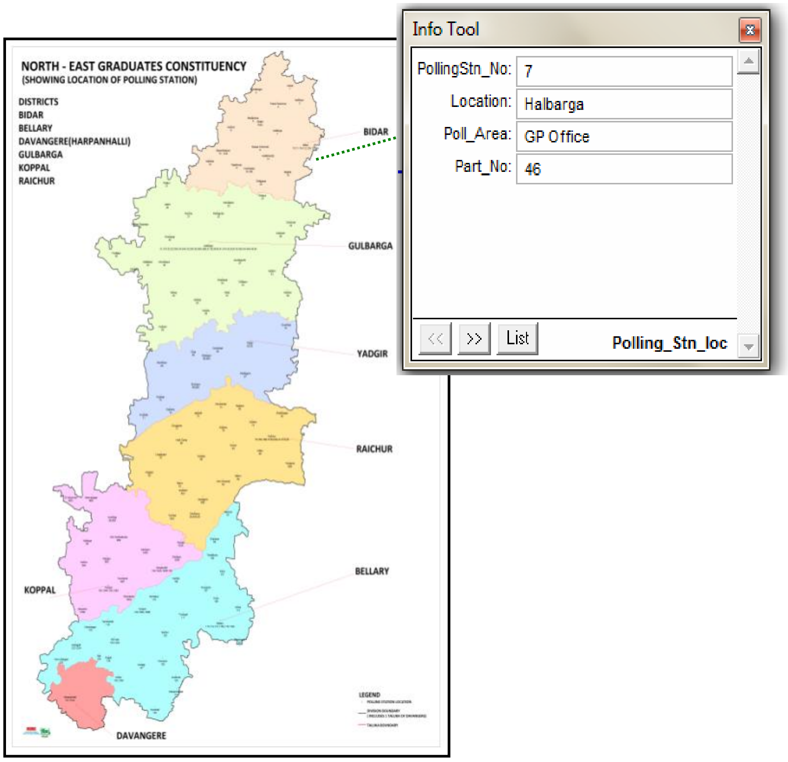
GIS Layer such as road, settlement location have been collected and brought into the same GIS format. Survey of India Toposheet (1:50,000) and Multi-Spectral satellite image available on public domain were used for updation of newly formed roads and settlements. Secondary data such as part number, polling station details, number of voters (Male & Female) and election officer route details for EVM disposal at polling station along with the vehicles used are collected from state election office branch at divisional head quarters. Constituency boundaries are delineated, Polling stations are placed with respect to the information collected from election office, later details regarding vehicles movement are digitized with the help of election staff put on duty. Thus by integrating all accordingly into GIS environment the final out up yield to GIS based Electoral constituency Maps.

Data Used

Survey of India Toposheet (1:50000), Satellite image available on public Domain, inputs from State Election Departments.

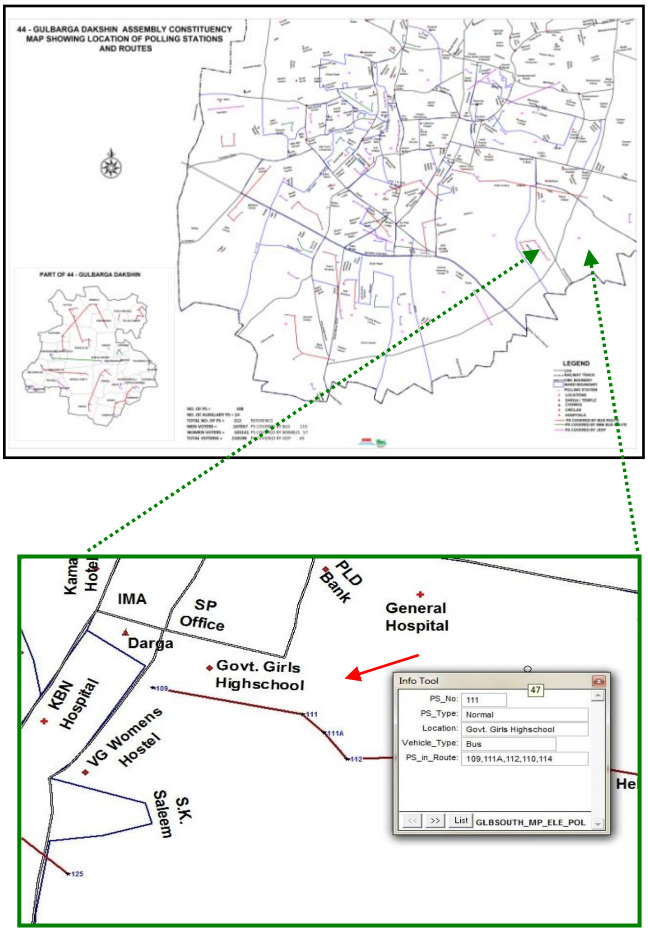
Results

Database created for all 9 Assembly constituencies, 1 Parliamentary constituency, Graduate Constituency (Sample Maps shown below).



PollingStn_No: 7
Location: Halbarga
Poll_Area: GP Office
Part_No: 46
Polling_Stn_loc

Fig.1 Map showing polling station details during North - East Graduate Constituency Elections 2011-12



PS_No: 111
PS_Type: Normal
Location: Govt. Girls Highschool
Vehicle_Type: Bus
PS_in_Route: 109,111A,112,110,114
GLBSOUTH_MP_ELE_POL

Fig. 2 Map showing polling station details during Assembly Bye-Elections in 44-Gulbarga Dakshina Constituency.

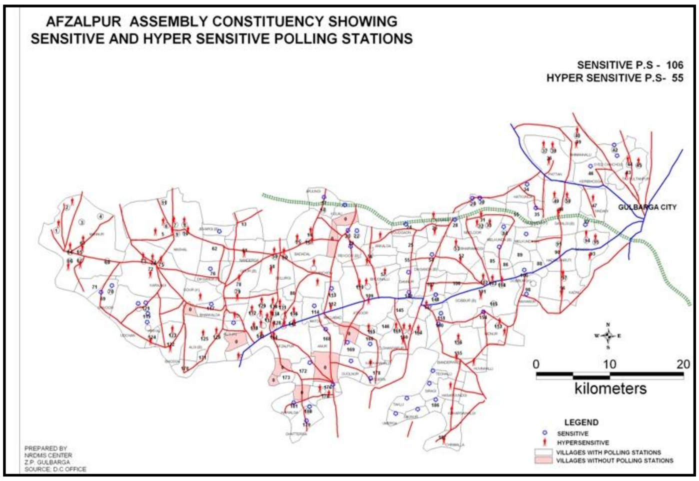


Fig.3 Map showing types of polling stations during Assembly Elections in Afzalpur Constituency

Utilization:

Maps Developed using this budding technology found to be real useful to show clear picture of management in making more practical polices while conducting the election processes viz. in examining number of electors in polling stations, location of emergency services, preparing transportation budget, manpower deployment etc. this work has been accepted by election section and highly appreciated.

Crime Mapping

Introduction

Mapping and analyzing the crimes require simultaneous access to digital crime data, digital maps, software, computers, police personnel, procedures, methods, and processes. In other words, it requires a fully functioning Geographic Information System (GIS). Today, Crime Mapping goes far beyond points on a map. Advanced geo-coding and location intelligence tools support complex analysis, provide solution to real-time problems and help to improve the quality of service that Police Departments provide to citizens around the world. Increasingly, GIS solutions are being designed specifically around the workflow and objectives of crime analysts. Location intelligence technologies provide the necessary insight to identify patterns, deploy police personnel, solve cases and prevent crime in ways that would have been unimaginable even a decade or two ago. Crime analysis is helpful because it states the purpose of crime analysis (criminal apprehension and prevention) as well as how it is accomplished through the systematic study of crime, including socio-demographic, spatial and temporal factors.

Crimes in general are influenced by a large number of factors. Statistics regarding some of these factors are available with different State Departments for their use. The Superintendent of Police has compiled the data on the Crime situation in the Shimoga City. Application of the concepts of the spatial information science for the crime data provides a greater insight for detailed analysis of the crime. Geographic Information System (GIS) helps in analysis of such data. GIS essentially relies on integration of the data. The data base once created conveying all aspects of crime can serve as a DSS for planners. This report presents a GIS application for crime data analysis. The general objective of the study presented here is to develop a GIS that can be used to determine the factors that affect crime rate and also put forward recommendations for future crime prevention, in terms of redeployment of police.

Study area

Shimoga municipality with a population of about 2,74,102 (as per Census 2001) and an area of about 50 sq. km has been chosen as the study area. The CMC has 35 wards and equal number of councilors and 5 Numbers of Nominee Councilors. Shimoga CMC Map with Ward Boundaries is shown in Map 1 and Population Distribution of Shimoga CMC is shown in Map 2.

Materials and Methodology

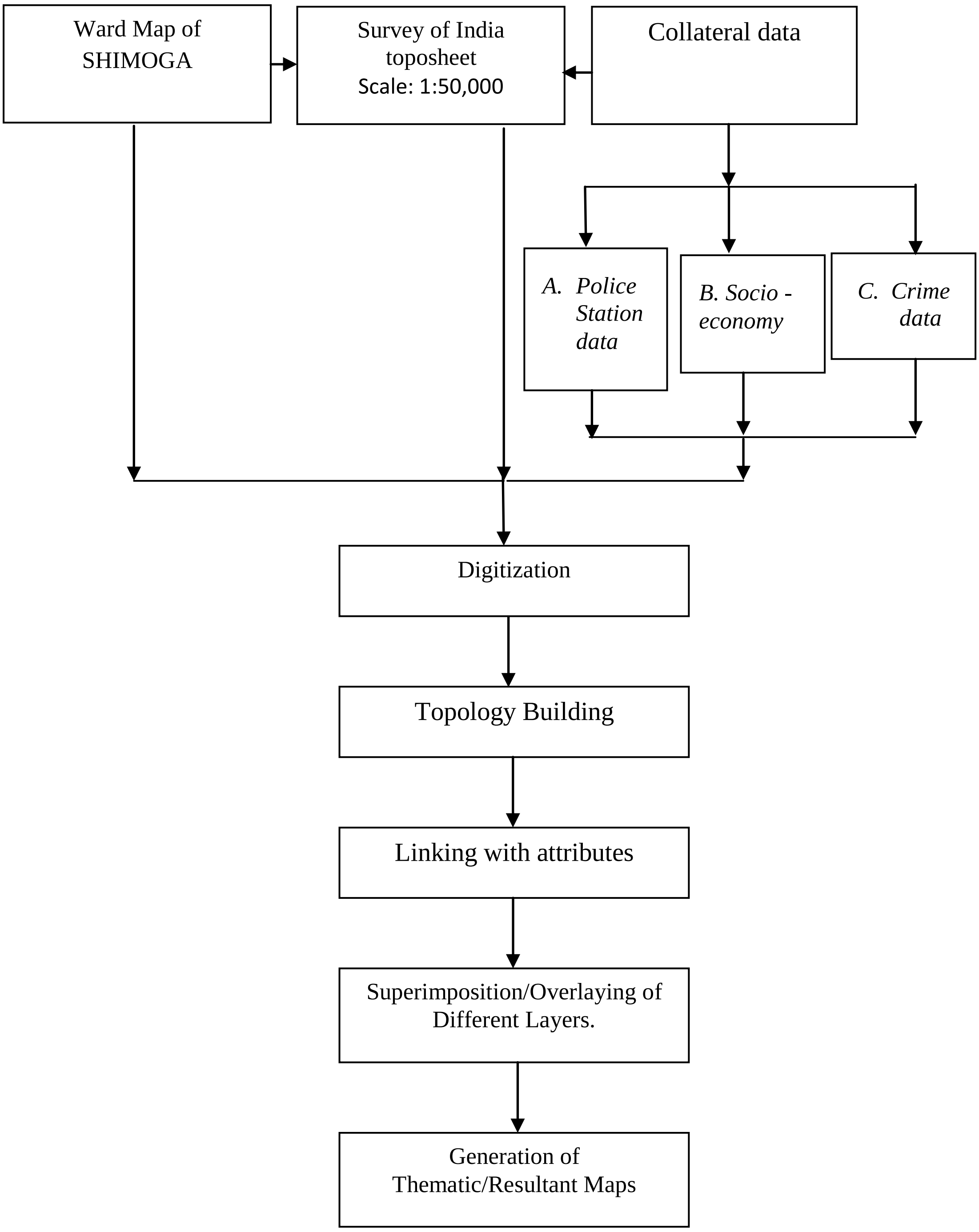


Fig.1 Flow chart showing the methodology involved in the mapping of crime

Development of the Geographic database which is a principle component of any GIS includes two types of data: non-spatial and spatial data. The non-spatial data includes crime and crime related data collected from SP Office, Shimoga. The Spatial data including the Ward boundaries were picked from City Municipality Corporation. Manual digitization with MapInfo 9 Software facilitated to capture the data in digital format. The relational database option included in the MapInfo 9 was used to develop the information database. It offers the facility to update, delete, correct and add them to the information system.

The individual wards were used as the basic building blocks for the development and analysis of the information system. Keeping the ward population and area as the basis, the crime committed in each ward were represented in terms of crime index. This gave a common base for comparing the wards. The different attributes of the data such as area, population, police personnel, police stations etc were stored in different layers. Selected overlays were made and weighted factors assigned on which the wards were classified as high, moderate or low in crime. The map generated is shown in Map 3. The thematic representation of the crime data for each ward gave greater insight into the spatial distribution and trend of the different crimes. The crime data has been represented for each ward with reference to the ward population and ward area. Existing Police Stations and its jurisdictions are shown in map 5.

Maps with reference to the police personnel and Police Stations as a percentage of the CMC population and ward area along with crime data were prepared using MapInfo 10. The overlaying of these layers gave scope for analysis of crime data in each ward. The analysis of the data showed that there are certain wards with high crime rate in spite of the large number of police personnel deployment in those wards. There were certain wards with higher crime rate and very low deployment of the police personnel. The methodology of overlaying yielded information on inter-relationship between various spatial and non spatial parameters. Based on the analysis certain observations/recommendations are made and the wards have been grouped in to 4 categories as follows:

1. High increase in police personnel/Police stations needed.
2. Moderate increase in police personnel/Police stations needed.
3. Moderate increase in Police stations needed.
4. Status Quo can be maintained.

Results and Discussions

The crime map has been generated for the Shimoga CMC and recommendations for each ward have been drafted as given above. These will help the law enforcing authorities to monitor and prevent crime. The crime map based on socio-economic data is generated, shown in Map 5. Based on the analysis certain observations/recommendations are made and shown in final Map 7.

It is recommended and highly suggested to use GIS to Map, monitor and check crimes in the district. Also, the cost involved in procuring and installing such GIS data will be also less when compared to the amount of distress people face, after being attacked and killed by the criminals. The time has come when the law enforcing authority must implement the GIS so as to effectively use their resources and control crime.

Impact

Applying GIS to Crime Mapping is a major innovation for Police organizations around the world. It enables efficient crime analysis. Administrators and law enforcing agencies can access and analyzed data for better enforcement of law and prevent crimes. It is proposed to integrate other collateral information for better visualization of crime detection, analysis and enforcement.

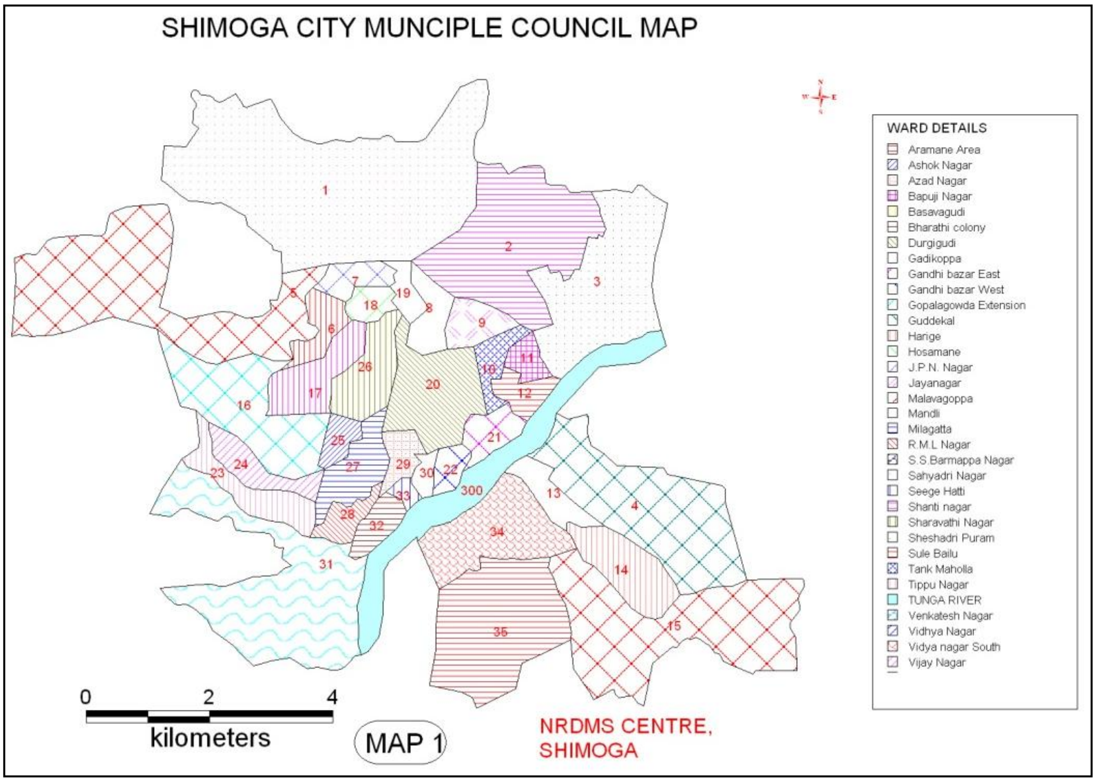


Fig.2 Shimoga City Municipal Council

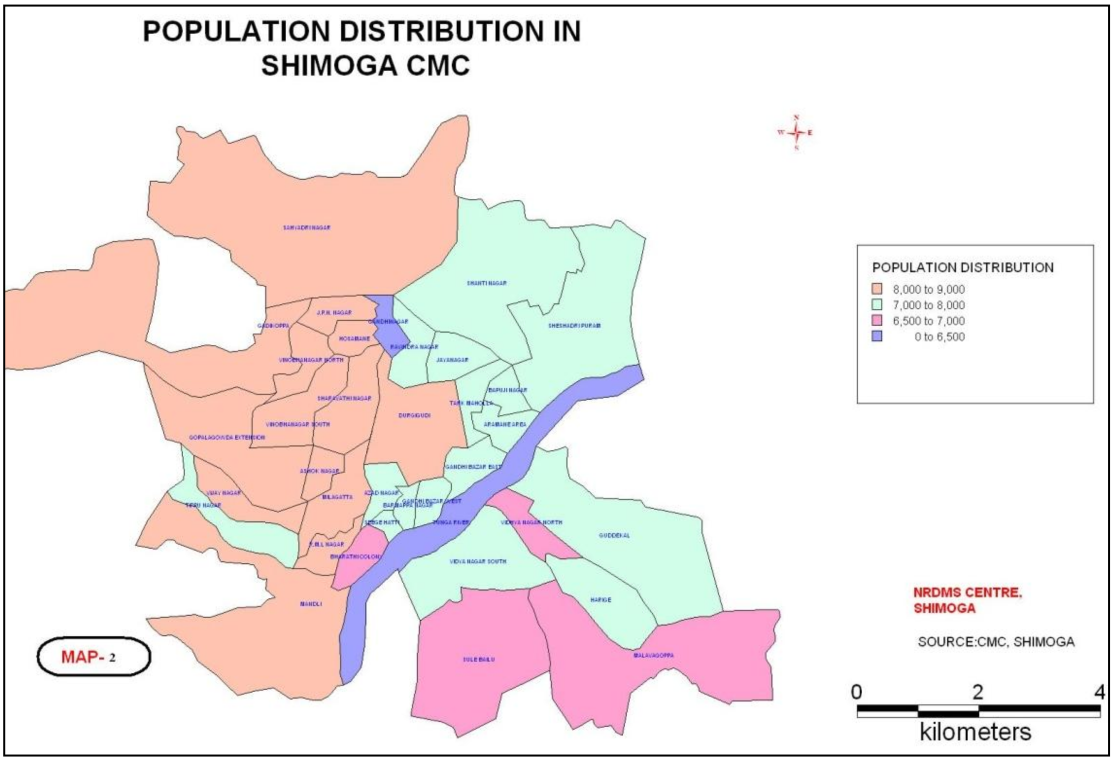


Fig.3 Population Distribution in Shimoga CMC

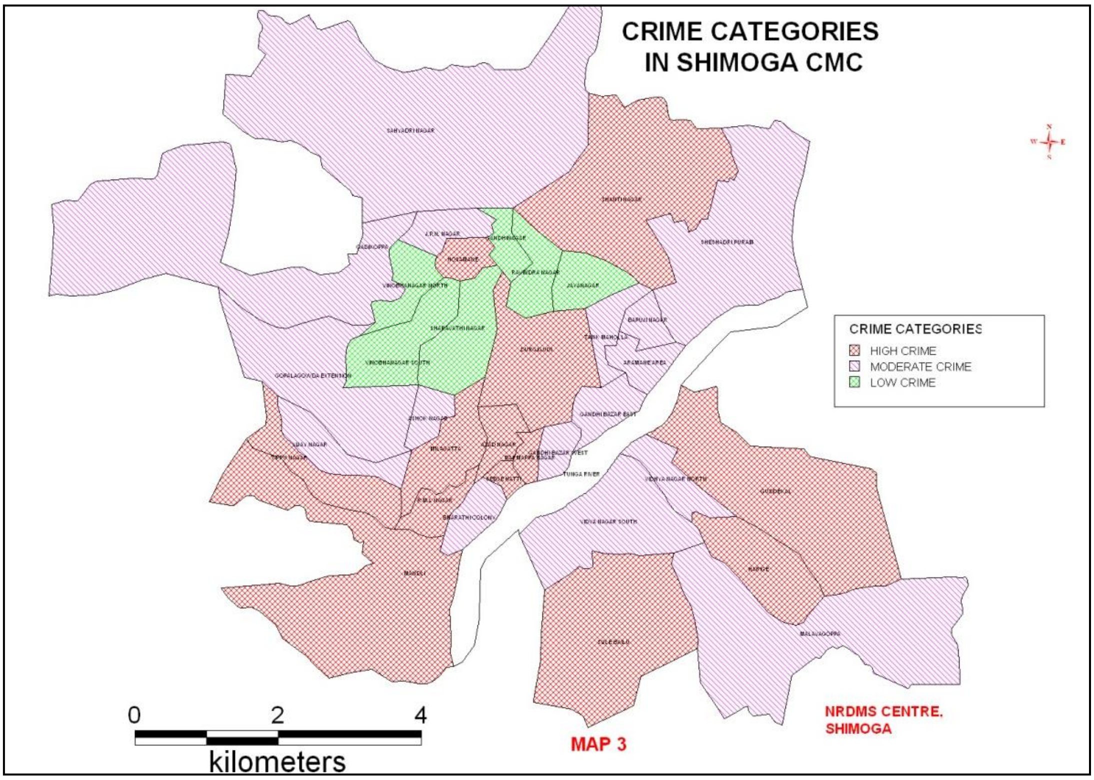


Fig.4 Crime Categories in Shimoga CMC

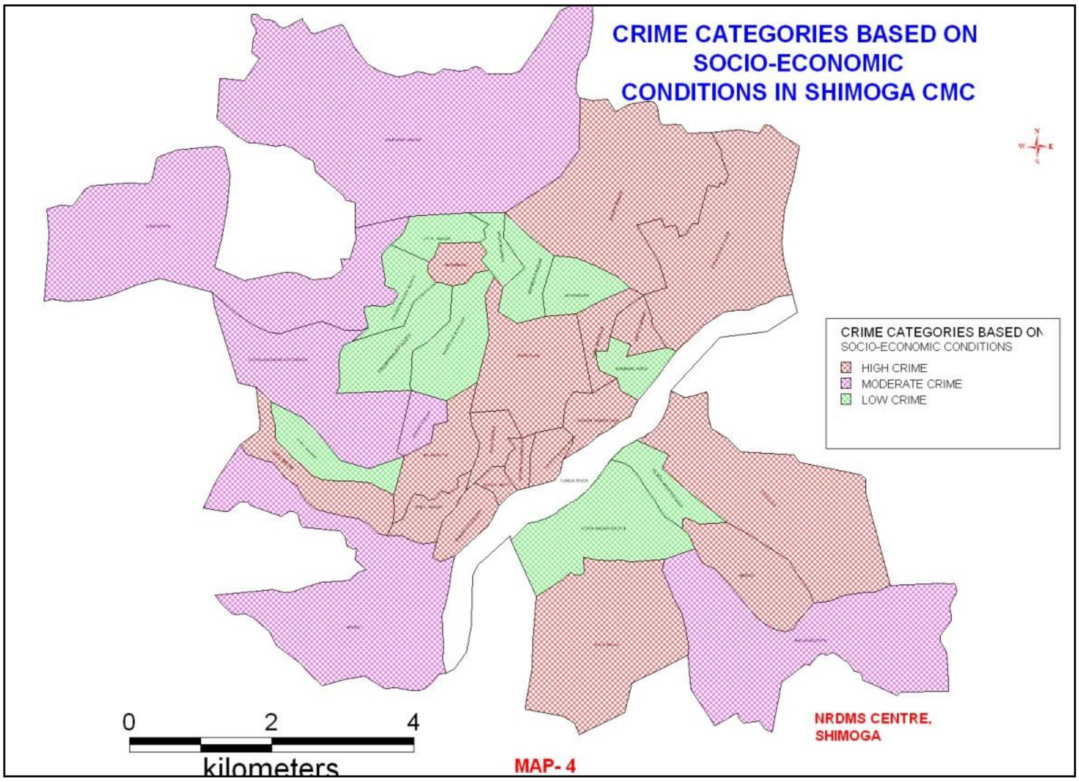


Fig.5 Crime Categories based on socio-economic conditions in Shimoga CMC

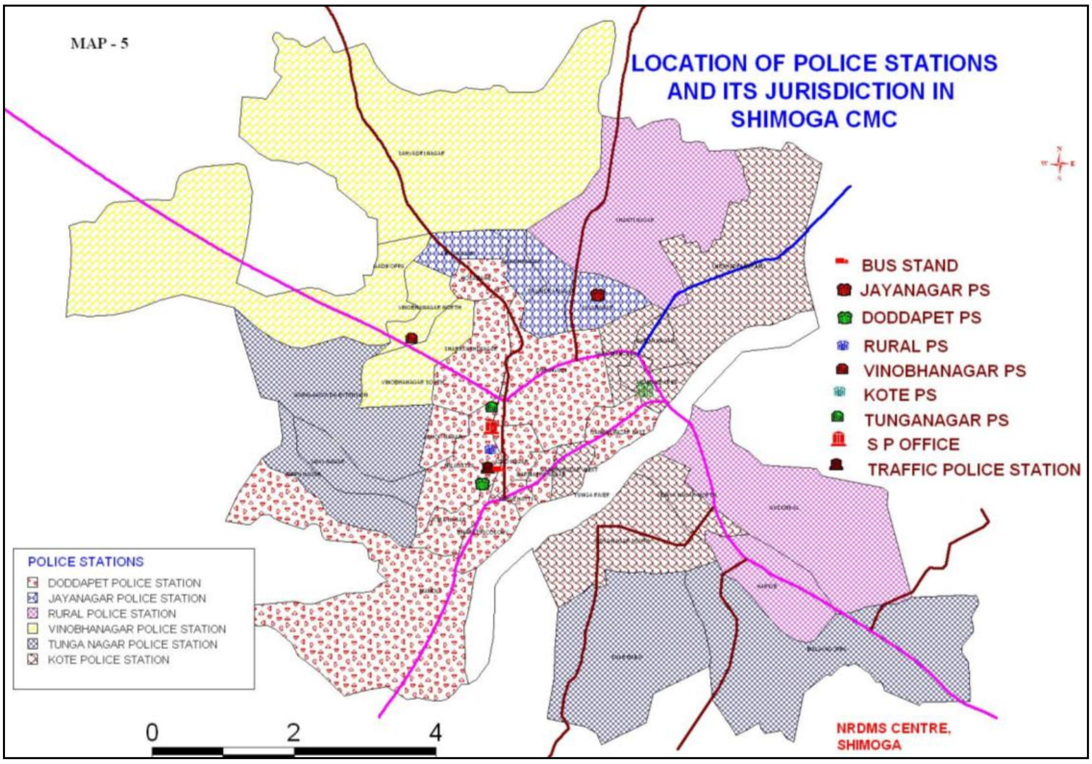


Fig.6 Location of Police Stations and its jurisdiction in Shimoga CMC

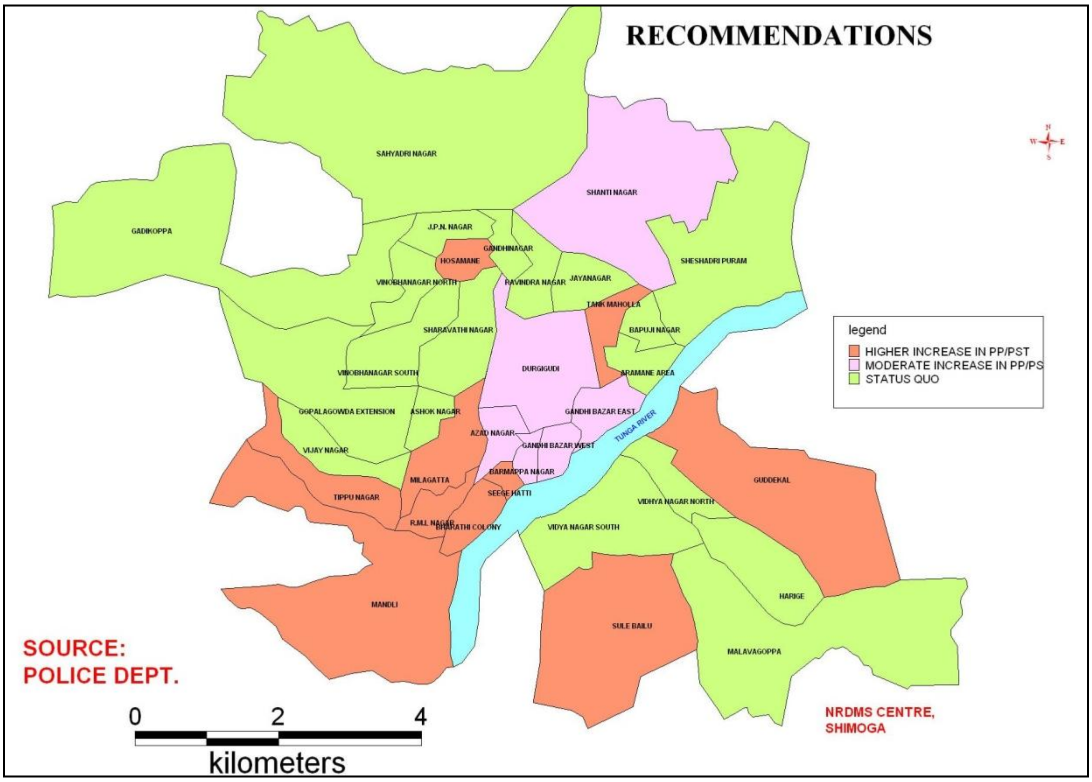


Fig.7 Recommendations for New Police Stations

Planning Atlas of Karnataka

The State Planning Board, Directorate of Economics and Statistics and the Council have jointly taken up the task of preparing “Planning Atlas of Karnataka” in the form of pictorial representation and statistical information on development indicators. The Planning Atlas mainly depicts development indicators in the country as well as different districts/regions of Karnataka. The council integrated the data sets and prepared geo spatial data on development indicators using geo spatial technologies.

This publication is the first and foremost of its kind in the Directorate of Economics and Statistics as well as in the State. This publication contains indicators of various parameters for the development of the State economy, infrastructure etc., and this report broadly throws light on the current level of achievement in important sectors. The same can be treated as a basis to gauge the extent of achievement made. This Atlas has been prepared in three parts viz.,
Part I : Inter-State position of important indicators of development among 19 major States
Part II : Rank Charts of Divisions according to the level of development.
Part III : Charts and Maps of the Districts based on the indicators of development.

The Atlas mainly relates to Karnataka’s position with regard to important indicators of development among 19 major states in India. This publication will be of immense use to planners, researchers, academicians and administrators and also to those who are prone to the positive growth of the nation in framing the measures for a comprehensive development for future. It will guide them to give proper directions towards developmental programmes, which ensure welfare and progress of the State.

The document contains 275 pages out of which more than 125 pages are dedicated spatial representation of developmental indicators. The council published the Planning Atlas on behalf of Directorate of Economics and Statistics.

19 Major States considered for comparison

SL NO	NAME OF THE STATE
1	Andhra Pradesh
2	Assam
3	Bihar
4	Chattisgarh
5	Gujarat
6	Haryana
7	Himachal Pradesh
8	Jharkhand
9	Karnataka
10	Kerala
11	Madhya Pradesh
12	Maharashtra
13	Orissa
14	Punjab
15	Rajasthan
16	Tamil Nadu
17	Uttar Pradesh
18	Uttaranchal
19	West Bengal

Position of Karnataka among 19 major states according to the Indicators

SL NO	INDICATOR	POSITION
1	Population 2001 Census	9
2	Density of Population as per 2001 Census (per sq.km)	12
3	Percentage of Urban Population - 2001 Census	4
4	Total Literacy Rate	10
5	Female Literacy Rate	9
6	Birth Rate 2006	8
7	Death Rate, 2006	6
8	Infant Mortality Rate, 2006	7
9	Life Expectancy(Male)	8
10	Life Expectancy (Female)	6
11	Percentage of Non Agricultural Workers to Total Workers - 2001 census	9
12	Number of Operational Holdings	7
13	Number of Operational Holdings (in percentage)	7
14	Area Operated by Operational Holdings	5
15	Area Operated by Operational Holdings (in percentage)	5
16	Average Size of Operational Holdings	6
17	Cropping Intensity 2003-04	18
18	Average Yield of Food Grains 2005-06	12
19	Percentage Share of Consumption for Agricultural Purposes 2004-05	4
20	Percentage of Area Under Forest 2003	9
21	Percentage of Electrified Villages	4
22	Percentage of Couple Using any Method of Family Planning	7
23	Percentage of Fully Immunised Children (age of 12-23 month)	9
24	Percentage of Households having Safe Drinking Water Facilities	9
25	No of Primary Schools per lakh of Population 2003-04	15
26	No. of Upper Primary Schools per lakh of Population 2003-04	3
27	Pupil-Teacher Ratio (Primary Schools)-2004-05	17
28	Pupil-Teacher Ratio (Upper Primary Schools)-2004-05	8
29	Total Employment in Public and Private Sectors per lakh of Population 2003-04	7
30	Growth Rate of Establishments 1998-2005	9
31	Growth Rate of Number of Workers 1998-2005	8
32	Per Capita Net State Domestic Product at Current Prices 2005-06	9
33	Percentage of Population Below Poverty Line 2004-05	11

Position of Southern States according to the Indicators

Sl No	Indicator	Andhra Pradesh	Tamil Nadu	Karnataka	Kerala
1	Population 2001 Census	I	II	III	IV
2	Density of Population as per 2001 Census (per sq.km)	III	II	IV	I
3	Percentage of Urban Population - 2001 Census	III	I	II	IV
4	Total Literacy Rate	IV	II	III	I
5	Female Literacy Rate	IV	II	III	I
6	Birth Rate 2006	II	I	III	IV
7	Death Rate, 2006	III	IV	II	I
8	Infant Mortality Rate, 2006	I	III	II	IV
9	Life Expectancy(Male)	IV	II	III	I
10	Life Expectancy (Female)	IV	II	III	I
11	Percentage of Non Agricultural Workers to Total Workers - 2001 census	IV	II	III	I
12	Number of Operational Holdings	I	II	III	IV
13	Number of Operational Holdings (in percentage)	I	II	III	IV
14	Area Operated by Operational Holdings	I	III	II	IV
15	Area Operated by Operational Holdings (in percentage)	I	III	II	IV
16	Average Size of Operational Holdings	II	III	I	IV
17	Cropping Intensity 2003-04	II	III	IV	I
18	Average Yield of Food Grains 2005-06	II	III	IV	I
19	Percentage Share of Consumption for Agricultural Purposes 2004-05	I	III	II	IV
20	Percentage of Area Under Forest 2003	IV	III	II	I
21	Percentage of Electrified Villages	II	IV	III	I
22	Percentage of Couple Using any Method of Family Planning	II	IV	III	I
23	Percentage of Fully Immunised Children (age of 12-23 month)	IV	I	III	II
24	Percentage of Households having Safe Drinking Water Facilities	III	I	II	IV
25	No of Primary Schools per lakh of Population 2003-04	I	II	III	IV

SL NO	INDICATOR	ANDHRA PRADESH	TAMIL NADU	KARNATAKA	KERALA
26	No. of Upper Primary Schools per lakh of Population 2003-04	II	III	I	IV
27	Pupil-Teacher Ratio (Primary Schools)	III	III	I	II
28	Pupil-Teacher Ratio (Upper Primary Schools)	II	IV	III	I
29	Total Employment in Public and Private Sectors per lakh of Population 2003-04	IV	II	III	I
30	Growth Rate of Establishments 1998-2005	III	II	IV	I
31	Growth Rate of Workers 1998-2005	I	III	IV	II
32	Per Capita Net State Domestic Product at Current Prices 2005-06	III	II	IV	I
33	Percentage of Population Below Poverty Line 2004-05	III	II	I	IV

Socio - Economic Development indicatiors – State wise

Sl No	State	Population 2001 Census	Density 2001 Census (per sq. km.)	Percentage of Urban Population 2001 Census	Literacy Rate 2001 Census	
					Total	Female
		1	2	3	4	5
1	Andhra Pradesh	76210007	277	27.30	61	50
2	Assam	26655528	340	12.90	63	55
3	Bihar	82998509	881	10.46	47	33
4	Chattisgarh	20833803	154	20.09	65	52
5	Gujarat	50671017	258	37.36	69	58
6	Haryana	21144564	478	28.92	68	56
7	Himachal Pradesh	6077900	109	9.80	76	67
8	Jharkhand	26945829	338	22.24	54	39
9	Karnataka	52850562	276	33.99	67	57
10	Kerala	31841374	819	25.96	91	88
11	Madhya Pradesh	60348023	196	26.46	64	50
12	Maharashtra	96878627	315	42.43	77	67
13	Orissa	36804660	236	14.99	63	51
14	Punjab	24358999	484	33.92	70	63
15	Rajasthan	56507188	165	23.39	60	44
16	Tamil Nadu	62405679	480	44.04	74	64
17	Uttar Pradesh	166197921	690	20.78	56	42
18	Uttaranchal	8489349	159	25.67	72	60
19	West Bengal	80176197	903	27.97	69	60
20	Jammu Kashmir	10143700	100	24.81	56	43
21	Sikkim	540851	76	11.07	69	60
22	Arunachal Pradesh	1097968	13	20.75	54	44
23	Nagaland	1990036	120	17.23	67	62

24	Manipur	2293896	103	25.11	71	61
25	Mizoram	888573	42	49.63	89	87
26	Tripura	3199203	305	17.06	73	65
27	Meghalaya	2318822	103	19.58	63	60
28	Goa	1347668	364	49.76	82	75
29	Pondicherry	974345	2034	66.57	82	74
30	Delhi	13850507	9340	93.18	82	75
	India	1028737436	325	27.81	65	54

Socio - Economic Development indicatiors – State wise

Sl. No.	**State**	**2006**			**Life Expectancy (1999-2003)**	
		Birth Rate	**Death Rate**	**Infant Mortality Rate**	**Male**	**Female**
		6	7	8	9	10
1	Andhra Pradesh	18.9	7.3	56	62.2	64.8
2	Assam	24.6	8.7	67	57.8	58.3
3	Bihar	29.9	7.7	60	61.6	59.7
4	Chattisgarh	26.9	8.1	61	N.A	N.A
5	Gujarat	23.5	7.3	53	62.5	64.6
6	Haryana	23.9	6.5	57	65.0	65.6
7	Himachal Pradesh	18.8	6.8	50	65.8	66.6
8	Jharkhand	26.2	7.5	49	N.A	N.A
9	Karnataka	20.1	7.1	48	62.9	66.4
10	Kerala	14.9	6.7	15	70.9	76.0
11	Madhya Pradesh	29.1	8.9	74	57.2	56.9
12	Maharashtra	18.5	6.7	35	65.2	67.6
13	Orissa	21.9	9.3	73	58.6	58.7
14	Punjab	17.8	6.8	44	67.6	69.6
15	Rajasthan	28.3	6.9	67	60.7	61.8
16	Tamil Nadu	16.2	7.5	37	64.3	66.5
17	Uttar Pradesh	30.1	8.6	71	59.6	58.7
18	Uttaranchal	21.0	6.7	43	N.A	N.A
19	West Bengal	18.4	6.2	38	63.5	65.0
20	Jammu Kashmir	18.7	5.9	52	N.A	N.A
21	Sikkim	19.2	5.6	33	N.A	N.A
22	Arunachal Pradesh	22.5	5.0	40	N.A	N.A
23	Nagaland	17.3	4.8	20	N.A	N.A
24	Manipur	13.4	4.5	11	N.A	N.A
25	Mizoram	17.8	5.5	25	N.A	N.A
26	Tripura	16.6	6.3	36	N.A	N.A
27	Meghalaya	24.7	8.0	53	N.A	N.A
28	Goa	15.1	7.4	15	N.A	N.A
29	Pondicherry	15.7	7.3	28	N.A	N.A
30	Delhi	18.4	4.7	37	N.A	N.A
	India	23.5	7.5	57	61.8	63.5

Socio - Economic Development indicatiors – State wise

SL NO	STATE	% of Non-agricultural workers to total workers 2001 census	Number of operational holdings (No. in 000s)	% age of number of operational holdings	Area operated by operational holdings (in 000 hectares)	% age of area operated by operational holdings	Average size of operational holdings (in hectares)
		11	12	13	14	15	16
1	Andhra Pradesh	37.84	11532	9.62	14400	9.03	1.25
2	Assam	47.64	2712	2.26	NA	NA	NA
3	Bihar	22.75	11574	9.65	6747	4.23	0.58
4	Chattisgarh	23.53	3255	2.72	5223	3.28	1.60
5	Gujarat	48.42	4239	3.54	9877	6.20	2.33
6	Haryana	48.71	1528	1.27	3550	2.23	2.32
7	Himachal Pradesh	31.53	914	0.76	979	0.61	1.07
8	Jharkhand	33.32	NA	NA	NA	NA	NA
9	Karnataka	44.29	7079	5.90	12307	7.72	1.74
10	Kerala	65.12	6657	5.55	1569	0.98	0.24
11	Madhya Pradesh	28.51	7360	6.14	16372	10.27	2.22
12	Maharashtra	45.04	12100	10.09	20062	12.59	1.66
13	Orissa	35.23	4067	3.39	5081	3.19	1.25
14	Punjab	61.05	997	0.83	4022	2.52	4.03
15	Rajasthan	34.09	5819	4.85	21251	13.33	3.65
16	Tamil Nadu	50.67	7859	6.56	6972	4.37	0.89
17	Uttar Pradesh	34.11	21668	18.07	17983	11.28	0.83
18	Uttaranchal	41.62	891	0.74	843	0.53	0.95
19	West Bengal	55.85	6790	5.66	5547	3.48	0.82
20	Jammu Kashmir	54.47	1443	1.20	962	0.60	0.67
21	Sikkim	43.64	67	0.06	104	0.07	1.55
22	Arunachal Pradesh	38.26	107	0.09	394	0.25	3.68
23	Nagaland	31.62	144	0.12	1047	0.66	7.27
24	Manipur	47.80	149	0.12	172	0.11	1.15
25	Mizoram	39.40	76	0.06	93	0.06	1.22
26	Tripura	49.17	479	0.40	270	0.17	0.56
27	Meghalaya	34.16	214	0.18	278	0.17	1.30
28	Goa	83.51	64	0.05	54	0.03	0.84
29	Pondicherry	75.72	38	0.03	26	0.02	0.68
30	Delhi	98.83	28	0.02	43	0.03	1.54
	India	40.76	119882	100.00	159397	100.00	1.33

Socio - Economic Development indicatiors – State wise

Sl No	State	Cropping intensity 2003-04	Average yield of food grains 2005-06 (Quintals /Hectare)	%share of consumption of electricity for agricultural purposes 2004-05	% of area under forest to Total Geographi-cal area 2003	% of Electrified villages 2005
		17	18	19	20	21
1	Andhra Pradesh	122.5	21.4	40.75	16.15	99.8
2	Assam	142.7	14.0	0.52	35.48	77.0
3	Bihar	139.4	11.9	23.09	5.90	51.3
4	Chattisgarh	116.6	9.8	12.79	41.42	76.6
5	Gujarat	111.6	14.1	46.48	7.62	98.7
6	Haryana	177.2	30.9	42.46	3.43	100.0
7	Himachal Pradesh	173.8	19.2	0.77	25.78	68.3
8	Jharkhand	118.0	12.3	2.20	28.50	31.5
9	Karnataka	116.3	13.9	38.01	19.00	98.1
10	Kerala	136.6	22.7	2.17	40.08	100.0
11	Madhya Pradesh	128.2	11.3	31.59	24.79	96.3
12	Maharashtra	127.0	8.4	18.72	15.23	86.5
13	Orissa	150.5	13.0	2.84	31.06	55.2
14	Punjab	191.0	40.4	27.25	3.14	100.0
15	Rajasthan	124.1	10.1	28.34	4.62	63.9
16	Tamil Nadu	120.4	18.7	26.79	17.41	94.9
17	Uttar Pradesh	154.7	19.6	19.76	5.86	58.2
18	Uttaranchal	160.0	17.0	21.97	45.74	92.2
19	West Bengal	177.1	24.8	7.39	13.91	84.8
20	Jammu Kashmir	147.9	16.9	4.09	9.57	98.2
21	Sikkim	109.2	14.0	0	45.97	94.4
22	Arunachal Pradesh	151.2	11.7	0	81.22	48.3
23	Nagaland	113.5	15.8	0.08	82.09	66.9
24	Manipur	139.4	24.0	0.43	77.12	82.2
25	Mizoram	37.8	18.9	0	87.42	80.6
26	Tripura	120.7	21.8	18.74	77.18	57.2
27	Meghalaya	107.8	16.7	0.07	75.08	57.6
28	Goa	119.1	28.7	1.12	58.24	100.0
29	Pondicherry	162.5	24.1	6.21	8.33	100.0
30	Delhi	179.3	26.2	1.26	11.46	100.0
	India	134.7	16.5	25.33	20.64	74.1

Socio - Economic Development indicatiors – State wise

Sl No	STATE	% of couples using any method of family planning 2005-06	% of fully immunized children(Age 12-23 months) 2005-06	% of households having safe drinking water facilities 2001 census	No of primary schools (I-V) per lakh of population 2003-04
		22	23	24	25
1	Andhra Pradesh	67.6	46.0	80.1	84
2	Assam	56.5	31.6	58.8	113
3	Bihar	34.1	32.8	86.6	49
4	Chattisgarh	53.2	48.7	70.5	156
5	Gujarat	66.6	45.2	84.1	14
6	Haryana	63.4	65.3	86.1	54
7	Himachal Pradesh	72.6	74.2	88.6	181
8	Jharkhand	35.7	34.5	42.6	61
9	Karnataka	63.6	55.0	84.6	50
10	Kerala	68.6	75.3	23.4	21
11	Madhya Pradesh	55.9	40.3	68.4	110
12	Maharashtra	66.9	58.8	79.8	43
13	Orissa	50.7	51.8	64.2	114
14	Punjab	63.3	60.1	97.6	54
15	Rajasthan	47.2	26.5	68.2	99
16	Tamil Nadu	61.4	80.9	85.6	52
17	Uttar Pradesh	43.6	23.0	87.8	72
18	Uttaranchal	59.3	60.0	86.7	168
19	West Bengal	71.2	64.3	88.5	62
20	Jammu Kashmir	52.6	66.7	65.2	121
21	Sikkim	57.6	69.6	70.7	92
22	Arunachal Pradesh	43.2	28.4	77.5	124
23	Nagaland	20.7	21.0	46.5	75
24	Manipur	48.7	46.8	37.0	111
25	Mizoram	59.9	46.5	36.0	169
26	Tripura	68.7	49.7	52.5	65
27	Meghalaya	24.3	32.9	39.0	252
28	Goa	48.2	78.6	70.1	75
29	Pondicherry	NA	NA	95.9	34
30	Delhi	66.9	63.2	97.2	15
	India	56.3	43.5	77.9	69

Socio - Economic Development indicatiors – State wise

Sl No	State	No of Upper primary Schools (VI-VIII) per lakh of Population 2003-04	Pupil Teacher Ratio 2004-05		Total Employment in Public & Pvt. Sectors per Lakh of Population 2003-04	Growth Rate of Establi-shments 1998-2005
			Primary schools	Upper Primary Schools		
		26	27	28	29	30
1	Andhra Pradesh	20	33	31	2709	4.68
2	Assam	31	42	16	4116	7.49
3	Bihar	12	104	75	635	2.31
4	Chattisgarh	45	48	46	1627	2.64
5	Gujarat	60	35	39	3201	3.44
6	Haryana	10	44	30	3079	6.61
7	Himachal Pradesh	34	24	30	4890	2.49
8	Jharkhand	16	81	61	3867	3.02
9	Karnataka	48	26	37	3444	4.14
10	Kerala	9	28	27	3783	8.69
11	Madhya Pradesh	51	43	30	1819	1.23
12	Maharashtra	27	37	37	3679	3.89
13	Orissa	31	53	44	2036	3.39
14	Punjab	10	43	19	3389	5.91
15	Rajasthan	42	49	34	2083	3.61
16	Tamil Nadu	11	33	41	3656	8.44
17	Uttar Pradesh	21	58	35	1278	5.16
18	Uttaranchal	42	25	18	3034	6.05
19	West Bengal	2	54	44	2495	3.82
20	Jammu Kashmir	36	34	16	2071	6.03
21	Sikkim	23	22	25	NA	5.79
22	Arunachal Pradesh	41	34	30	NA	4.80
23	Nagaland	24	19	16	3593	2.70
24	Manipur	36	30	20	3514	3.83
25	Mizoram	102	17	8	4668	9.71
26	Tripura	14	54	15	3854	8.88
27	Meghalaya	67	44	16	3532	5.69
28	Goa	6	21	17	3947	0.37
29	Pondicherry	13	24	21	5791	2.12
30	Delhi	5	40	26	6057	1.43
	India	25	46	35	2570	4.69

Socio - Economic Development indicatiors – State wise

SL NO	State	Growth rate of workers 1998-2005	Per Capita NSDP at Current Prices 2006-07	% of Population Below Poverty Line 2004-05
		31	32	33
1	Andhra Pradesh	5.87	29582	15.8
2	Assam	0.09	20166	19.7
3	Bihar	0.23	9214	41.4
4	Chattisgarh	1.89	20151	40.9
5	Gujarat	2.08	34157	16.8
6	Haryana	5.35	49038	14.0
7	Himachal Pradesh	1.93	36782	10.0
8	Jharkhand	-0.53	20811	40.3
9	Karnataka	2.73	27101	25.0
10	Kerala	5.86	33609	15.0
11	Madhya Pradesh	0.19	16578	38.3
12	Maharashtra	1.14	37081	30.7
13	Orissa	2.61	20240	46.4
14	Punjab	3.67	40566	8.4
15	Rajasthan	2.81	19512	22.1
16	Tamil Nadu	4.92	32733	22.5
17	Uttar Pradesh	2.34	14685	32.8
18	Uttaranchal	4.23	27879	39.6
19	West Bengal	1.94	25223	24.7
20	Jammu Kashmir	6.82	NA	5.4
21	Sikkim	5.33	29521	20.1
22	Arunachal Pradesh	4.61	23788	17.6
23	Nagaland	0.04	NA	19.0
24	Manipur	2.34	22495	17.3
25	Mizoram	4.68	NA	12.6
26	Tripura	5.32	24706	18.9
27	Meghalaya	3.98	25141	18.5
28	Goa	0.80	70112	13.8
29	Pondicherry	0.98	52669	22.4
30	Delhi	0.23	61676	14.7
	India	2.78	25716	27.5

Karnataka Indicators

SL NO	INDICATOR	DIVISION WISE RANK			
		BANGALORE	BELGAUM	GULBARGA	MYSORE
1	Population - 2001 Census	I	II	IV	III
2	Area(in sq.kms)	II	I	III	IV
3	Density of Population (per sq.km)	I	III	IV	II
4	Percentage of Urban Population to total Population as Per 2001 Census	I	II	III	IV
5	Contribution of Industrial Sector to State Domestic Product 2005-06	I	III	IV	II
6	Per Capita Net Domestic Product from Commodity Producing Sectors2005-06	I	IV	III	II
7	Percentage of NDDP to NSDP	I	III	IV	II
8	Per Capita Income at Current Prices (Rs.) 2005-06	I	IV	III	II
9	Percentage of SC/ST Population to Total Population as Per 2001 Census	II	IV	I	III
10	Literacy Percentage - Total	I	III	IV	II
11	Literacy Percentage - Female	I	III	IV	II
12	Percentage of Total Workers to Total Population as Per 2001 Census	II	III	IV	I
13	Percentage of Area Under Forest to Total Geographical Area 2005-06	III	II	IV	I
14	Percentage of Cultivable Land to Total Geogrphical Area	III	II	I	IV
15	Percentage of Net Area Sown to Cultivable Land Area 2005-06	III	I	II	IV
16	Percentage of Net Area Sown to Total Geographic Area 2005-06	III	II	I	IV
17	Percentage of Gross Irrigated Area to Gross Area Sown 2005-06	I	III	IV	II
18	Percentage of Irrigated Area by Tubewells to Net Irrigated Area 2005-06	I	II	III	IV
19	Percentage of Commercial Crops to Gross Cropped Area 2005-06	IV	II	III	I
20	Intensity Cropping 2005-06	IV	I	III	II
21	Average Yield of Food Grains 2005-06	I	III	IV	II
22	No. of Regulated Markets Per Lakh ha.of Net Area Sown 2005-06	I	II	III	II
23	Distribution of Fertilizers ha. of Gross Area Sown 2006-07	II	IV	III	1
24	Number of Operational Holdings as Per Agricultural Census	II	III	IV	I
25	Percentage of Operational Holdings as Per Agricultural Census 2005-06	II	III	IV	I
26	Area Operated as Per Agricultural Census 2005-06	III	I	II	IV
27	Percentage of Area Operated as Per Agricultural Census	III	I	II	IV

Karnataka Indicators

28	Average Size of Operational Holdings(In Hectares) as Per Agricultural Census 2005-06	III	II	I	IV
29	Normal Rainfall 2007	III	II	IV	I
30	Actual Rainfall 2007	III	II	IV	I
31	Total Number of Establishments as Per Economic Census 2005	I	III	IV	II
32	Percentage of Establishments as Per Economic Census 2005	I	III	IV	II
33	Total Number of Employments as Per Economic Census 2005	I	III	IV	II
34	Percentage of Employments as Per Economic Census 2005	I	III	IV	II
35	Growth Rate in Employment from 1998-2005	IV	III	II	I
36	Growth Rate in Establishment from 1998-2005	III	IV	II	I
37	No. of Factories Per Lakh of Population 2006-07	I	II	III	IV
38	No. of Employment in Factories Per Lakh of Population 2006-07	I	II	III	IV
39	Percentage of Workers engaged in Household Industry to Total Workers as Per 2001 Census	III	II	IV	I
40	Per Capita of Gross Value of Industrial Produce (Rs.)	I	IV	II	III
41	Value Added Per Workers in Registered Factories	IV	III	I	II
42	Invested Capital Per Industrial Worker	IV	III	II	I
43	Length of Total Pucca Roads Per Lakh of Population (Km) 2004-05	III	I	II	IV
44	Length of Total Pucca Roads Per Thousand Sq.Km in Area (Km)	II	III	IV	I
45	No. of Registered Motor Vehicles Per Lakh of Population 2006-07	I	II	III	IV
46	Percentage of Consumption of Electricity in Industry to Total Consumption	I	IV	II	III
47	Percentage of Electrified Villages to Total Inhabited Villages 2006-07	III	IV	I	II
48	Per Capita Consumption of Electricity 2006-07	BESCOM I	MESCOM I	GESCOM V	HESCOM & CESCO IV & III
49	No. of Telephone Connections(BSNL) Per Lakh of Population 2006-07	I	II	IV	III
50	No. of Post Offices Per Lakh of Population 2006-07	II	I	I	III

Karnataka Indicators

51	No. of Scheduled Commercial Banks Per Lakh of Population 2006-07	I	II	III	IV
52	Credit Deposit Ratio, 2007	III	II	I	IV
53	Enrolment of Students in Primary Schools 2006-07	I	II	III	IV
54	Pupil Teacher Ratio(Primary Schools) 2006-07	II	III	IV	I
55	Enrolment of Students in Secondary Schools 2006-07	I	II	IV	III
56	Pupil Teacher Ratio(Secondary Schools) 2006-07	I	III	III	II
57	No. of Polytechnics Per Lakh of Population	I	III	II	IV
58	No. of Allopathic Hospitals Per Lakh of Population (Including Phcs) 2006-07	I	III	II	IV
59	No. of Beds in Allopathic Hospitals /PHCs Per Lakh of Population 2006-07	II	IV	III	I
60	Percentage of Rural Households Below Poverty Line	IV	III	I	II

Ramanagara and Chickballapur districts formed during 2007;
No data has been compiled separately

Socio Economic Development indicators - District wise

SL NO	District	Population 2001 Census	Area in Sq. Kms.	Density of Population (Per sq.km) 2001 Census	% of Urban Population to Total Population 2001 Census
		1	2	3	4
	BANGALORE DIVISION	**18490811**	**49666**	**372**	**46.99**
1	Bangalore	6537124	2190	2985	88.11
2	Bangalore (Rural)	1881514	5815	324	21.64
3	Chitradurga	1517896	8440	180	18.05
4	Davanagere	1790952	5924	302	30.32
5	Kolar	2536069	8223	308	24.68
6	Shimoga	1642545	8477	194	34.75
7	Tumkur	2584711	10597	244	19.61
	BELGAUM DIVISION	**13042163**	**54514**	**239**	**29.12**
8	Belgaum	4214505	13415	314	24.02
9	Bijapur	1806918	10494	172	21.91
10	Bagalkote	1651892	6575	251	29.00
11	Dharwad	1604253	4260	377	54.99
12	Gadag	971835	4656	209	35.19
13	Haveri	1439116	4823	298	20.78
14	Uttara Kannada	1353644	10291	132	28.66
	GULBARGA DIVISION	**9526286**	**44138**	**216**	**26.49**
15	Bellary	2027140	8450	240	34.88
16	Bidar	1502373	5448	276	22.90
17	Gulbarga	3130922	16224	193	27.24
18	Raichur	1669762	6827	245	25.21
19	Koppal	1196089	7189	166	16.56
	MYSORE DIVISION	**11791302**	**43473**	**271**	**25.03**
20	Chikmagalur	1140905	7201	158	19.54
21	Dakshina Kannada	1897730	4560	416	38.43
22	Udupi	1112243	3880	287	18.53
23	Hassan	1721669	6814	253	17.71
24	Kodagu	548561	4102	134	13.84
25	Mandya	1763705	4961	356	16.04
26	Mysore	2641027	6854	385	37.18
27	Chamarajanagar	965462	5101	189	15.32
	STATE	**52850562**	**191791**	**276**	**33.99**

Socio Economic Development indicators - District wise

SL NO	District	Contribution of Industrial Sector to SDP 2005-06	Per capita NDDP from Commodity Producing Sectors	Percentage of NDDP to NSDP at Current Prices	Per Capita Income at Current Prices (Rs.) 2005-06	% of SC/ST Population to Total Population
		5	6	7	8	9
	BANGALORE DIVISION	**54.05**	**8496**	**45.44**	**33785**	**23.76**
1	Bangalore	43.24	11704	28.18	59277	14.33
2	Bangalore (Rural)	4.59	10008	3.72	27188	23.39
3	Chitradurga	0.80	6172	1.96	17728	39.72
4	Davanagere	1.17	6464	2.65	20374	30.32
5	Kolar	1.15	5736	3.13	16992	34.62
6	Shimoga	1.09	6925	2.58	21627	19.78
7	Tumkur	2.01	5764	3.20	17038	25.84
	BELGAUM DIVISION	**14.50**	**6507**	**18.78**	**19802**	**17.04**
8	Belgaum	5.83	7526	6.09	19858	16.75
9	Bijapur	0.66	4625	2.02	15392	20.14
10	Bagalkote	1.71	7483	2.36	19625	20.04
11	Dharwad	2.55	6420	3.08	26424	12.59
12	Gadag	0.68	5106	1.37	19409	19.65
13	Haveri	1.70	6512	1.80	17197	20.99
14	Uttara Kannada	1.36	5759	2.06	20932	9.31
	GULBARGA DIVISION	**13.86**	**8531**	**14.52**	**20952**	**31.87**
15	Bellary	6.85	16855	5.12	34715	36.46
16	Bidar	0.61	3231	1.46	13361	32.02
17	Gulbarga	2.27	6145	4.01	17624	27.85
18	Raichur	0.61	5963	1.99	16382	37.13
19	Koppal	3.51	10909	1.94	22253	27.09
	MYSORE DIVISION	**17.60**	**8652**	**21.26**	**24794**	**8.28**
20	Chikmagalur	0.41	13341	2.33	28059	24.01
21	Dakshina Kannada	8.01	10912	5.24	37943	10.23
22	Udupi	1.54	6793	2.15	26558	9.89
23	Hassan	0.54	6332	2.25	17947	19.63
24	Kodagu	0.19	18625	1.52	37996	20.58
25	Mandya	0.99	6624	2.11	16460	14.97
26	Mysore	5.40	8047	4.68	24383	27.98
27	Chamarajanagar	0.52	4639	0.99	14117	35.61
	STATE	**100.00**	**8046**	**100.00**	**26015**	**22.76**

Socio Economic Development indicators - District wise

SL No	**District**	**Total Literacy % 2001 Census**	**Female Literacy % 2001 Census**	**% of Total Workers to Total Population 2001 Census**	**% of Area Under Forests to Total Geographical Area 2005-06**	**% of Cultivable Land to Total Geographical Area 2005-06**	**% of Net Area Sown to Cultivable Land Area 2005-06**
		10	11	12	13	14	15
	BANGALORE DIVISION	**72.36**	**63.96**	**44.52**	**13.21**	**59.84**	**81.91**
1	Bangalore	82.97	77.45	39.27	2.33	44.02	76.90
2	Bangalore (Rural)	64.70	55.01	47.47	13.88	61.73	87.50
3	Chitradurga	64.47	53.80	47.56	9.57	67.51	80.05
4	Davangere	67.43	57.99	43.77	15.05	70.92	90.98
5	Kolar	62.83	52.26	48.70	9.02	58.88	75.91
6	Shimoga	74.50	66.81	43.52	32.66	32.89	80.28
7	Tumkur	66.98	56.92	50.95	4.24	72.45	80.33
	BELGAUM DIVISION	**65.14**	**53.49**	**43.73**	**22.02**	**69.72**	**86.54**
8	Belgaum	64.21	52.40	44.54	14.16	75.45	78.78
9	Bijapur	57.00	43.40	39.73	0.19	92.62	86.04
10	Bagalkot	57.30	43.50	43.52	12.31	78.99	89.81
11	Dharwad	71.63	61.83	42.64	8.25	84.86	89.77
12	Gadag	66.10	52.55	47.12	7.00	87.64	93.14
13	Haveri	67.80	57.43	46.28	9.78	79.60	95.07
14	Uttara Kannada	76.58	68.44	42.91	79.40	13.53	82.99
	GULBARGA DIVISION	**53.63**	**41.07**	**43.19**	**5.55**	**82.69**	**83.31**
15	Bellary	57.38	45.25	45.44	11.93	71.95	81.90
16	Bidar	60.96	48.86	37.08	5.11	82.74	79.04
17	Gulbarga	50.01	37.87	43.12	4.29	85.12	86.18
18	Raichur	48.80	35.90	43.83	2.17	88.96	81.20
19	Koppal	54.10	39.71	46.32	5.33	81.89	84.14
	MYSORE DIVISION	**69.22**	**61.51**	**46.47**	**22.54**	**52.50**	**79.81**
20	Chikmagalur	72.13	63.86	45.31	27.77	46.58	88.86
21	Dakshina Kannada	83.37	77.12	49.85	26.93	36.93	74.90
22	Udupi	81.21	75.09	43.88	28.08	41.32	68.03
23	Hassan	68.64	58.95	50.23	8.87	68.69	87.11
24	Kodagu	77.80	72.08	48.45	32.77	41.76	88.47
25	Mandya	61.01	51.48	47.62	4.97	70.18	66.12
26	Mysore	63.48	55.85	42.03	9.29	64.91	78.60
27	Chamarajanagar	50.88	42.38	46.38	48.36	38.75	80.13
	STATE	**66.64**	**56.87**	**44.52**	**16.13**	**66.20**	**83.32**

Socio Economic Development indicators - District wise

SL NO	District	% of Net Area Sown to Total Geographical Area 2005-06	% of Gross Irrigated Area to Gross Area Sown 2005-06	% of Irrigated Area by Tube wells to Net Irrigated Area 2005-06	% of Area Under Commercial Crops to Gross Cropped Area 2005-06	Intensity of Cropping 2005-06
		16	17	18	19	20
	BANGALORE DIVISION	**49.02**	**31.07**	**60.03**	**1.89**	**111.94**
1	Bangalore	33.85	20.84	78.57	0.05	103.12
2	Bangalore (Rural)	54.01	24.36	80.05	0.61	103.52
3	Chitradurga	54.04	17.92	90.73	2.83	123.08
4	Davanagere	64.52	45.77	36.54	3.36	122.05
5	Kolar	44.70	25.13	92.02	0.15	104.26
6	Shimoga	26.41	62.50	12.13	5.77	115.33
7	Tumkur	58.20	26.29	80.67	0.41	106.58
	BELGAUM DIVISION	**60.33**	**27.75**	**29.28**	**12.21**	**130.98**
8	Belgaum	59.44	42.62	24.48	20.23	132.78
9	Bijapur	79.69	24.13	25.62	3.50	122.56
10	Bagalkote	70.94	42.51	30.58	12.28	124.29
11	Dharwad	76.18	11.34	26.92	15.66	156.15
12	Gadag	81.63	16.35	41.45	9.87	149.21
13	Haveri	75.67	16.46	62.68	14.05	120.19
14	Uttara Kannada	11.23	21.28	8.22	5.74	109.97
	GULBARGA DIVISION	**68.89**	**25.81**	**21.82**	**3.66**	**123.93**
15	Bellary	58.93	41.61	32.39	5.69	124.31
16	Bidar	65.40	9.61	33.63	6.71	124.03
17	Gulbarga	73.35	16.86	7.53	2.72	120.23
18	Raichur	72.23	36.62	9.20	3.02	122.16
19	Koppal	68.91	30.45	47.75	2.27	137.67
	MYSORE DIVISION	**41.90**	**27.78**	**18.43**	**17.52**	**127.00**
20	Chikmagalur	41.39	11.88	28.07	23.21	114.80
21	Dakshina Kannada	27.66	47.07	12.66	0.06	120.21
22	Udupi	28.11	27.21	1.12	0.01	123.17
23	Hassan	59.84	23.45	35.97	12.22	121.02
24	Kodagu	36.94	4.12	12.09	54.30	101.96
25	Mandya	46.40	53.50	8.00	12.28	121.65
26	Mysore	51.02	29.74	3.90	23.43	165.11
27	Chamarajanagar	31.05	27.11	64.84	7.95	122.40
	STATE	**42.37**	**27.88**	**32.66**	**8.61**	**123.95**

Socio Economic Development indicators - District wise

SL NO	District	Average Yield of Food grains 2005-06 (Kgs /Hec)	No. of Regulated Markets Per Lakh Hectares of Net Area Sown 2005-06	Distribution of Fertilizers In Kgs/Hectares of Gross Area Sown 2006-07	No. of Operational Holdings as per Agricultural Census 2005-06	% of Operational Holdings as per Agricultural Census 2005-06
		21	22	23	24	25
	BANGALORE DIVISION	**2154**	**5.50**	**125.60**	**2011314**	**26.53**
1	Bangalore	2318	12.23	508.08	76278	1.00
2	Bangalore (Rural)	2071	4.43	106.90	345100	4.55
3	Chitradurga	1227	3.36	48.48	282375	3.72
4	Davanagere	3012	3.63	182.81	265580	3.51
5	Kolar	1978	6.89	151.39	417815	5.51
6	Shimoga	2631	9.83	243.20	201563	2.66
7	Tumkur	1602	5.49	49.87	422603	5.58
	BELGAUM DIVISION	**1368**	**5.13**	**91.53**	**1722704**	**22.72**
8	Belgaum	1600	5.88	137.04	532973	7.04
9	Bijapur	830	2.03	50.25	319689	4.22
10	Bagalkote	1651	4.28	106.08	218613	2.89
11	Dharwad	1054	4.91	98.42	126166	1.66
12	Gadag	1057	5.79	48.33	148970	1.97
13	Haveri	1915	5.18	101.77	200422	2.64
14	Uttara Kannada	2085	24.33	109.13	175871	2.32
	GULBARGA DIVISION	**1289**	**3.17**	**111.03**	**1588960**	**20.96**
15	Bellary	2332	4.17	200.50	261950	3.46
16	Bidar	588	3.95	49.67	238409	3.14
17	Gulbarga	965	2.46	68.12	575793	7.60
18	Raichur	1600	2.48	139.15	304330	4.01
19	Koppal	1612	4.47	137.50	208478	2.76
	MYSORE DIVISION	**1976**	**5.46**	**147.42**	**2257895**	**29.78**
20	Chikmagalur	1771	5.02	153.27	210577	2.78
21	Dakshina Kannada	2316	8.33	114.19	213304	2.81
22	Udupi	2367	5.99	60.40	197401	2.60
23	Hassan	1767	5.80	140.38	470772	6.21
24	Kodagu	2499	4.61	234.07	72547	0.95
25	Mandya	2279	6.92	281.95	524471	6.91
26	Mysore	2032	4.35	99.15	371042	4.89
27	Chamarajanagar	1425	3.96	118.02	197781	2.60
	STATE	**1598**	**4.71**	**114.06**	**7580873**	**100.00**

Socio Economic Development indicators - District wise

SL NO	District	Area Operated as per Agricultural Census 2005-06	% of Operated area as per Agricultural Census 2005-06	Average size of Operational Holdings (in Hectares) 2005-06	Normal Rainfall (In mm)	Actual Rainfall (In mm) 2007
		26	27	28	29	30
	BANGALORE DIVISION	**2892569**	**23.36**	**1.44**	**873**	**1066**
1	Bangalore	90928	0.73	1.19	867	1022
2	Bangalore (Rural)	361212	2.91	1.04	822	832
3	Chitradurga	579133	4.68	2.05	570	764
4	Davangere	418692	3.38	1.57	657	839
5	Kolar	483003	3.9	1.15	734	844
6	Shimoga	260961	2.11	1.29	1818	2470
7	Tumkur	698640	5.64	1.65	719	853
	BELGAUM DIVISION	**3749286**	**30.27**	**2.18**	**1207**	**1403**
8	Belgaum	1008305	8.14	1.89	823	907
9	Bijapur	971523	7.85	3.03	631	573
10	Bagalkot	503534	4.06	2.29	586	642
11	Dharwad	346823	2.80	2.75	786	891
12	Gadag	388014	3.13	2.60	630	838
13	Haveri	381667	3.08	1.91	777	960
14	Uttara Kannada	149420	1.91	0.84	2885	3421
	GULBARGA DIVISION	**3549937**	**28.66**	**2.23**	**742**	**743**
15	Bellary	548500	4.42	2.09	636	690
16	Bidar	466717	3.77	1.96	885	742
17	Gulbarga	1382084	11.16	2.39	839	760
18	Raichur	697132	5.63	2.29	681	794
19	Koppal	455504	3.68	2.18	583	733
	MYSORE DIVISION	**2192929**	**17.71**	**0.97**	**1703**	**1944**
20	Chikmagalur	307046	2.48	1.45	1904	2400
21	Dakshina Kannada	193185	1.56	0.90	3911	4118
22	Udupi	154704	1.25	0.78	4182	4459
23	Hassan	466163	3.76	0.98	987	1278
24	Kodagu	175289	1.41	2.43	2642	3344
25	Mandya	324060	2.62	0.61	722	753
26	Mysore	360824	2.91	0.97	766	822
27	Chamarajanagar	211658	1.71	1.07	816	875
	STATE	**12384721**	**100.00**	**1.63**	**1151**	**1323**

Socio Economic Development indicators - District wise

SL NO	District	Total no. of Establishments as Per Economic Census 2005	% of Establishments As per Economic Census 2005	Growth Rate in Establishments from 1998-2005	Total no. of Employments As per Economic Census 2005	% of Employment As per Economic Census 2005
		31	32	33	34	35
	BANGALORE DIVISION	**903575**	**35.59**	**3.41**	**2665142**	**42.00**
1	Bangalore	295728	11.66	3.43	1247713	19.66
2	Bangalore (Rural)	114715	4.52	2.82	295518	4.66
3	Chitradurga	72144	2.84	5.36	148822	2.35
4	Davangere	62239	2.45	4.52	124653	1.96
5	Kolar	138428	5.45	2.21	348056	5.49
6	Shimoga	78381	3.09	1.23	210446	3.32
7	Tumkur	141940	5.59	5.44	289934	4.57
	BELGAUM DIVISION	**545877**	**21.50**	**3.25**	**1221681**	**19.25**
8	Belgaum	204610	8.06	4.66	442325	6.97
9	Bijapur	56045	2.21	3.73	115723	1.82
10	Bagalkot	67613	2.66	2.51	155668	2.45
11	Dharwad	61935	2.44	2.53	170895	2.69
12	Gadag	44505	1.75	3.09	98872	1.56
13	Haveri	54874	2.16	2.45	109617	1.73
14	Uttara Kannada	56295	2.22	1.15	128581	2.03
	GULBARGA DIVISION	**323641**	**12.75**	**4.18**	**711263**	**11.21**
15	Bellary	88699	3.49	7.87	211293	3.33
16	Bidar	49807	1.96	5.24	101841	1.60
17	Gulbarga	91417	3.60	2.02	192101	3.03
18	Raichur	53245	2.10	5.11	116015	1.83
19	Koppal	40473	1.59	1.35	90013	1.42
	MYSORE DIVISION	**765781**	**30.16**	**5.69**	**1747500**	**27.54**
20	Chikmagalur	56930	2.24	6.46	136106	2.15
21	Dakshina Kannada	203334	8.01	8.94	352093	5.55
22	Udupi	87018	3.43	8.94	174602	2.75
23	Hassan	88225	3.47	4.88	201449	3.17
24	Kodagu	17178	0.68	0.80	42785	0.67
25	Mandya	104333	4.11	3.44	222001	3.50
26	Mysore	165913	6.53	7.77	536982	8.46
27	Chamarajanagar	42850	1.69	-2.89	81482	1.28
	STATE	**2538874**	**100.00**	**4.14**	**6345586**	**100.00**

Socio Economic Development indicators - District wise

SL NO	District	Employment Growth Rate 1998-2005	No. of Factories Per Lakh of Population 2006-07	No. of Employment in Factories Per Lakh of Population 2006-07	% of Workers Engaged in Household Industry to Total Workers 2001 Census	Per Capita Gross Value of Industrial Produce (Rs.) 2004-05
		36	37	38	39	40
	BANGALORE DIVISION	**2.11**	**39.8**	**3937**	**3.45**	**7424**
1	Bangalore	3.49	91.3	9437	2.69	18626
2	Bangalore (Rural)	-0.05	20.5	2507	4.70	5588
3	Chitradurga	6.03	5.7	252	3.32	63
4	Davangere	2.47	16.9	508	3.83	320
5	Kolar	-0.02	6.20	540	3.24	190
6	Shimoga	3.22	11.6	1137	2.52	1623
7	Tumkur	1.91	10.5	718	4.63	457
	BELGAUM DIVISION	**2.50**	**10.1**	**978**	**3.80**	**1825**
8	Belgaum	3.49	13.2	1357	3.46	2930
9	Bijapur	3.70	2.2	188	2.92	117
10	Bagalkot	1.77	3.4	508	7.50	298
11	Dharwad	2.32	24.4	1875	2.78	4342
12	Gadag	3.06	10.4	758	3.71	78
13	Haveri	2.68	5.4	532	4.20	1487
14	Uttara Kannada	-0.41	6.6	997	2.24	1156
	GULBARGA DIVISION	**2.92**	**9.9**	**647**	**2.60**	**4335**
15	Bellary	7.88	16.7	1000	2.82	14294
16	Bidar	3.65	7.1	626	2.51	288
17	Gulbarga	1.29	3.6	353	2.52	1019
18	Raichur	1.91	14.4	686	2.05	403
19	Koppal	-0.44	12.0	787	3.24	6713
	MYSORE DIVISION	**3.35**	**5.4**	**517**	**6.35**	**3263**
20	Chikmagalur	9.45	8.4	408	2.32	101
21	Dakshina Kannada	3.69	26.9	2020	21.14	11718
22	Udupi	4.28	25.0	1749	12.50	1131
23	Hassan	3.32	3.3	272	1.62	2894
24	Kodagu	1.20	8.4	637	0.75	225
25	Mandya	1.53	3.3	257	2.14	346
26	Mysore	5.53	18.6	2735	1.89	3428
27	Chamarajanagar	4.69	2.2	101	4.46	91
	STATE	**2.60**	**21.1**	**2016**	**4.08**	**4557**

Socio Economic Development indicators - District wise

SL NO	District	Value Added Per Worker in Registered Factories (Rs.) 2004-05	Invested Capital Per Industrial Worker 2004-05 (' 000Rs)	Length of Total Pucca Roads Per Lakh of Population (Km) 2004-05	Length of Total Pucca Roads Per Thousand Sq.km. of Area (Km) 2004-05	No. of Registered Motor Vehicles Per Lakh of Population 2006-07	% of Consumption of Electricity in Industries to Total Consumption
		41	42	43	44	45	46
	BANGALORE DIVISION	**442551**	**731**	**77.59**	**288.89**	**20798**	**27.61**
1	Bangalore	441470	643	10.17	303.65	42233	36.20
2	Bangalore (Rural)	705022	2131	98.30	317.97	10302	29.96
3	Chitradurga	116465	1703	147.36	265.05	6116	10.61
4	Davanagere	147833	966	103.18	311.95	10347	11.26
5	Kolar	181304	202	99.92	308.16	7258	7.25
6	Shimoga	374663	1098	139.62	270.61	13058	38.58
7	Tumkur	236538	870	113.00	275.64	8292	11.46
	BELGAUM DIVISION	**473366**	**1163**	**103.27**	**247.06**	**9173**	**15.37**
8	Belgaum	480985	1114	87.71	275.51	10276	19.14
9	Bijapur	156384	877	123.74	213.07	6188	4.75
10	Bagalkote	190603	1158	103.33	259.62	7234	7.64
11	Dharwad	684627	1675	70.57	265.73	15196	33.10
12	Gadag	50938	583	125.51	262.03	6373	14.09
13	Haveri	473496	560	93.75	279.70	6460	7.80
14	Uttara Kannada	349464	1167	157.16	206.78	9850	20.60
	GULBARGA DIVISION	**2207231**	**1628**	**101.20**	**218.41**	**6375**	**23.47**
15	Bellary	3904541	3	105.48	253.02	9275	30.09
16	Bidar	145822	863	95.87	264.32	4957	10.67
17	Gulbarga	802769	3961	93.74	180.90	5867	24.05
18	Raichur	545617	659	100.48	245.79	5890	20.23
19	Koppal	2576035	3631	121.15	201.56	5244	25.36
	MYSORE DIVISION	**735907**	**2310**	**49.64**	**327.63**	**4497**	**18.26**
20	Chikmagalur	106072	231	180.81	286.49	9209	8.05
21	Dakshina Kannada	1508807	5214	73.56	306.14	15040	22.68
22	Udupi	87249	242	108.72	311.60	11382	22.53
23	Hassan	4083443	3200	161.50	408.13	8053	8.51
24	Kodagu	208968	525	232.42	311.07	11646	9.78
25	Mandya	249001	2749	109.01	387.62	6300	7.51
26	Mysore	517411	1660	83.49	321.71	15679	35.85
27	Chamarajanagar	331818	666	143.89	272.50	4713	2.52
	STATE	**558213**	**1246**	**97.82**	**269.56**	**13131**	**23.32**

Socio Economic Development indicators - District wise

SL NO	District	% of Electrified Villages to Total Inhabited Villages 2006-07	Per Capita Consumption of Electricity 2006-07 (K.W.H)	No. of BSNL Telephone Connections Per Lakh of Population 2006-07	No. of Post Offices Per Lakh of Population 2006-07	No. of Commercial Banks Per Lakh of Population 2006-07
		47	48	49	50	51
	BANGALORE DIVISION	**99.92**		**6264**	**14**	**10**
1	Bangalore	100.00	1212.63	12187	4	16
2	Bangalore (Rural)	100.00	945.27	3539	19	6
3	Chitradurga	100.00	394.52	2301	19	8
4	Davangere	100.00	412.49	1909	10	7
5	Kolar	100.00	484.10	3234	17	7
6	Shimoga	99.45	493.45	4588	29	10
7	Tumkur	99.96	893.15	2648	22	7
	BELGAUM DIVISION	**93.30**		**3448**	**20**	**9**
8	Belgaum	99.60	498.43	3366	17	8
9	Bijapur	100.00	340.84	2356	23	7
10	Bagalkot	100.00	584.62	2441	20	8
11	Dharwad	100.00	319.03	4789	14	13
12	Gadag	100.00	204.87	3085	18	8
13	Haveri	100.00	331.89	2099	18	7
14	Uttara Kannada	72.63	220.80	6493	37	13
	GULBARGA DIVISION	**100.00**		**1897**	**20**	**7**
15	Bellary	100.00	482.85	2649	22	8
16	Bidar	100.00	341.71	2378	20	6
17	Gulbarga	100.00	257.93	1730	20	6
18	Raichur	100.00	328.56	1108	17	6
19	Koppal	100.00	547.23	1556	18	7
	MYSORE DIVISION	**99.99**		**2066**	**10**	**5**
20	Chikmagalur	99.90	332.09	5256	27	12
21	Dakshina Kannada	100.00	464.72	9205	29	17
22	Udupi	100.00	342.52	9748	24	20
23	Hassan	100.00	291.10	3209	24	10
24	Kodagu	100.00	156.50	8667	40	20
25	Mandya	100.00	547.37	2065	21	7
26	Mysore	100.00	429.57	3541	11	10
27	Chamarajanagar	100.00	461.82	1755	34	6
	STATE	**98.70**	**542.27**	**4506**	**19**	**10**

Socio Economic Development indicators - District wise

SL NO	District	Credit Deposit Ratio 2007	No. of Students Enrolled in Primary Schools 2006-07	Pupil Teacher Ratio in Primary Schools 2006-07	No. of Students Enrolled in Secondary Schools 2006-07	Pupil Teacher Ratio in Secondary Schools 2006-07
		52	53	54	55	56
	BANGALORE DIVISION	**77.36**	**2599512**	**28**	**888776**	**24**
1	Bangalore	77.11	922781	31	301842	18
2	Bangalore (Rural)	40.12	236914	25	93554	32
3	Chitradurga	90.70	222828	29	74952	28
4	Davanagere	125.30	275326	30	85022	25
5	Kolar	78.68	392122	27	124408	31
6	Shimoga	83.25	226806	27	79987	28
7	Tumkur	90.06	322735	24	129011	27
	BELGAUM DIVISION	**82.24**	**2097425**	**33**	**620474**	**31**
8	Belgaum	78.17	656794	34	199702	34
9	Bijapur	107.77	362506	37	85824	31
10	Bagalkote	103.18	280210	34	72563	31
11	Dharwad	87.96	245515	34	80273	28
12	Gadag	92.62	149930	32	47858	27
13	Haveri	106.03	215443	33	66771	31
14	Uttara Kannada	39.99	187027	24	67483	33
	GULBARGA DIVISION	**105.92**	**1645242**	**41**	**338659**	**31**
15	Bellary	106.57	350563	39	80489	34
16	Bidar	68.30	303613	36	73211	26
17	Gulbarga	104.25	506248	43	84260	28
18	Raichur	126.42	278795	48	54051	43
19	Koppal	125.19	206023	40	46648	32
	MYSORE DIVISION	**65.85**	**1484265**	**27**	**563737**	**29**
20	Chikmagalur	94.79	140207	23	48593	27
21	Dakshina Kannada	57.68	252716	32	103975	32
22	Udupi	43.51	130467	27	57564	29
23	Hassan	90.30	207327	22	79051	27
24	Kodagu	84.96	68017	26	25857	27
25	Mandya	90.78	204878	25	84104	30
26	Mysore	71.63	361257	29	125396	27
27	Chamarajanagar	90.55	119396	30	39197	34
	STATE	**77.48**	**7826444**	**31**	**2411646**	**27**

Socio Economic Development indicators - District wise

SL NO	District	No of Polytechnic Colleges 2006-07	No of Allopathic Hospitals/ Dispensaries Per Lakh of Population (Including Primary Health Centers) 2006-07	No of Beds in Allopathic Hospitals/ Dispensaries Per Lakh of Population (including Primary Health Centers) 2006-07	Total Fertility Rate 2001 Census	% of Children Having Complete Immunization 2007
		57	58	59	60	61
	BANGALORE DIVISION	**89**	**5**	**108**		
1	Bangalore	57	3	137	1.9	100.00
2	Bangalore (Rural)	4	6	62	2.2	100.00
3	Chitradurga	3	6	96	2.3	100.00
4	Davangere	3	6	107	2.4	91.50
5	Kolar	9	5	104	2.5	88.81
6	Shimoga	7	7	117	2.0	98.85
7	Tumkur	6	5	78	2.2	84.31
	BELGAUM DIVISION	**33**	**4**	**76**		
8	Belgaum	10	4	63	2.7	98.88
9	Bijapur	4	4	79	3.0	99.20
10	Bagalkot	2	4	55	3.1	100.00
11	Dharwad	7	2	118	2.5	75.48
12	Gadag	3	4	58	2.6	99.61
13	Haveri	2	6	61	2.6	98.84
14	Uttara Kannada	5	7	113	2.2	94.46
	GULBARGA DIVISION	**25**	**4**	**88**		
15	Bellary	7	5	111	3.1	98.83
16	Bidar	4	4	87	3.4	88.15
17	Gulbarga	9	5	89	3.5	90.27
18	Raichur	2	4	75	3.3	89.19
19	Koppal	3	4	66	3.4	98.40
	MYSORE DIVISION	**32**	**3**	**120**		
20	Chikmagalur	3	9	125	1.9	100.00
21	Dakshina Kannada	6	5	100	1.7	95.18
22	Udupi	3	7	89	1.5	97.30
23	Hassan	3	8	120	1.9	85.84
24	Kodagu	2	9	240	2.0	97.47
25	Mandya	3	7	105	1.9	100.00
26	Mysore	11	6	143	2.1	93.36
27	Chamarajanagar	1	6	89	2.0	87.80
	STATE	**179**	**5**	**99**	**2.4**	**94.96**

Socio Economic Development indicators - District wise

SL NO	District	% of Women Who Having Safe Delivery 2007	% of Women Adopting Spacing Method of Family Planning 2007	%of Women Having Aware-ness about HIV/ AIDS 2007	Gender Development Index 2005	Human Development Index 2005	Percentage of Rural Households Below Poverty Line 2006-07
		62	63	64	65	66	67
	BANGALORE DIVISION						**22.57**
1	Bangalore	98.50	10.93	83.2	0.73	0.75	22.00
2	Bangalore (Rural)	94.00	9.43	66.7	0.64	0.65	22.97
3	Chitradurga	86.44	7.94	65.8	0.62	0.63	19.08
4	Davangere	84.28	6.81	83.6	0.62	0.64	20.92
5	Kolar	83.77	9.98	57.7	0.61	0.63	30.66
6	Shimoga	92.50	9.90	77.2	0.66	0.67	17.03
7	Tumkur	88.87	10.91	62.0	0.62	0.63	21.64
	BELGAUM DIVISION						**27.84**
8	Belgaum	89.11	10.46	81.4	0.64	0.65	24.69
9	Bijapur	74.19	10.27	74.0	0.57	0.59	24.79
10	Bagalkote	74.29	9.42	76.8	0.57	0.59	29.82
11	Dharwad	89.08	10.51	59.2	0.63	0.64	16.15
12	Gadag	78.98	8.91	74.1	0.63	0.63	19.12
13	Haveri	80.34	8.17	44.2	0.60	0.60	38.44
14	Uttara Kannada	92.07	6.76	80.3	0.64	0.65	40.31
	GULBARGA DIVISION						**37.90**
15	Bellary	55.55	5.88	66.3	0.61	0.62	24.29
16	Bidar	78.58	5.24	56.7	0.57	0.60	17.19
17	Gulbarga	54.11	6.31	50.1	0.54	0.56	48.88
18	Raichur	59.15	4.69	37.7	0.53	0.55	53.35
19	Koppal	56.39	3.65	41.4	0.56	0.58	33.15
	MYSORE DIVISION						**28.96**
20	Chikmagalur	93.35	9.12	77.7	0.64	0.65	48.69
21	Dakshina Kannada	99.11	8.11	74.7	0.71	0.72	17.84
22	Udupi	98.75	7.26	88.5	0.70	0.71	24.14
23	Hassan	93.86	8.33	76.4	0.63	0.64	30.69
24	Kodagu	91.47	9.79	89.2	0.69	0.70	25.68
25	Mandya	95.37	6.70	72.2	0.59	0.61	17.81
26	Mysore	96.15	8.99	71.3	0.61	0.63	33.21
27	Chamarajanagar	89.31	8.87	60.0	0.56	0.58	38.86
	STATE	**83.34**	**8.65**	**68.7**	**0.64**	**0.65**	**28.51**

Population 2001 census

Districts having highest values

NAME	VALUE
1. BANGALORE	6537124
2. BELGAUM	4214505
3. GULBARGA	3130922
4. MYSORE	2641027
5. TUMKUR	2584711

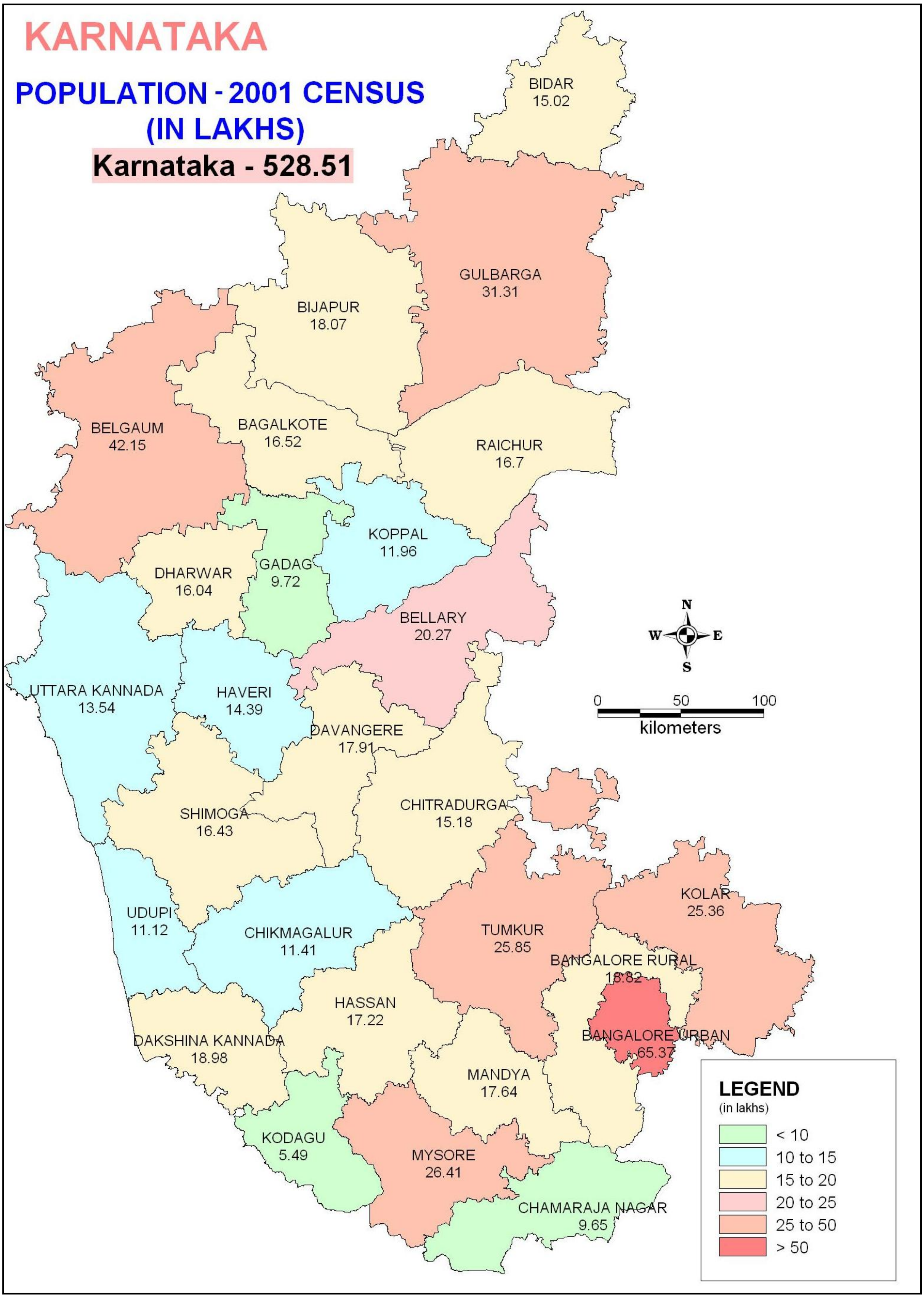
Districts having lowest values

NAME	VALUE
1. KODAGU	548561
2. CHAMARAJANAGAR	965462
3. GADAG	971835
4. UDUPI	1112243
5.CHICKMAGALUR	1140905

Inter Divisional position

DIVISIONS	RANK	VALUE
1. BANGALORE	I	18490811
2. BELGAUM	II	13042163
3. MYSORE	III	11791302
4. GULBARGA	IV	9526286

Source: Census of India 2001


KARNATAKA
POPULATION - 2001 CENSUS
(IN LAKHS)
Karnataka - 528.51
BIDAR 15.02
GULBARGA 31.31
BIJAPUR 18.07
BELGAUM 42.15
BAGALKOTE 16.52
RAICHUR 16.7
KOPPAL 11.96
GADAG 9.72
DHARWAR 16.04
BELLARY 20.27
UTTARA KANNADA 13.54
HAVERI 14.39
DAVANGERE 17.91
CHITRADURGA 15.18
SHIMOGA 16.43
UDUPI 11.12
CHIKMAGALUR 11.41
TUMKUR 25.85
KOLAR 25.36
BANGALORE RURAL 18.82
BANGALORE URBAN 65.37
HASSAN 17.22
DAKSHINA KANNADA 18.98
MANDYA 17.64
KODAGU 5.49
MYSORE 26.41
CHAMARAJA NAGAR 9.65
N
W
E
S
0
50
100
kilometers
LEGEND
(in lakhs)
< 10
10 to 15
15 to 20
20 to 25
25 to 50
> 50

Total literacy in percentage
2001 Census

Districts having highest values

NAME	VALUE
1. DAKSHINA KANNADA	83.37
2. BANGALORE	82.97
3. UDUPI	81.21
4. KODAGU	77.80
5. UTTARA KANNADA	76.58

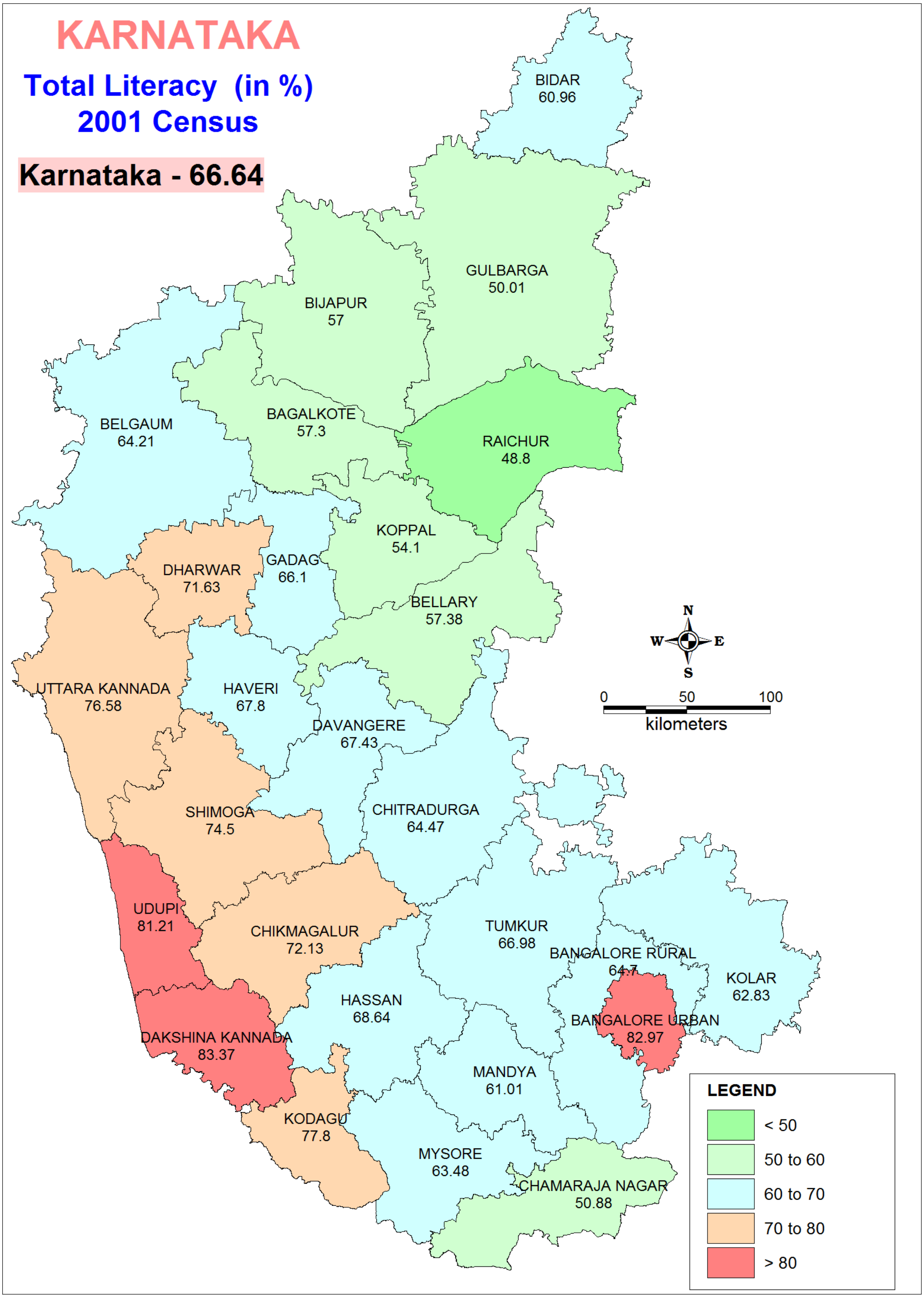
Districts having lowest values

NAME	VALUE
1. RAICHUR	48.80
2. GULBARA	50.01
3. CHAMARAJNAGAR	50.88
4. KOPPAL	54.10
5. BIJAPUR	57.00

Inter Divisional position

DIVISIONS	RANK	VALUE
1.BANGALORE	I	72.36
2.MYSORE	II	69.22
3.BELGAUM	III	65.14
4.GULBARGA	IV	53.63

Source: Census of India 2001



KARNATAKA

Total Literacy (in %) 2001 Census

Karnataka - 66.64

Assessment of the status of Traditional Water Harvesting Systems (Kalyanis) in different Agro-climatic zones of Karnataka State using Geospatial Technologies

Preamble

The main objective of this study is to ascertain the geo-hydrological and physical status of Kalyanis, the Traditional Water Harvesting structures, which used to store rain water for domestic use in various villages in Karnataka. Most of the Kalyanis have become dump yards and become invariably orphans resulting into the decline in their potentials. The temple tanks too which enjoyed protection from humans because of attracted religious sanctity have disappeared in course of time.

It is in the context of the relevance of fostering Traditional Rain Water Harvesting systems (TWHS), an emphasis laid on the physical assessment and technical evaluation of the performance of the existing structures and scientific revival of these traditional rain water harvesting structures is essential so as to enhance the possibility of such sources to address the water scarcity facing by an ever growing population. In most of the taluks in the state, the ground water level has dropped to 700-800 feet. With the depletion of ground water level comes the problem of drinking water. As the water level drops Fluoride contamination becomes greater. Fluoride contamination is found to be more in majority of the villages comes under this watershed region of the district.

It is in this context that the importance of Kalyanis, traditional water harvesting systems comes into play in the watershed area. With this backdrop, a detailed study has been undertaken to assess their physical, geo-hydrological status along with the assessment of water quality using Geospatial technologies in Tumkur, Hassan and Bagalkot districts representing 3 different Agro-climatic zones in the State.

The study concludes that, out of around 650 Kalyanis selected for Survey, only 15% of Kalyanis are in good condition and are under use. More than 55% of Kalyanis are not under use and they are in bad condition without water. Around 30% of Kalyanis are polluted with physical and chemical components having more than permissible limits which require proper measures for restoration. Various scientific interventions have also been provided to restore and rejuvenate these water bodies. The study would be a gateway for further exploration of surface water and groundwater in the watershed area.

Key words: Traditional Water Harvesting systems (TWHS), Geo-spatial Technology, Rejuvenation, Polysense Aqua and Interventions

Introduction

Kalyanis are traditional tanks, which used to store rain water for domestic use such as drinking, bathing, washing. These are ponds paved with stones on the banks and gradually sloping towards the centre. The water is thus in contact with soil only for half its area. Kalyanis constructed near temples called Pushkaranis plays very important role in socio-religious and cultural activities of Indian tradition and as a storage reservoir to supply water for temples. Apart from the sanctity attached to them, these ponds helps to recharge the wells in and around the area. That was one of the reasons for the ancient rulers to allot funds for their maintenance.

Traditionally, where the rainfall was relatively low, every effort was made to retain all the water that fell on the ground through appropriate water retention and conservation strategies such as Kalyanis, temple tanks and ponds. Traditionally, Kalyanis seem to have played three hydraulic roles:

- As a storage reservoir to store rain water for domestic use and as source of waters supply for houses and temples.
- As a storage, which acted as insurance against low rainfall periods and also recharges groundwater in the surrounding area.

- As a flood control measure, preventing soil erosion and wastage of runoff water during the period of heavy rainfall and
- As a device which was crucial to the overall eco-system.

Rampant exploitation of ground water, indiscriminate digging of bore wells and drying up of traditional water sources have led to a water crisis in most of the taluks in the state. The water table is dipping a meter deeper with each passing year. On an average about 90% of rural population in the state is dependent on ground water for their daily needs. According to Department of Mines and Geology, GOK around 85 taluks have been identified as ground water scarce regions and most of the taluks are categorized as a dark zone in the selected districts. It is in this context that the importance of Kalyanis, traditional water harvesting systems comes into play in the watershed area. Most of the Kalyanis have gone dry because of low rainfall and Ground water exploitation and also been neglected by the community.

Objectives

The primary objectives of this study are as follows:

- To survey and map the location of Kalyanis using GPS technology
- To create the digital database both spatial & non spatial database on various parameters and Geo-tag the present photographs using Geospatial technology.
- To Assess the present status and storage capacity
- To ascertain the water quality which involves the analysis of physio-chemical parameters of water quality for different uses
- To provide scientific remedial measures for rejuvenation based on its location, Physical status, quality and usage.

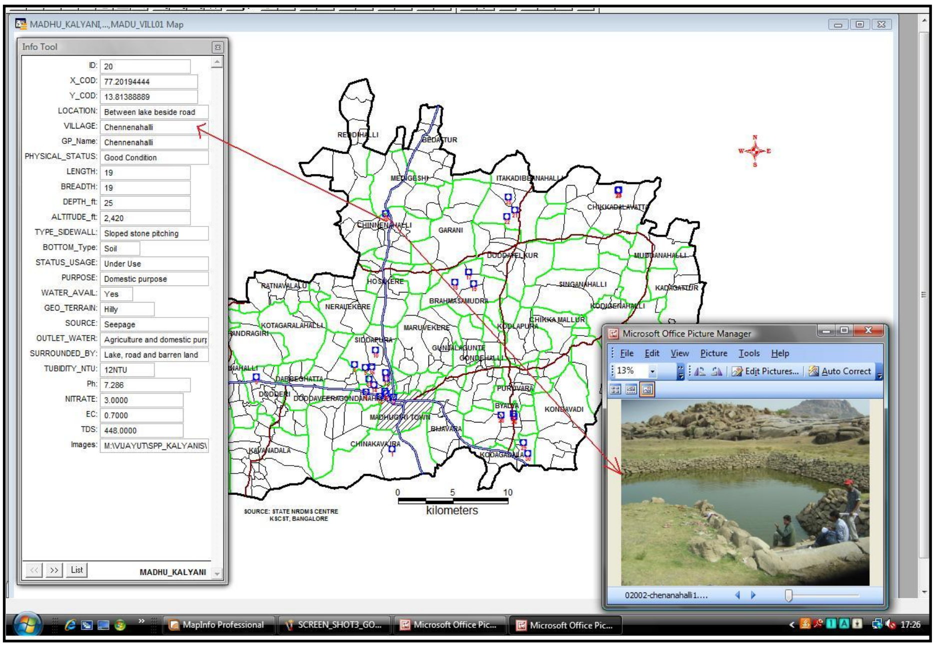
Methodology

As part of assessing the status of surface water bodies in the watershed area, attempts have been made to study the present physical status of all Kalyanis in the area. Field survey was under taken by physically inspecting all Kalyanis in the watershed area using GPS and other instruments. The following methodology has been adopted to map the geographical location of these water bodies in GIS environment.

- Collection of secondary data on location of Kalyanis in the study area from Panchayath raj Institutions
- Physical visit of Kalyanis in the study area and interacting with locals to get details
- Collecting the primary data of Kalyanis such as its location, Structure details, Physical status, water availability
- Surveying and Capturing the geographical location of Kalyanis using GPS
- Mapping the location of Kalyanis in GIS environment
- Creation of digital database on both spatial and non spatial data of the Kalyanis
- Geo-tagging of photographs using Geospatial technologies as shown in figure no.1&2
- Linking, integration and Superimposition of different layers for Analysis- Drainage, Soil, Land use/Land cover, etc as shown in Fig nos 3,4,5 and 6.
- Tested the water quality of Kalyanis where there is water using Poly sense Aqua developed IIT, Bombay which measures p^H, TDS, Nitrate, Electrical conductivity, Iron and fluorides.
- Analysed and categorized the Kalyanis based on their physical status, functionality, type of usage and water availability as shown in fig no.7
- Analysed and categorized the Kalyanis based on water quality parameters on p^H, TDS, Nitrate, Iron, EC and Fluoride as shown in fig no.8
- Scientific remedial measures have been suggested based on the results obtained on physical status, water storage capacity, water availability and water quality

Data used:

- Topographical Maps: 1:50,000 scale maps prepared by the Survey of India were collected from State NRDMS Centre, KSCST, Bangalore.
- Surface water bodies map with Road network maps from Survey of India and PWD, Bangalore
- Thematic maps like Soil, Slope, Geology, LU/LC, Hydro-geomorphology and Administrative boundary maps from District NRDMS centre, ZP Tumkur/Hassan/Bagalkot and State NRDMS Centre, KSCST, IISc, Bangalore.
- Statistical data collected from respective DSO Offices and District NRDMS centres.
- Ground water data from Mines and Geology, GOK/CGWB, Bangalore.



ID: 20
X_COD: 77.20194444
Y_COD: 13.81388889
LOCATION: Between lake beside road
VILLAGE: Chennenahalli
GP_Name: Chennenahalli
PHYSICAL_STATUS: Good Condition
LENGTH: 19
BREADTH: 19
DEPTH_ft: 25
ALTITUDE_ft: 2,420
TYPE_SIDEWALL: Sloped stone pitching
BOTTOM_Type: Soil
STATUS_USAGE: Under Use
PURPOSE: Domestic purpose
WATER_AVAIL: Yes
GEO_TERRAIN: Hilly
SOURCE: Seepage
OUTLET_WATER: Agriculture and domestic purp
SURROUNDED_BY: Lake, road and barren land
TUBIDITY_NTU: 12NTU
Ph: 7.286
NITRATE: 3.0000
EC: 0.7000
TDS: 448.0000
Images: M:\VIJAYUTI\SPP_KALYANIS\

Fig.1 Geo-tagging of Location of Kalyanis

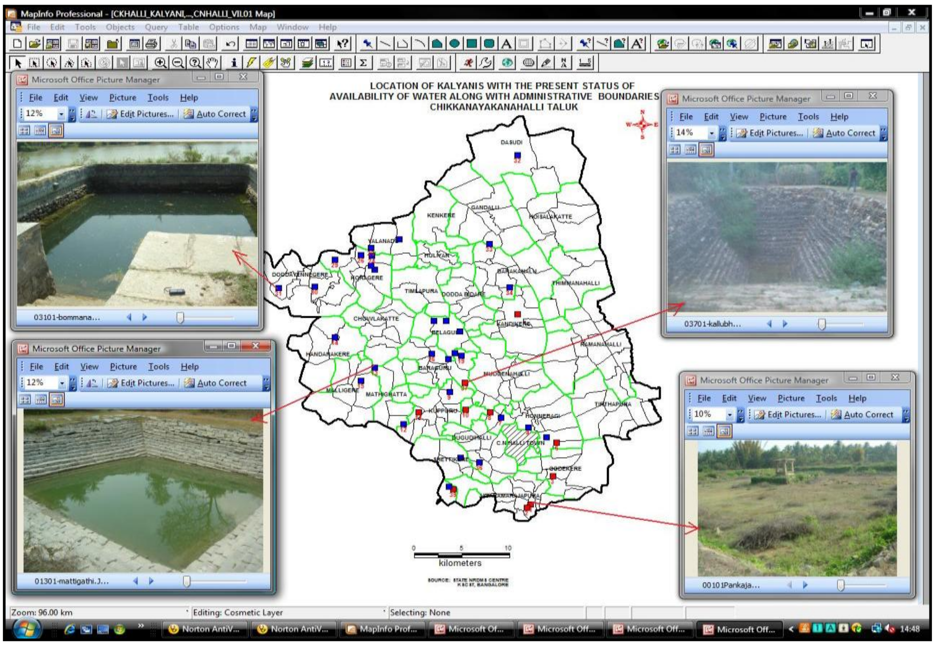


Fig.2 Location of Kalyanis with their physical status

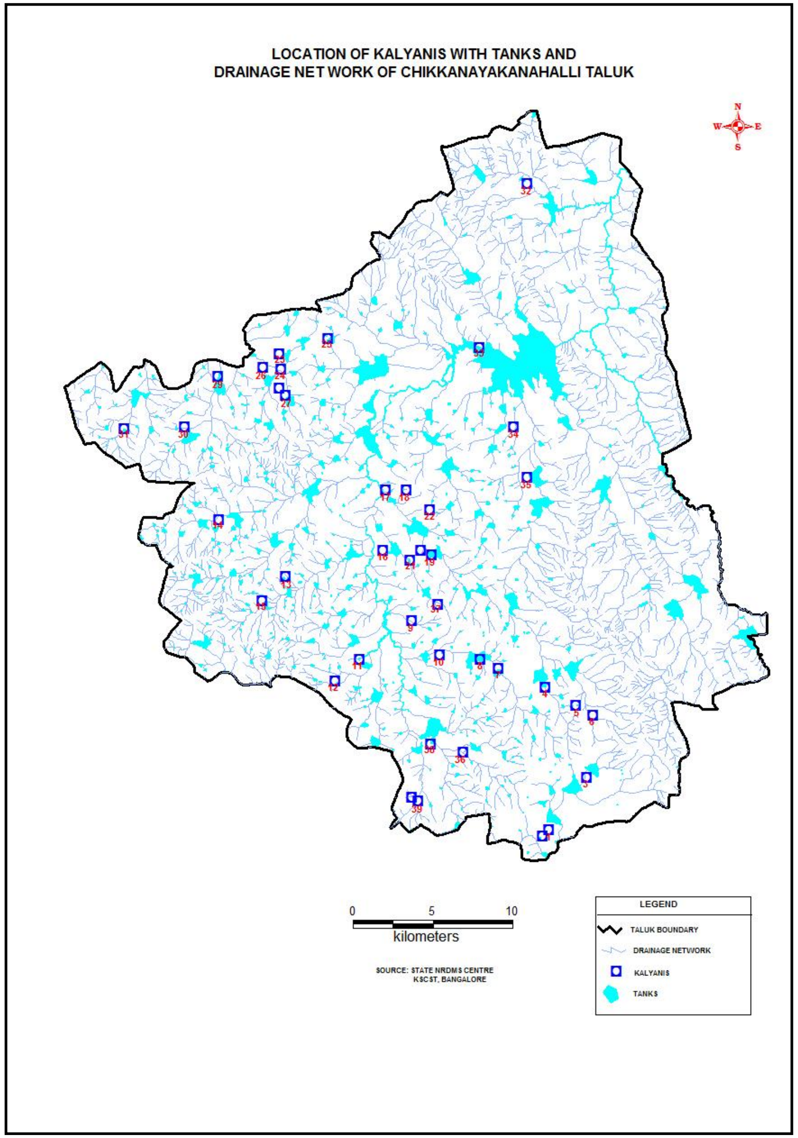


Fig.3 Kalyanis superimposed on Drainages with Tanks

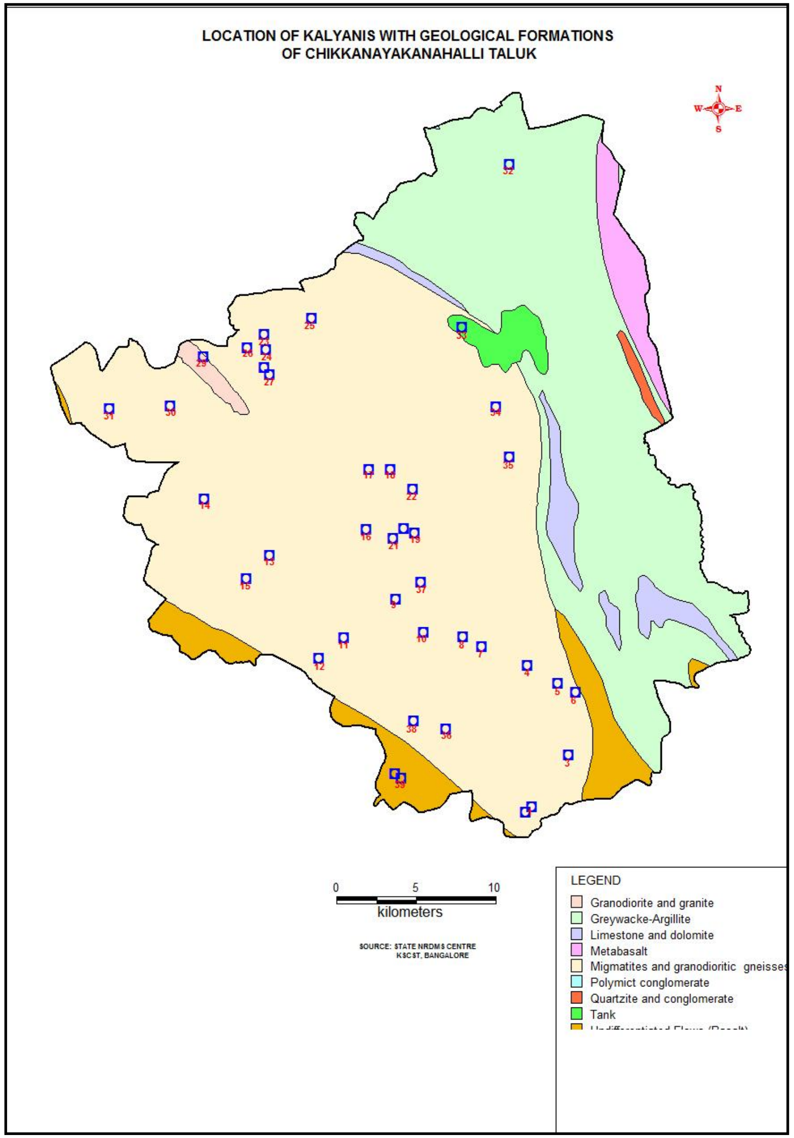


Fig.4 Kalyanis superimposed on Geological formation

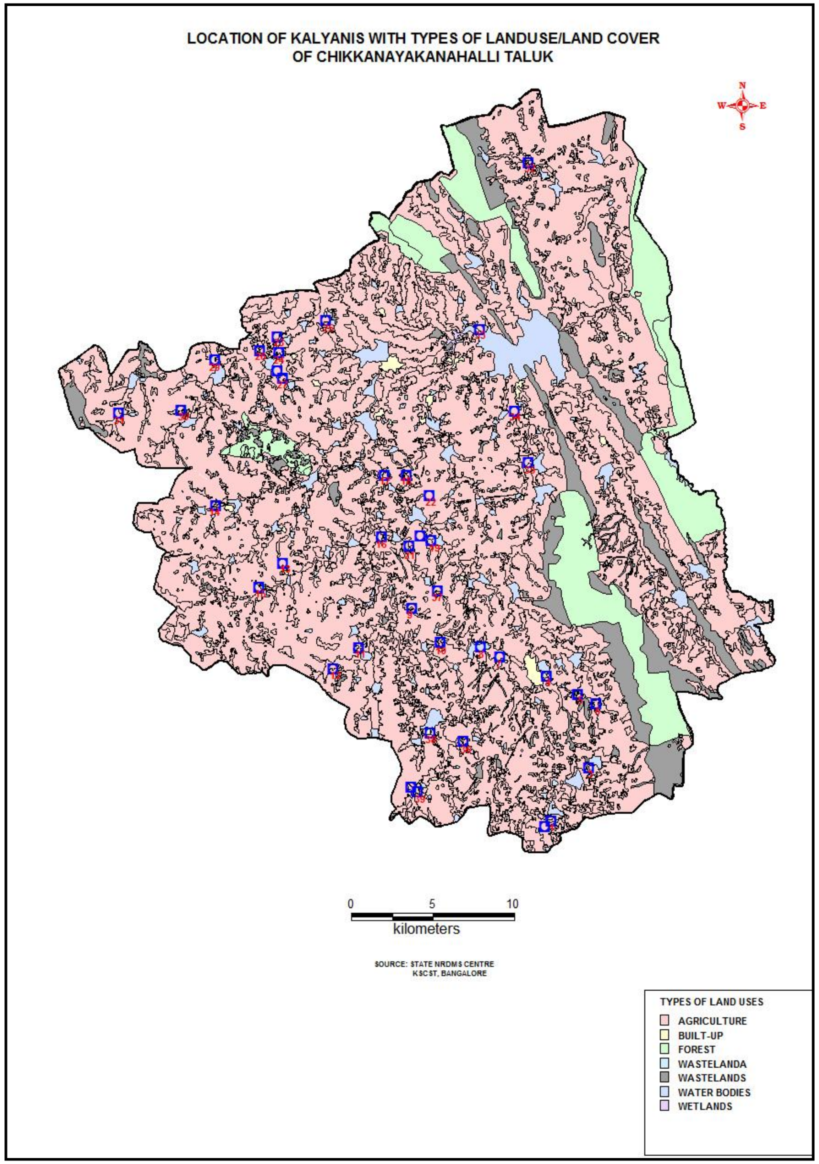


Fig.5 Kalyanis superimposed on Land use/Land cover

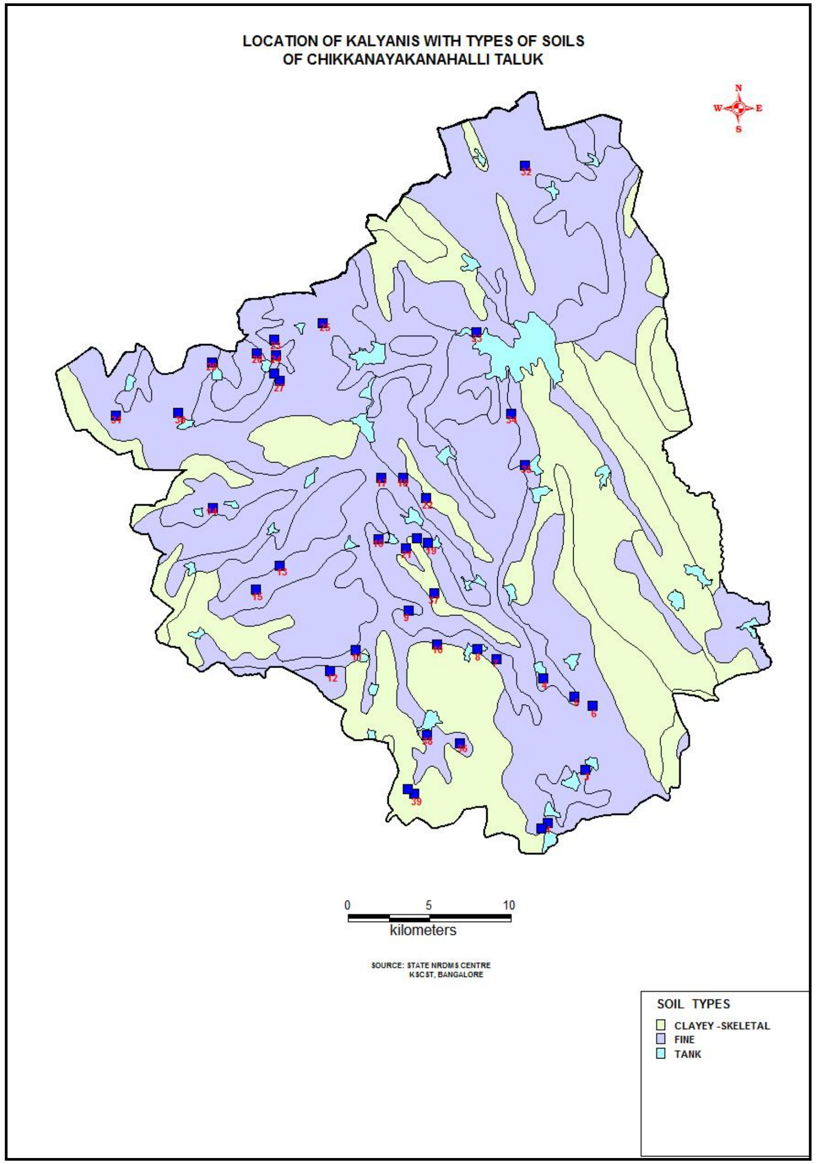


Fig.6 Kalyanis superimposed on Types of Soil

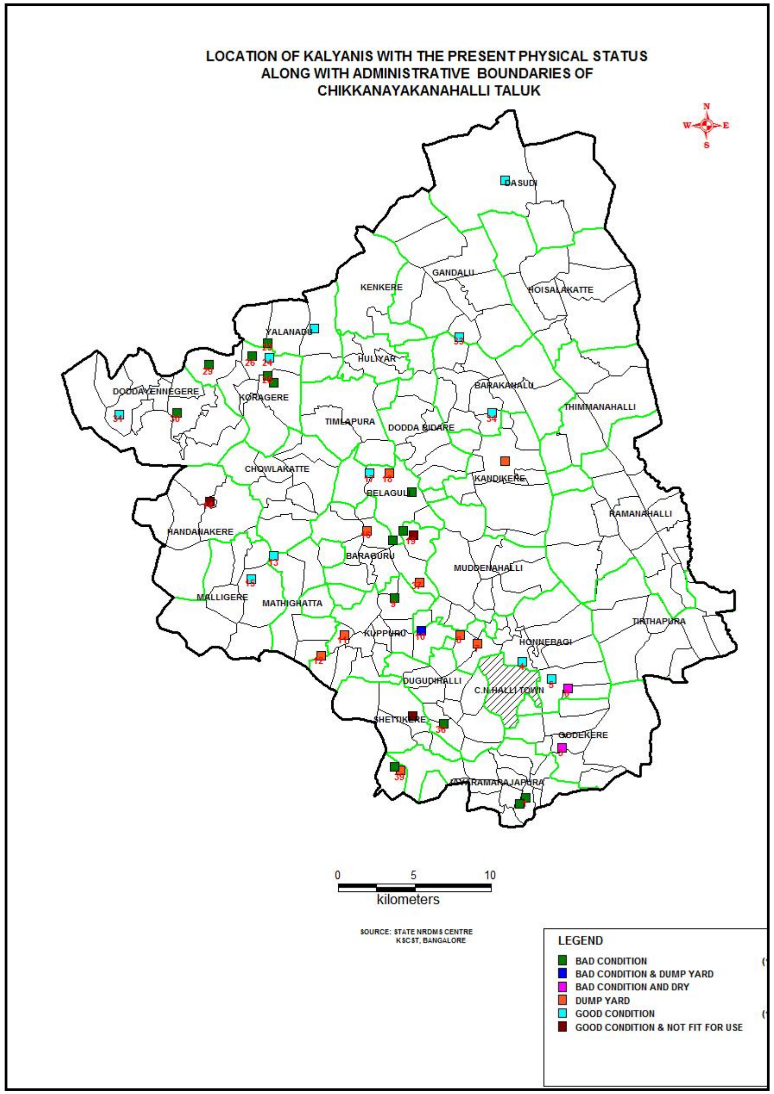


Fig.7 Physical status of Kalyanis

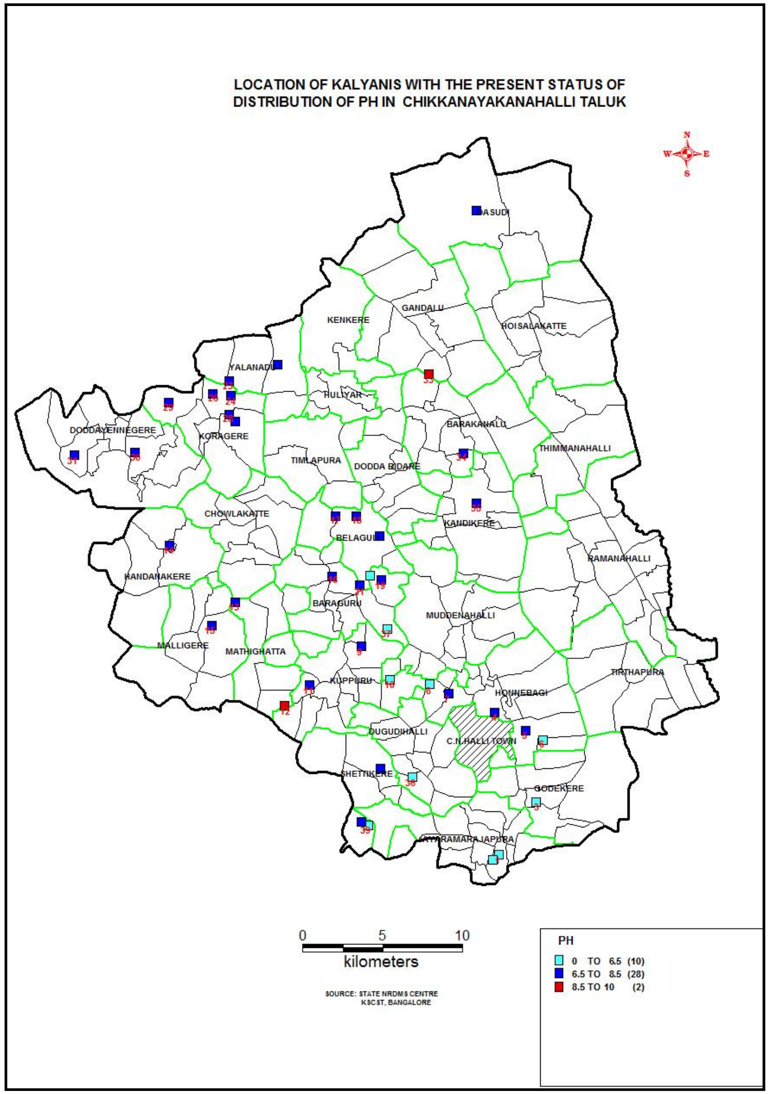


Fig.8 Distribution of p^H

Fig.9 Physical survey of Kalyani

Fig.10 Water quality test using Polysense Aqua

Conclusions

The study concludes that, out of around 650 Kalyanis selected for Survey, only 15% of Kalyanis are in good condition and are under use. More than 55% of Kalyanis are not under use and they are in bad condition without water. Around 30% of Kalyanis are polluted with physical and chemical components having more than permissible limits which require proper measures for restoration.

Scientific measures for Rejuvenation

Based on the conclusions drawn on the status of Kalyanis in the area, some of the following scientific remedial measures have been suggested based on their physical status and quality of water.

- Clean the inlet and outlet channels and bail out contaminated water
- Remove the weeds, Alga, garbage, bushes and slush formed in Kalyanis
- De-silting, spreading of clay and sand in the bottom of Kalyanis
- Repairing of steps, side walls, side pitching and parapet wall wherever necessary based on its physical status as mentioned in the table
- Rearing of fish in some Kalyanis to enhance the aquaculture
- Community should start using the water for domestic use, secondary purposes in order to avoid the stagnation of water in the body
- Regular maintenance and cleaning of the water body is important to realize the importance of traditional water harvesting system
- Since most of Kalyanis have become dry due to depletion of ground water table provision should be made to allow the runoff and surface water flow during rainy season to these water bodies
- Rain water harvesting system should be adopted to fill these water bodies
- Panchayath Raj Institutions and community should own up the Kalyanis for proper maintenance and security

Geospatial Databases for Urban Planning – Mysore Urban Development Authority (MUDA)

Introduction

The planning for a region or state or nation needs detailed information on various elements of natural resources, infrastructure and other related socio-economic parameters. It is a fact that a lot of data related to natural resources already exists in a scattered form at many places in the government departments and are not easily available in a consolidated manner when needed by the planners. The planning based on proper and equitable distribution requires optimal management of natural resources. Therefore, attempts are required to produce data from the concerned sources in the standardized formats and put in an appropriate database. The set of activities related to data management on resources, such as data generation, data collection, compilation, storage, retrieval and processing are mutually interacting and inter-dependent, which naturally opens up the option of management as a system.

Resource and Infrastructure management is a pre- requisite to sustainable development. The process and practice of resource/ infrastructure management are being decentralized to the Panchayath Raj Institutions (PRIs) /Urban Local Bodies (ULBs) in order to make the related strategies area-specific and responsive to the local aspirations and needs. Through the 73rd /74th Constitutional Amendment, 1992, 29 and 40-odd items have been identified in the Eleventh/Twelfth Schedules for the PRIs/ULBs to frame local development strategies. Framing such strategies being complex and information-intensive, there is a need for providing relevant spatial (geographical maps) and collateral data support to the PRIs/ULBs. Issues like good Governance, Services; and resource/ Infrastructure Management in urban/rural areas require high resolution maps and understanding their inter-dependencies and inter-relationships. Various stakeholders like citizens, Resident Welfare Associations (RWAs); NGOs; business and Industrial houses; civic bodies/ ULBs; governmental agencies; policy-makers etc. need to have access to relevant spatial datasets/ information so as to effectively participate in the process and practice of planning.

In order to provide the required high resolution spatial data support to the workflow/ business processes of different Urban Local Bodies, it is proposed to generate spatial to suit the need of urban planning. Karnataka State Council for Science & Technology has the in-house capacity and expertise to develop a high resolution spatial database to address this need. It is therefore proposed to improve management and decision-making processes in Urban Local Bodies by the help of IT and GIS.

Urban Mapping

Urban mapping encompasses information on urban local bodies, infrastructure details, amenities, identification and linking of property owners etc., The integration of these sets of data would aid the decision making process for systematic urban planning , resource utilization and also aid sustainable development goals. Urban mapping using Total Station and GPS will enable the urban local bodies in planning, visualizing, monitoring, documenting, evaluation, implementation and maintenance of developmental activities, infrastructural facilities and also making quality decision-making. The objective of urban mapping is to identify properties, ownership details, infrastructure and amenities (public/private) in the urban areas to assist ULB’s and all the organizations/agencies serving in the areas of planning and development for sustainable development.

A combination of field survey, GPS (Global Positioning System), Total Station and digital maps/imageries will be used in the preparation of geospatial databases. GIS enables effective and efficient manipulation of spatial and non-spatial data for scientific management of resource and evolve alternative development models for the benefit of local people.

The Council is also willing take up continuous updation of databases through district Natural Resources Data Management System (NRDMS) centre, Mysore. The process of data base generation/updation involves collection of data/information available at various government agencies.

The geospatial database thus prepared, will serve the purpose of providing up-to-date information on the MUDA layouts, infrastructure facilities etc., projected on GIS platform. The Council also in future intends to share the geospatial data among all the users through a web based Geoportal for discovering and accessing data services proposed under Karnataka State Spatial Data Infrastructure (KSSDI) web based geo-portal for easy accessibility and interoperability.

METHODOLOGY

Urban mapping

This Project proposal aims at listing and explaining in brief the works that have to be taken up to build basic spatial information infrastructure in two stages.

I. Preparation of base map and

II. Integration of attribute data

I. Preparation of Base Map

- **TECHNOLOGY TO BE USED**

A combination of field survey and surveying equipments like Global Positioning system (GPS) and Total Station will be used to create the MUDA layouts map with GIS techniques. The survey of habitations includes –

I. Conducting detailed topographic survey for 207 acres of land in Vijayanagar 1st stage, for the following parameters:

- ✓ Layout Boundary
- ✓ Sites
- ✓ Roads
- ✓ Drainages
- ✓ Power Lines
- ✓ Water Supply
- ✓ Other utilities

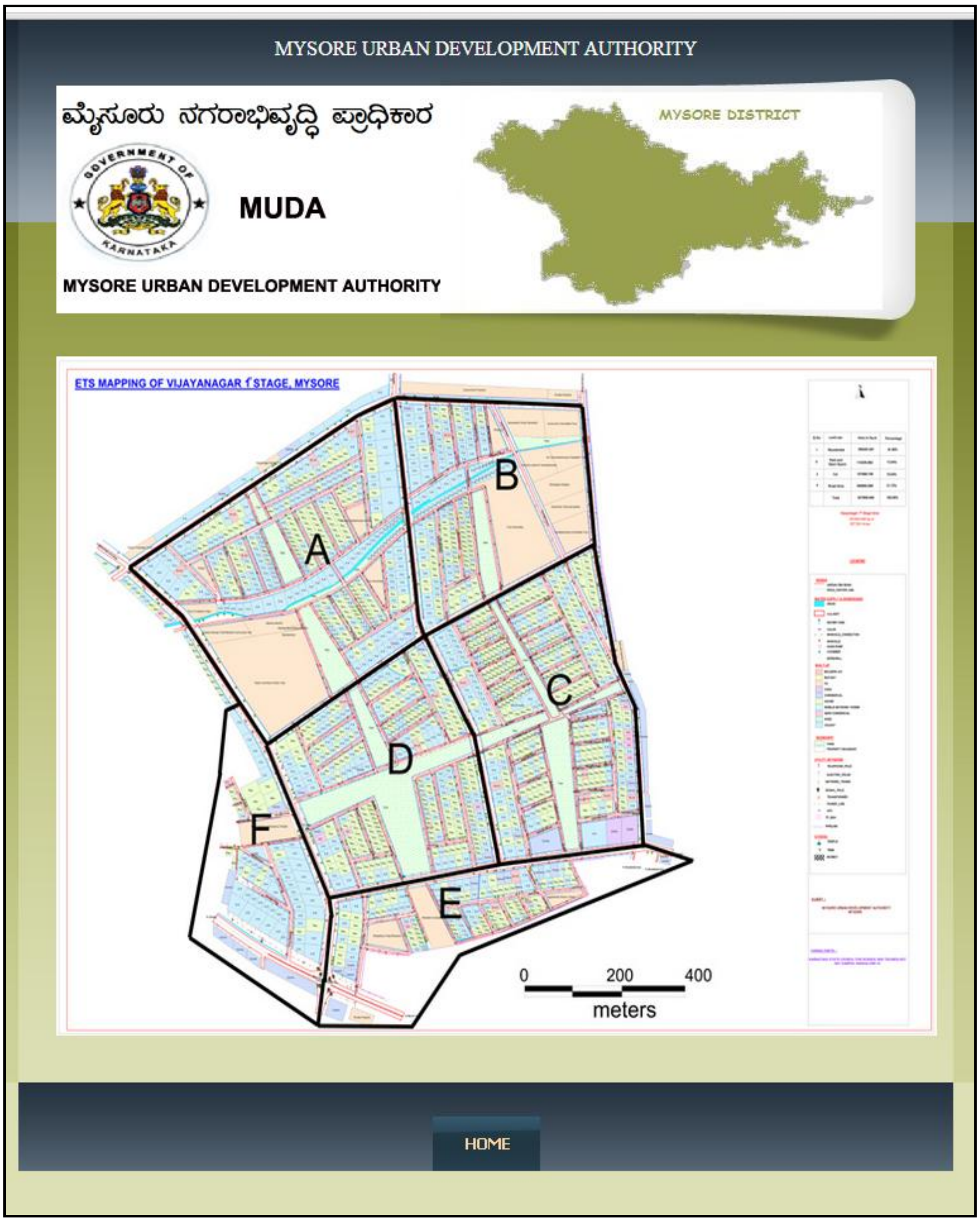
II. Converting the Surveyed Data to GIS Format & Geo - referencing of the same.
III. Attaching the attribute data to the Utilities as required by the client (data will shall be provided by MUDA).
IV. Attaching/Hyper linking of photos of individual plots.
V. Printing of layout in required scale.
VI. Data will be delivered in shape/dxf format.
VII. Hard and soft copies of the geospatial data.
VII. Site details provided by MUDA will linked/incorporated to GIS map.

Preparation of layer wise spatial entities with database:

Field survey using GPS and Total station will be taken up for identifying parcels/properties in the MUDA layouts. Attribute data will be simultaneously collected of the parcels on certain parameters in consultation with the MUDA officials. The survey Team will be assisted by the concerned officials identified by MUDA.

II. Integration of attribute data

Once the spatial data preparation is complete, the attribute data will linked and shared among the user agency. This will encourage the users to make use of the maps for recording information that is relevant to them and also pointing out any modifications that need to be incorporated into the base map. This way the base map can be regularly refined and updated.



MYSORE URBAN DEVELOP

ಮೈಸೂರು ನಗರಾಭಿವೃದ್ಧಿ ಪ್ರಾಧಿಕಾರ

MUDA

MYSORE URBAN DEVELOPMENT AUTHORITY

Resource and Infrastructure Mapping of Gram Panchayaths

Introduction:

The planning for a region or state or nation needs detailed information on various elements of natural resources, infrastructure and other related socio-economic parameters. It is a fact that a lot of data related to natural resources already exists in a scattered form at many places in the government departments and are not easily available in a consolidated manner when needed by the planners. The planning based on proper and equitable distribution requires optimal management of natural resources. Therefore, attempts are required to produce data from the concerned sources in the standardized formats and put in an appropriate database. The set of activities related to data management on resources, such as data generation, data collection, compilation, storage, retrieval and processing are mutually interacting and inter-dependent, which naturally opens up the option of management as a system.

Resource and Infrastructure management is a pre- requisite to sustainable development. The process and practice of resource/ infrastructure management are being decentralized to the Panchayath Raj Institutions (PRIs) /Urban Local Bodies (ULBs) in order to make the related strategies area-specific and responsive to the local aspirations and needs. Through the 73rd /74th Constitutional Amendment, 1992, 29 and 40-odd items have been identified in the Eleventh/Twelfth Schedules for the PRIs/ULBs to frame local development strategies. Framing such strategies being complex and information-intensive, there is a need for providing relevant spatial (geographical maps) and collateral data support to the PRIs/ULBs. Issues like good Governance, Services; and resource/ Infrastructure Management in urban/rural areas require high resolution maps and understanding their inter-dependencies and inter-relationships. Various stakeholders like citizens, Resident Welfare Associations (RWAs); NGOs; business and Industrial houses; civic bodies/ ULBs; governmental agencies; policy-makers etc. need to have access to relevant spatial datasets/ information so as to effectively participate in the process and practice of planning.

Resource & Infrastructure mapping

Resource mapping encompasses information on natural resources related to land, water, forests, minerals, soils etc. and socio-economic information such as demographic data, amenities, infrastructure etc. The integration of these sets of data would aid the decision making process for systematic resource utilization and also aid sustainable development goals. Geospatial databases enable the Gram Panchayaths/Panchayath Raj Institutions (PRIs) in planning, visualizing, monitoring, documenting, evaluation, implementation and maintenance of developmental activities, infrastructural facilities and also making quality decision-making.

The information derived from topomaps and other socio-economic data is stored in GIS as a database. GIS enables effective and efficient manipulation of spatial and non-spatial data for scientific management of resource and evolve alternative development models for the benefit of local people.

The continuous updation of databases is being carried out by district Natural Resources Data Management System (NRDMS) centres with the support and assistance of line departments and data generating agencies in the districts. The process of data base generation/updation involves collection of data/information available at various government departments, research organizations, universities, data generating agencies and Non-governmental organizations.

The Gram Panchayath wise geospatial database thus prepared, will serve the purpose of providing up-to-date information on the available resources and infrastructure facilities. The Council also in future intends to share the geospatial data among all the users through a web based Geoportal for discovering and accessing data services proposed under Karnataka State Spatial Data Infrastructure (KSSDI) web based geo-portal for easy accessibility and interoperability.

METHODOLOGY

The resource and infrastructure mapping includes the following.

I. Preparation of base map and

II. Integration of attribute data

I. Preparation of Base Map

- ✓ **TECHNOLOGY TO BE USED**

A combination of field survey and surveying equipments like Global Positioning system (GPS), satellite imageries and other base layers are used to create the village habitation map with GIS techniques. Derived boundaries such as GP, TP and ZP (Existing with State NRDMS centre) are also be used for preparing the database. The survey of habitations included the following –

- ✓ Parcels (public/commercial/semi-commercial)
- ✓ Roads (category/type)
- ✓ Electric and Telecom installations (poles/transformers),
- ✓ Water pipeline (PWS/MWS/OHT etc),
- ✓ Drainage
- ✓ Preparation of layer wise spatial entities with database:

Field survey using GPS taken up for identifying parcels/properties within the habitation and during filed survey time stamped geotagged photographs are captured for the listed properties identified by Gram Panchayaths. Attribute data was simultaneously collected of the parcels on certain parameters (about 15 parameters) in consultation with the ZP/GP with the support of local agencies. The survey Team was assisted by the Concerned Gram Panchayath Secretary/ Bill Collector and Assistant Engineer/ Junior Engineer identified by Zilla Panchayath.

II. Integration of attribute data

The spatial data captured during the field visit is appropriately linked to the attribute data and shared among the user agency. This encouraged the users to make use of the maps for recording information that is relevant to them and also for requesting any modifications that need to be incorporated into the base map. This way the base map can be regularly refined and updated.

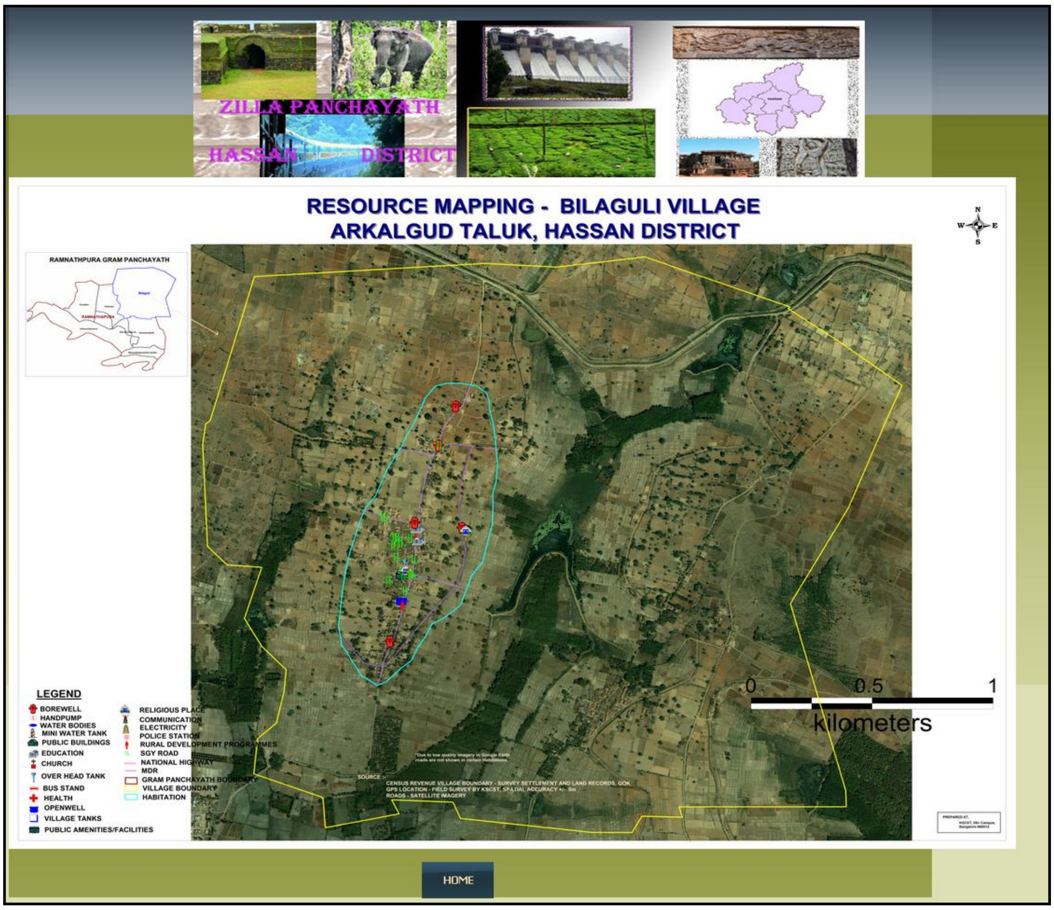
A. Cadastral mapping

The revenue village map (cadastral) provided by the ZP will be digitized and relevant data pertaining to revenue parcels was digitized and integrated with other datasets. Surveying of revenue parcels is not part of this project. The information so generated is used for planning and visualization purpose only.

The Gram Panchayaths were provided with both hard and soft copy (web pages) of resource and infrastructure maps. Few images are provided for reference.

B. Instructions for using web pages:

- ✓ The Map Viewer opens up to a complete view of the particular Gram Panchayath.
- ✓ Clicking on each feature on the map produces a new popup window with a detailed photo and a heading pertaining to the respective feature/object.
- ✓ Each of the Habitations is also separately linked to provide a better view of the different features within the habitations.
- ✓ The features in each habitation are also linked to the appropriate feature details.
- ✓ Clicking on back button at the bottom of each page reverts back to the previous view of the GP layout.

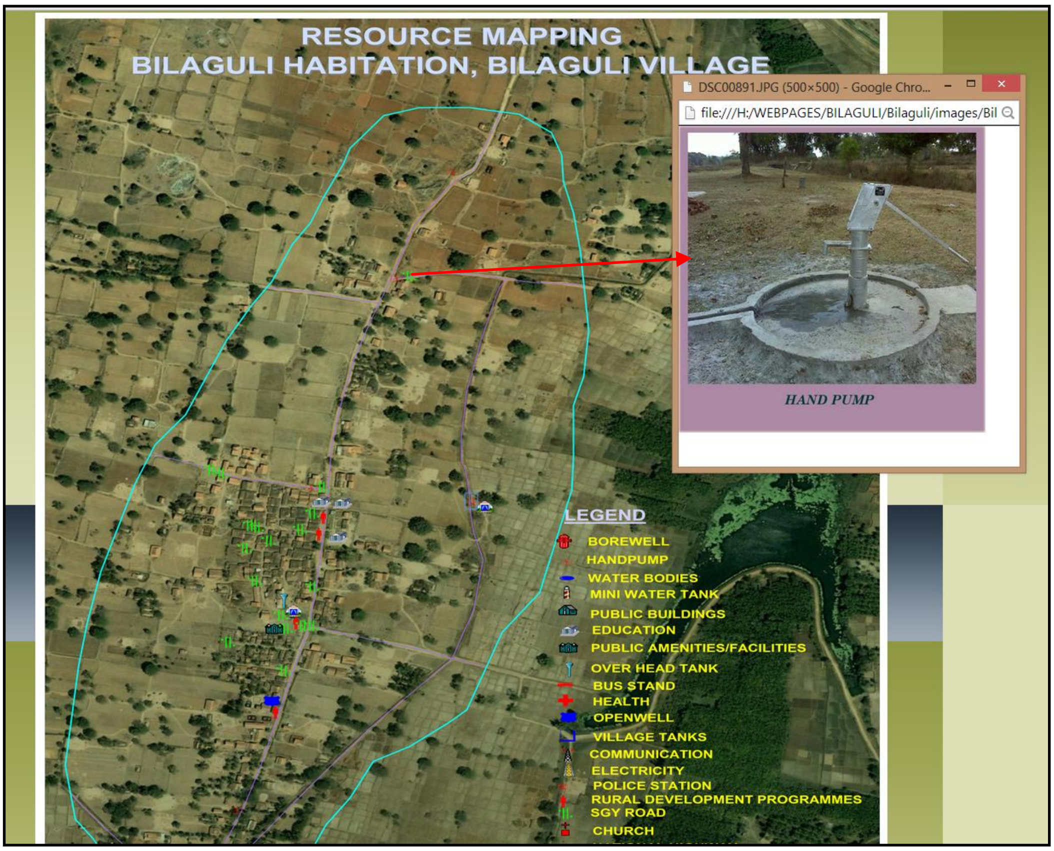


RESOURCE MAPPING - BILAGULI VILLAGE
ARKALGUD TALUK, HASSAN DISTRICT

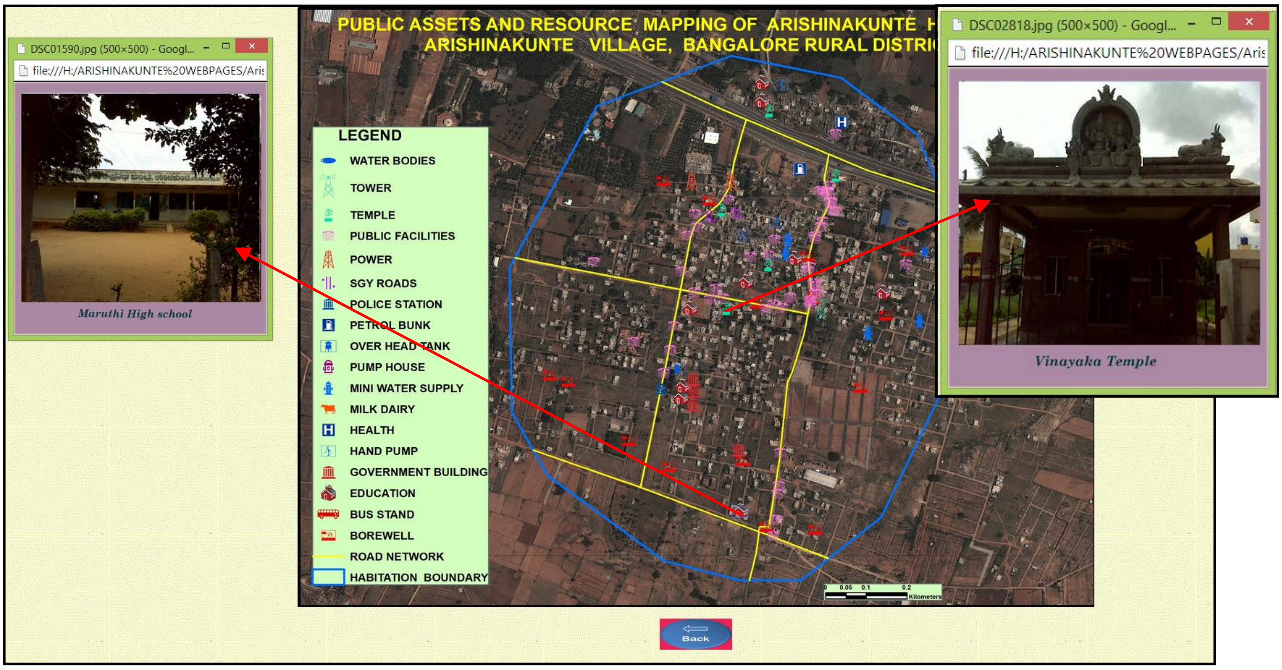
*Due to low quality imagery in Google Earth roads are not shown in certain Habitations.

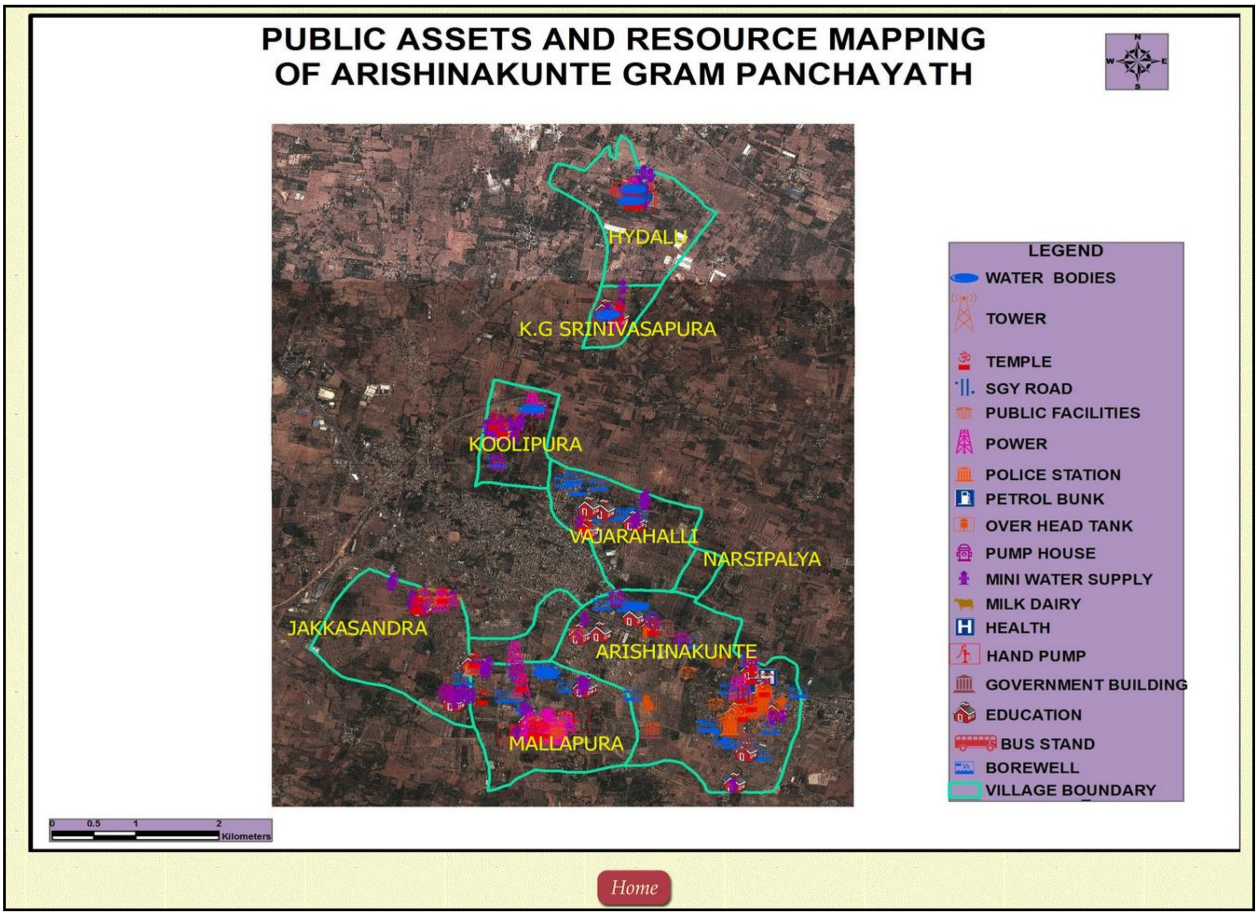
SOURCE :-
CENSUS REVENUE VILLAGE BOUNDARY - SURVEY SETTLEMENT AND LAND RECORDS, GOK
GPS LOCATION - FIELD SURVEY BY KSCST, SPATIAL ACCURACY +/- 5m
ROADS - SATELLITE IMAGERY

PREPARED AT,
KSCST, IISc Campus,
Bangalore-560012



RESOURCE MAPPING
BILAGULI HABITATION, BILAGULI VILLAGE


PUBLIC ASSETS AND RESOURCE MAPPING OF ARISHINAKUNTE H
ARISHINAKUNTE VILLAGE, BANGALORE RURAL DISTRI
LEGEND
WATER BODIES
TOWER
TEMPLE
PUBLIC FACILITIES
POWER
SGY ROADS
POLICE STATION
PETROL BUNK
OVER HEAD TANK
PUMP HOUSE
MINI WATER SUPPLY
MILK DAIRY
HEALTH
HAND PUMP
GOVERNMENT BUILDING
EDUCATION
BUS STAND
BOREWELL
ROAD NETWORK
HABITATION BOUNDARY
0 0.05 0.1 0.2 Kilometers
DSC01590.jpg (500×500) - Googl...
file:///H:/ARISHINAKUNTE%20WEBPAGES/Aris
Maruthi High school
DSC02818.jpg (500×500) - Googl...
file:///H:/ARISHINAKUNTE%20WEBPAGES/Aris
Vinayaka Temple
Back


PUBLIC ASSETS AND RESOURCE MAPPING
OF ARISHINAKUNTE GRAM PANCHAYATH
N
W
E
S
HYDALU
K.G SRINIVASAPURA
KOOLIPURA
VAJARAHALLI
NARSIPALYA
JAKKASANDRA
ARISHINAKUNTE
MALLAPURA
LEGEND
WATER BODIES
TOWER
TEMPLE
SGY ROAD
PUBLIC FACILITIES
POWER
POLICE STATION
PETROL BUNK
OVER HEAD TANK
PUMP HOUSE
MINI WATER SUPPLY
MILK DAIRY
HEALTH
HAND PUMP
GOVERNMENT BUILDING
EDUCATION
BUS STAND
BOREWELL
VILLAGE BOUNDARY
0 0.5 1 2 Kilometers
Home

Divisional Level Training Programs on "Application of Remote Sensing and GIS for Governance"

(Held during August and September, 2013)

Background:

Under a joint project of Natural Resources Data Management System (NRDMS) of Department of Science & Technology, Government of India, and the Government of Karnataka, Karnataka State Council for Science & Technology (KSCST), Bangalore has developed district level GIS databases to support the process of Local Level Planning at the levels of district, taluk and village. Over the past two decade all the thirty districts of Karnataka State have been covered under NRDMS. The NRDMS has been institutionalized in the state, through the Department of Rural Development and Panchayath Raj and is supporting 30 Zilla Panchayaths for implementation of their activities and plans. With increasing dependence of the Zilla Panchayaths/Urban local bodies, Line Departments and other stake-holders of local level planning on spatial datasets, a need has been felt to speed up the process of discovery of and access to up-to-date spatial datasets, the Council with the support DST - GoI and DST – GoK has developed a Geoportal and Data Clearing House to discover/ access spatial data sets useful in the local level planning process through Karnataka State Spatial Data Infrastructure (KSSDI) Project. Karnataka Geo-portal for the benefit of planners and administrators; provides seamless state-wide GIS database on selected layers viz. administrative boundaries, derived boundaries for Panchayath raj institutions for administration, infrastructure maps (on amenities and utilities) etc. The spatial data is free and open to all for viewing-access and discovery.

The KSSDI portal passed preliminary stage of development and was released to users during October, 2009 for portal functionality testing. The release allowed the testing of the portal to undergo usability testing with selected users who provided feedback to the project team. Identified malfunctions were rectified. The Council officially launched Karnataka Geoportal during December, 2009 at the 9th annual event of National Spatial Data infrastructure by the Honourable Minister of State for Science & technology, GOI, Sri. Prithviraj Chavan. The portal was also dedicated to the state of Karnataka in the national event i.e., NSDI-12 meet held in Bangalore.

The Council in the 2nd phase of the Karnataka Geoportal has plans to implement online web map solutions and spatial services such as transactional web feature services (WFS-T), Geo-web services. Geo visualization, publishing meta data (both for data and services), searching and examining spatial data or services etc. An R&D project costing around Rs. 71 lakhs has been sanctioned to KSCST during March, 2013 to develop web based geospatial applications/decision support system for selected schemes of Watershed and Health Departments to support G-governance on Karnataka Geoportal platform. The 2nd phase of KSSDI project is expected to maximize utilization of the Karnataka State Geoportal and to demonstrate the utility of the Geoportal in two identified sectors i.e. Watershed Management and Health. The concept of g-governance i.e., to plan, monitor, review and evaluate several government schemes requiring spatial datasets is planned to be demonstrated on Karnataka Geoportal platform.

In Karnataka, satellite images and GIS have been used from late 1980 onwards and Karnataka was one of the first state to establish, in 1986, a separate Karnataka State RS Utilization Centre – which later was renamed, in 1997, as Karnataka State RS Applications Centre (KSRSAC). In the past 25 years, KSRSAC has brought in a variety of RS and GIS applications for different users and has or ganized a variety of GIS databases for the state – thereby supporting a large number of departments/projects of GOK with valuable maps and GIS data and also being a "focal point" for RS images. As a result of these efforts of KSRSAC, over the past 10 years, use of satellite/aerial images and GIS have proliferated in various departments of GOK - Department of Forests, Town Planning Department, Department of Agriculture, Urban Development Department, various city municipalities and authorities (Bangalore city was one of the first cities to use RS and GIS for urban planning and now Mysore, Hubli, Mangalore and many others adopt GIS), Irrigation Department, Mines and Geology department and many others have been using RS and GIS as part of their projects.

The Karnataka State Natural Disaster Management Centre (KSNDMC) has excellent application and infrastructure in the field of Disaster Management, including early warning and mitigation aspects. KSNDMC collects weather, geological, hydrological data on real time. KSNDMC operates a Master Control Facility, which is supported by a network of 1600 Telemetric Rain Gauges, 200 Satellite and GPRS linked weather stations, 13 Earthquake Monitoring Stations – all of these pumping weather/disaster data on a continuous basis to a centralized GIS database and a web enabled GIS Applications system with modern geo-information processing and real-time communication/delivery systems. In the late 1990s, many private organizations also started providing RS and GIS services to end users.

Purpose and intentions of workshop:

Even though many agencies are providing geospatial services in the state, it is generally seen that the utility of GIS in not profoundly seen in governance. The full potential of GIS technology is yet to be achieved and exploited in the state for decision-support by planners, decision-makers, citizens and many others who are stake holders for governance. Mainly the GIS initiatives have been successful in sporadic cases where individuals have taken interest and lead in a project mode, and GIS is yet to be integrated in governance due to lack of mandate to the departments through policy initiatives. Few other reasons for this situation are (i) lack of easily available and regularly updated GIS-Ready data, and (ii) lack of user friendly GIS apps.

To create awareness and to showcase the potential of web based geospatial technologies, a one-day Divisional Level Training-workshop on Geospatial Technology was held in all the four divisions of Karnataka during August – September, 2013 with the concurrence of Rural Development and Panchayath Raj (RDPR) department. The workshop was primarily aimed at familiarizing geospatial technologies through lectures and with ample usage of case studies. The workshop is expected to help the implementing agencies to understand the importance of GIS and RS for planning and implementation on the field and orient the resource maps with the field conditions. The spatial data for effective implementation of various rural schemes using scientifically prepared action plan maps.

Belgaum Division Training-Workshop

13 August, 2013

The Inaugural function of the first divisional training-workshop was held in the Conference hall of Belgaum Zilla Panchayat, Belgaum on 13th August 2013. The workshop was attended by about 100 officials of PRED engineers of the division and district level officers of Agriculture, Watershed, Mines and Geology, Health, Education, Sericulture, Fisheries and Town Planning Authority.
The inaugural function startred with welcome speech by Mr.R.G.Nayak, Deputy Secretary (Administration) who invited all dignitaries and participants and in his welcome speech he stressed the importance of remote sensing and GIS in current scenario in implementing government work for better governance.

Smt. Deepa Cholan, CEO of Ziila Panchayat, Belgaum inaugurated the function by lighting the lamp and in her addres highlighted the benefits of Remote Sensing and GIS. She informed the district officials to make use of this Training – workshop and expected the particapnts to adopt the technologies in their work to bring in transparency and efficiency in implementation of development works of the government.

Dr. M Prithviraj, Executive Secretary, KSCST in his presidential remark call upon the officials participanting in the workshop to make use of this opportunity and adopt geospatial technologies to plan and minotor government schemes.

After the inaugural function, technical session of the workshop commenced with a brief introduction About Karnataka State Council for Science and Technology by Dr. M Prithviraj, Executive Secretary, KSCST.

Mr. H. Hemanth Kumar Fellow and PI-NRDMS program gave a brief introduction to the training-workshop and the relevance of it in the present scenario. He further informed that RDPR is taking keen interest in adopting geospatial technologies for governance and a feedback at the end of these divisional workshop would help them in identifying the key areas for support.

Dr. A. Perumal, Chair Professor - Sir MV Geospatial Technology Chair, Indian Institute of Science, Bangalore spoke on the journry of Remote Sensing and GIS applications for Natural Resources Management since ISRO's launch remote sensing satellites. He gave a detailed description of ISRO's efforts in popularsing RS and GIS for planning, data processing and application projects in diversified areas. Prof Perumal in his lecture gave more emphasis to utility of RS and GIS for Conservation, development and optimal utilisation of land and water resources for the ultimate benefit of the people.

Mr. H.Hemanth Kumar, in the morning session delved on NRDMS Program; Introduction to maps and data; Geospatial Technologies for Governance followed by applications of Crowd Sourcing and its demonstration. He informed the 73rd and 74th Amendments of the Indian Constitution passed in 1993 emphasized the need for geospatial data for development planning to local level governments or Panchayats. He told that the objective of NRDMS programme was to establish district NRDMS centers in all the districts to develop spatial database and applications that are relevant to planning and administration for "Decentralized Planning" using geospatial technologies. He explained the journey of NRDMS centers, Establishment of NRDMS centers in all the districts, institutionalization of spatial data centers in Karnataka. With the available data he infoirmed the partaicapnts these district spataial data centres have been providing support to ditrict level planning for all the line departments. Several applications developd by the state and district NRDMS centres on health, crime, urban planning, usage of google maps, MI tanks, watershed, fisheries etc were demonstrated during the workshop.
In the afternoon session, Mr. H Hemanth Kumar demonstrated gathering of geospatial information at higher resolution through crowd sourcing concepts apart from providing information on the initiative taken up by the government and the Council in resource mapping; urban and cadastral mapping; use

of google and other public portals in adding value to the existing data for planning and monitoring several government schemes.

In the afternoon session Mr. Anil R. Naik of Uttara Kannada District NRDMS centre highglighted the activities and support provided by his centre to various line departments.

After the technical session there was discussion and interaction session where participants raised their queries which were well addressed by experts.

On behalf of the Zilla Panchayath, Mr. Manjunath Totad proposed the vote of thanks.

The divisional workshop were conducted in other three division with a good number participation of senior officers from line departments and the dates on which they have been conducted is provided under program schedule.

Deliberations & conclusions:

During interaction with the officials of the line departments, the following issues came up and needs to be resolved to successfully adopt geospatial technologies for governance.

a. Desktop/Laptop for all the Group A and Group B officers
b. Periodical training and hand-holding of staff including computer operators in geospatial technologies to
c. Hardware and software (GIS software, computers, Internet, UPS, printers etc.)
d. Directive from the heads of departments to adopt technologies
e. Easily available reliable and updated GIS ready data in centralized server for departments to access
f. GPS instrument for capturing information of all the schemes
g. Technical support in planning, monitoring, review and evaluation

Program Schedule

Divisional Level Training-Workshop on "Application of Remote Sensing and GIS for Governance"

Time	Program Details
10.00 – 10.30 am	Registration
10.30 - 10.50 am	Inauguration
10.50 - 11.00 am	Introduction to the training – Workshop
11.00 - 11.10 am	About Karnataka State Council for Science and Technology
11.10 - 12.10 pm	Basics of GIS and Remote Sensing
12.10 - 01.30 pm	a. Introduction to NRDMS Program b. Introduction to Maps and Data and Geospatial Technologies for Governance
01.30 - 02.30 pm	Lunch
02.30 - 03.15 pm	a. Crowd Sourcing and its demonstration b. Presentation by District Project personnel
03.15 - 04.00 pm	Laser scanning & 3D Modeling of heritage sites and restoration of Kalyanies
04.00 - 04.30 pm	Discussion and Interaction

Divisional training-workshop

Division	Date	Officers Participation
Belgaum	13 August 2013	96
Mysore	23 August 2013	80
Bangalore	06 September 2013	80
Gulbarga	20 September 2013	65

Snaps of Division workshop

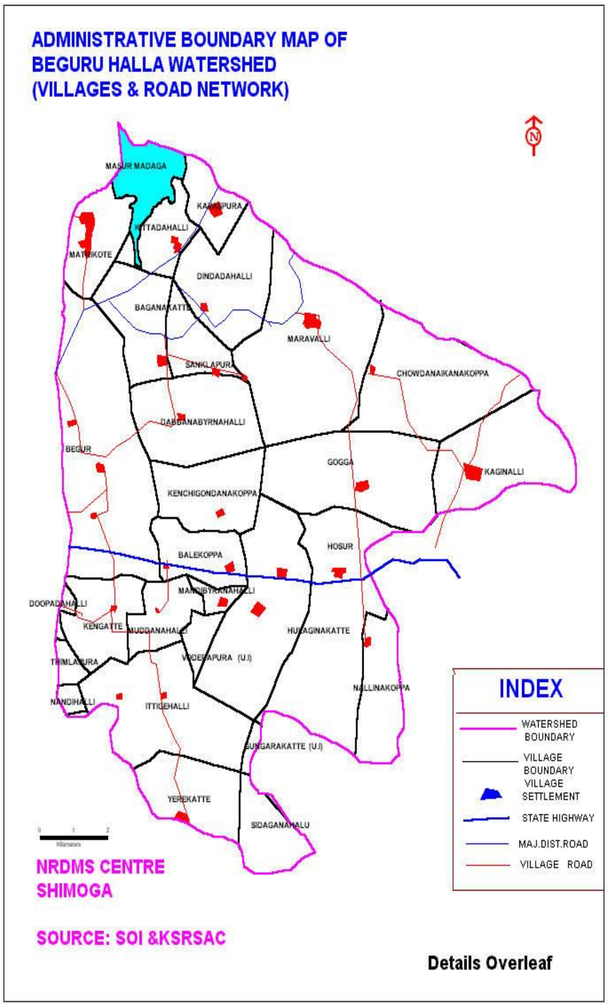
Applications/Maps

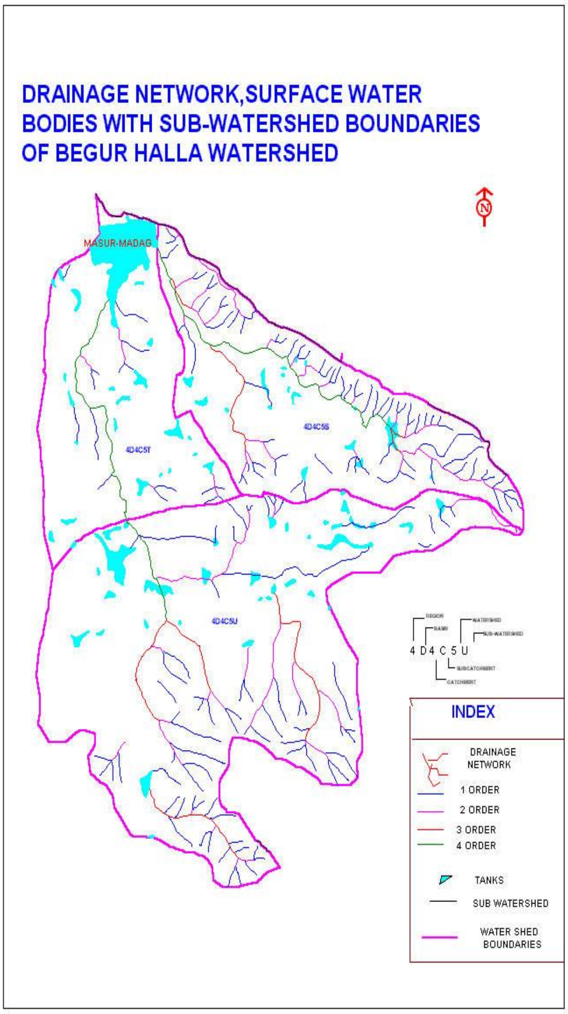
Action Plan for Beguruhalla Watershed in Shikaripura taluk, Shimoga District

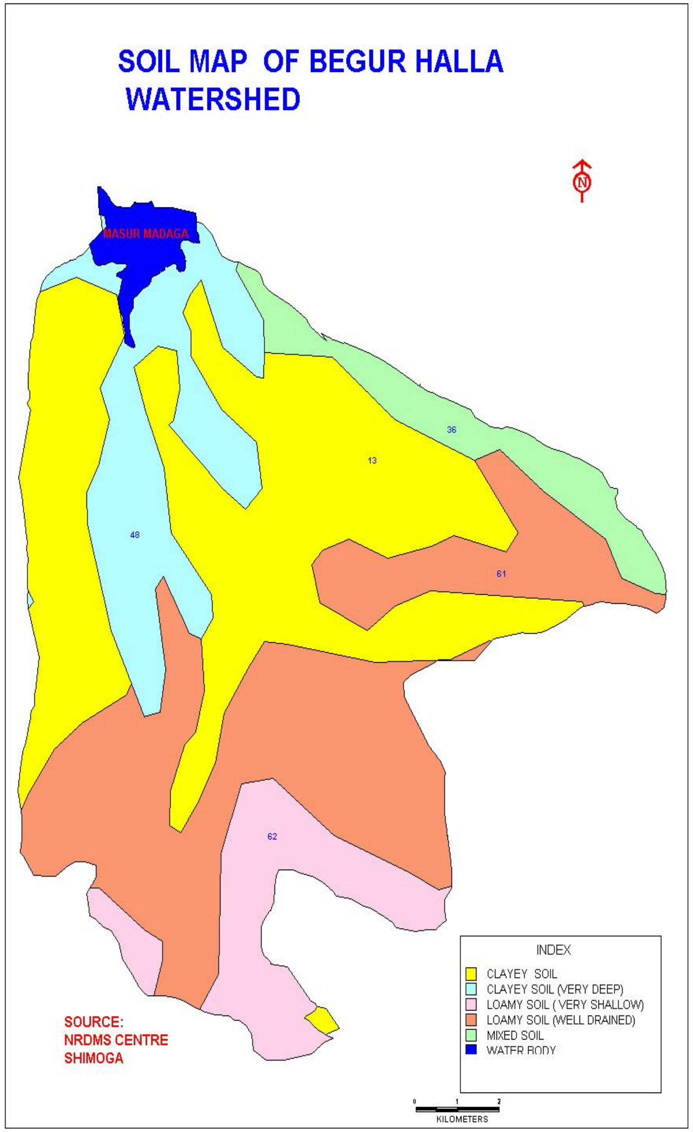
Objective: To prepare action plan for wasteland development, soil and water conservation

Components

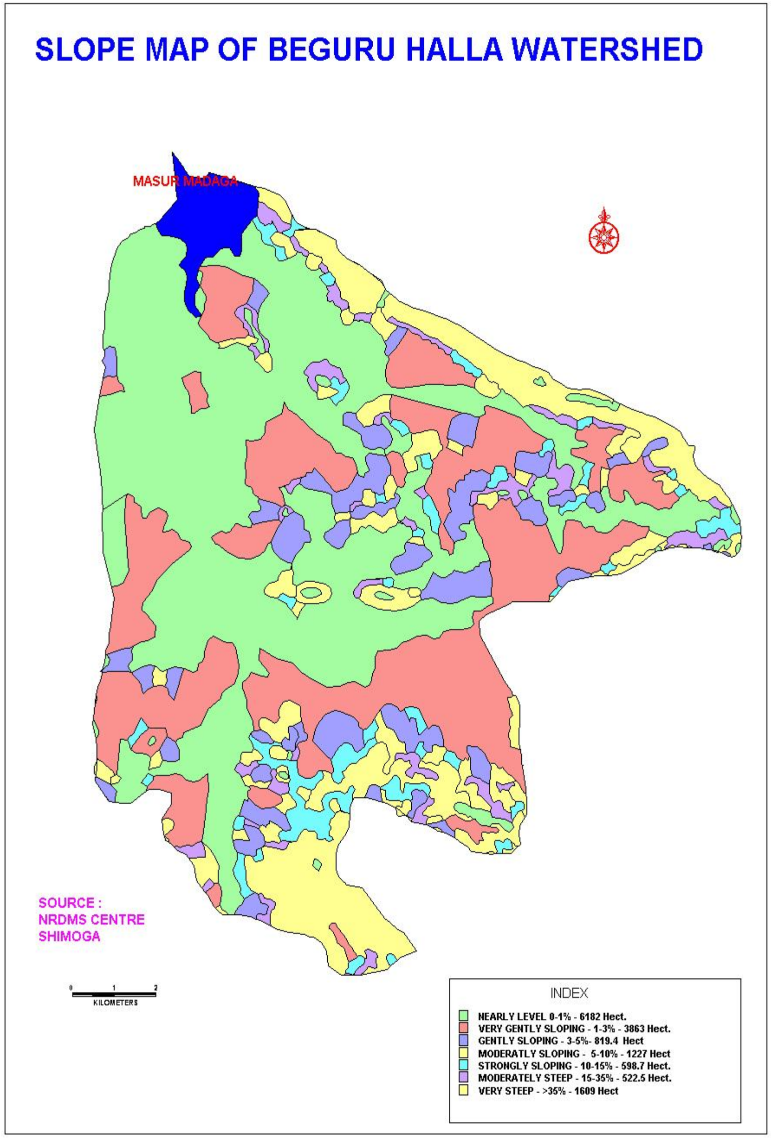
- Preparation of Base maps.
- Study of Watershed characteristics.
- Morphometric analysis, Surface water, Ground water status.
- Integration of various themes to prepare Water resources and Agriculture resources action plan.





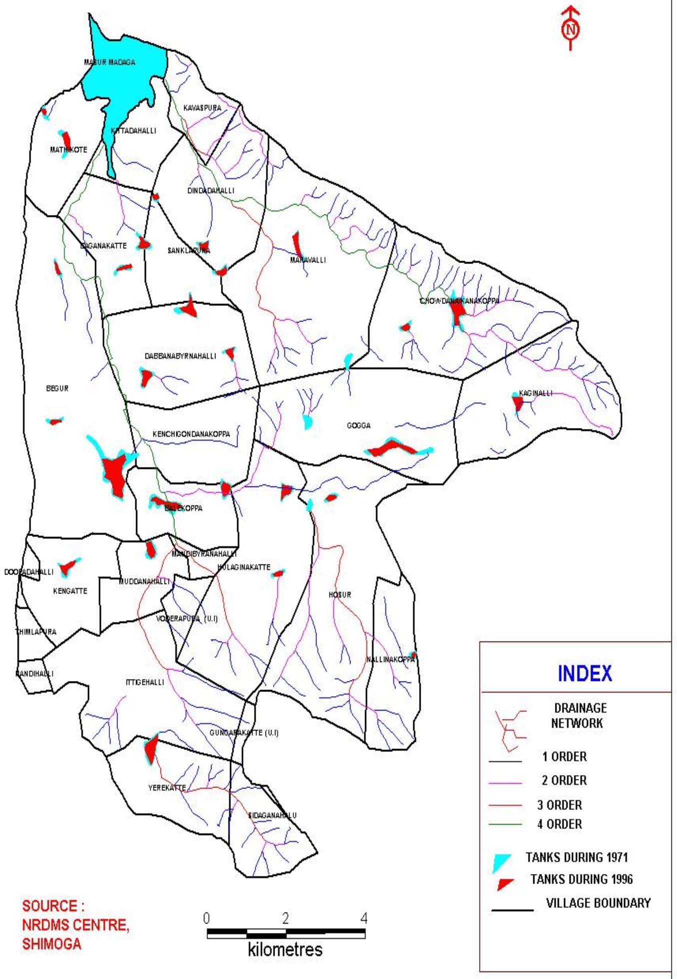

SOIL MAP OF BEGUR HALLA WATERSHED

SOURCE:
NRDMS CENTRE
SHIMOGA


SLOPE MAP OF BEGURU HALLA WATERSHED

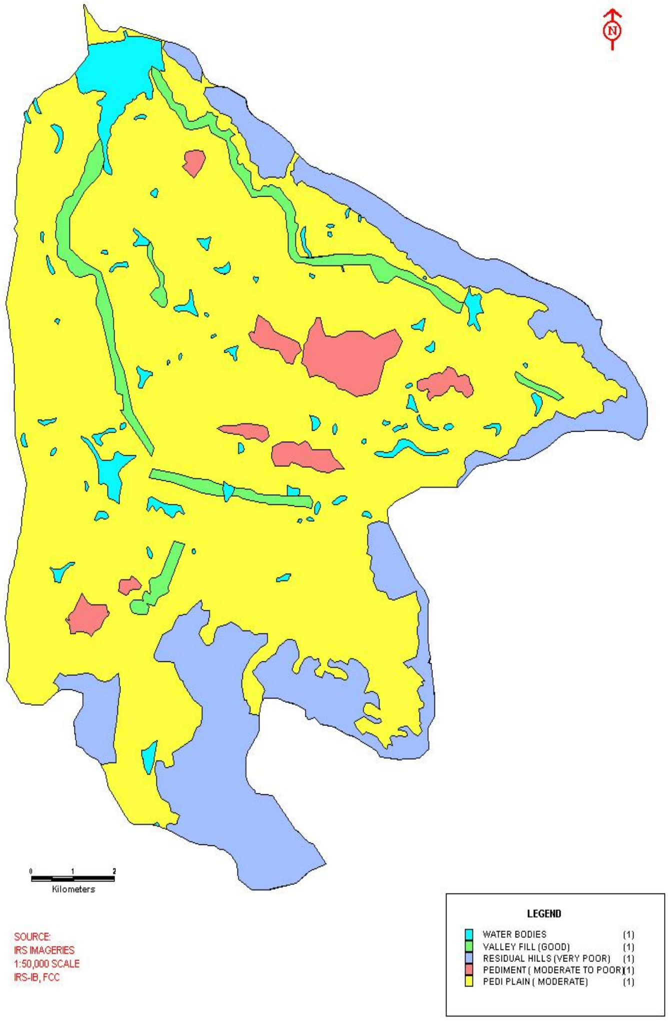
SOURCE :
NRDMS CENTRE
SHIMOGA

CHANGE IN WATERSPREAD AREA OF M.I. TANKS (SUPERIMPOSITION OF 1996-IRS DATA ON 1971-72 SOI TOPOSHEET DATA)



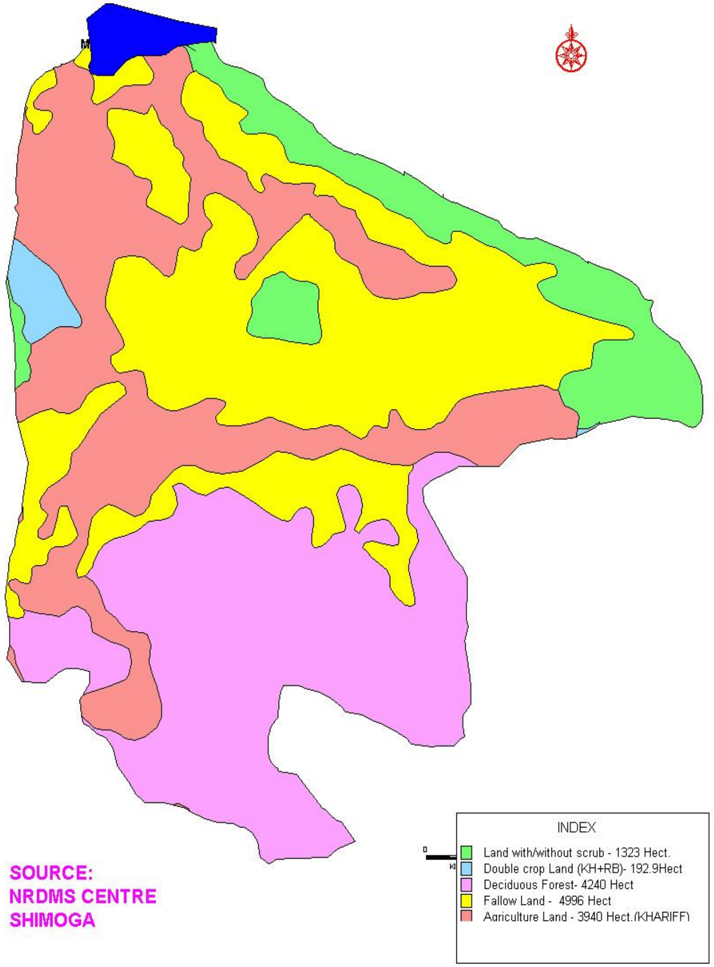
SOURCE :
NRDMS CENTRE,
SHIMOGA

HYDROGEOMORPHOLOGICAL MAP OF BEGURUHALLA WATERSHED



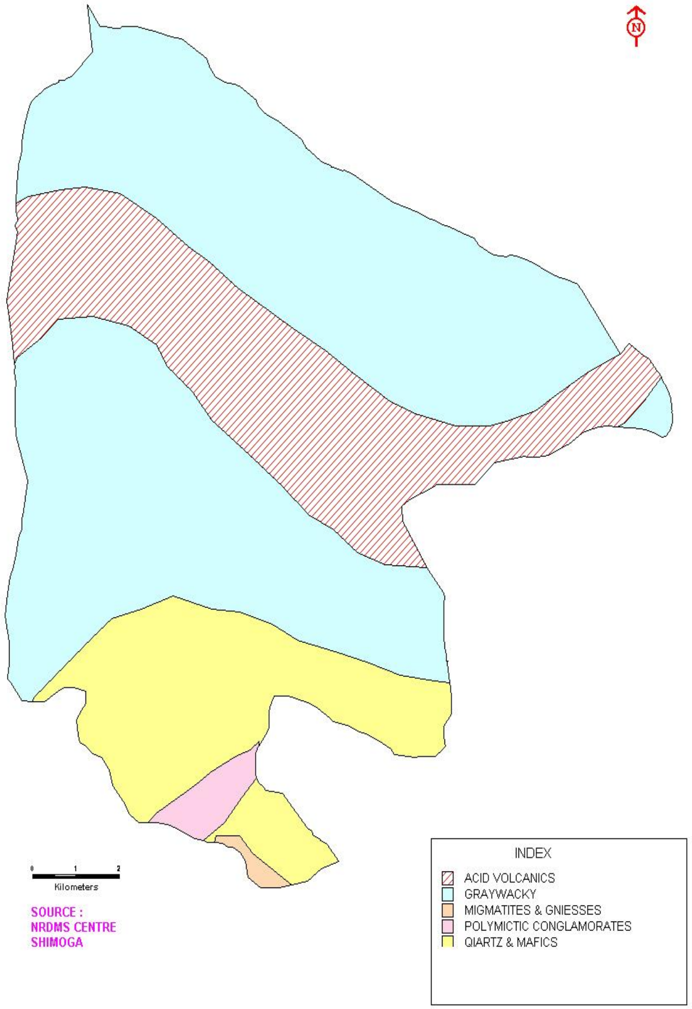
SOURCE:
IRS IMAGERIES
1:50,000 SCALE
IRS-IB, FCC

LAND USE / LAND COVER MAP OF BEGURU HALLA WATERSHED



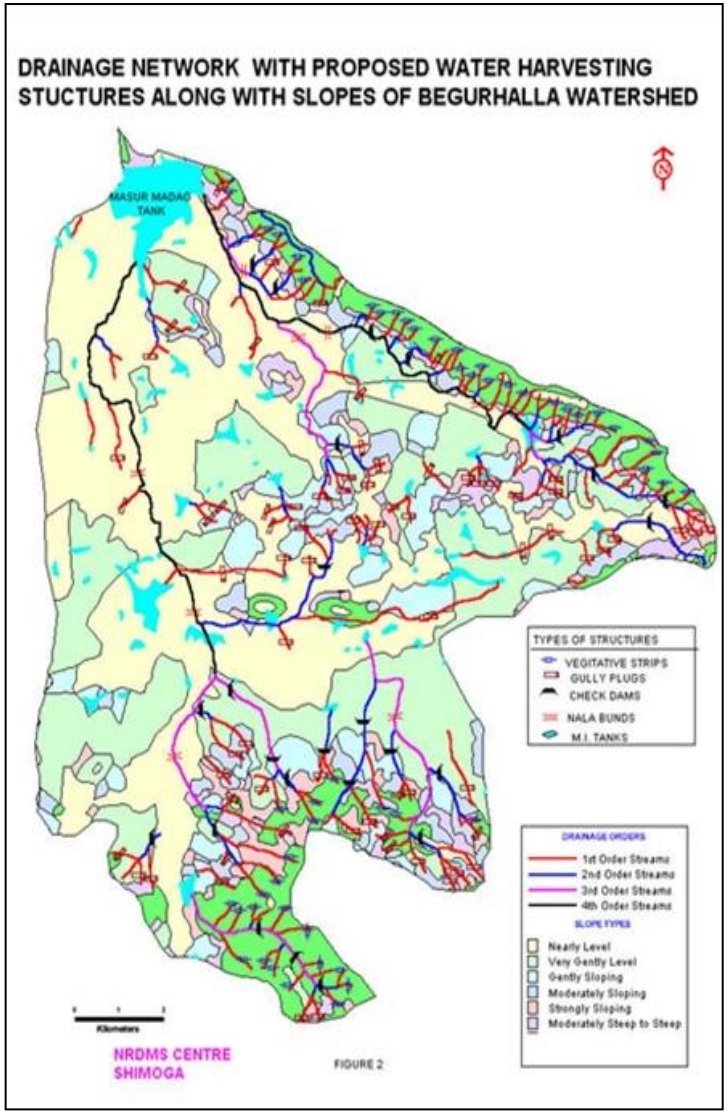
SOURCE:
NRDMS CENTRE
SHIMOGA

GEOLOGICAL MAP OF BEGURUHALLA WATERSHED

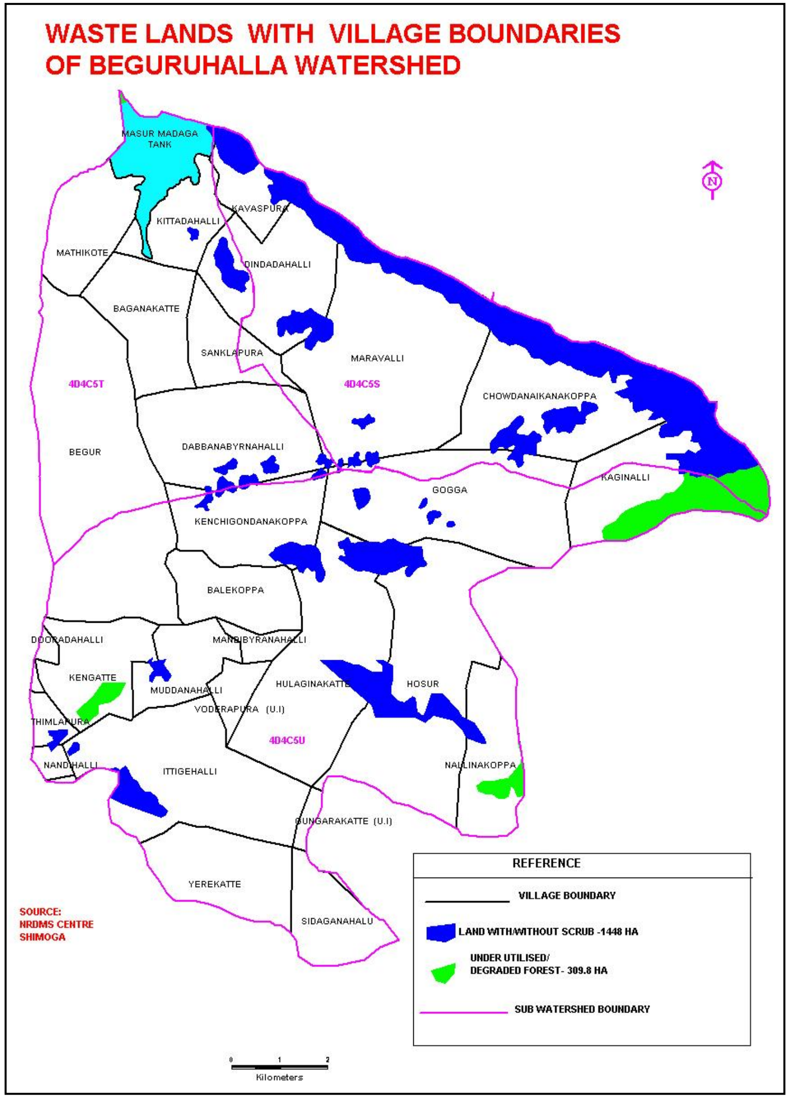


SOURCE :
NRDMS CENTRE
SHIMOGA

WASTE LAND RECLAMATION ACTION PLAN



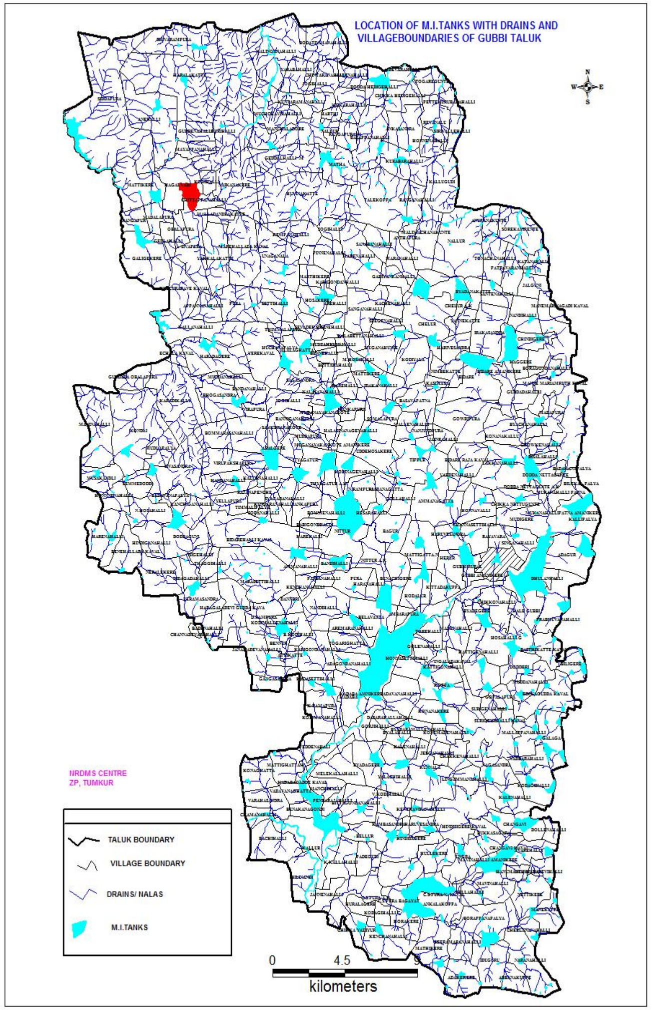
SL NO.	TYPES OF WATER HARVESTING STRUCTURES	NO. OF STRUCTURES
		Proposed
1	Vegetative Barriers/Strips	64
2	Gully plugs	73
3	Check Dams	25
4	Nala Bunds	8
5	Form ponds	
	a. 12 x 12 x 3.6cm	15
	b. 14 x 14 x 3.6cm	12

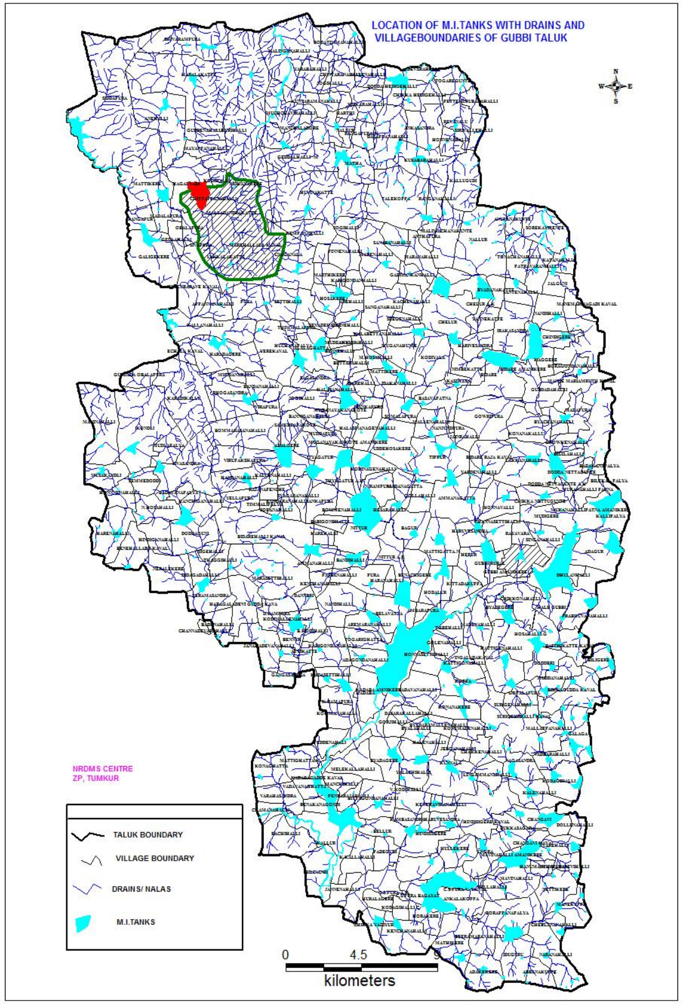


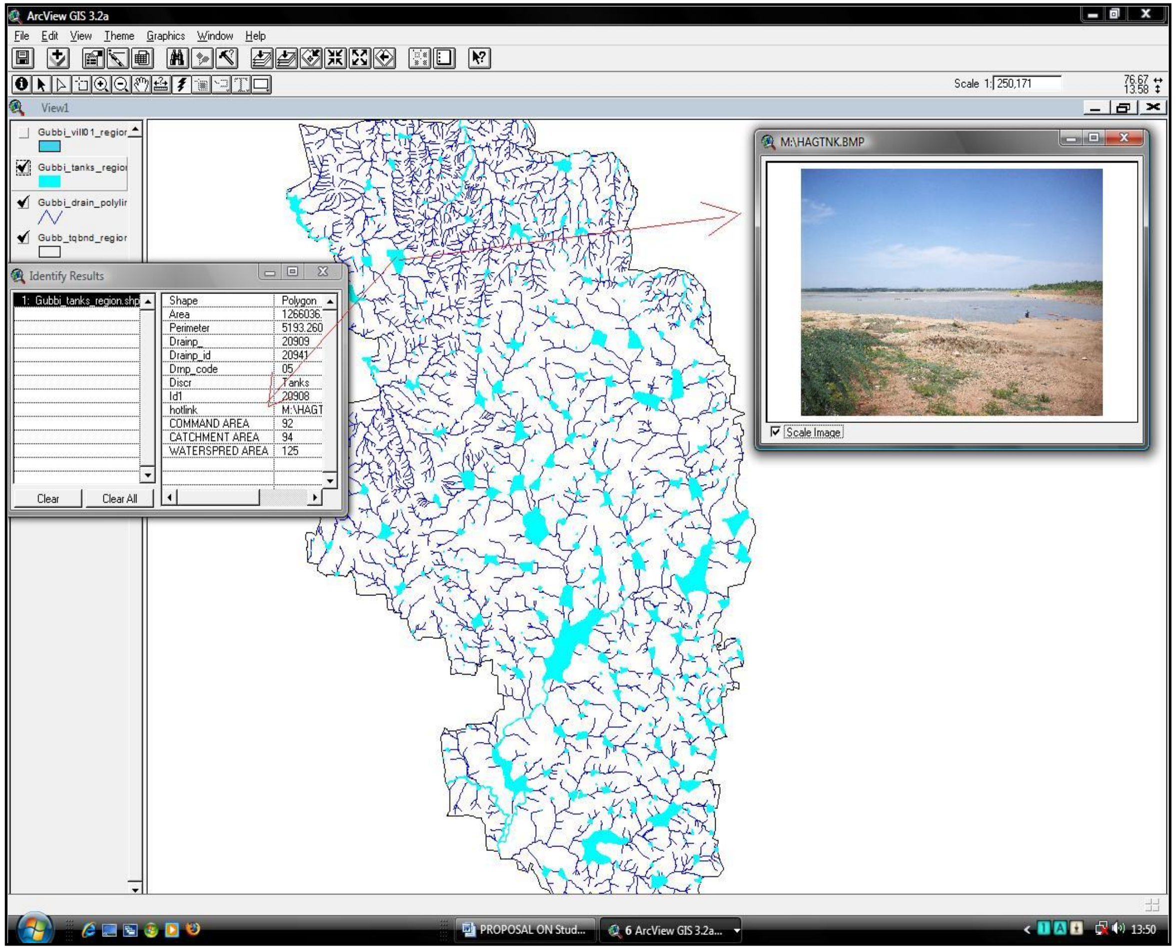
SL NO.	TYPE PF WASTELAND	EXTENT IN Ha	SLOPE	SUGGESTED LAND USE
1	Upland with / without Scrub	819.50	7	Silvipasture Fuel and fodder plantation Agro- forestry Agro-Horticulture
		30.00	5 & 6	
		284.00	3 & 4	
		326.50	1 & 2	
2	Under utilized Degraded Forest land	310.00	6 & 7	Afforestation

Assessment of status of few MI tanks in Tumkur district

Objective: To prepare Taluk wise Tank information system



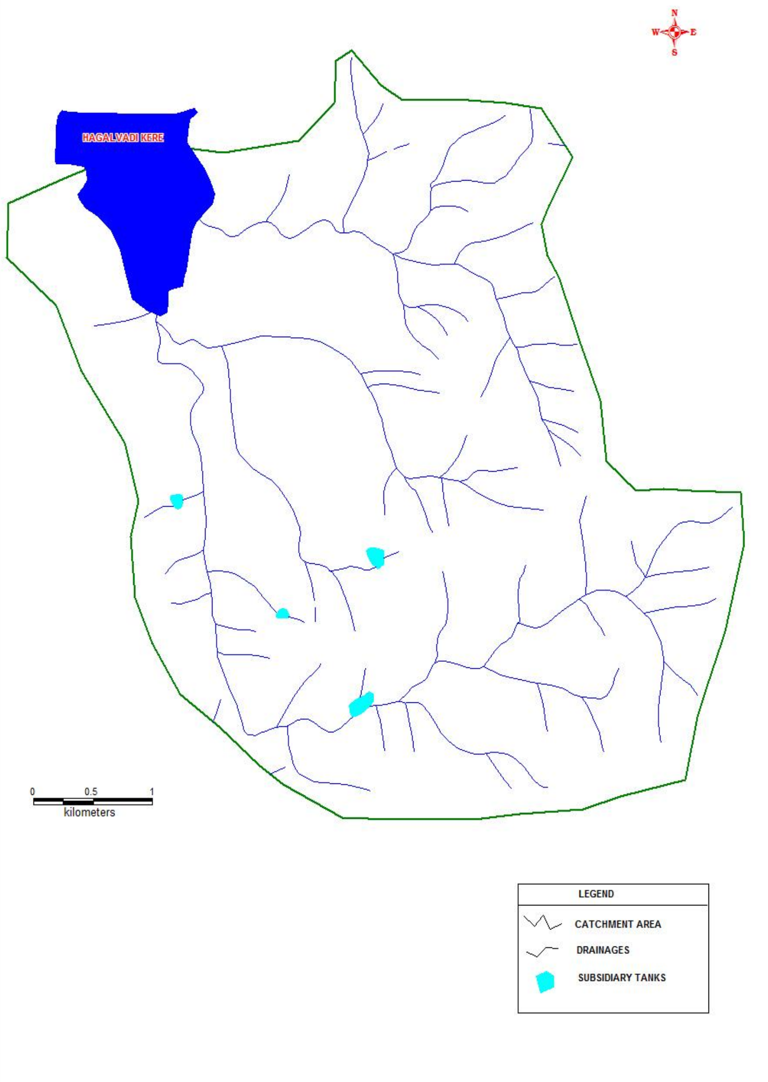




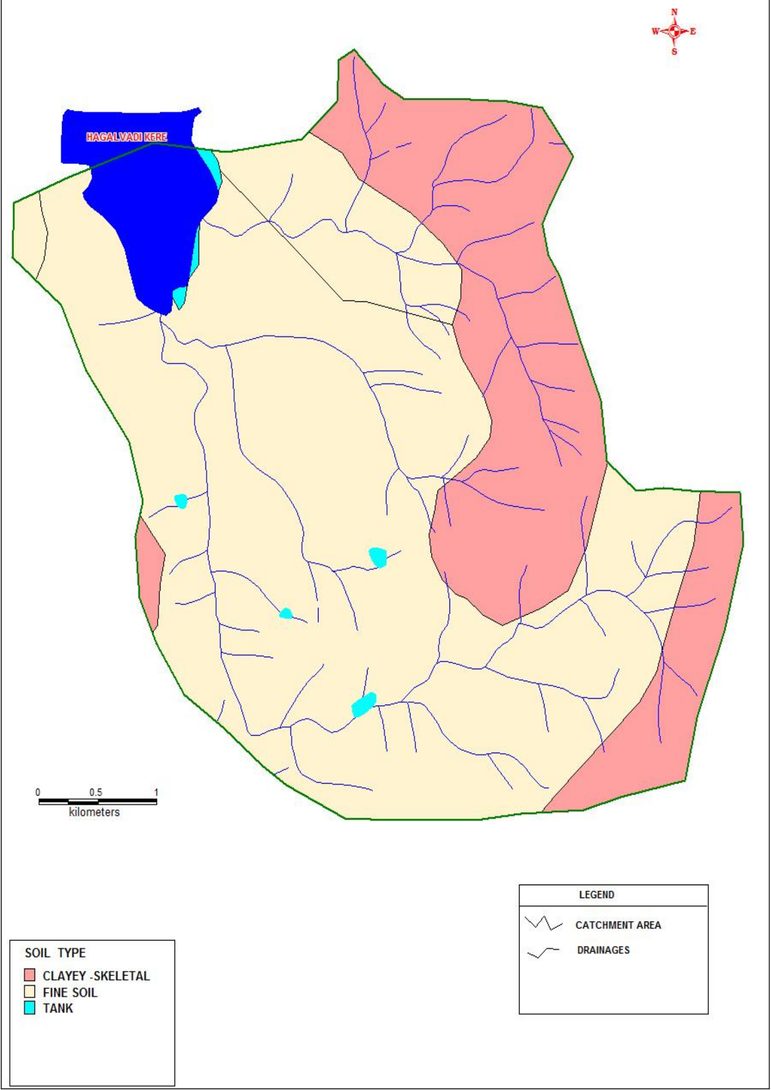
1: Gubbi_tanks_region.shp

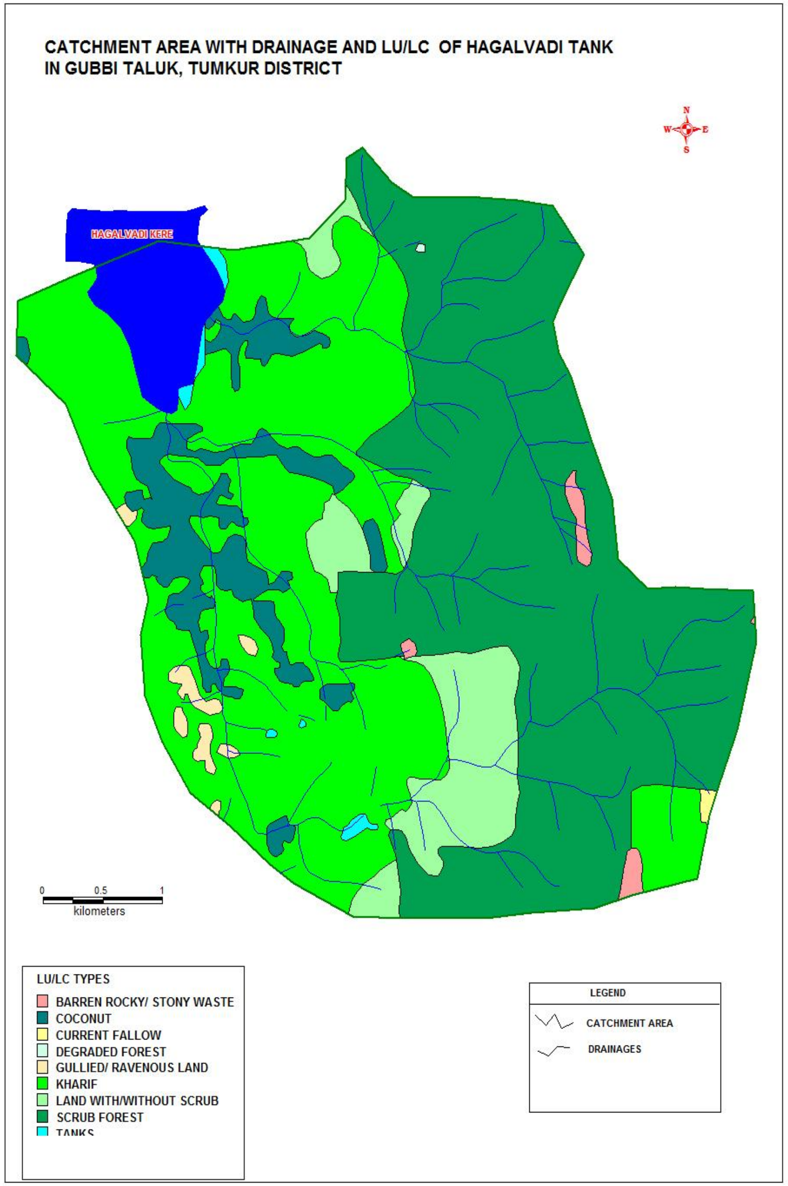
Shape	Polygon
Area	1266036.
Perimeter	5193.260
Drainp_	20909
Drainp_id	20941
Drnp_code	05
Discr	Tanks
Id1	20908
hotlink	M:\HAGT
COMMAND AREA	92
CATCHMENT AREA	94
WATERSPRED AREA	125

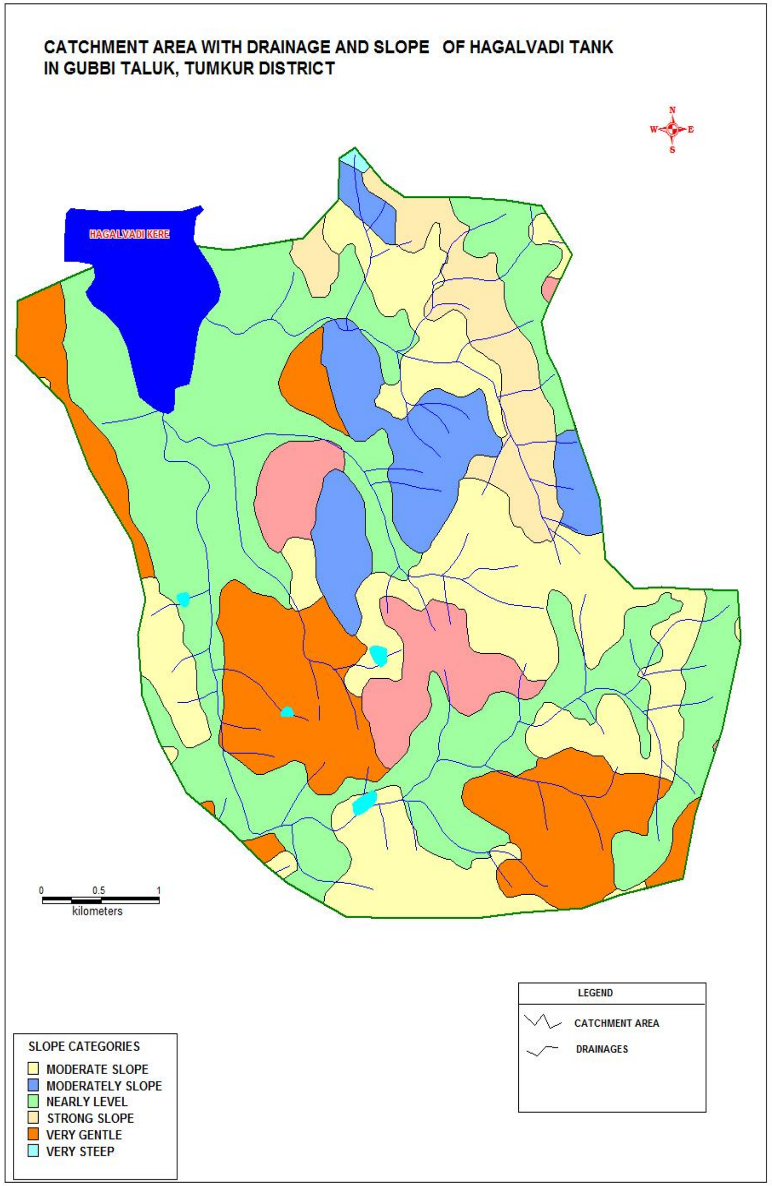
CATCHMENT AREA WITH DRAINAGE NETWORK OF HAGALVADI TANK
IN GUBBI TALUK, TUMKUR DISTRICT



CATCHMENT AREA WITH DRAINAGE AND SOIL OF HAGALVADI TANK
IN GUBBI TALUK, TUMKUR DISTRICT

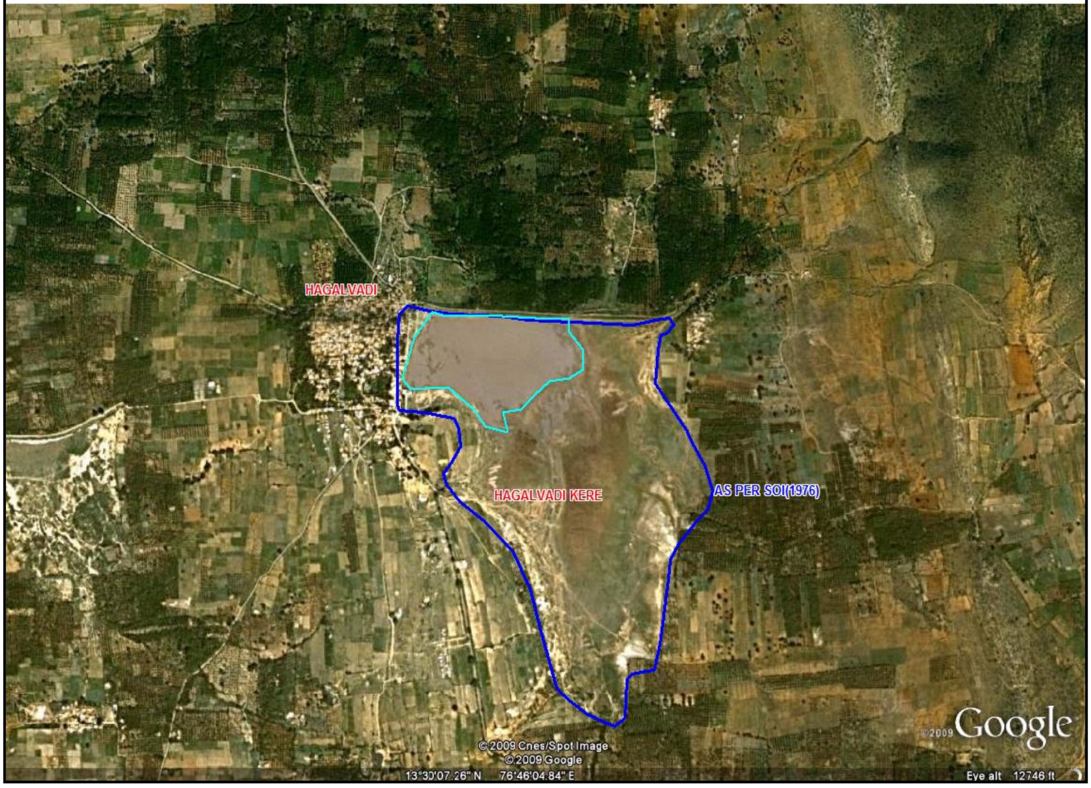



CATCHMENT AREA WITH DRAINAGE AND LU/LC OF HAGALVADI TANK IN GUBBI TALUK, TUMKUR DISTRICT


CATCHMENT AREA WITH DRAINAGE AND SLOPE OF HAGALVADI TANK IN GUBBI TALUK, TUMKUR DISTRICT

SATELLITE IMAGE OF HAGALVADI TANK
IN GUBBI TALUK, TUMKUR DISTRICT

OVERLAY OF WATERSPREAD AREA OF DIFFERENT TEMPORAL MAPS
OF HAGALVADI TANK IN GUBBI TALUK, TUMKUR DISTRICT



Details of Results of Hagalvadi tank

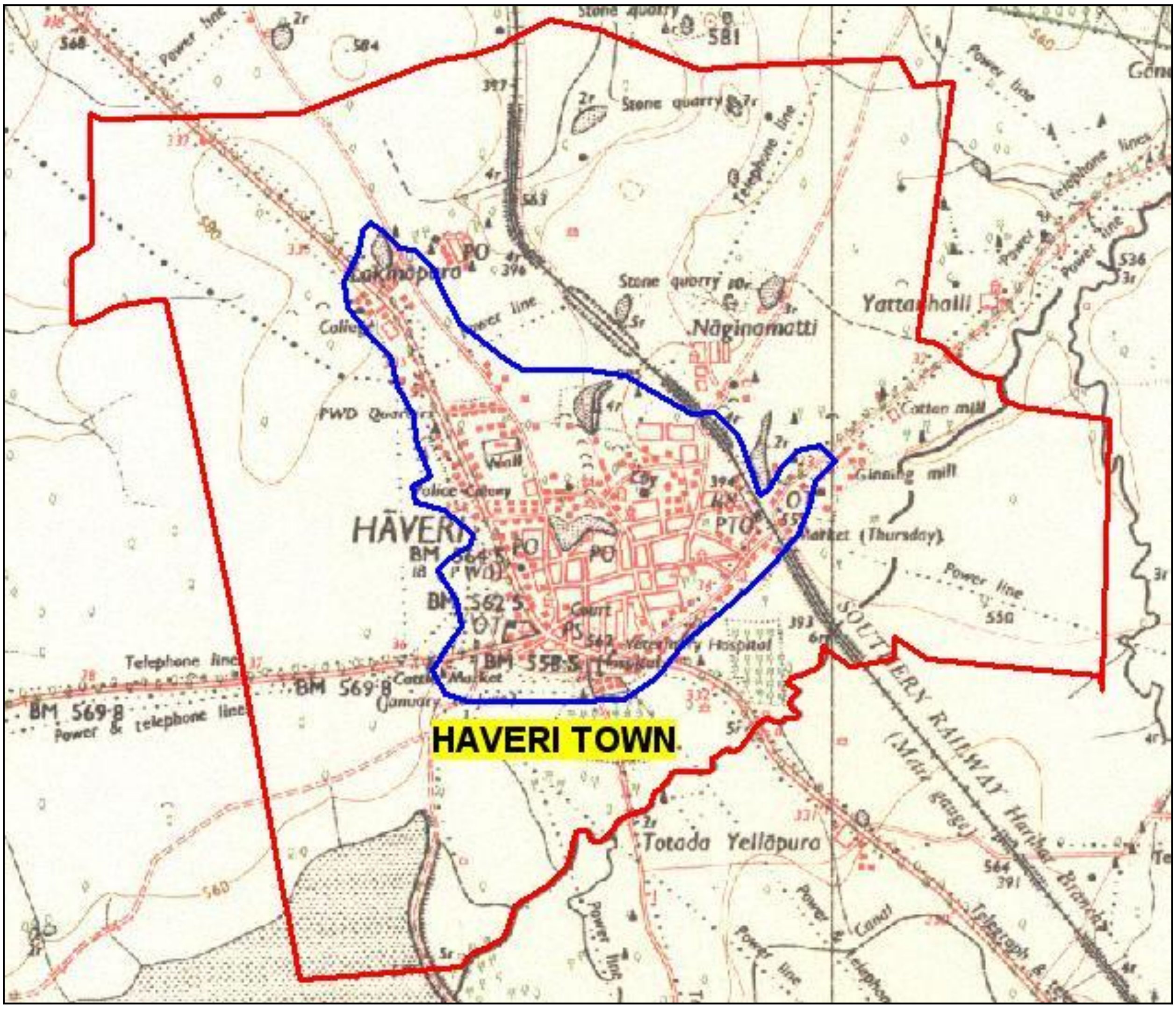
Tanks	Atchkat area (in hectares)	Water Spread Area (in hectares)	Catchment Area (in Sq. Kms)	Tank Capacity (in MCft)
Hagalvadi	91.66	122.4	23.82	107.64

Tanks	Land use Distribution in the Catchment (in square metres)					
	Agricultural land	Forest land	Waste land/ Scrub land	Built - up land	Grazing land	Total
Hagalvadi tank	10710000	10060000	2157000	-	-	22927000
	46.71%	43.88%	9.40%	-	-	

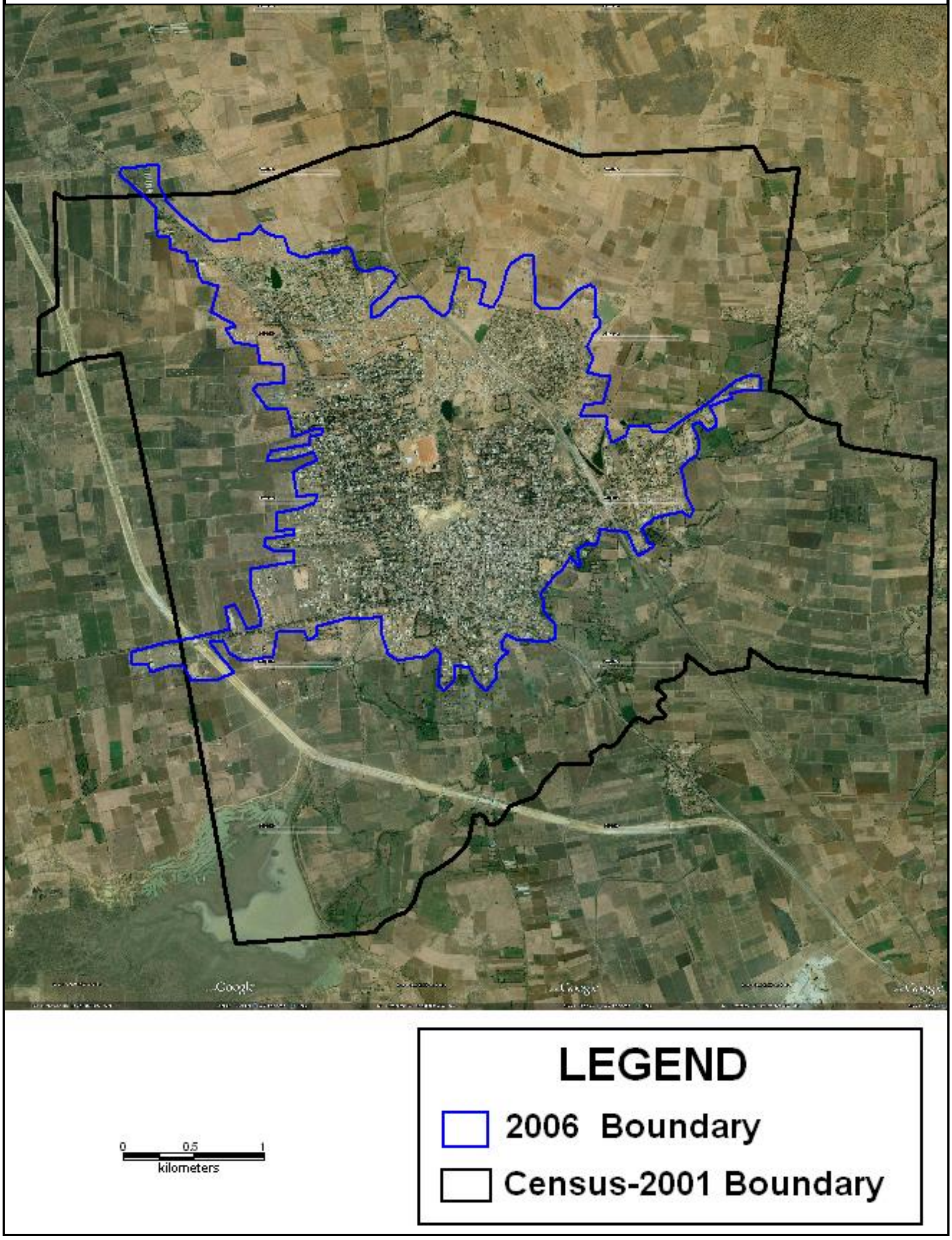
Study Tanks	Hagalvadi tank
Tank Area (surveyed during 1978-79) (in hectares) (as per SOI topo sheet)	127.1
Tank area calculated from RS imagery (in hectares)	114
Present water spread as per the RS imagery taken in the year 2007 (in hectares)	22.78
% Change in tank area	10.31
Change in the present water spread area	82.08

Sl No	Parameters	Class I	Class II	Class III	Results	Remarks
1	%Na	<20	20-60	>61	69.74	III
2	SAR	<10	10-26	>26	4.35	II
3	RSC	<1.25	1.25-2.5	>2.5	2.37	II
4	EC	0-1000	1000-3000	>3000	2000	II
5	Ca	<100	100-400	>400	19.2	I
6	Mg	<25	25-60	>61	41	II
7	K	<2	2-10	>10	8	II
8	TDS	0-700	700-2000	>2000	1800	II
9	Carbonate (Co3)	<10	10-30	>30	22	II
10	Bicarbonate (HCo3)	<90	90-510	>510	470	II
11	Nitrates (No3)	<5	5-30	>30	24	II
12	Ph	6-8.5			7.8	I

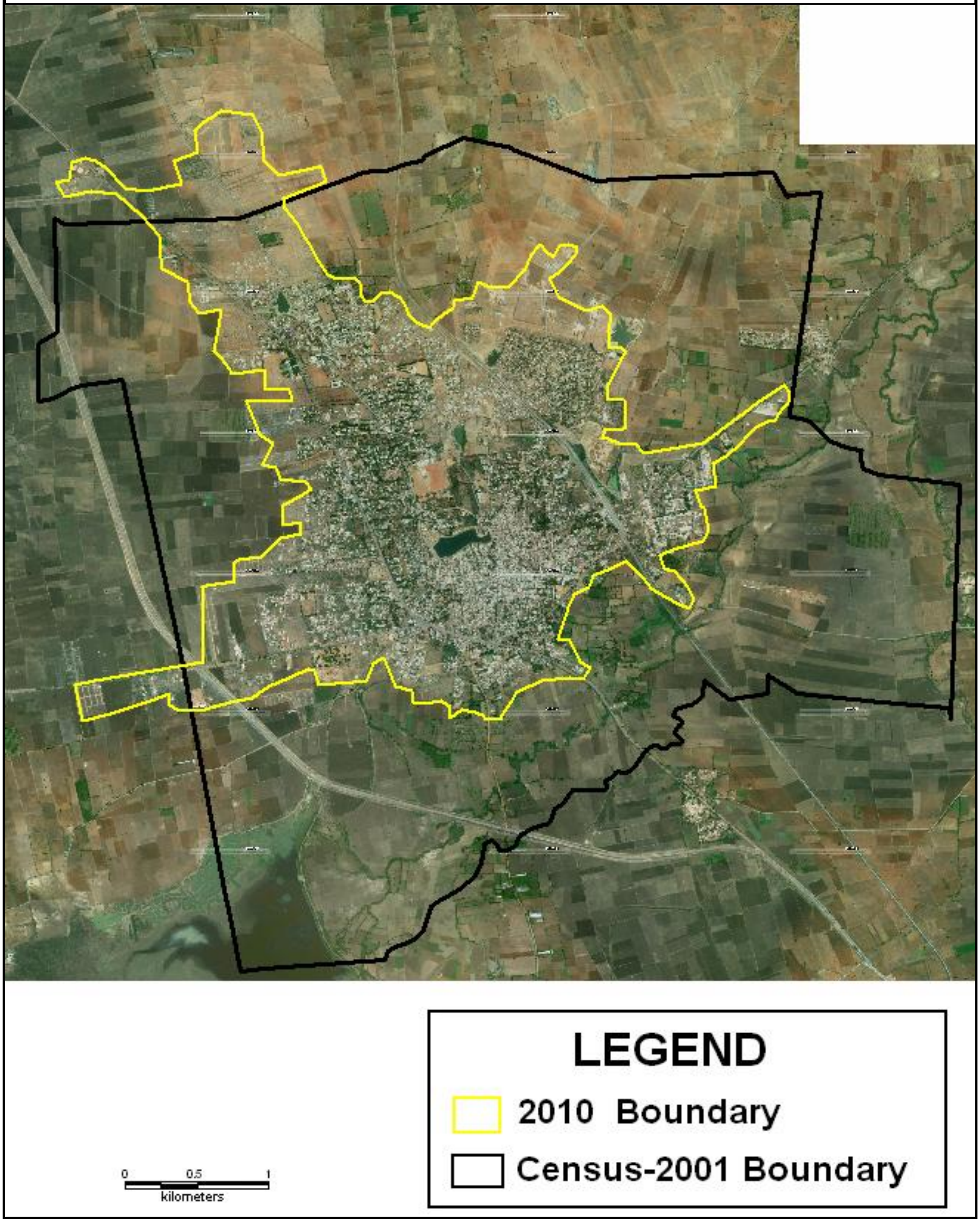
Haveri Town –Toposheet-1975-76



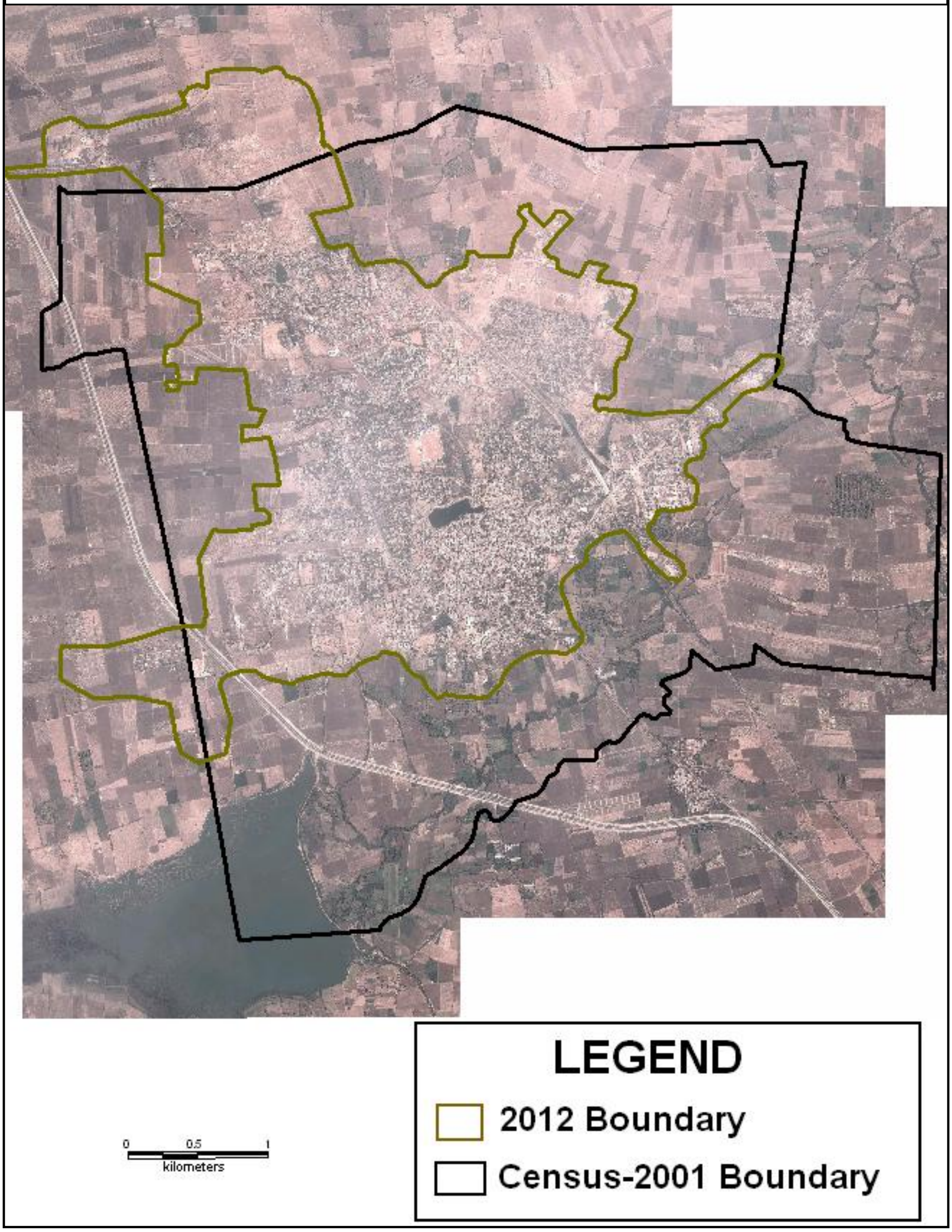
GOOGLE EARTH IMAGE -2006
OF HAVERI CITY



GOOGLE EARTH IMAGE -2010
OF HAVERI CITY



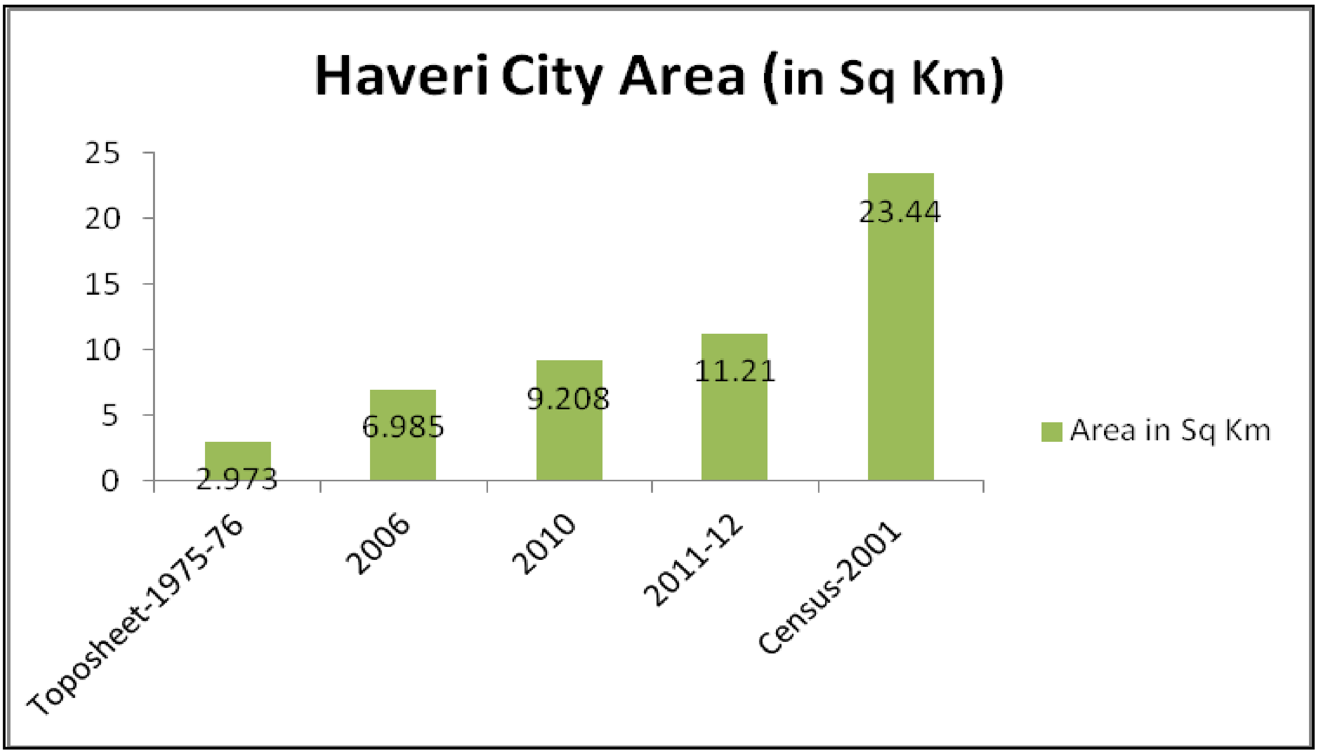
GOOGLE EARTH IMAGE -2012
OF HAVERI CITY



Haveri City Boundary Year wise Measurements:

Sl No	Year	Haveri City Boundary* in (Sq Km-Approximate)	Perimeter in (Km)
1	Toposheet-1975-76	2.973	9.3
2	2006	6.985	25.66
3	2010	9.208	25.97
4	2012	11.21	28.13
5	Census-2001	23.44	23.14

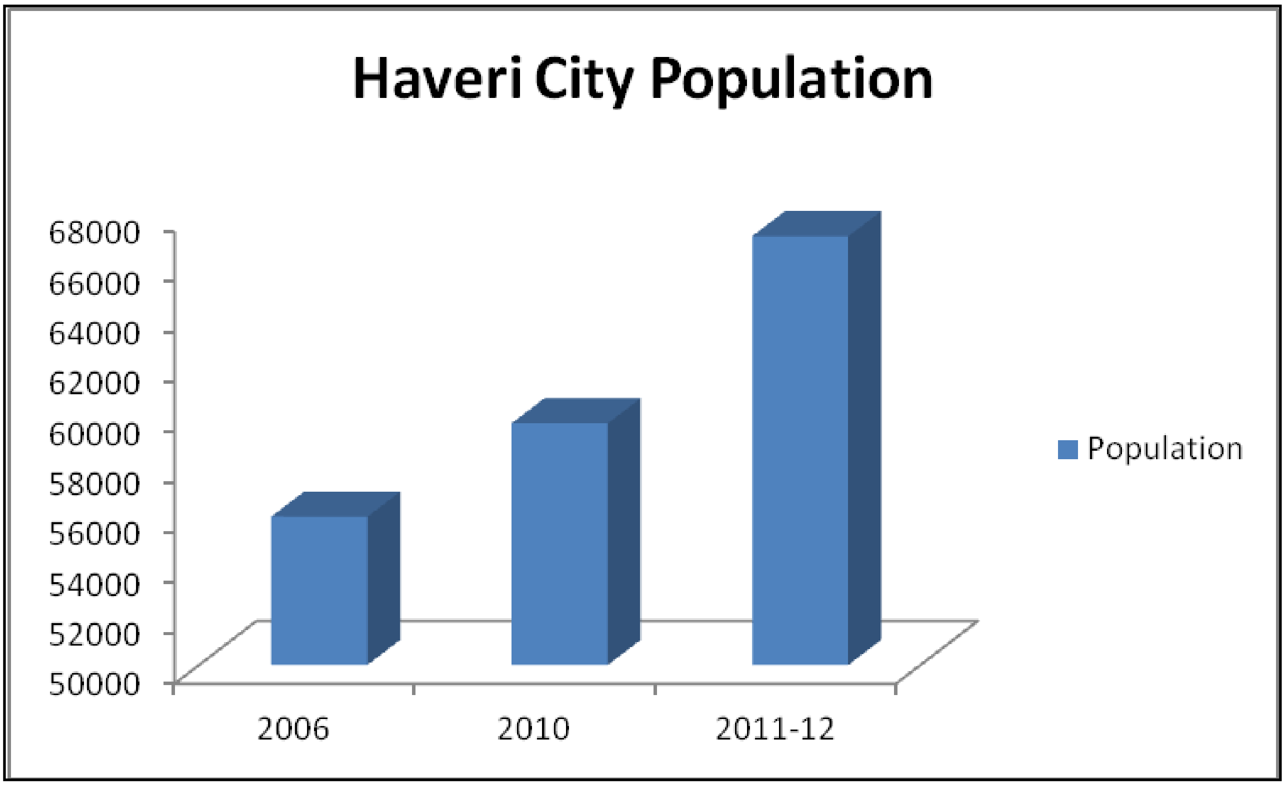
*-Google satellite Imagery-2006, 2010, 2012 is referred for boundary measurements



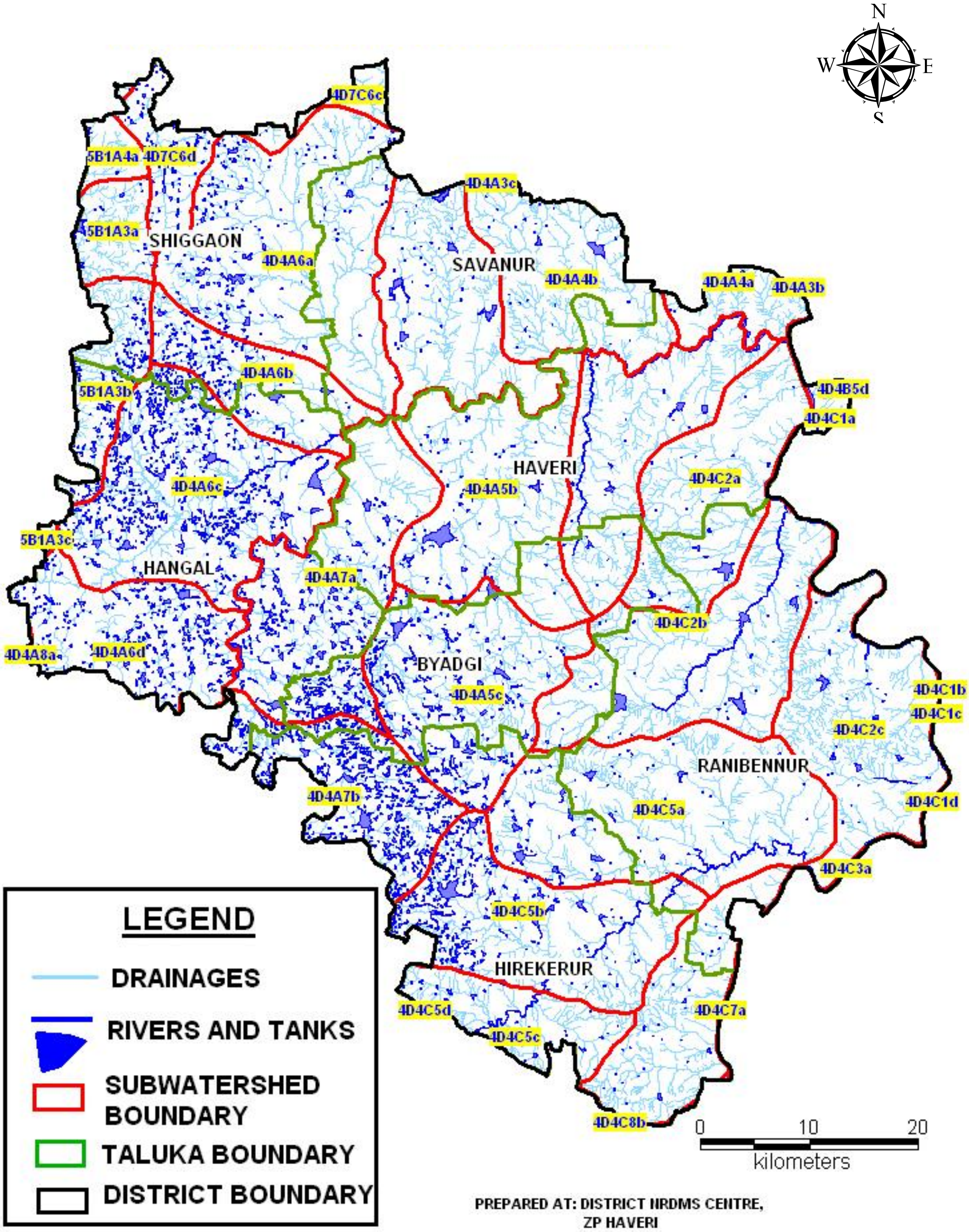
Haveri City Population:

Sl No	Year	Population	Male	Female
1	2006	55913	28589	27384
2	2010	59633	(Provisional 2011)	
3	2011-12	67088	(Provisional 2011)	

Data collect from Statistical office



HAVERI DISTRICT WITH DRAINAGE NETWORK, WATERSHED BOUNDARY AND SURFACE WATER BODIES



PREPARED AT: DISTRICT NRDMS CENTRE,
ZP HAVERI

Hydro-geological Atlas of Tumkur district 2012

This Atlas provides information on physiography, hydrometeorology, depth to water level and Chemical quality of water in the bore wells and also status of utilization of ground water in the Tumkur district.

Basic Thematic layers

- ✓ Administration Setup
- ✓ Physiography
- ✓ Hydrometeorology
- ✓ Soil
- ✓ Landuse
- ✓ Geomorphology
- ✓ Drainage Network and surface water body
- ✓ Watershed

i. Hydrogeology

- **Depth to water level**

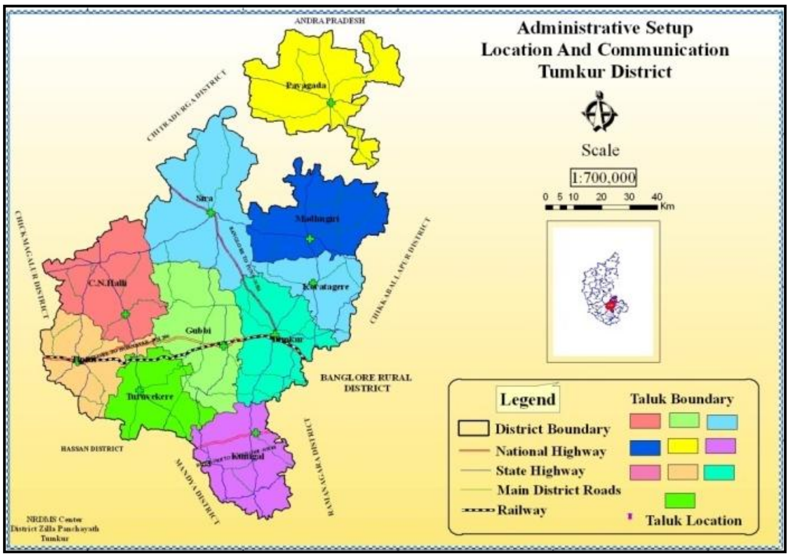
a. Pre-monsoon 2011
b. Post-monsoon 2011
c. Ground water level Hydrograph of each taluk station

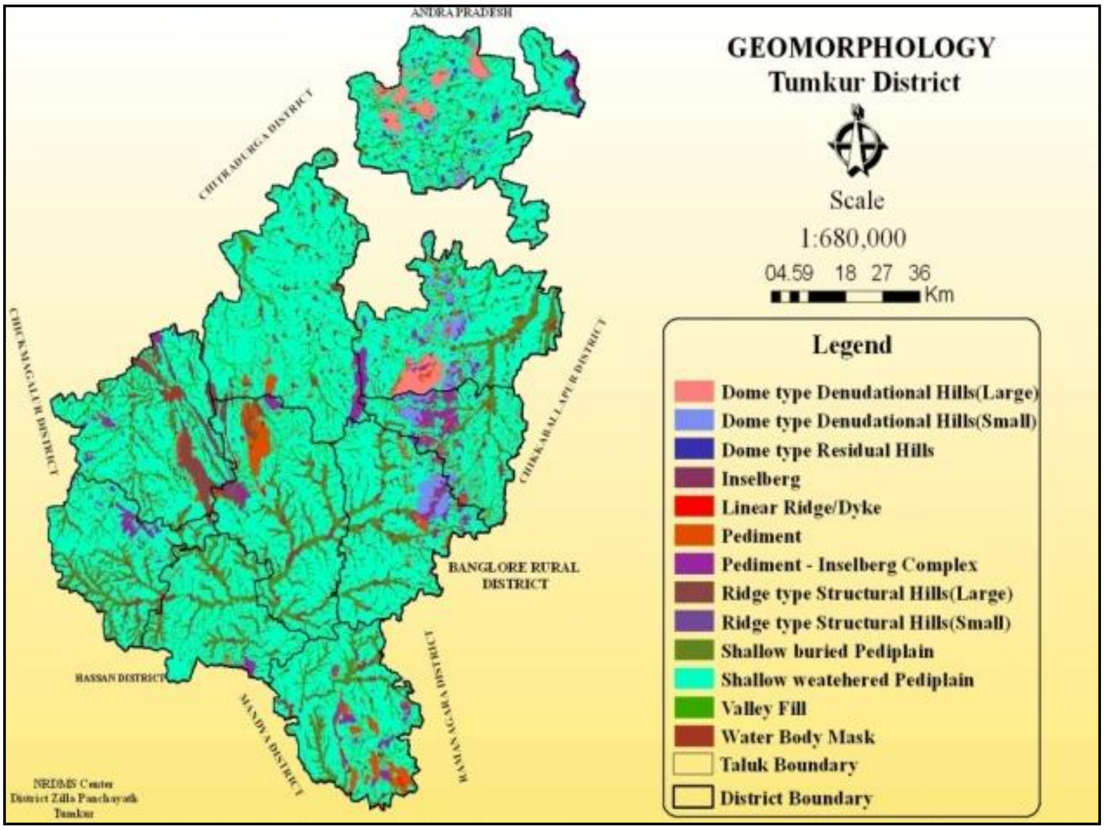
- **Chemical quality of ground water wells**

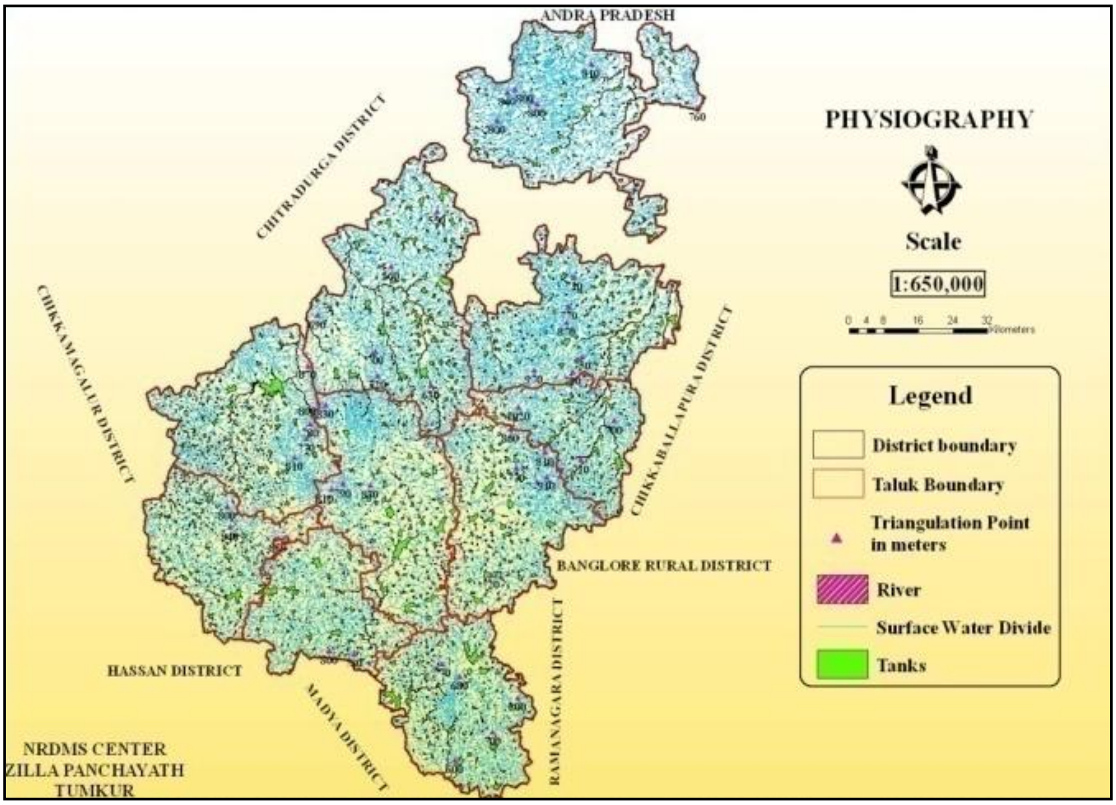
a. Fluoride
b. Iron
c. Nitrate

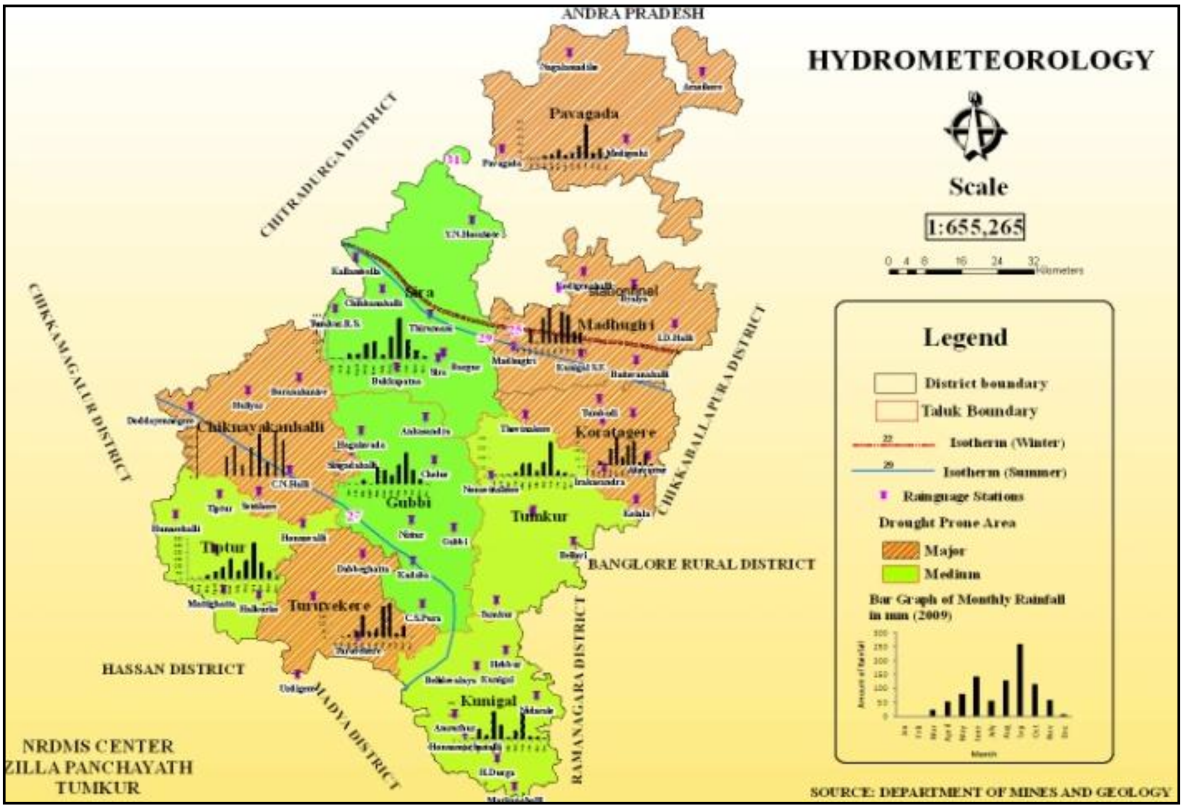
- **Ground water Potential**

a. Ground water prospect
b. Status of utilization of ground water

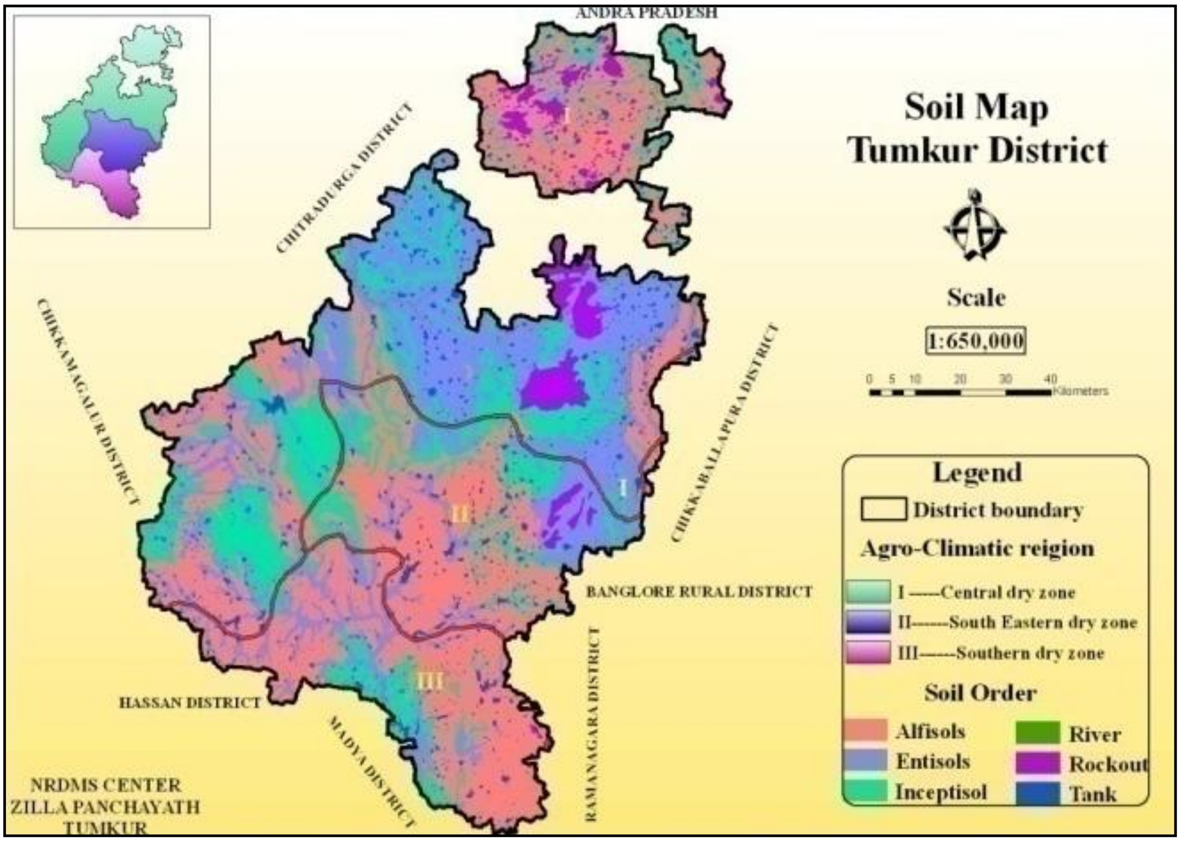


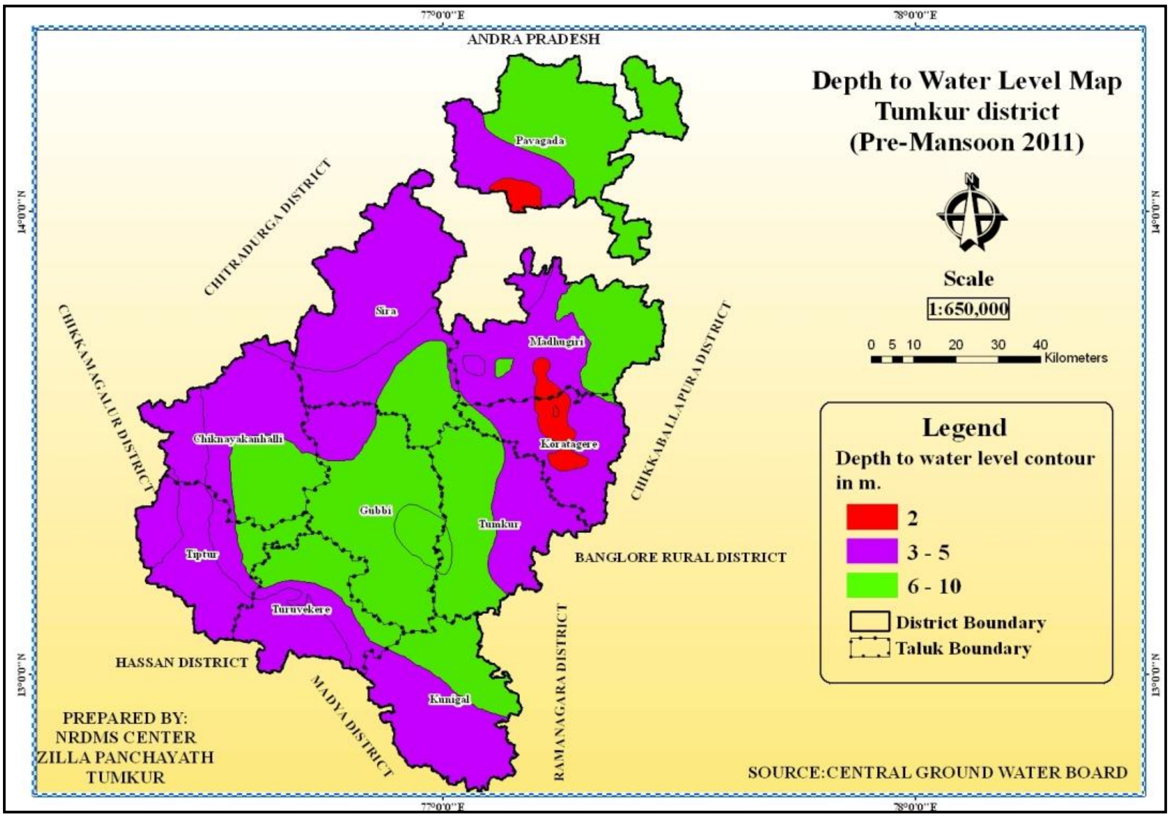

ANDRA PRADESH
GEOMORPHOLOGY
Tumkur District
Scale
1:680,000
04.59 18 27 36
Km
Legend
Dome type Denudational Hills(Large)
Dome type Denudational Hills(Small)
Dome type Residual Hills
Inselberg
Linear Ridge/Dyke
Pediment
Pediment - Inselberg Complex
Ridge type Structural Hills(Large)
Ridge type Structural Hills(Small)
Shallow buried Pediplain
Shallow weatehered Pediplain
Valley Fill
Water Body Mask
Taluk Boundary
District Boundary
CHITRADURGA DISTRICT
CHICKMAGALUR DISTRICT
CHIKKABALLAPUR DISTRICT
BANGLORE RURAL DISTRICT
RAMANAGARA DISTRICT
MANDYA DISTRICT
HASSAN DISTRICT
NRDMS Center
District Zilla Panchayath
Tumkur

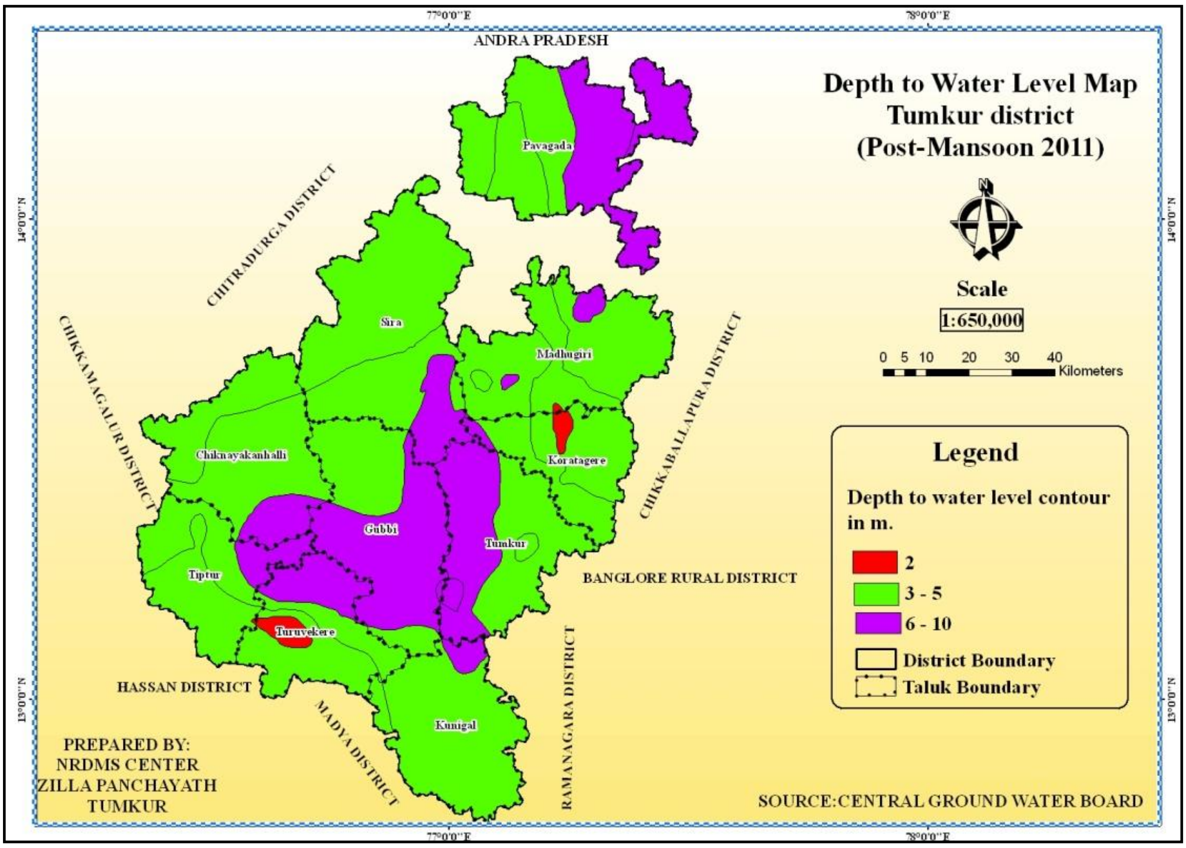

ANDRA PRADESH
PHYSIOGRAPHY
Scale
1:650,000
0 4 8 16 24 32
Kilometers
Legend
District boundary
Taluk Boundary
Triangulation Point in meters
River
Surface Water Divide
Tanks
CHITRADURGA DISTRICT
CHIKKAMAGALUR DISTRICT
CHIKKABALLAPURA DISTRICT
BANGLORE RURAL DISTRICT
RAMANAGARA DISTRICT
MADYA DISTRICT
HASSAN DISTRICT
NRDMS CENTER
ZILLA PANCHAYATH
TUMKUR

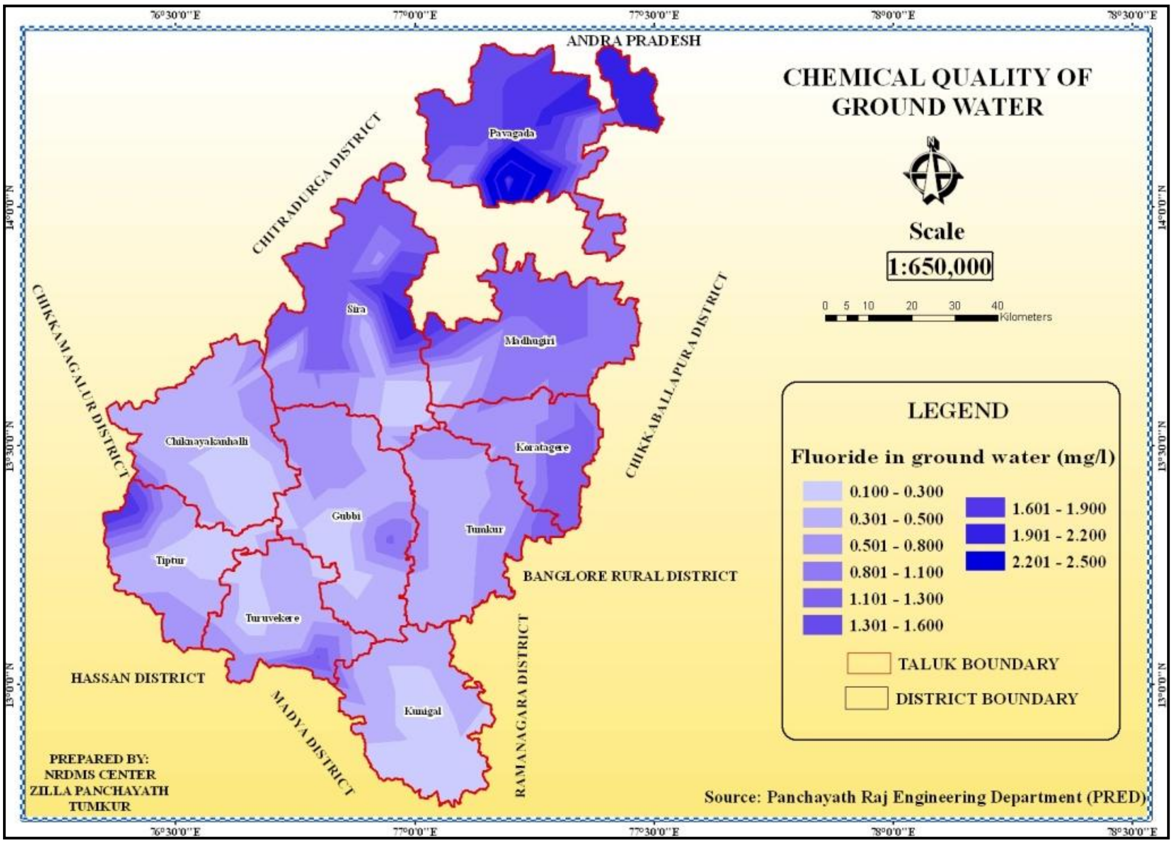


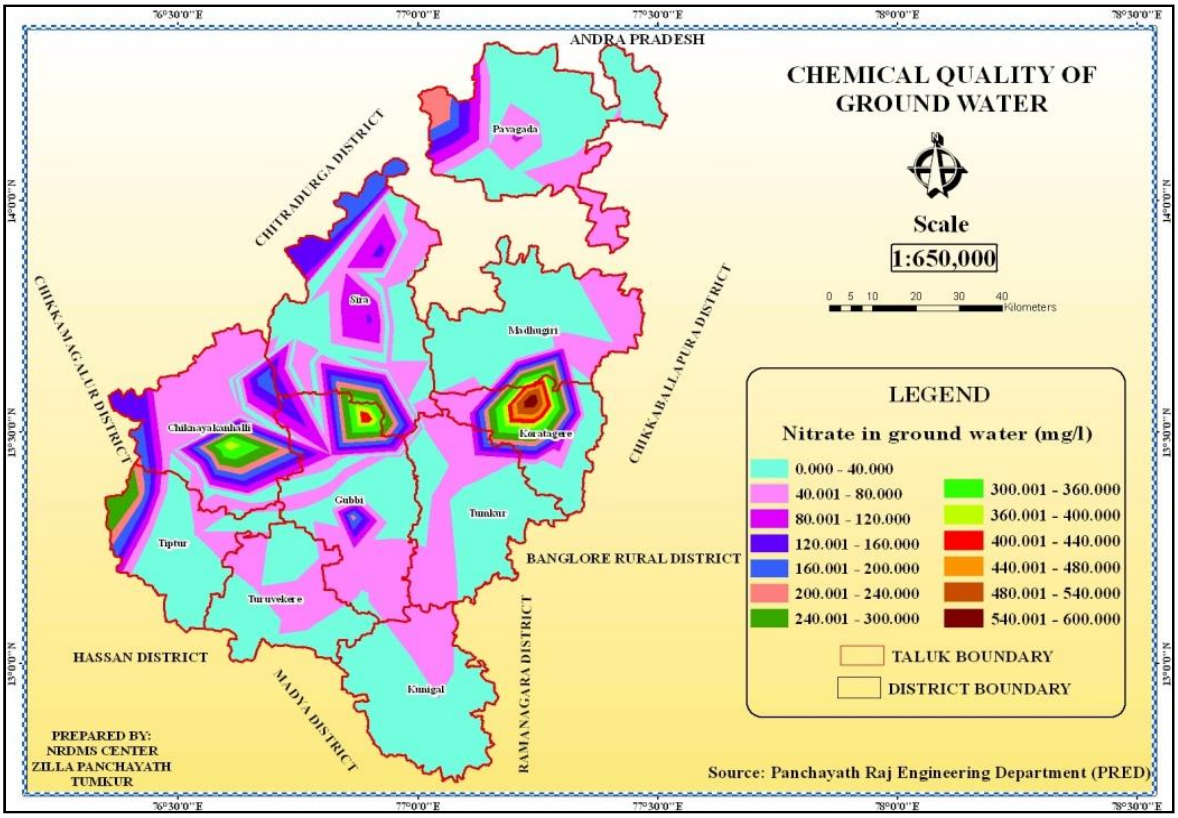
SOURCE: DEPARTMENT OF MINES AND GEOLOGY

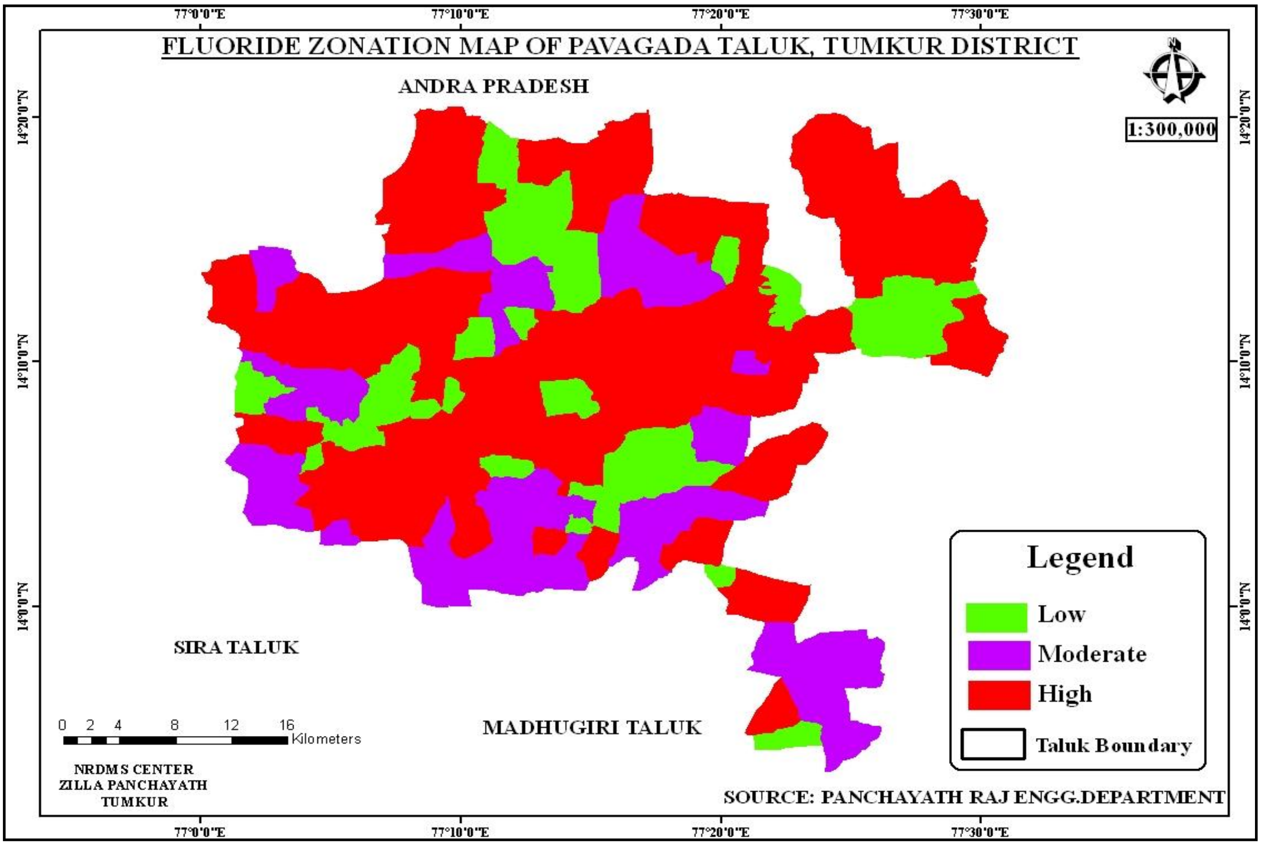



77°0'0"E
78°0'0"E
ANDRA PRADESH
Depth to Water Level Map
Tumkur district
(Pre-Mansoon 2011)
N
Scale
1:650,000
0 5 10 20 30 40
Kilometers
Legend
Depth to water level contour in m.
🟥 2
🟪 3 - 5
🟩 6 - 10
District Boundary
Taluk Boundary
14°0'0"N
13°0'0"N
CHITRADURGA DISTRICT
CHIKKAMAGALUR DISTRICT
CHIKKABALLAPURA DISTRICT
BANGLORE RURAL DISTRICT
RAMANAGARA DISTRICT
MADYA DISTRICT
HASSAN DISTRICT
Pavagada
Sira
Madhugiri
Koratagere
Chiknayakanhalli
Gubbi
Tumkur
Tiptur
Turuvekere
Kunigal
PREPARED BY:
NRDMS CENTER
ZILLA PANCHAYATH
TUMKUR
SOURCE:CENTRAL GROUND WATER BOARD

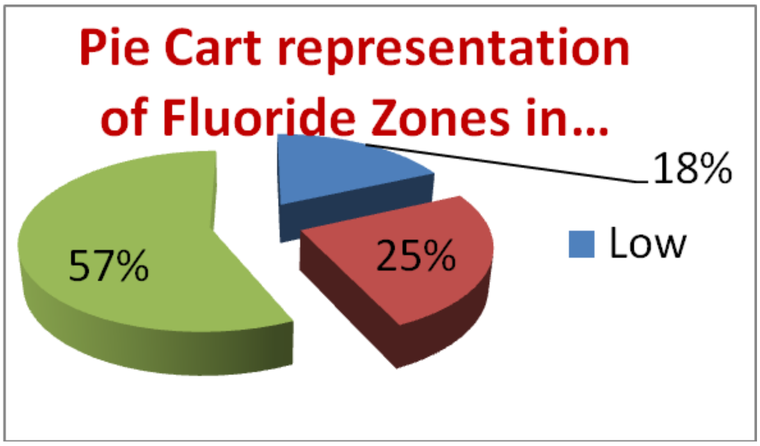

77°0'0"E
78°0'0"E
ANDRA PRADESH
Depth to Water Level Map
Tumkur district
(Post-Mansoon 2011)
N
Scale
1:650,000
0 5 10 20 30 40
Kilometers
Legend
Depth to water level contour in m.
🟥 2
🟩 3 - 5
🟪 6 - 10
District Boundary
Taluk Boundary
14°0'0"N
13°0'0"N
CHITRADURGA DISTRICT
CHIKKAMAGALUR DISTRICT
CHIKKABALLAPURA DISTRICT
BANGLORE RURAL DISTRICT
RAMANAGARA DISTRICT
MADYA DISTRICT
HASSAN DISTRICT
Pavagada
Sira
Madhugiri
Koratagere
Chiknayakanhalli
Gubbi
Tumkur
Tiptur
Turuvekere
Kunigal
PREPARED BY:
NRDMS CENTER
ZILLA PANCHAYATH
TUMKUR
SOURCE:CENTRAL GROUND WATER BOARD

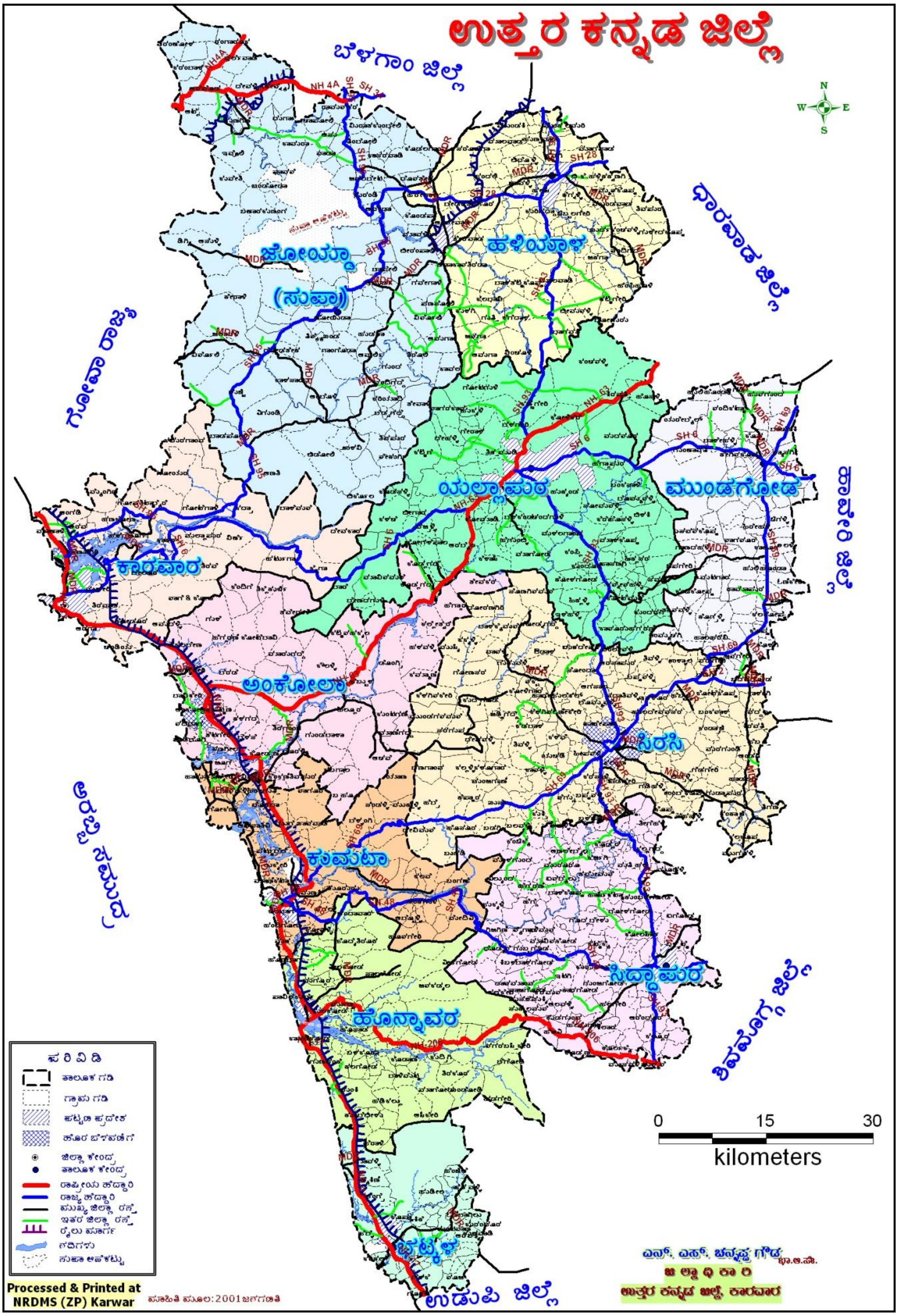

CHEMICAL QUALITY OF GROUND WATER
Scale
1:650,000
0 5 10 20 30 40 Kilometers
LEGEND
Fluoride in ground water (mg/l)
0.100 - 0.300
0.301 - 0.500
0.501 - 0.800
0.801 - 1.100
1.101 - 1.300
1.301 - 1.600
1.601 - 1.900
1.901 - 2.200
2.201 - 2.500
TALUK BOUNDARY
DISTRICT BOUNDARY
ANDRA PRADESH
CHITRADURGA DISTRICT
CHIKKAMAGALUR DISTRICT
CHIKKABALLAPURA DISTRICT
BANGLORE RURAL DISTRICT
RAMANAGARA DISTRICT
MADYA DISTRICT
HASSAN DISTRICT
Pavagada
Sira
Madhugiri
Chiknayakanhalli
Koratagere
Gubbi
Tumkur
Tiptur
Turuvekere
Kunigal
76°30'0"E
77°0'0"E
77°30'0"E
78°0'0"E
78°30'0"E
14°0'0"N
13°30'0"N
13°0'0"N
PREPARED BY:
NRDMS CENTER
ZILLA PANCHAYATH
TUMKUR
Source: Panchayath Raj Engineering Department (PRED)


CHEMICAL QUALITY OF GROUND WATER
Scale
1:650,000
0 5 10 20 30 40 Kilometers
LEGEND
Nitrate in ground water (mg/l)
0.000 - 40.000
40.001 - 80.000
80.001 - 120.000
120.001 - 160.000
160.001 - 200.000
200.001 - 240.000
240.001 - 300.000
300.001 - 360.000
360.001 - 400.000
400.001 - 440.000
440.001 - 480.000
480.001 - 540.000
540.001 - 600.000
TALUK BOUNDARY
DISTRICT BOUNDARY
ANDRA PRADESH
CHITRADURGA DISTRICT
CHIKKAMAGALUR DISTRICT
CHIKKABALLAPURA DISTRICT
BANGLORE RURAL DISTRICT
RAMANAGARA DISTRICT
MADYA DISTRICT
HASSAN DISTRICT
Pavagada
Sira
Madhugiri
Chiknayakanhalli
Koratagere
Gubbi
Tumkur
Tiptur
Turuvekere
Kunigal
76°30'0"E
77°0'0"E
77°30'0"E
78°0'0"E
78°30'0"E
14°0'0"N
13°30'0"N
13°0'0"N
PREPARED BY:
NRDMS CENTER
ZILLA PANCHAYATH
TUMKUR
Source: Panchayath Raj Engineering Department (PRED)



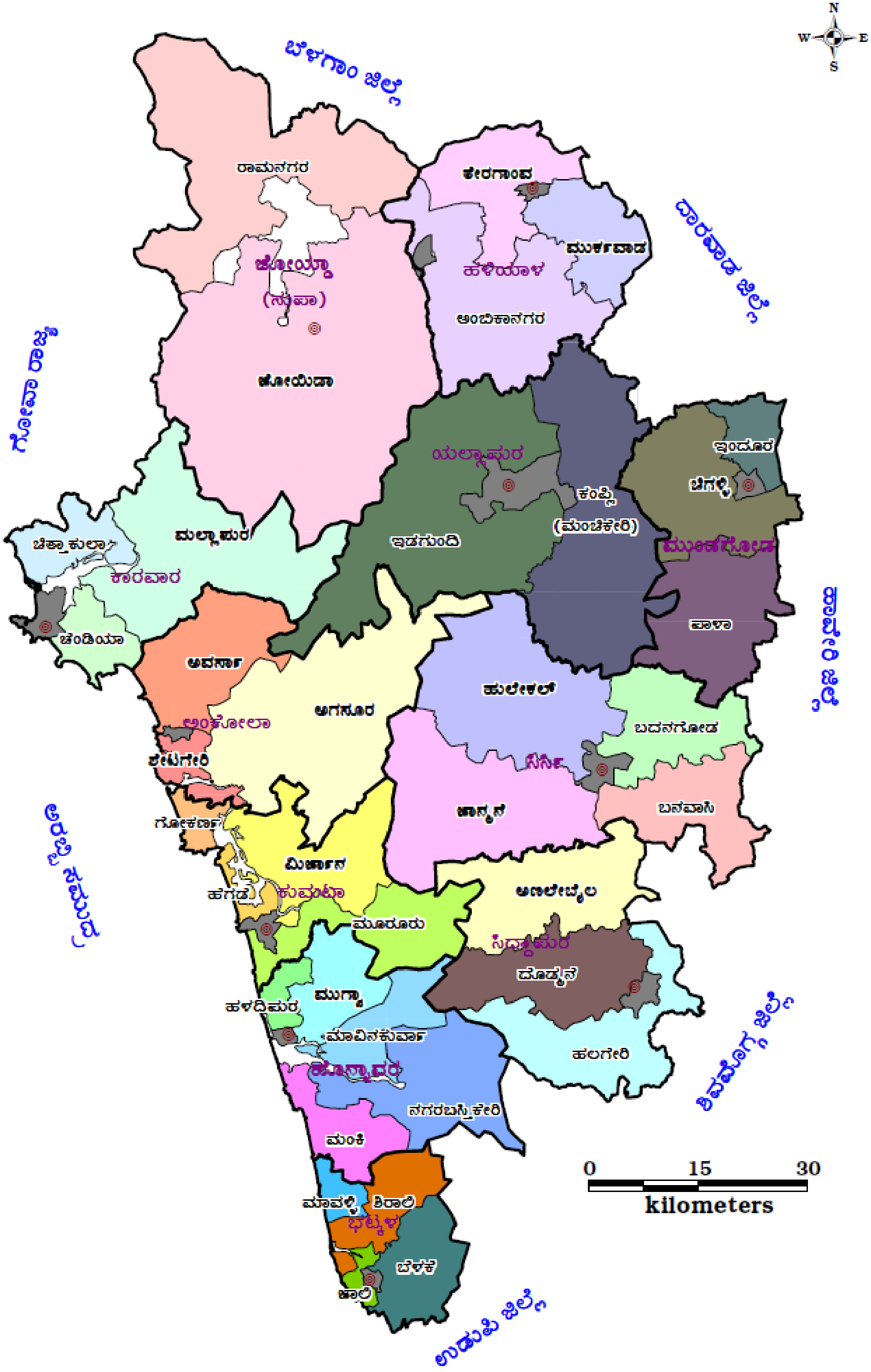
Sl.no	Zones	Area in sqkm	Percentage
1	Low	248.95	18
2	Moderate	340.52	25
3	High	775.361	57
	Total	1364.831	100




ಉತ್ತರ ಕನ್ನಡ ಜಿಲ್ಲೆ
ಬೆಳಗಾಂ ಜಿಲ್ಲೆ
ಧಾರವಾಡ ಜಿಲ್ಲೆ
ಹಾವೇರಿ ಜಿಲ್ಲೆ
ಶಿವಮೊಗ್ಗ ಜಿಲ್ಲೆ
ಉಡುಪಿ ಜಿಲ್ಲೆ
ಗೋವಾ ರಾಜ್ಯ
ಅರಬ್ಬಿ ಸಮುದ್ರ
N
W
E
S
ಜೋಯ್ಡಾ
(ಸುಪಾ)
ಹಳಿಯಾಳ
ಯಲ್ಲಾಪುರ
ಮುಂಡಗೋಡ
ಕಾರವಾರ
ಅಂಕೋಲಾ
ಸಿರಸಿ
ಕುಮಟಾ
ಸಿದ್ದಾಪುರ
ಹೊನ್ನಾವರ
ಭಟ್ಕಳ
NH 4A
NH 63
NH 17
NH 206
SH 6
SH 28
SH 34
SH 48
SH 69
SH 93
SH 95
MDR
ಪರಿವಿಡಿ
ತಾಲೂಕ ಗಡಿ
ಗ್ರಾಮ ಗಡಿ
ಪಟ್ಟಣ ಪ್ರದೇಶ
ಹೊರ ಬೆಳವಣಿಗೆ
ಜಿಲ್ಲಾ ಕೇಂದ್ರ
ತಾಲೂಕ ಕೇಂದ್ರ
ರಾಷ್ಟ್ರೀಯ ಹೆದ್ದಾರಿ
ರಾಜ್ಯ ಹೆದ್ದಾರಿ
ಮುಖ್ಯ ಜಿಲ್ಲಾ ರಸ್ತೆ
ಇತರ ಜಿಲ್ಲಾ ರಸ್ತೆ
ರೈಲು ಮಾರ್ಗ
ನದಿಗಳು
ಸುಪಾ ಅಣೆಕಟ್ಟು
0
15
30
kilometers
Processed & Printed at
NRDMS (ZP) Karwar
ಮಾಹಿತಿ ಮೂಲ: 2001ಜನಗಣತಿ
ಎನ್. ಎಸ್. ಚನ್ನಪ್ಪ ಗೌಡ ಭಾ.ಆ.ಸೇ.
ಜಿಲ್ಲಾಧಿಕಾರಿ
ಉತ್ತರ ಕನ್ನಡ ಜಿಲ್ಲೆ, ಕಾರವಾರ

ಉತ್ತರ ಕನ್ನಡ ಜಿಲ್ಲೆ

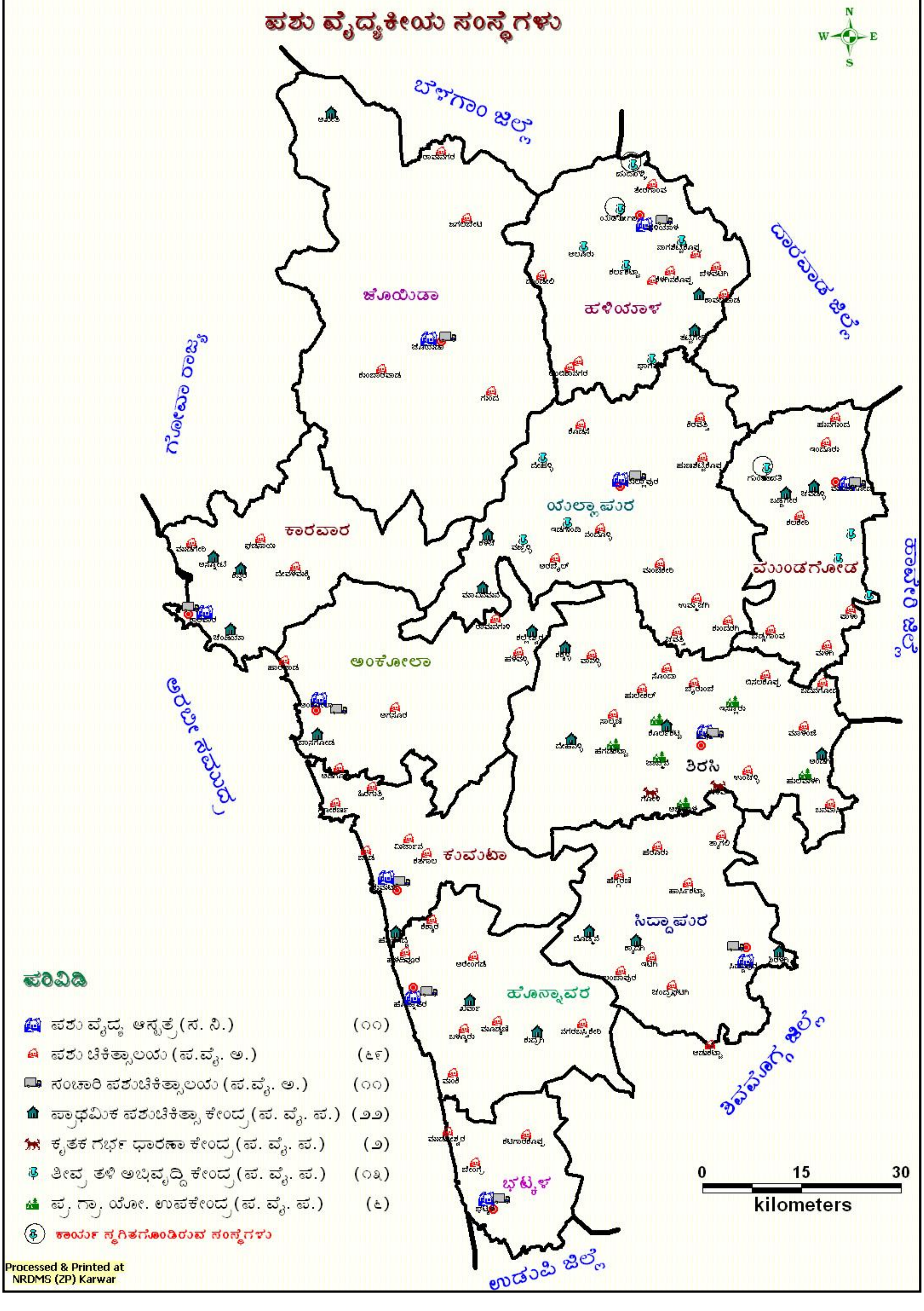
ಜಿಲ್ಲಾ ಪಂಚಾಯತ್ ಕ್ಷೇತ್ರಗಳು



Processed & Printed at
NRDMS (ZP) Karwar

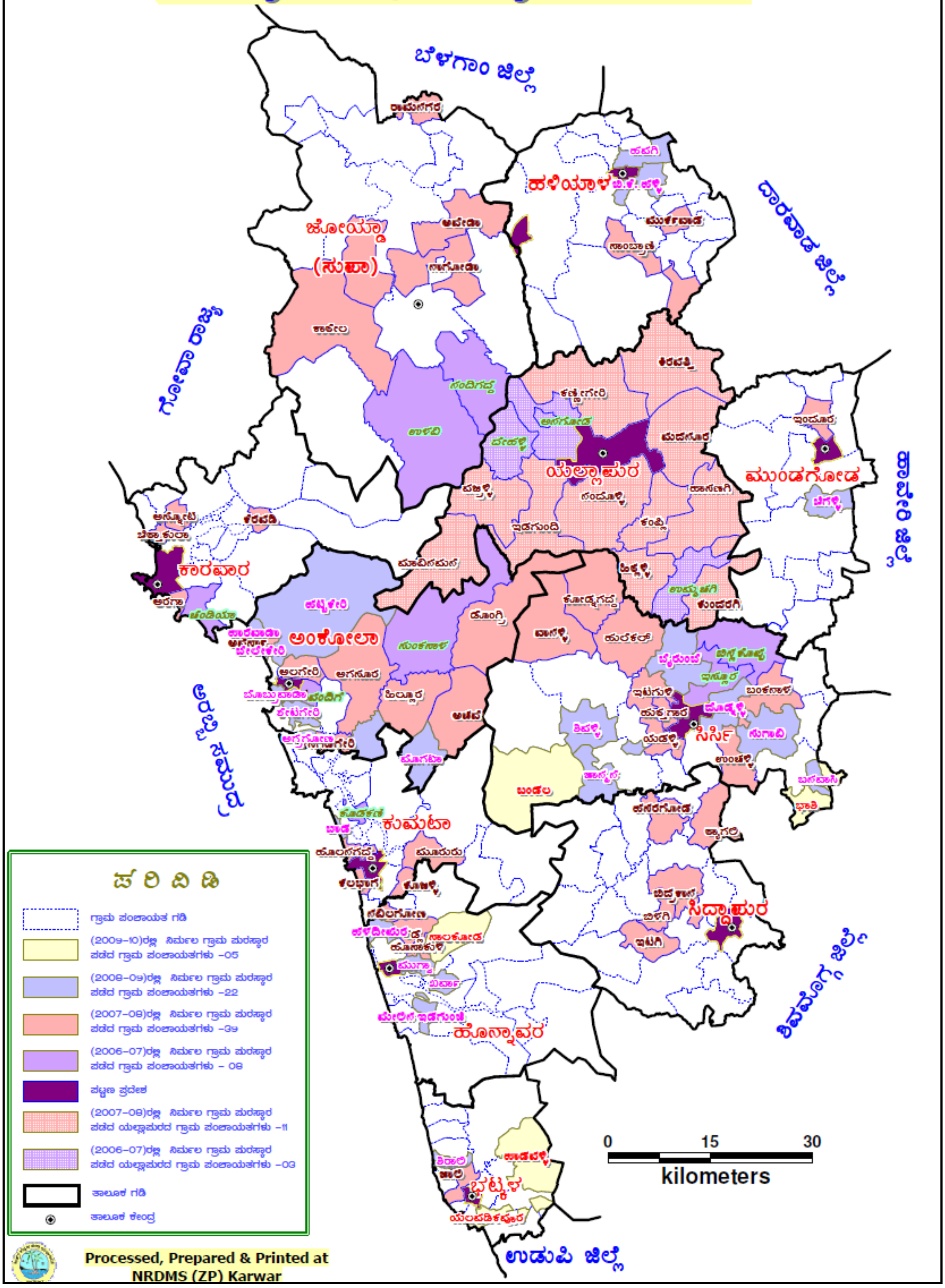
ಉತ್ತರ ಕನ್ನಡ ಜಿಲ್ಲೆ

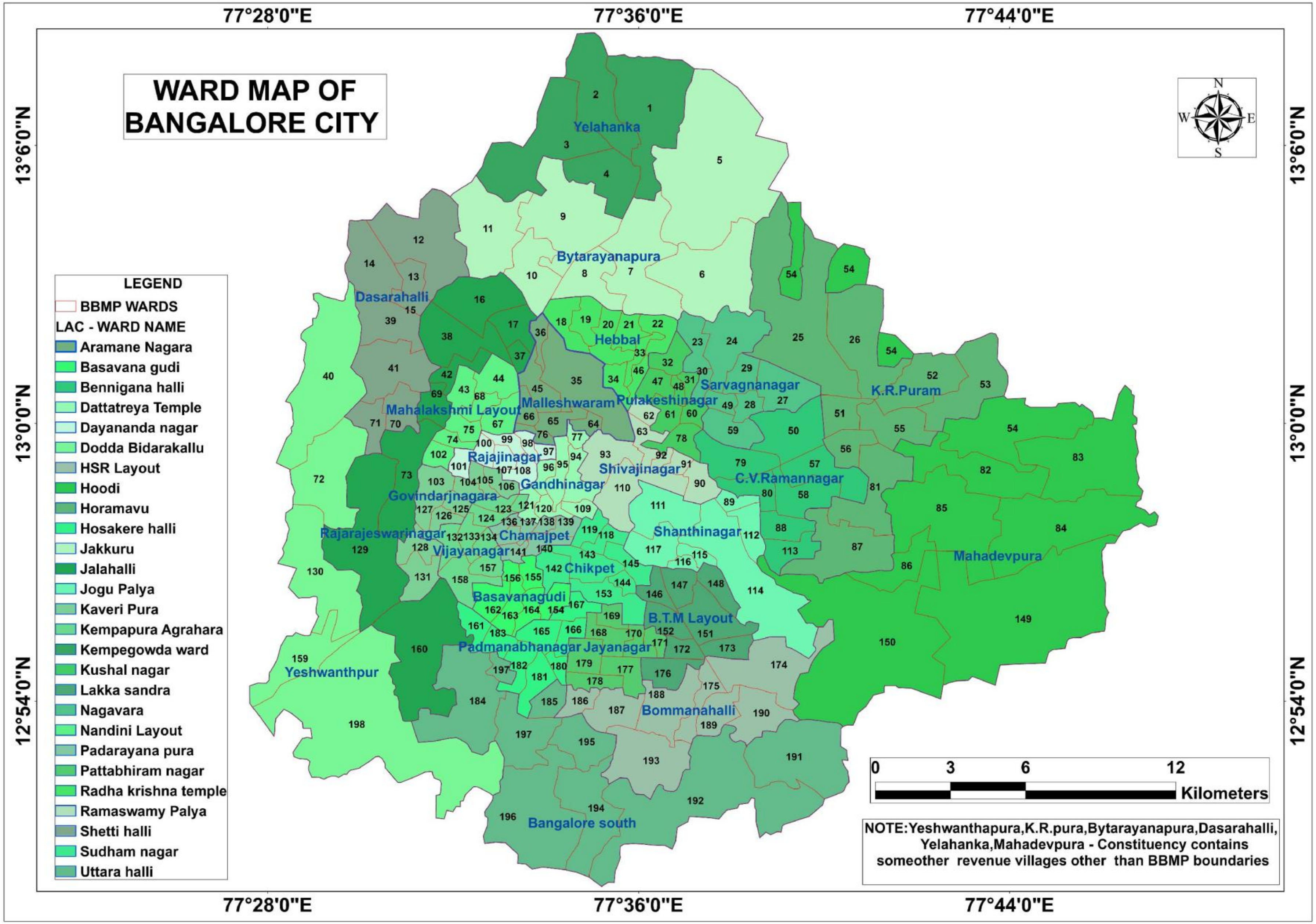
ಪಶು ವೈದ್ಯಕೀಯ ಸಂಸ್ಥೆಗಳು



ಉತ್ತರ ಕನ್ನಡ ಜಿಲ್ಲೆ

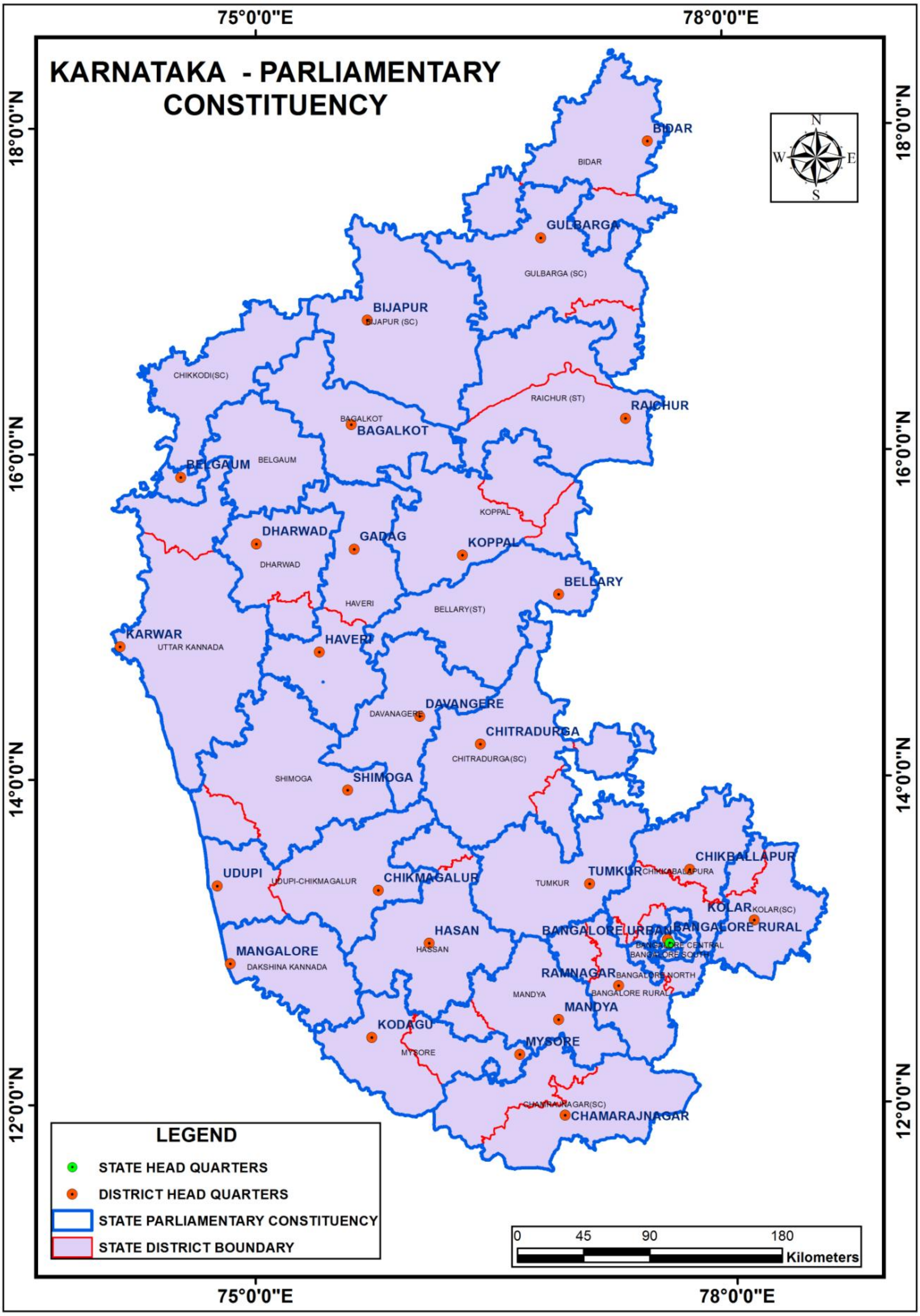
ನಿರ್ಮಲ ಗ್ರಾಮ ಪುರಸ್ಕಾರ ಪಡೆದ ಗ್ರಾಮ ಪಂಚಾಯತಗಳು



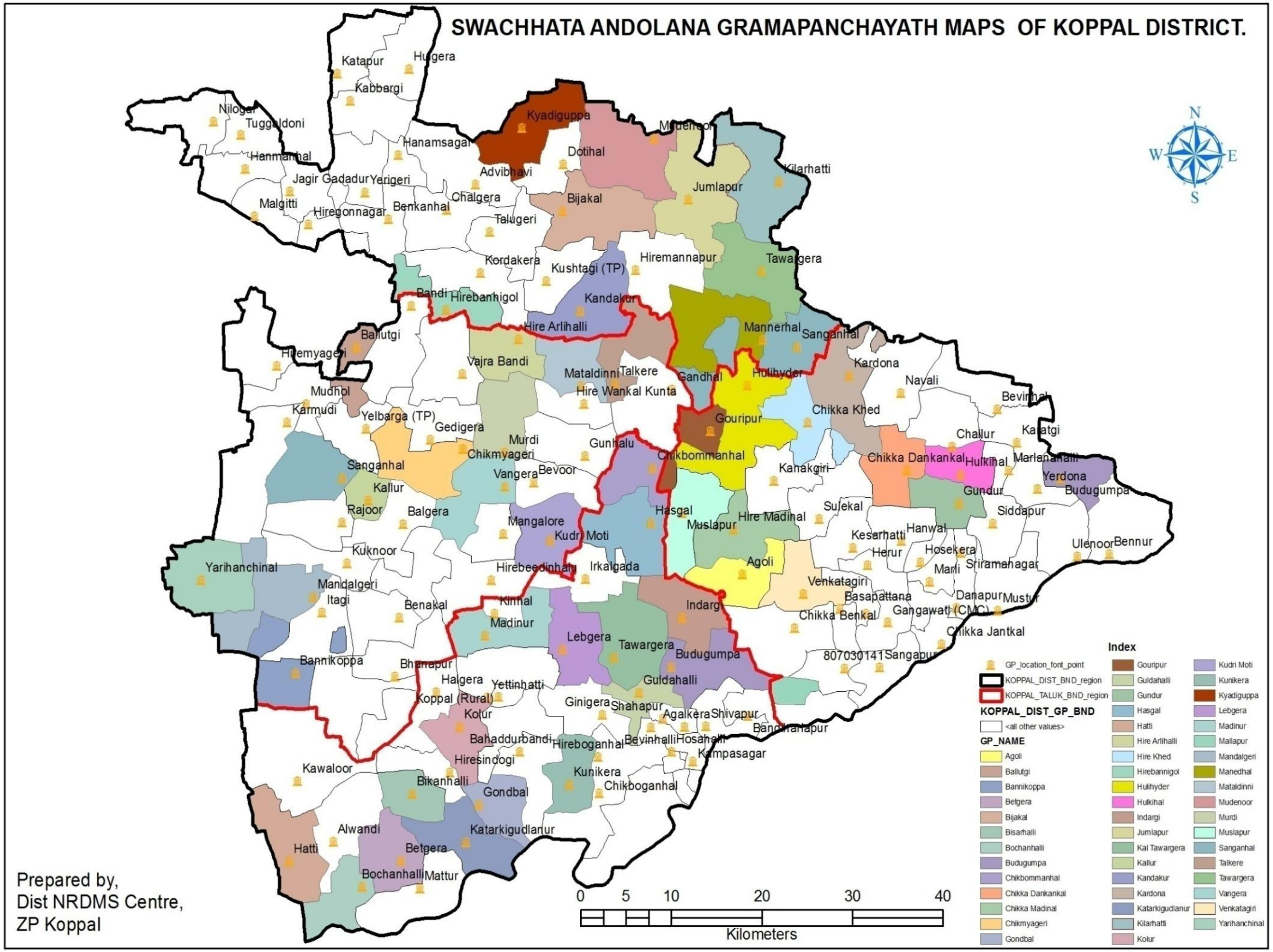


NOTE:Yeshwanthapura,K.R.pura,Bytarayanapura,Dasarahalli, Yelahanka,Mahadevpura - Constituency contains someother revenue villages other than BBMP boundaries

WARD No	WARD NAME	WARD No	WARD NAME	WARD No	WARD NAME	WARD No	WARD NAME
1	Kempegowda ward	51	Vignana Pura	101	Kamakshi Palya	151	Koramangala
2	Chowdeshwari ward	52	K.R.Puram	102	Vrishabhavathi nagar	152	Saddugunte palya
3	Atturu ward	53	Basavanapura	103	Kaveri Pura	153	Jayanagar
4	Yelanka Sattelite town	54	Hoodi	104	Govindaraja Nagar	154	Basavana gudi
5	Jakkuru	55	Devasandra	105	Agrahara Dasarahalli	155	Hanumanth nagar
6	Thanisandra	56	A. Narayanapura	106	Dr.Rajkumar ward	156	Srinagar
7	Byatarayanapura	57	C.V.Raman nagar	107	Shiva nagar	157	Gali Anjeneya Temple ward
8	Kodigehalli	58	New Thippa sandra	108	Sriram mandir	158	Deepanjali nagar
9	Vidyaranyapura	59	Maruthi seva nagar	109	Chickpet	159	Kengeri
10	Dodda bommasandra	60	Sagayara Puram	110	Sampangirama nagar	160	Rajarajeshwari nagar
11	Kuvempu nagara	61	S.K. Garden	111	Shanthala nagar	161	Hosakere halli
12	Shetti halli	62	Ramaswamy Palya	112	Domlur	162	Girinagar
13	Malla sandra	63	Jayamahal	113	Konene agrahara	163	Katriguppe
14	Bagala kunte	64	Rajamahal Guttahalli	114	Agaram	164	Vidya Peeta ward
15	T.Dasara halli	65	Kadu Malleshwar ward	115	Vannarpet	165	Ganesh Mandir ward
16	Jalahalli	66	Subramanya Nagara	116	Neela sandra	166	Kari sandra
17	JP Park	67	Nagapura	117	Shanti Nagar	167	Yediyur
18	Radha krishna temple	68	Mahalakshmi Puram	118	Sudham nagar	168	Pattabhiram nagar
19	Sanjaya nagar	69	Laggere	119	Dharmaraya Swamy Temple	169	Byra sandra
20	Ganga nagara	70	Rajagopala nagar	120	Cottonpete	170	Jayanagar East
21	Hebbala	71	Heggana halli	121	Binnipete	171	Gurappana Palya
22	Vishwanatha Nagenahalli	72	Herohalli	122	Kempapura Agrahara	172	Madiwala
23	Nagavara	73	Kottige Palya	123	Vijaya nagar	173	Jakka sandra
24	HBR Layout	74	Shakthi Ganapathi nagara	124	Hosahalli	174	HSR Layout
25	Horamavu	75	Shankar Mutt	125	Marena halli	175	Bommanahalli
26	Ramamurthy nagara	76	Gayathri nagar	126	Maruthi Mandir ward	176	BTM Layout
27	Banaswadi	77	Dattatreya Temple	127	Mudal Palya	177	JP Nagara
28	Kammana halli	78	Pulakeshi nagar	128	Nagarabhavi ward	178	Sarakki
29	Kacharkana halli	79	Sarvagna nagar	129	Jnana Bharathi ward	179	Shakhambari Nagar
30	Kadu Gondanahalli	80	Hoysala nagar	130	Ullalu	180	Banashankari Temple ward
31	Kushal nagar	81	Vijnana nagar	131	Nayanda halli	181	Kumaraswamy Layout
32	Kavalbyra sandra	82	Garudachar Palya	132	Attiguppe	182	Padmanabha Nagar
33	Manorayana Palya	83	Kadugodi	133	Hampi nagara	183	Chikkalla sandra
34	Gangena halli	84	Hagadur	134	Bapuji nagar	184	Uttara halli
35	Aramane Nagara	85	Dodda Nekkundi	135	Padarayana pura	185	Yekkena halli
36	Matthikere	86	Marathhalli	136	Jagajeevanram nagar	186	Jaragana halli
37	Yeshwanth pura	87	HAL Airport	137	Rayapuram	187	Puttena halli
38	HMT Ward	88	Jeevan Bheema nagar	138	Chalavadi Palya	188	Bilekahalli
39	Chokka sandra	89	Jogu Palya	139	K.R.Market	189	Honga sandra
40	Dodda Bidarakallu	90	Halasooru	140	Chamarajpet	190	Mangammana Palya
41	Peenya Industrial Area	91	Bharathi nagar	141	Azad nagar	191	Singa sandra
42	Lakshmi Devi nagara	92	Shivaji nagar	142	Sunkena halli	192	Begur
43	Nandini Layout	93	Vasanth nagar	143	Vishveshwara puram	193	Arakere
44	Marappana palya	94	Gandhi nagar	144	Siddapura	194	Gottigere
45	Malleshwaram	95	Subhash Nagar	145	Hombegowda nagara	195	Konana kunte
46	Jayachamarajendra nagar	96	Okalipuram	146	Lakka sandra	196	Anjana pura
47	Devara Jeevana halli	97	Dayananda nagar	147	Adugodi	197	Vasanth Pura
48	Muneshwara nagar	98	Prakash Nagar	148	Eijipura	198	Hemmigepura
49	Lingarajapuram	99	Rajaji nagar	149	Varthuru		
50	Bennigana halli	100	Basaveshwara nagar	150	Bellanduru		


KARNATAKA - PARLIAMENTARY CONSTITUENCY
75°0'0"E
78°0'0"E
18°0'0"N
16°0'0"N
14°0'0"N
12°0'0"N
N
S
E
W
BIDAR
GULBARGA
GULBARGA (SC)
BIJAPUR
BIJAPUR (SC)
CHIKKODI(SC)
RAICHUR
RAICHUR (ST)
BAGALKOT
BELGAUM
KOPPAL
DHARWAD
GADAG
BELLARY
BELLARY(ST)
HAVERI
KARWAR
UTTAR KANNADA
DAVANAGERE
CHITRADURGA
CHITRADURGA(SC)
SHIMOGA
UDUPI
UDUPI-CHIKMAGALUR
CHIKMAGALUR
TUMKUR
CHIKBALLAPUR
CHIKKABALLAPURA
KOLAR
KOLAR(SC)
BANGALORE URBAN
BANGALORE RURAL
BANGALORE CENTRAL
BANGALORE SOUTH
BANGALORE NORTH
HASAN
HASSAN
MANGALORE
DAKSHINA KANNADA
RAMNAGAR
MANDYA
KODAGU
MYSORE
CHAMARAJNAGAR
CHAMARAJNAGAR(SC)
LEGEND
STATE HEAD QUARTERS
DISTRICT HEAD QUARTERS
STATE PARLIAMENTARY CONSTITUENCY
STATE DISTRICT BOUNDARY
0
45
90
180
Kilometers

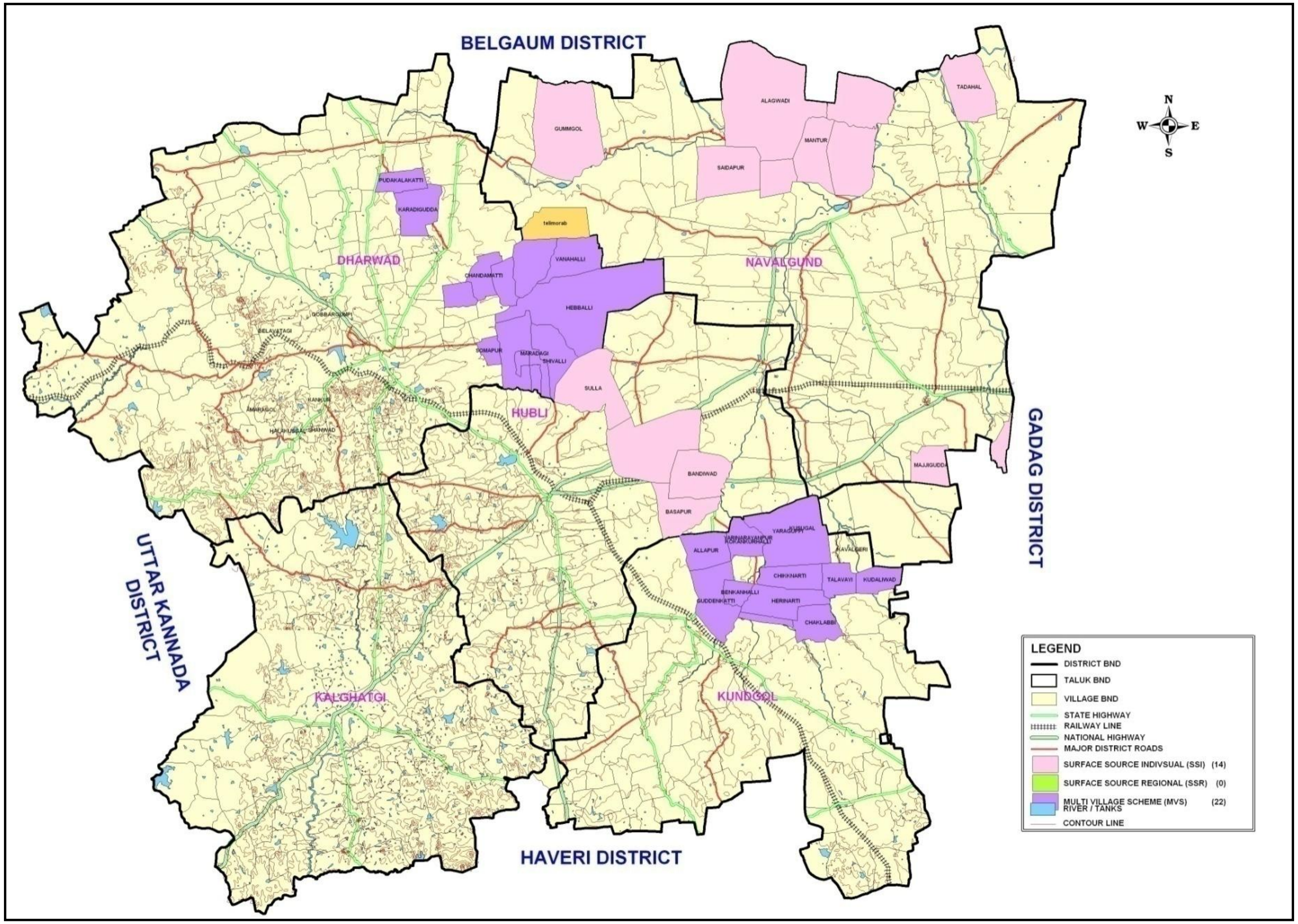
SWACHHATA ANDOLANA GRAMAPANCHAYATH MAPS OF KOPPAL DISTRICT.

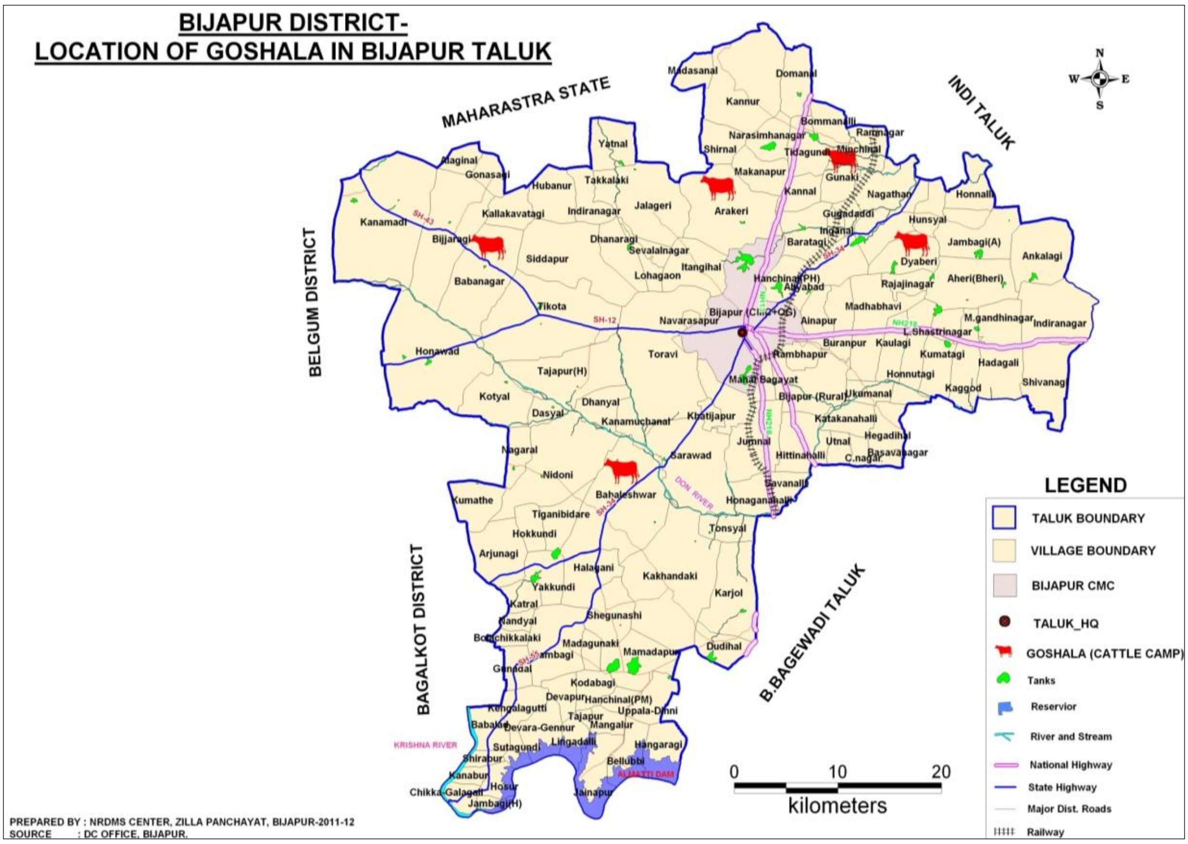


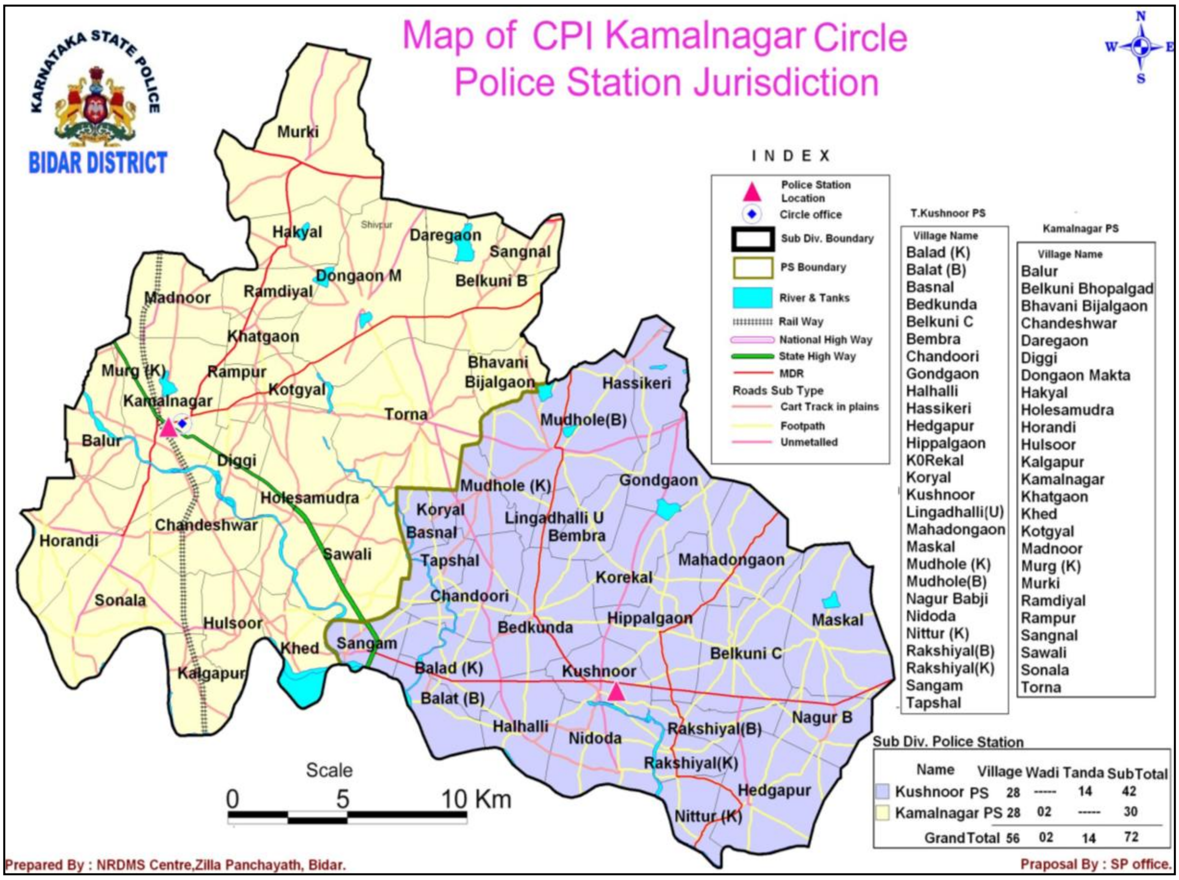
Prepared by,
Dist NRDMS Centre,
ZP Koppal

MAP SHOWING DETAILS OF SCHEMES PROPOSED UNDER ADDITIONAL FINANCING UNDER JAL NIRMAL PROJECT

DHARWAD DISTRICT







T.Kushnoor PS

Village Name
- Balad (K)
- Balat (B)
- Basnal
- Bedkunda
- Belkuni C
- Bembra
- Chandoori
- Gondgaon
- Halhalli
- Hassikeri
- Hedgapur
- Hippalgaon
- K0Rekal
- Koryal
- Kushnoor
- Lingadhalli(U)
- Mahadongaon
- Maskal
- Mudhole (K)
- Mudhole(B)
- Nagur Babji
- Nidoda
- Nittur (K)
- Rakshiyal(B)
- Rakshiyal(K)
- Sangam
- Tapshal

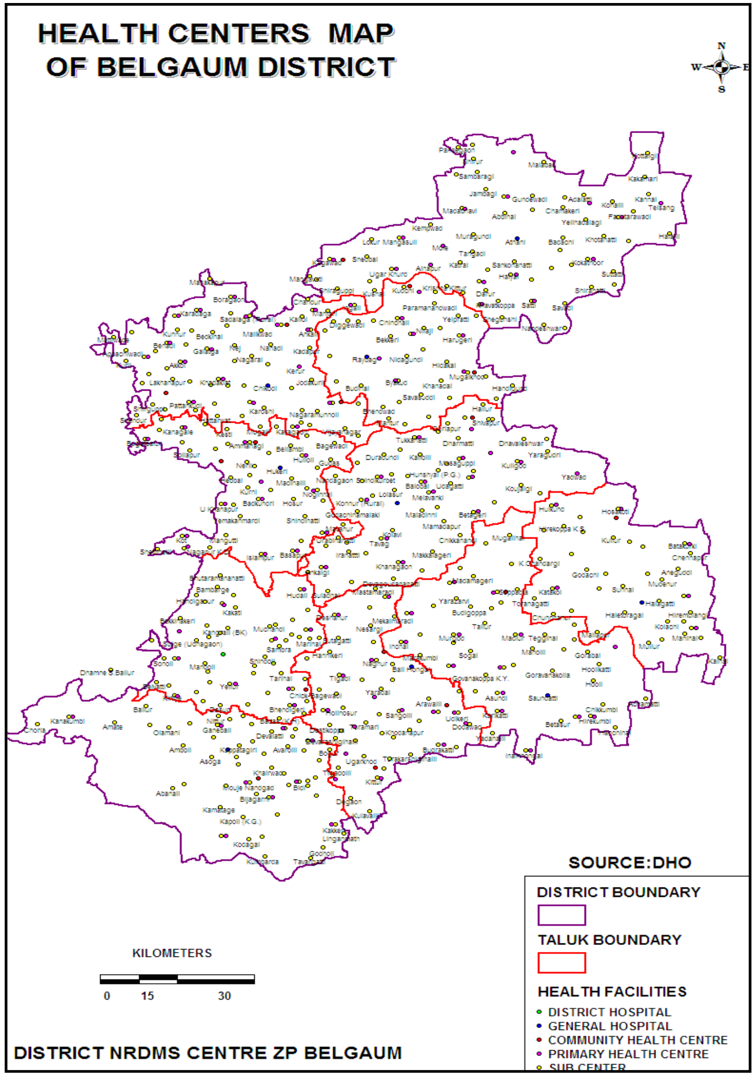
Kamalnagar PS

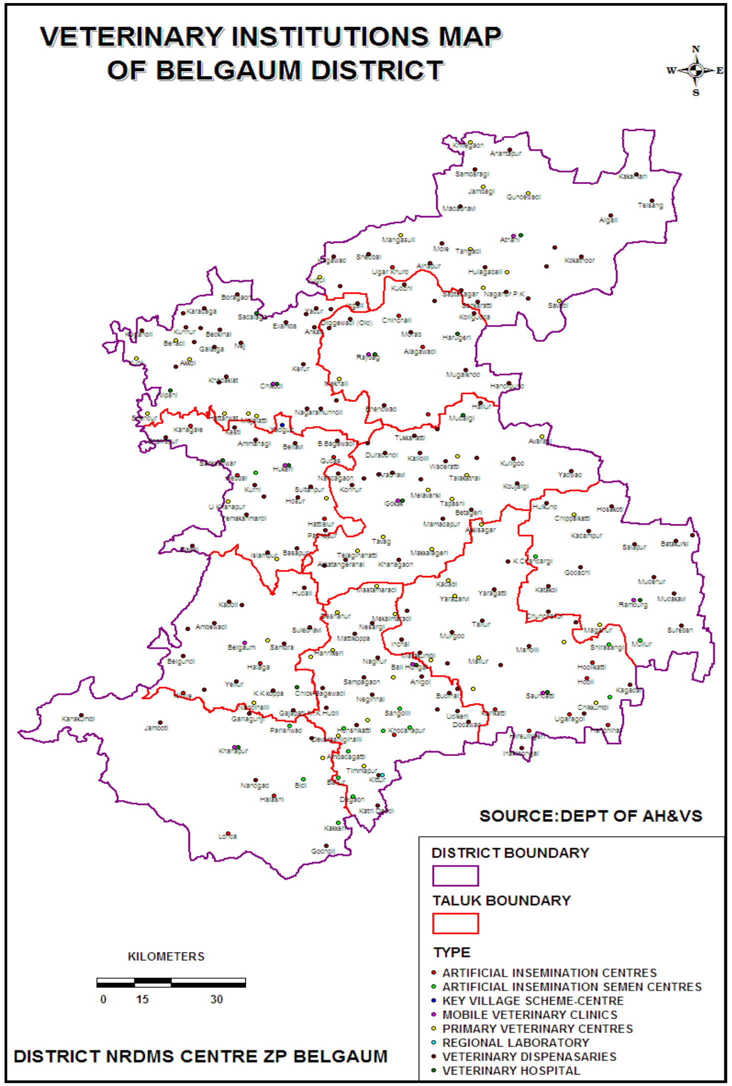
Village Name
- Balur
- Belkuni Bhopalgad
- Bhavani Bijalgaon
- Chandeshwar
- Daregaon
- Diggi
- Dongaon Makta
- Hakyal
- Holesamudra
- Horandi
- Hulsoor
- Kalgapur
- Kamalnagar
- Khatgaon
- Khed
- Kotgyal
- Madnoor
- Murg (K)
- Murki
- Ramdiyal
- Rampur
- Sangnal
- Sawali
- Sonala
- Torna

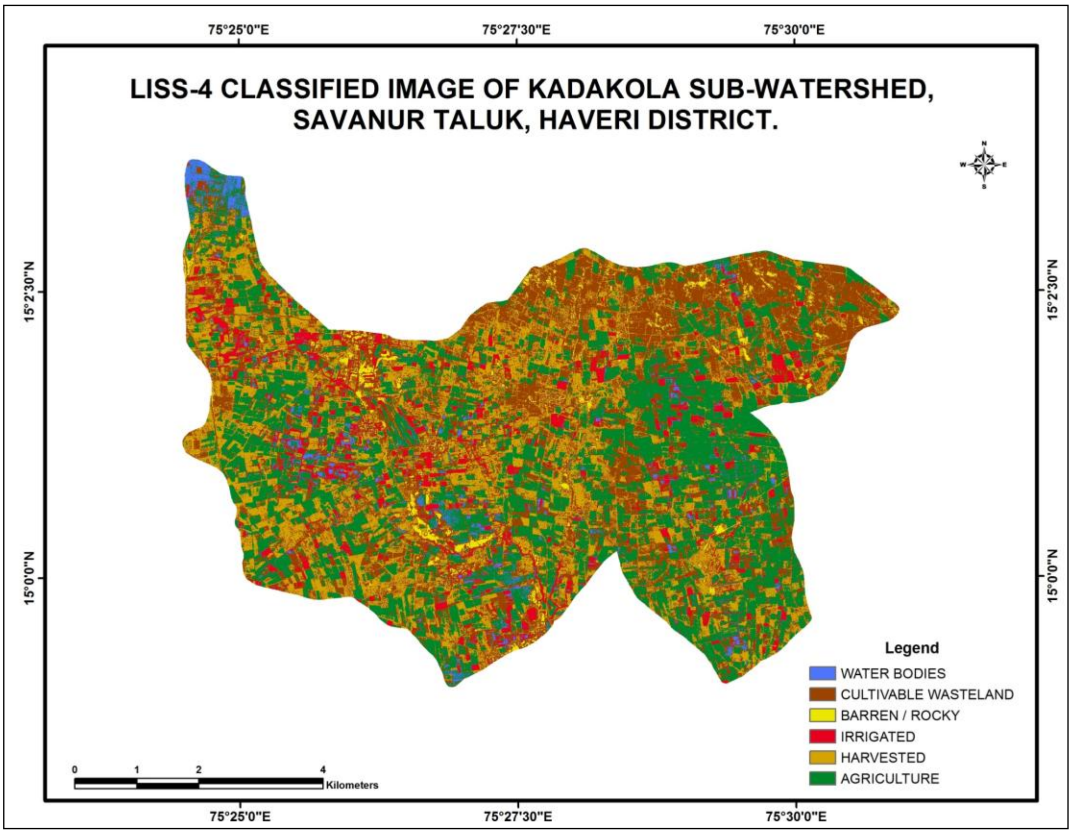
Sub Div. Police Station

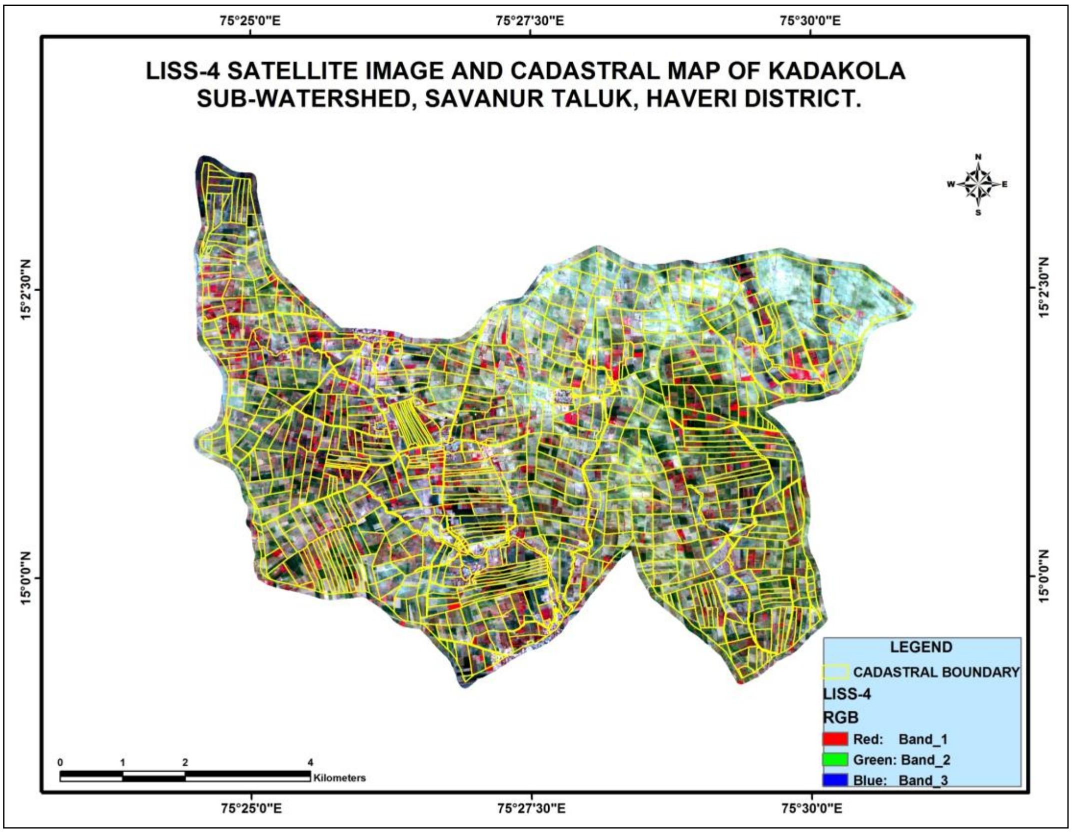
	Name	Village	Wadi	Tanda	SubTotal
🟦	Kushnoor PS	28	-----	14	42
🟨	Kamalnagar PS	28	02	-----	30
	Grand Total	56	02	14	72

Health and Veterinary facilities

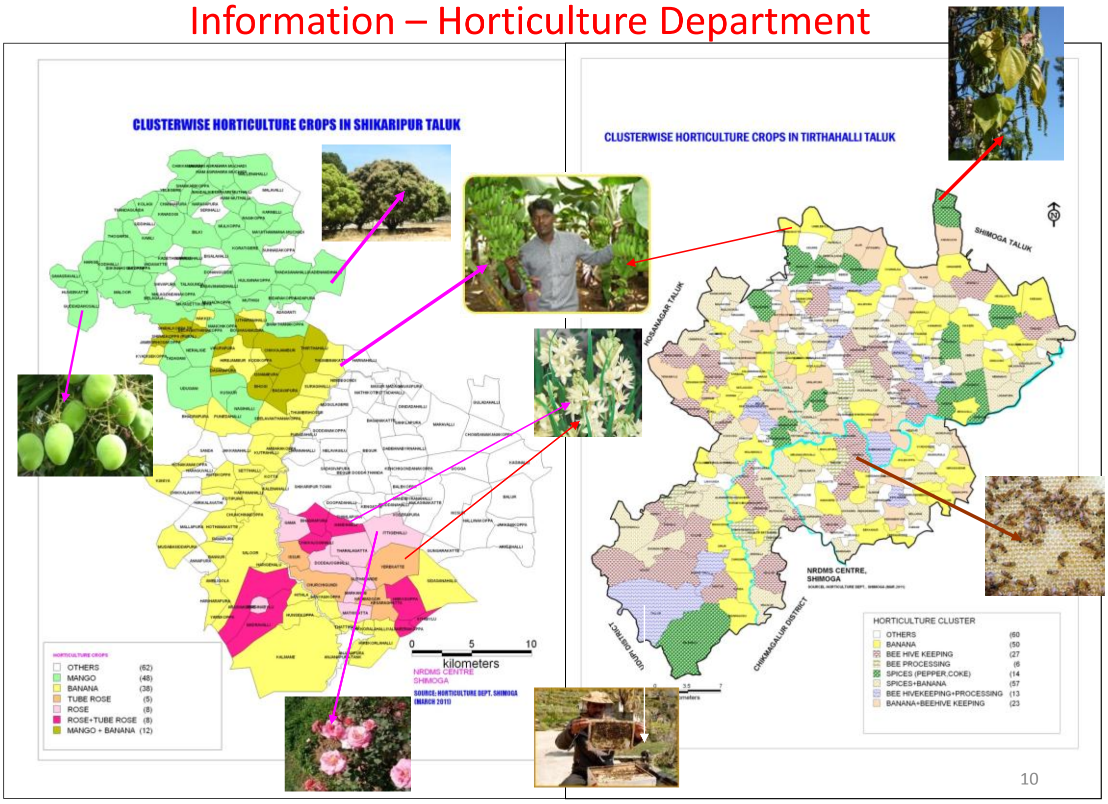




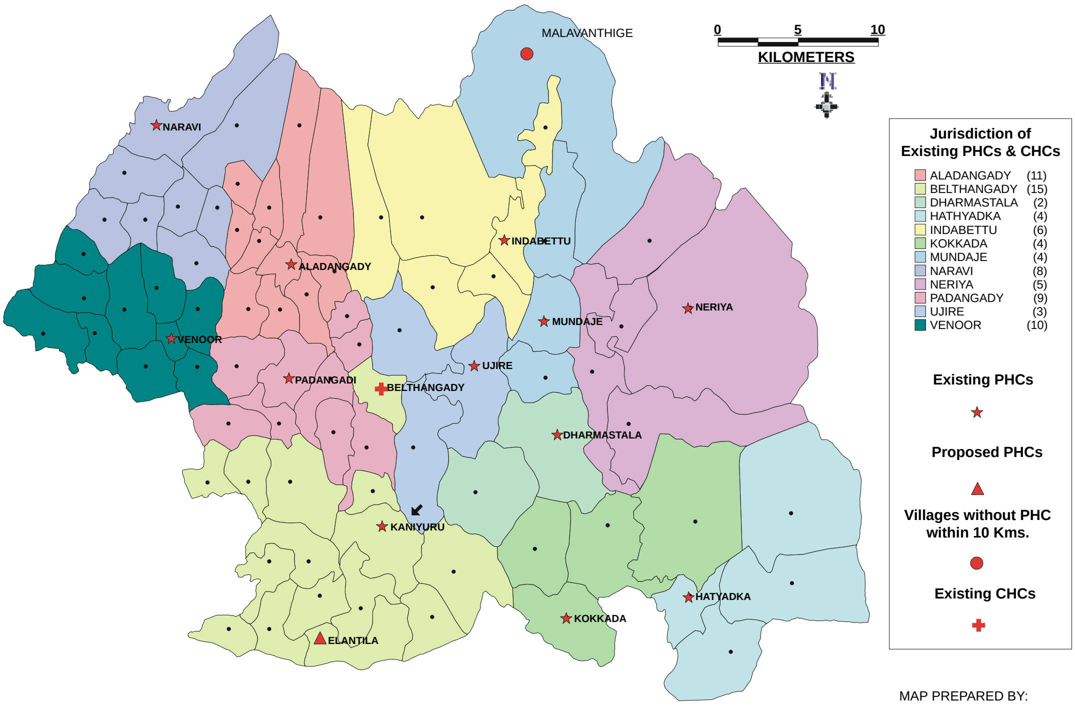

75°25'0"E
75°27'30"E
75°30'0"E
LISS-4 CLASSIFIED IMAGE OF KADAKOLA SUB-WATERSHED, SAVANUR TALUK, HAVERI DISTRICT.
N
W
E
S
15°2'30"N
15°0'0"N
Legend
WATER BODIES
CULTIVABLE WASTELAND
BARREN / ROCKY
IRRIGATED
HARVESTED
AGRICULTURE
0
1
2
4
Kilometers


75°25'0"E
75°27'30"E
75°30'0"E
LISS-4 SATELLITE IMAGE AND CADASTRAL MAP OF KADAKOLA SUB-WATERSHED, SAVANUR TALUK, HAVERI DISTRICT.
N
W
E
S
15°2'30"N
15°0'0"N
LEGEND
CADASTRAL BOUNDARY
LISS-4
RGB
Red: Band_1
Green: Band_2
Blue: Band_3
0
1
2
4
Kilometers

Information – Horticulture Department

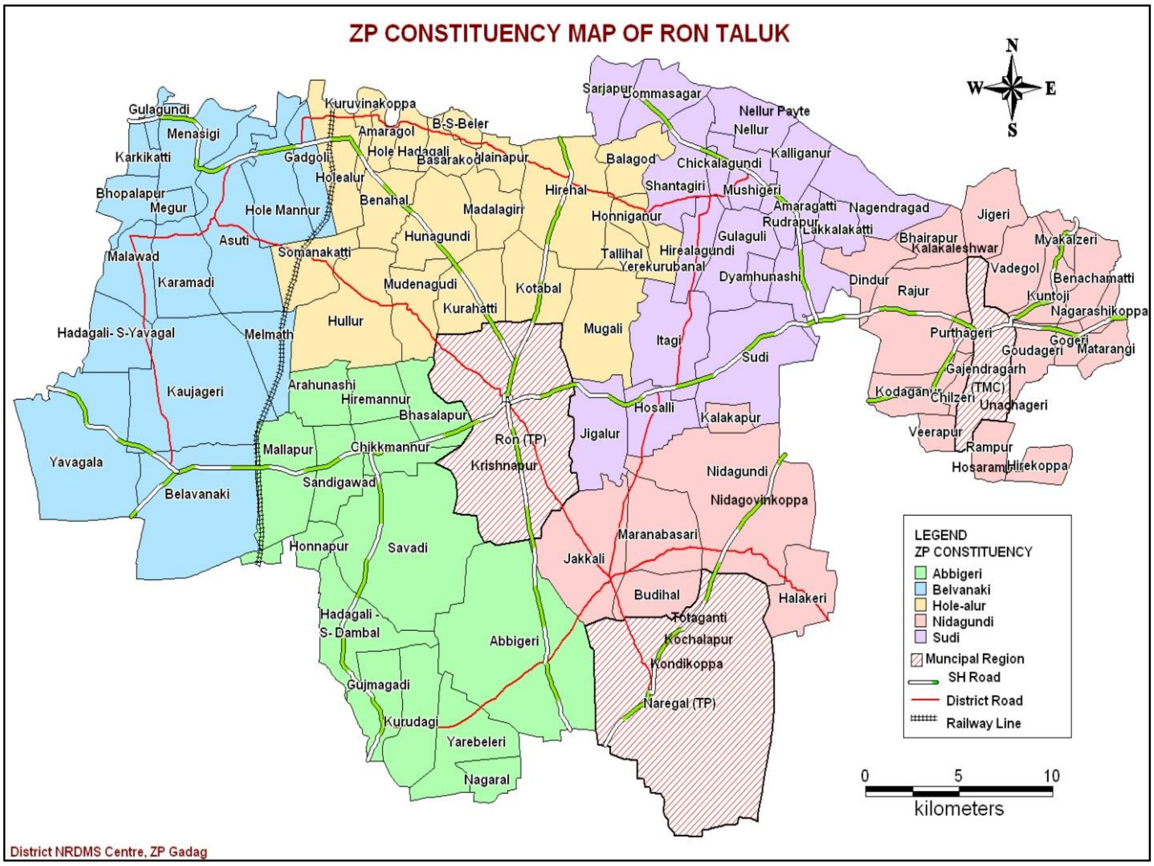


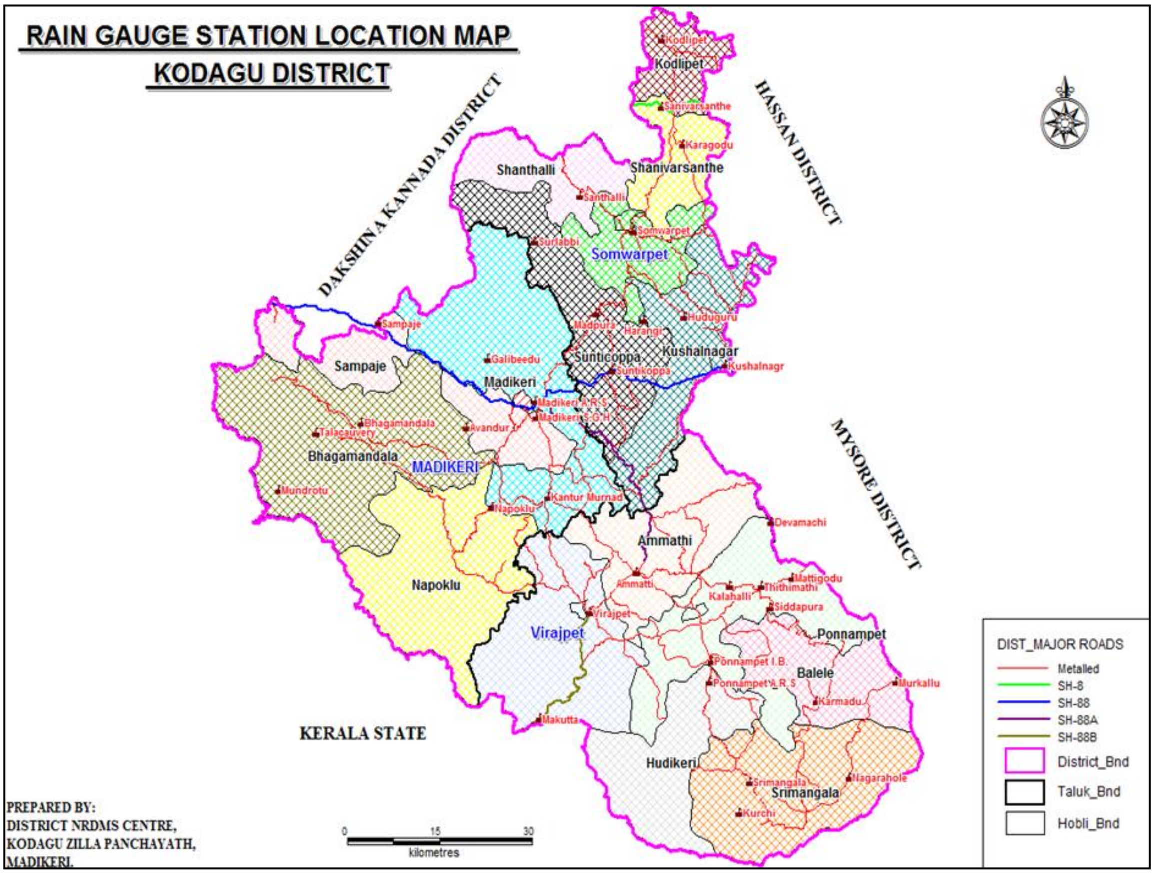
EXISTING AND PROPOSED HEALTH FACILITIES (PHC & CHC) IN BELTHANGADY TALUK WITH JURISDICTION OF EXISTING PHCS AND CHCS

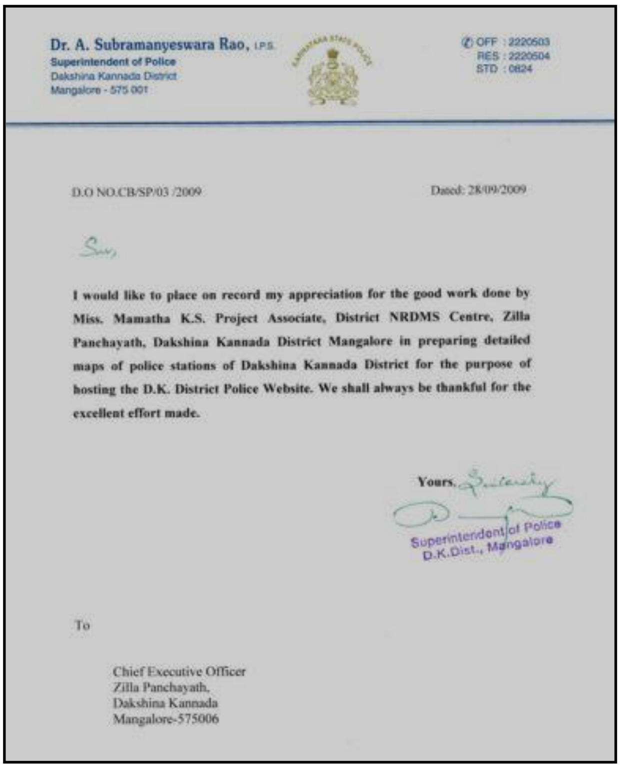


NOTE: ↙ SHOWS PHC KANIYURU WHICH IS SANCTIONED BUT NOT STARTED.
HENCE NO SEPERATE JURISDICTION IS GIVEN FOR THE SAME

MAP PREPARED BY:
DK NRDMS
MANGALORE


ZP CONSTITUENCY MAP OF RON TALUK
N
W
E
S
LEGEND
ZP CONSTITUENCY
🟩 Abbigeri
🟦 Belvanaki
🟨 Hole-alur
🟥 Nidagundi
🟪 Sudi
▨ Muncipal Region
SH Road
District Road
Railway Line
0
5
10
kilometers
Ron (TP)
Naregal (TP)
Gajendragarh (TMC)
District NRDMS Centre, ZP Gadag


RAIN GAUGE STATION LOCATION MAP
KODAGU DISTRICT
DAKSHINA KANNADA DISTRICT
HASSAN DISTRICT
MYSORE DISTRICT
KERALA STATE
Somwarpet
MADIKERI
Virajpet
DIST_MAJOR ROADS
Metalled
SH-8
SH-88
SH-88A
SH-88B
District_Bnd
Taluk_Bnd
Hobli_Bnd
0
15
30
kilometres
PREPARED BY:
DISTRICT NRDMS CENTRE,
KODAGU ZILLA PANCHAYATH,
MADIKERI.



Dr. A. Subramanyeswara Rao, I.P.S.
Superintendent of Police
Dakshina Kannada District
Mangalore - 575 001

✆ OFF : 2220603
RES : 2220604
STD : 0824

D.O NO.CB/SP/03 /2009

Dated: 28/09/2009

Sir,

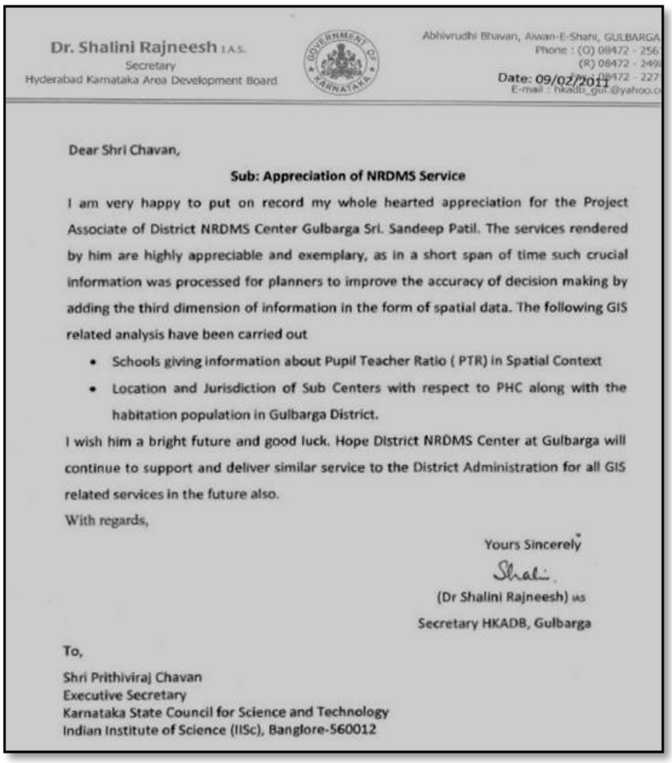
I would like to place on record my appreciation for the good work done by Miss. Mamatha K.S. Project Associate, District NRDMS Centre, Zilla Panchayath, Dakshina Kannada District Mangalore in preparing detailed maps of police stations of Dakshina Kannada District for the purpose of hosting the D.K. District Police Website. We shall always be thankful for the excellent effort made.

Yours,

Superintendent of Police
D.K.Dist., Mangalore

To

Chief Executive Officer
Zilla Panchayath,
Dakshina Kannada
Mangalore-575006



Dr. Shalini Rajneesh I.A.S.
Secretary
Hyderabad Karnataka Area Development Board

Abhivrudhi Bhavan, Aiwan-E-Shahi, GULBARGA
Phone : (O) 08472 - 256
(R) 08472 - 249
08472 - 227
E-mail : hkadb_gul@yahoo.c

Date: 09/02/2011

Dear Shri Chavan,

Sub: Appreciation of NRDMS Service

I am very happy to put on record my whole hearted appreciation for the Project Associate of District NRDMS Center Gulbarga Sri. Sandeep Patil. The services rendered by him are highly appreciable and exemplary, as in a short span of time such crucial information was processed for planners to improve the accuracy of decision making by adding the third dimension of information in the form of spatial data. The following GIS related analysis have been carried out

- Schools giving information about Pupil Teacher Ratio (PTR) in Spatial Context
- Location and Jurisdiction of Sub Centers with respect to PHC along with the habitation population in Gulbarga District.

I wish him a bright future and good luck. Hope District NRDMS Center at Gulbarga will continue to support and deliver similar service to the District Administration for all GIS related services in the future also.

With regards,

Yours Sincerely

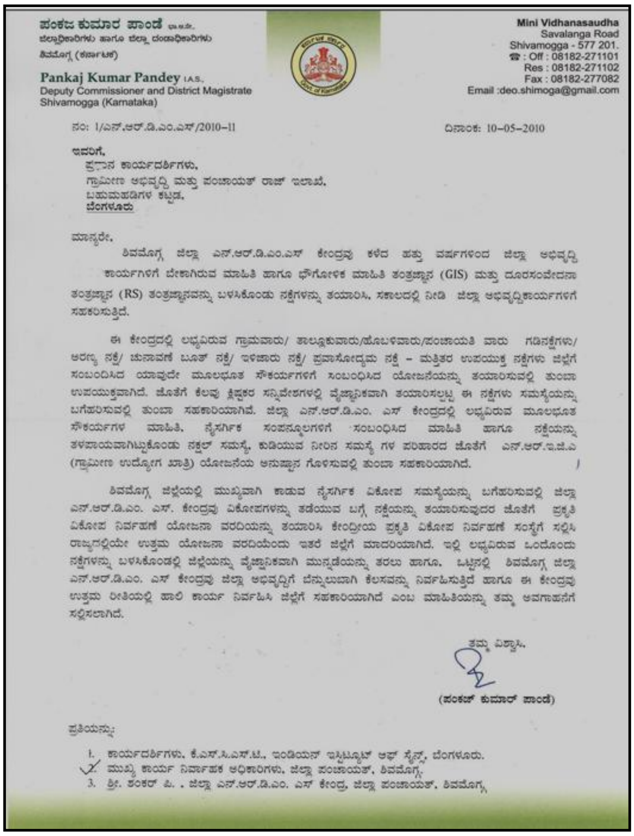
Shali

(Dr Shalini Rajneesh) IAS

Secretary HKADB, Gulbarga

To,

Shri Prithiviraj Chavan
Executive Secretary
Karnataka State Council for Science and Technology
Indian Institute of Science (IISc), Banglore-560012



ಪಂಕಜ ಕುಮಾರ ಪಾಂಡೆ ಭಾ.ಆ.ಸೇ.
ಜಿಲ್ಲಾಧಿಕಾರಿಗಳು ಹಾಗೂ ಜಿಲ್ಲಾ ದಂಡಾಧಿಕಾರಿಗಳು
ಶಿವಮೊಗ್ಗ (ಕರ್ನಾಟಕ)

Pankaj Kumar Pandey I.A.S.
Deputy Commissioner and District Magistrate
Shivamogga (Karnataka)

Mini Vidhanasaudha
Savalanga Road
Shivamogga - 577 201.
☎ : Off : 08182-271101
Res : 08182-271102
Fax : 08182-277082
Email :deo.shimoga@gmail.com

ನಂ: 1/ಎನ್.ಆರ್.ಡಿ.ಎಂ.ಎಸ್/2010–11

ದಿನಾಂಕ: 10–05–2010

ಇವರಿಗೆ,
ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿಗಳು,
ಗ್ರಾಮೀಣಾ ಅಭಿವೃದ್ಧಿ ಮತ್ತು ಪಂಚಾಯತ್ ರಾಜ್ ಇಲಾಖೆ,
ಬಹುಮಹಡಿಗಳ ಕಟ್ಟಡ,
ಬೆಂಗಳೂರು

ಮಾನ್ಯರೇ,

ಶಿವಮೊಗ್ಗ ಜಿಲ್ಲಾ ಎನ್.ಆರ್.ಡಿ.ಎಂ.ಎಸ್ ಕೇಂದ್ರವು ಕಳೆದ ಹತ್ತು ವರ್ಷಗಳಿಂದ ಜಿಲ್ಲಾ ಅಭಿವೃದ್ಧಿ ಕಾರ್ಯಗಳಿಗೆ ಬೇಕಾಗಿರುವ ಮಾಹಿತಿ ಹಾಗೂ ಭೌಗೋಳಿಕ ಮಾಹಿತಿ ತಂತ್ರಜ್ಞಾನ (GIS) ಮತ್ತು ದೂರಸಂವೇದನಾ ತಂತ್ರಜ್ಞಾನ (RS) ತಂತ್ರಜ್ಞಾನವನ್ನು ಬಳಸಿಕೊಂಡು ನಕ್ಷೆಗಳನ್ನು ತಯಾರಿಸಿ, ಸಕಾಲದಲ್ಲಿ ನೀಡಿ ಜಿಲ್ಲಾ ಅಭಿವೃದ್ಧಿಕಾರ್ಯಗಳಿಗೆ ಸಹಕರಿಸುತ್ತಿದೆ.

ಈ ಕೇಂದ್ರದಲ್ಲಿ ಲಭ್ಯವಿರುವ ಗ್ರಾಮವಾರು/ ತಾಲ್ಲೂಕುವಾರು/ಹೋಬಳಿವಾರು/ಪಂಚಾಯತಿ ವಾರು ಗಡಿನಕ್ಷೆಗಳು/ ಅರಣ್ಯ ನಕ್ಷೆ/ ಚುನಾವಣೆ ಬೂತ್ ನಕ್ಷೆ/ ಇಳಿಜಾರು ನಕ್ಷೆ/ ಪ್ರವಾಸೋದ್ಯಮ ನಕ್ಷೆ – ಮತ್ತಿತರ ಉಪಯುಕ್ತ ನಕ್ಷೆಗಳು ಜಿಲ್ಲೆಗೆ ಸಂಬಂಧಿಸಿದ ಯಾವುದೇ ಮೂಲಭೂತ ಸೌಕರ್ಯಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ಯೋಜನೆಯನ್ನು ತಯಾರಿಸುವಲ್ಲಿ ತುಂಬಾ ಉಪಯುಕ್ತವಾಗಿದೆ. ಜೊತೆಗೆ ಕೆಲವು ಕ್ಲಿಷ್ಟಕರ ಸನ್ನಿವೇಶಗಳಲ್ಲಿ ವೈಜ್ಞಾನಿಕವಾಗಿ ತಯಾರಿಸಲ್ಪಟ್ಟ ಈ ನಕ್ಷೆಗಳು ಸಮಸ್ಯೆಯನ್ನು ಬಗೆಹರಿಸುವಲ್ಲಿ ತುಂಬಾ ಸಹಕಾರಿಯಾಗಿವೆ. ಜಿಲ್ಲಾ ಎನ್.ಆರ್.ಡಿ.ಎಂ. ಎಸ್ ಕೇಂದ್ರದಲ್ಲಿ ಲಭ್ಯವಿರುವ ಮೂಲಭೂತ ಸೌಕರ್ಯಗಳ ಮಾಹಿತಿ. ನೈಸರ್ಗಿಕ ಸಂಪನ್ಮೂಲಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ಮಾಹಿತಿ ಹಾಗೂ ನಕ್ಷೆಯನ್ನು ತಳಪಾಯವಾಗಿಟ್ಟುಕೊಂಡು ನಕ್ಸಲ್ ಸಮಸ್ಯೆ, ಕುಡಿಯುವ ನೀರಿನ ಸಮಸ್ಯೆ ಗಳ ಪರಿಹಾರದ ಜೊತೆಗೆ ಎನ್.ಆರ್.ಇ.ಜಿ.ಎ (ಗ್ರಾಮೀಣ ಉದ್ಯೋಗ ಖಾತ್ರಿ) ಯೋಜನೆಯ ಅನುಷ್ಠಾನ ಗೊಳಿಸುವಲ್ಲಿ ತುಂಬಾ ಸಹಕಾರಿಯಾಗಿದೆ.

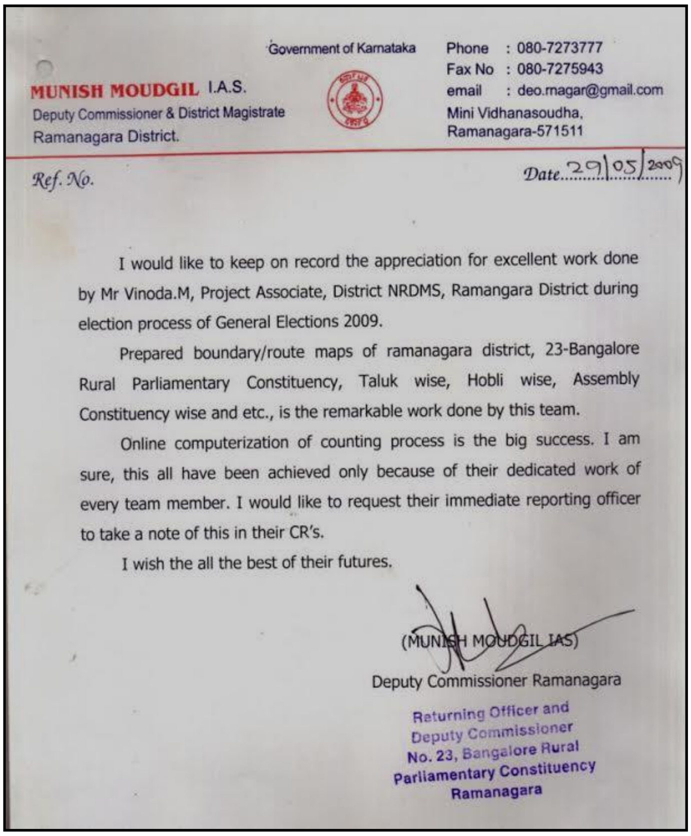
ಶಿವಮೊಗ್ಗ ಜಿಲ್ಲೆಯಲ್ಲಿ ಮುಖ್ಯವಾಗಿ ಕಾಡುವ ನೈಸರ್ಗಿಕ ವಿಕೋಪ ಸಮಸ್ಯೆಯನ್ನು ಬಗೆಹರಿಸುವಲ್ಲಿ ಜಿಲ್ಲಾ ಎನ್.ಆರ್.ಡಿ.ಎಂ. ಎಸ್. ಕೇಂದ್ರವು ವಿಕೋಪಗಳನ್ನು ತಡೆಯುವ ಬಗ್ಗೆ ನಕ್ಷೆಯನ್ನು ತಯಾರಿಸುವುದರ ಜೊತೆಗೆ ಪ್ರಕೃತಿ ವಿಕೋಪ ನಿರ್ವಹಣೆ ಯೋಜನಾ ವರದಿಯನ್ನು ತಯಾರಿಸಿ ಕೇಂದ್ರೀಯ ಪ್ರಕೃತಿ ವಿಕೋಪ ನಿರ್ವಹಣೆ ಸಂಸ್ಥೆಗೆ ಸಲ್ಲಿಸಿ ರಾಜ್ಯಗಳಲ್ಲಿಯೇ ಉತ್ತಮ ಯೋಜನಾ ವರದಿಯೆಂದು ಇತರೆ ಜಿಲ್ಲೆಗೆ ಮಾದರಿಯಾಗಿದೆ. ಇಲ್ಲಿ ಲಭ್ಯವಿರುವ ಒಂದೊಂದು ನಕ್ಷೆಗಳನ್ನು ಬಳಸಿಕೊಂಡಲ್ಲಿ ಜಿಲ್ಲೆಯನ್ನು ವೈಜ್ಞಾನಿಕವಾಗಿ ಮುನ್ನಡೆಯನ್ನು ತರಲು ಹಾಗೂ. ಒಟ್ಟಿನಲ್ಲಿ ಶಿವಮೊಗ್ಗ ಜಿಲ್ಲಾ ಎನ್.ಆರ್.ಡಿ.ಎಂ. ಎಸ್ ಕೇಂದ್ರವು ಜಿಲ್ಲಾ ಅಭಿವೃದ್ಧಿಗೆ ಬೆನ್ನುಲುಬಾಗಿ ಕೆಲಸವನ್ನು ನಿರ್ವಹಿಸುತ್ತಿದೆ ಹಾಗೂ ಈ ಕೇಂದ್ರವು ಉತ್ತಮ ರೀತಿಯಲ್ಲಿ ಹಾಲಿ ಕಾರ್ಯ ನಿರ್ವಹಿಸಿ ಜಿಲ್ಲೆಗೆ ಸಹಕಾರಿಯಾಗಿದೆ ಎಂಬ ಮಾಹಿತಿಯನ್ನು ತಮ್ಮ ಅವಗಾಹನೆಗೆ ಸಲ್ಲಿಸಲಾಗಿದೆ.

ತಮ್ಮ ವಿಶ್ವಾಸಿ,

(ಪಂಕಜ್ ಕುಮಾರ್ ಪಾಂಡೆ)

ಪ್ರತಿಯನ್ನು:

1. ಕಾರ್ಯದರ್ಶಿಗಳು, ಕೆ.ಎಸ್.ಸಿ.ಎಸ್.ಟಿ., ಇಂಡಿಯನ್ ಇನ್ಸ್ಟಿಟ್ಯೂಟ್ ಆಫ್ ಸೈನ್ಸ್, ಬೆಂಗಳೂರು.
2. ಮುಖ್ಯ ಕಾರ್ಯ ನಿರ್ವಾಹಕ ಅಧಿಕಾರಿಗಳು, ಜಿಲ್ಲಾ ಪಂಚಾಯತ್, ಶಿವಮೊಗ್ಗ.
3. ಶ್ರೀ. ಶಂಕರ್ ಪಿ. . ಜಿಲ್ಲಾ ಎನ್.ಆರ್.ಡಿ.ಎಂ. ಎಸ್ ಕೇಂದ್ರ, ಜಿಲ್ಲಾ ಪಂಚಾಯತ್, ಶಿವಮೊಗ್ಗ



Government of Karnataka

MUNISH MOUDGIL I.A.S.
Deputy Commissioner & District Magistrate
Ramanagara District.

Phone : 080-7273777
Fax No : 080-7275943
email : deo.rnagar@gmail.com
Mini Vidhanasoudha,
Ramanagara-571511

Ref. No.

Date. 29/05/2009

I would like to keep on record the appreciation for excellent work done by Mr Vinoda.M, Project Associate, District NRDMS, Ramangara District during election process of General Elections 2009.

Prepared boundary/route maps of ramanagara district, 23-Bangalore Rural Parliamentary Constituency, Taluk wise, Hobli wise, Assembly Constituency wise and etc., is the remarkable work done by this team.

Online computerization of counting process is the big success. I am sure, this all have been achieved only because of their dedicated work of every team member. I would like to request their immediate reporting officer to take a note of this in their CR's.

I wish the all the best of their futures.

(MUNISH MOUDGIL IAS)

Deputy Commissioner Ramanagara

Returning Officer and
Deputy Commissioner
No. 23, Bangalore Rural
Parliamentary Constituency
Ramanagara

ಅಭಿವೃದ್ಧಿಯಲ್ಲಿ ಭೌಗೋಳಿಕ ಮಾಹಿತಿ ಅವಶ್ಯ

■ **ವಿಕ ಸುದ್ದಿಲೋಕ** ಬೆಳಗಾವಿ

ಬೆಳಗಾವಿ ಜಿಪಂನಲ್ಲಿ ಮಂಗಳವಾರ ಏರ್ಪಡಿಸಿದ್ದ ಕಾರ್ಯಾಗಾರದಲ್ಲಿ ಜಿಪಂ ಮುಖ್ಯ ಕಾರ್ಯನಿರ್ವಾಹಕ ಅಧಿಕಾರಿ ದೀಪಾ ಚೋಳನ್ ಮಾತನಾಡಿದರು. ಡಾ. ಎಂ. ಪೃಥ್ವಿರಾಜ್, ಡಾ. ಎ. ಪೆರುಮಾಳ್, ಹೆಚ್. ಹೇಮಂತಕುಮಾರ, ಆರ್.ಜಿ. ನಾಯಕ ಉಪಸ್ಥಿತರಿದ್ದರು.

ಪ್ರಾಮಾಣಿಕ ಮತ್ತು ಪಾರದರ್ಶಕ ಆಡಳಿತ ನೀಡುವ ದೃಷ್ಟಿಯಿಂದ ಅಭಿವೃದ್ಧಿಯಲ್ಲಿ ದೂರ ಸಂವೇದಿ ಮತ್ತು ಭೌಗೋಳಿಕ ಮಾಹಿತಿ ವ್ಯವಸ್ಥೆಯ ಪಾತ್ರ ಮಹತ್ವದ್ದಾಗಿದೆ ಎಂದು ಜಿಪಂ ಮುಖ್ಯ ಕಾರ್ಯನಿರ್ವಾಹಕ ಅಧಿಕಾರಿ ದೀಪಾ ಚೋಳನ್ ಹೇಳಿದರು.

ನಗರದ ಹಳೆಯ ಜಿಪಂ ಸಭಾಂಗಣದಲ್ಲಿ ಮಂಗಳವಾರ ಏರ್ಪಡಿಸಿದ್ದ ಒಂದು ದಿನದ ವಿಭಾಗ ಮಟ್ಟದ ಕಾರ್ಯಾಗಾರದಲ್ಲಿ ಪಾಲ್ಗೊಂಡು ಅವರು ಮಾತನಾಡಿದರು.

ಗ್ರಾಮೀಣ ಭಾಗದಲ್ಲಿ ನಡೆಯುತ್ತಿರುವ ಅಭಿವೃದ್ಧಿ ಕಾರ್ಯಕ್ರಮಗಳು ವ್ಯವಸ್ಥಿತವಾಗಿ ಅನುಷ್ಠಾನಗೊಳ್ಳುವ ದೃಷ್ಟಿಯಿಂದ ಬೆಳಗಾವಿ ವಿಭಾಗದ ಎಲ್ಲ ಅಧಿಕಾರಿಗಳು ಅಭಿವೃದ್ಧಿಯಲ್ಲಿ ದೂರ ಸಂವೇದಿ ಮತ್ತು ಭೌಗೋಳಿಕ ಮಾಹಿತಿ ವ್ಯವಸ್ಥೆಯ ಸಂಪೂರ್ಣ ಮಾಹಿತಿ ಪಡೆದುಕೊಂಡು ಯಥಾವತ್ತಾಗಿ ತಮ್ಮ ಇಲಾಖೆಯಲ್ಲಿ ಅನುಷ್ಠಾನಗೊಳಿಸಬೇಕೆಂದು ತಿಳಿಸಿದರು.

ಅಧ್ಯಕ್ಷತೆ ವಹಿಸಿದ್ದ ಕರ್ನಾಟಕ ರಾಜ್ಯ ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರವಿದ್ಯಾ ಮಂಡಳಿಯ ಕಾರ್ಯನಿರ್ವಾಹಕ ಕಾರ್ಯದರ್ಶಿ ಡಾ. ಎಂ. ಪೃಥ್ವಿರಾಜ್ ಮಾತನಾಡಿ, ವಿಭಾಗ ಮಟ್ಟದ ಎಲ್ಲ ಅಧಿಕಾರಿಗಳು ತರಬೇತಿಯ ಪ್ರಯೋಜನ ಪಡೆದುಕೊಂಡು ಯಶಸ್ವಿಯಾಗಿ ಸರಕಾರದ ಯೋಜನೆಗಳನ್ನು ಅನುಷ್ಠಾನಗೊಳಿಸ ಬೇಕೆಂದು ಹೇಳಿದರು.

ಪ್ರಾಸ್ತಾವಿಕವಾಗಿ ಮಾತನಾಡಿದ ಜಿಪಂ ಆಡಳಿತ ಉಪ ಕಾರ್ಯದರ್ಶಿ ಆರ್.ಜಿ. ನಾಯಕ, ಅಭಿವೃದ್ಧಿಯಲ್ಲಿ ದೂರ ಸಂವೇದಿ ಮತ್ತು ಭೌಗೋಳಿಕ ಮಾಹಿತಿ ಹಿಂದೆಂದಿಗಿಂತ ಅವಶ್ಯವಾಗಿದೆ ಎಂದರು.

ಕಾರ್ಯಾಗಾರದಲ್ಲಿ ಕರ್ನಾಟಕ ರಾಜ್ಯ ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರವಿದ್ಯಾ ಮಂಡಳಿಯ ಹಿರಿಯ ವಿಜ್ಞಾನಿಗಳಾದ ಡಾ. ಎ. ಪೆರುಮಾಳ್, ಹೆಚ್. ಹೇಮಂತಕುಮಾರ, ಯು.ಟಿ. ವಿಜಯ, ಪಾಲನೇತ್ರ ಹಾಗೂ ಅನೀಲ ನಾಯಕ ಇವರು ದೂರ ಸಂವೇದಿ ಮತ್ತು ಭೌಗೋಳಿಕ ಮಾಹಿತಿ ವ್ಯವಸ್ಥೆಯ ತರಬೇತಿ ನೀಡಿದರು. ಕಾರ್ಯಾಗಾರದಲ್ಲಿ ಬೆಳಗಾವಿ ವಿಭಾಗದ ಆಯ್ದ 120 ಜನ ಜಿಲ್ಲಾ ಮಟ್ಟದ ಅಧಿಕಾರಿಗಳು ಭಾಗವಹಿಸಿದ್ದರು.

ಕರ್ನಾಟಕ ರಾಜ್ಯ ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರವಿದ್ಯಾ ಮಂಡಳಿ ಹಾಗೂ ಗ್ರಾಮೀಣಾಭಿವೃದ್ಧಿ ಮತ್ತು ಪಂಚಾಯತ್ ರಾಜ್ ಇಲಾಖೆ ಸಂಯುಕ್ತವಾಗಿ ಇದನ್ನು ಆಯೋಜಿಸಿದ್ದವು.

NRDMS facilitates rural development

Veerendra P M
DH News Service

Shimoga: Knowledge and information is equated with power in the modern context. In order to facilitate the Panchayat Raj institutions in decision making, Department of Science and Technology of Union Government established Natural Resource Data Management System (NRDMS) in each district.

NRDMS centres will act as repertories of data and information regarding natural resources, demography, infrastructure and socio-economic sector of the region. The centre will design and analyse the data bases and maps and make it adaptable to computers. Data collection and renewal is a perpetual process in NRDMS and will feed the same to the district administration, Zilla Panchayat and other departments which are working for rural development. Based on the data available at the centre, local bodies can take decision regarding utilisation of natural resources, implementation of welfare projects among others.

NRDMS has ensured the availability of maps and data, which are prepared by assembling the information collected from survey, conducted by competent authorities, satellite and remote sensing and from geographic information system. Cost and time benefit can be achieved in implementation of projects due to availability of scientific data. The database will guide the officials and elected representatives in modifying the projects designed at National and State level according to local needs.

Karnataka State Council for Science and Technology (KSCST) is coordinating the functioning of NRDMS in the State. In Shimoga, NRDMS was established at the premises of the office of Deputy Commissioner in June 1995. During 2002-03, the centre was shifted to the premises of Zilla Panchayat.

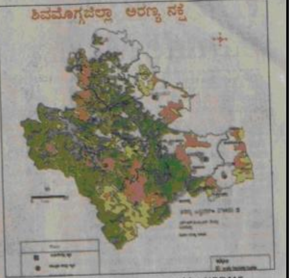
Achievements

NRDMS in the district is ahead of all centres in the State and was declared as best centre for the year 2006-07 by KSCST. For the first time Shimoga unit of NRDMS has prepared maps in Kannada language by using GIS and remote sensing technology. All district's maps are prepared by the centre in Kannada and the centre has planned to follow the same in preparing village maps also. The centre has helped the district administration during general election by preparing maps about the boundary of Assembly segments, polling booths and roads to approach the polling booths. Technical workshops are held on regular basis for district and taluk level officials regarding GIS and remote sensing. A report was submitted to Department of Water Resources regarding the conditions of water bodies in Sorab taluk based on which the department has taken initiative to rejuvenate the same. NRDMS has coordinated with Watershed Development Project in preparing action plan regarding Begurhalla reservoir. The plan, which was submitted to the Central Government, was okayed and is being implemented. Maps prepared by NRDMS during natural calamity this year was of great help for the district administration.

Unfortunately, many in the district are naive about the existence of the NRDMS. NGOs and research institutions which operate in rural areas can utilise the technical expertise and database maintained at NRDMS. Government officials rely on NRDMS only for preparing the maps. However facilities at the centre can be used to analyse and interpret the data and maps.

Speaking to *Deccan Herald*, Mr Shankar who is serving as Assistant Programme Officer at NRDMS said that public awareness should be created about the centre and its importance in the functioning of local bodies.

With this objective, a workshop is organised at ZP on November 16 where beneficiaries of NRDMS will interact with experts in GIS and remote sensing. Shankar also added that the workshop is an attempt to take the activities of NRDMS to the mass.



The forest map of Shimoga prepared by NRDMS.

DH photo

ನಾಳೆ ಜಿಪಂನಲ್ಲಿ ಕಾರ್ಯಾಗಾರ

ಮೈಸೂರು: ರಾಜ್ಯ ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರ ವಿದ್ಯಾಮಂಡಳಿ, ಬೆಂಗಳೂರಿನ ಎನ್‌ಆರ್‌ಡಿಎಂಎಸ್ ವಿಭಾಗ ಹಾಗೂ ಗ್ರಾಮೀಣಾಭಿವೃದ್ಧಿ ಮತ್ತು ಪಂಚಾಯತ್‌ರಾಜ್ ಇಲಾಖೆ ಸಂಯುಕ್ತವಾಗಿ ಅಭಿವೃದ್ಧಿಯಲ್ಲಿ ದೂರ ಸಂವೇದಿ ಮತ್ತು ಭೌಗೋಳಿಕ ಮಾಹಿತಿ ವ್ಯವಸ್ಥೆಯ ಪಾತ್ರ ಒಂದು ದಿನದ ವಿಭಾಗೀಯ ಮಟ್ಟದ ಕಾರ್ಯಾಗಾರವನ್ನು ಜಿಪಂ ಸಭಾಂಗಣದಲ್ಲಿ ಆ. 23ರಂದು ಆಯೋಜಿಸಿದೆ. ಜಿಪಂ ಸಿಇಒ, ಉಪ ಕಾರ್ಯದರ್ಶಿ ಮತ್ತು ಮುಖ್ಯ ಯೋಜನಾಧಿಕಾರಿ ಭಾಗವಹಿಸುವರು. ರಾಜ್ಯ ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರ ವಿದ್ಯಾಮಂಡಳಿಯ ಕಾರ್ಯನಿರ್ವಾಹಕ ಕಾರ್ಯದರ್ಶಿ ಡಾ.ಎಂ. ಪೃಥ್ವಿರಾಜ್ ಅಧ್ಯಕ್ಷತೆ ವಹಿಸುವರು. ಕರ್ನಾಟಕ ರಾಜ್ಯ ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರ ವಿದ್ಯಾಮಂಡಳಿಯ ಹಿರಿಯ ವಿಜ್ಞಾನಿಗಳು ದೂರ ಸಂವೇದಿ ಮತ್ತು ಭೌಗೋಳಿಕ ಮಾಹಿತಿ ವ್ಯವಸ್ಥೆಯ ಬಗ್ಗೆ ತರಬೇತಿ ನೀಡುವರು. ಈ ಕಾರ್ಯಾಗಾರದಲ್ಲಿ ಮೈಸೂರು ವಿಭಾಗದ ಜಿಲ್ಲಾ ಮಟ್ಟದ ಅಧಿಕಾರಿಗಳು ಹಾಗೂ ಪಂಚಾಯತ್ ರಾಜ್ ಎಂಜಿನಿಯರಿಂಗ್ ವಿಭಾಗದವರು ಭಾಗವಹಿಸುವರು. ಮೈಸೂರು ವಿಭಾಗದ ಎಲ್ಲಾ ಅಧಿಕಾರಿಗಳು ಈ ಕಾರ್ಯಾಗಾರದ ಸಂಪೂರ್ಣ ಮಾಹಿತಿ ಪಡೆದುಕೊಂಡು ತಮ್ಮ ಇಲಾಖೆಗಳಲ್ಲಿ ಅಭಿವೃದ್ಧಿಯನ್ನು ಅನುಷ್ಠಾನಗೊಳಿಸಲು ಸಹಕಾರಿಯಾಗಲಿದೆ ಎಂದು ಯೋಜನಾಧಿಕಾರಿ ಬಿ.ಎಂ. ಪ್ರದೀಪ್ ಕುಮಾರ್, ಎಂ. ವಿನೋದ್ ತಿಳಿಸಿದ್ದಾರೆ. ಹೆಚ್ಚಿನ ಮಾಹಿತಿಗೆ ಮೊ. 9341151618 ಅಥವಾ 9844942930 ಸಂಪರ್ಕಿಸಬಹುದು.

ಬರಲಿದೆ ಇಯಂತೆ ಜಿ-ಆಡಳಿತ

▪ **ವಿಕ ಸುದ್ದಿಲೋಕ** ಬೆಂಗಳೂರು

ಇ-ಆಡಳಿತ ಮಾದರಿಯಲ್ಲೇ ಮುಂದಿನ ದಿನಗಳಲ್ಲಿ 'ಜಿ-ಆಡಳಿತ' ಎಂಬ ನೂತನ ವ್ಯವಸ್ಥೆ ಜಾರಿಗೆ ಬರಲಿದೆ ಎಂದು ಮಾಹಿತಿ ಮತ್ತು ತಂತ್ರಜ್ಞಾನ ಇಲಾಖೆ ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿ ಎಂ. ಎನ್ ವಿದ್ಯಾಶಂಕರ್ ಹೇಳಿದ್ದಾರೆ.

ನಗರದ ಐಐಎಸ್‌ಸಿಯಲ್ಲಿ ರಾಷ್ಟ್ರೀಯ ಪ್ರಾದೇಶಿಕ ದತ್ತಾಂಶ ಸೌಕರ್ಯಗಳು(ಎನ್‌ಎಸ್‌ಡಿಐ)ವಿಷಯ ಕುರಿತ ರಾಷ್ಟ್ರೀಯ ವಿಚಾರ ಸಂಕಿರಣದಲ್ಲಿ ಬುಧವಾರ ಅವರು ಮಾತನಾಡಿದರು.

ಜನರಿಗೆ ಸರಕಾರಿ ಸೇವೆಗಳನು ಮೊಬೈಲ್ ಮೂಲಕ ದೊರೆಕಿಸಲು 'ಜಿ-ಆಡಳಿತ 'ವ್ಯವಸ್ಥೆ ಜಾರಿಗೆ ವರದಿ ಸಿದ್ಧಪಡಿಸಲು ಕಾರ್ಯಪಡೆ ರಚಿಸಲಾಗಿದೆ. ಕಾರ್ಯಪಡೆ ವರದಿ ಅನ್ವಯ ಮೊಬೈಲ್ ಆಡಳಿತ ಜಾರಿ ಪ್ರಕ್ರಿಯೆ ಚುರುಕುಗೊಳ್ಳಲಿದೆ. ಇದು ಪಾರ ದರ್ಶಕ ಆಡಳಿತ ನೀಡಲು ಸಹಕಾರಿ. ಜತೆಗೆ ರಾಜ್ಯದ ಎಲ್ಲ ಜಿಲ್ಲೆಗಳ ಭೌಗೋಳಿಕ ಮಾಹಿತಿ ಲಭ್ಯ. ಈ ನಿಟ್ಟಿನಲ್ಲಿ ಸರಕಾರ ಕಾರ್ಯಪ್ರವೃತ್ತ ವಾಗಿದೆ ಎಂದು ತಿಳಿಸಿದರು.

ಕೋಟಿ ವೆಚ್ಚ ಏನಾಯಿತು?: ರಾಷ್ಟ್ರದಲ್ಲಿ ಒಟ್ಟು 633ಜಿಲ್ಲೆಗಳಿವೆ. ಪ್ರತಿ ಜಿಲ್ಲೆಗೆ ವಾರ್ಷಿಕ ನೂರು ಕೋಟಿ ರೂ.ಗೂ ಅಧಿಕ ವೆಚ್ಚ ಮಾಡಲಾಗುತ್ತಿದೆ. ಈ ಹಣ ಎಲ್ಲಿ ಹೋಗುತ್ತಿದೆ ಎಂಬುದೇ ತಿಳಿಯುತ್ತಿಲ್ಲ. ಆದರೆ, ಈ ಹಣ ಯಾವುದಕ್ಕೆ ಬಳಕೆ ಆಗುತ್ತಿದೆ? ಯಾವುದಕ್ಕೆ ಆಗುತ್ತಿಲ್ಲ? ಎಷ್ಟು ಹಣ ಬಾಕಿ ಉಳಿದಿದೆ ಇತ್ಯಾದಿ ಮಾಹಿತಿ ತಿಳಿಯುತ್ತಿಲ್ಲ. ಇದನ್ನು ತಡೆಗಟ್ಟಿ ಜಿಲ್ಲೆಗಳ ಸಮಗ್ರ ಮಾಹಿತಿ ತಿಳಿಯಲು ಮುಂದಿನ ದಿನಗಳಲ್ಲಿ 'ಜಿಯೋ ಪೋರ್ಟಲ್' ಎಂಬ ನೂತನ ತಂತ್ರಜ್ಞಾನ ಅಳವಡಿಸಿ ಎಲ್ಲ ಮಾಹಿತಿಯನ್ನೂ ಅದರಲ್ಲಿ ಅಳವಡಿಸಲಾಗುವುದು ಎಂದರು.

ಈ ವಿನೂತನ ವ್ಯವಸ್ಥೆ ಜಾರಿಯಿಂದ ಬಸ್ ನಿಲ್ದಾಣ, ಕೊಳವೆ ಬಾವಿ, ಔಷಧ ಮಳಿಗೆ, ಪ್ರಮುಖ ಸರಕಾರಿ ಕಚೇರಿ ಸೇರಿದಂತೆ ಜಿಲ್ಲೆಗಳ ಎಲ್ಲಾ ಮಾಹಿತಿ 'ಜಿಯೋಪೋರ್ಟಲ್'ನಲ್ಲಿ ಲಭ್ಯವಿರುತ್ತದೆ. ಇದನ್ನೇ ಆಧಾರವಾಗಿಟ್ಟುಕೊಂಡು ಎಲ್ಲಿ ಯಾವ ಕೆಲಸ ಆಗಿವೆ ? ಎಷ್ಟು ಬಾಕಿ ಉಳಿದುಕೊಂಡಿವೆ ? ಅಲ್ಲದೆ, ಮುಂದೆ ತೆಗೆದುಕೊಳ್ಳಬೇಕಾದ ಕ್ರಮ ಗಳ ಬಗ್ಗೆ ಮಾಹಿತಿ ದೊರೆಯಲಿದೆ ಎಂದರು.

ಭಾರತೀಯ ವಿಜ್ಞಾನ ಸಂಸ್ಥೆ ನಿರ್ದೇಶಕ ಪ್ರೊ. ಬಲರಾಮ್, ಪ್ರಾಧ್ಯಾಪಕ ಪ್ರೊ. ಮೋಹನ್‌ಕುಮಾರ್, ಭೂವಿಜ್ಞಾನ ವಿಭಾಗದ ಅಧ್ಯಕ್ಷ ಪ್ರೊ.ಬಿ.ಎನ್. ರಘುನಂದನ್, ಎನ್‌ಎಸ್‌ಡಿಐನ ಮುಖ್ಯ ಕಾರ್ಯನಿರ್ವಹಣಾಧಿಕಾರಿ ಮೇಜರ್ ಜನರಲ್ ಆರ್. ಶಿವಕುಮಾರ್ ಕಾರ್ಯಕ್ರಮದಲ್ಲಿ ಪಾಲ್ಗೊಂಡಿದ್ದರು.

State frontrunner in launching geospatial portal

Scientists being roped in to come up with a roadmap on how to use geospatial data

Staff Reporter

BANGALORE: Surging ahead of other States in the race for mapping or creating geospatial data directories, Karnataka today launched its web portal (accessible at www.karnatakageoportal.in) which provides free and ready access to spatial maps of the State.

In a rudimentary stage at present, this web portal is the first step towards bringing together geospatial data sets on a common platform. The portal, released here on Wednesday by M.N. Vidyashankar, Principal Secretary for e-governance, makes available data collected by Spatial Data Infrastructure (SDI) units at the district-level. Mr. Vidyashankar said that the State has set up a task force, comprising senior ISRO scientists, on 'geospatial governance' to come up with a roadmap on how to collect, make available and use geospatial data. He also said that a policy on m-governance (using mobile phones) was on the anvil.

S. Subba Rao, Surveyor-General of India, said that Karnataka was indeed "a leader", having established the geo-portal and SDIs in every district.

Mapping India

Mr. Rao said that by June 30, the Survey of India will complete uploading maps (of 1:50,000 in scale) to its web portal, open for free access. At present, the task has been completed for the entire State of Andhra Pradesh, he said, adding that the process of making higher resolution maps available online (1:10,000 in scale) had also commenced, and is likely to be completed within three years.

"We need over 50,000 people who are spatially literate to carry out these projects," he added.

Emphasising on the need for clarity in adaption of standards and meta-data while building such inventories, he said the Survey of India was liaising with different departments such as the Forest Survey of India and the Geographical Survey of India to map existing resources and data sets in the country. The next phase of governance, he said, is moving to the mobile platform.

Director of the Indian Institute of Science P. Balaram commended the role of the Karnataka State Council for Science and Technology.

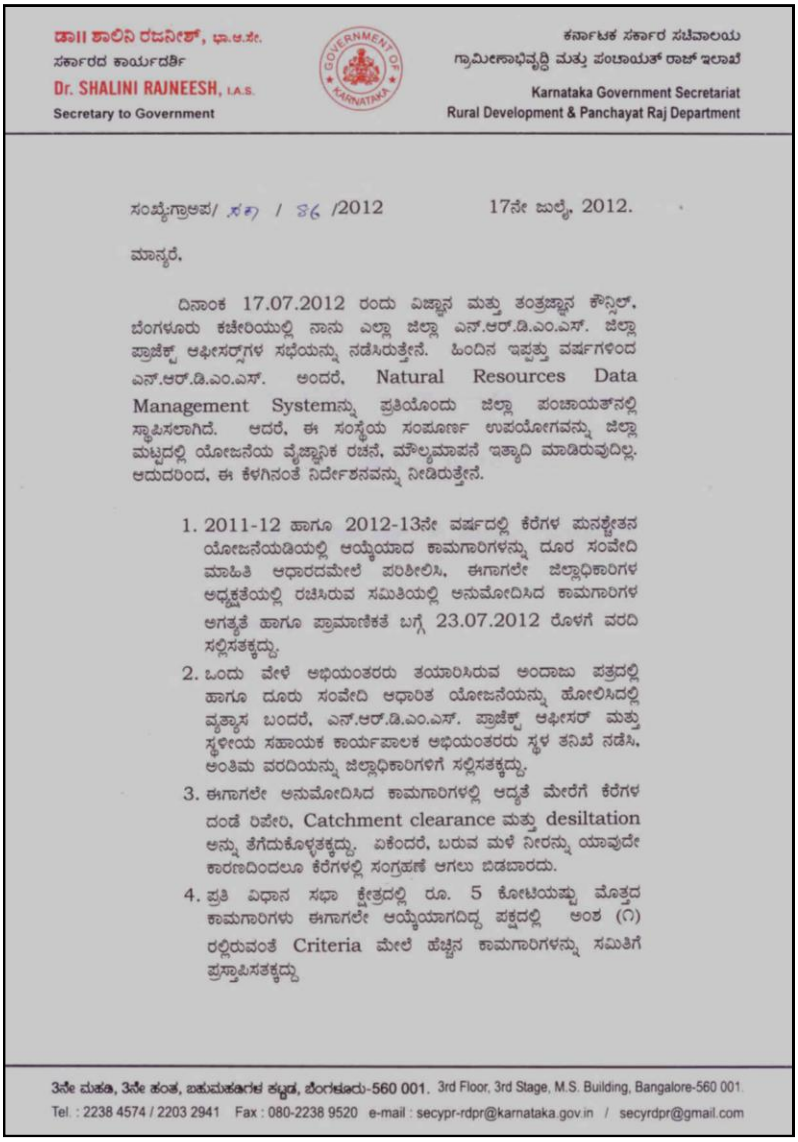
PATHBREAKING: *(From left) B.N. Raghunandan, Divisional Chairman, Earth & Environmental Sciences, IISc.; M.N. Vidyashankar, Principal Secretary, IT, BT and S&T; P. Balaram, Director, IISc.; and S. Subba Rao, Surveyor-General of India, at the conference in Bangalore on Wednesday.* – PHOTO: K. GOPINATHAN

M. Visvesvaraya chair at IISc.

Staff Reporter

BANGALORE: The Government of India has sanctioned the M. Visvesvaraya chair for geospatial studies at the Indian Institute of Science.

This is the first chair in the institute in the name of the visionary-engineer-scholar. A similar chair on the same subject has also been sanctioned for the Dr. Babasaheb Ambedkar Marathwada University in Aurangabad. The announcement was made by R. Shivakumar, director of the National Spatial Data Infrastucture, a wing of the Union Department of Science and Technology. Accepting the sanction letter, IISc. professor B.M. Raghunandan said that he hoped that the State Government would provide "support" to the chair.



ಡಾ॥ ಶಾಲಿನಿ ರಜನೀಶ್, ಭಾ.ಆ.ಸೇ.
ಸರ್ಕಾರದ ಕಾರ್ಯದರ್ಶಿ
Dr. SHALINI RAJNEESH, I.A.S.
Secretary to Government

ಕರ್ನಾಟಕ ಸರ್ಕಾರ ಸಚಿವಾಲಯ
ಗ್ರಾಮೀಣಾಭಿವೃದ್ಧಿ ಮತ್ತು ಪಂಚಾಯತ್ ರಾಜ್ ಇಲಾಖೆ
Karnataka Government Secretariat
Rural Development & Panchayat Raj Department

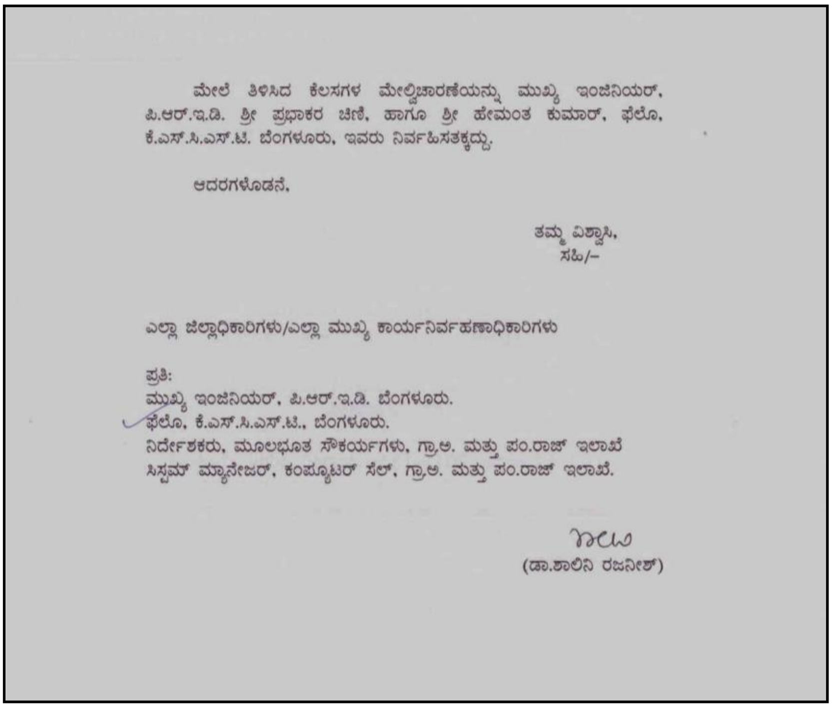
ಸಂಖ್ಯೆ:ಗ್ರಾಅಪ/ ೫೯ / ೮೬ /2012 17ನೇ ಜುಲೈ, 2012.

ಮಾನ್ಯರೆ,

ದಿನಾಂಕ 17.07.2012 ರಂದು ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರಜ್ಞಾನ ಕೌನ್ಸಿಲ್, ಬೆಂಗಳೂರು ಕಚೇರಿಯಲ್ಲಿ ನಾನು ಎಲ್ಲಾ ಜಿಲ್ಲಾ ಎನ್.ಆರ್.ಡಿ.ಎಂ.ಎಸ್. ಜಿಲ್ಲಾ ಪ್ರಾಜೆಕ್ಟ್ ಆಫೀಸರ್ಸ್‌ಗಳ ಸಭೆಯನ್ನು ನಡೆಸಿರುತ್ತೇನೆ. ಹಿಂದಿನ ಇಪ್ಪತ್ತು ವರ್ಷಗಳಿಂದ ಎನ್.ಆರ್.ಡಿ.ಎಂ.ಎಸ್. ಅಂದರೆ, Natural Resources Data Management Systemನ್ನು ಪ್ರತಿಯೊಂದು ಜಿಲ್ಲಾ ಪಂಚಾಯತ್‌ನಲ್ಲಿ ಸ್ಥಾಪಿಸಲಾಗಿದೆ. ಆದರೆ, ಈ ಸಂಸ್ಥೆಯ ಸಂಪೂರ್ಣ ಉಪಯೋಗವನ್ನು ಜಿಲ್ಲಾ ಮಟ್ಟದಲ್ಲಿ ಯೋಜನೆಯ ವೈಜ್ಞಾನಿಕ ರಚನೆ, ಮೌಲ್ಯಮಾಪನೆ ಇತ್ಯಾದಿ ಮಾಡಿರುವುದಿಲ್ಲ. ಆದುದರಿಂದ, ಈ ಕೆಳಗಿನಂತೆ ನಿರ್ದೇಶನವನ್ನು ನೀಡಿರುತ್ತೇನೆ.

1. 2011-12 ಹಾಗೂ 2012-13ನೇ ವರ್ಷದಲ್ಲಿ ಕೆರೆಗಳ ಪುನಶ್ಚೇತನ ಯೋಜನೆಯಡಿಯಲ್ಲಿ ಆಯ್ಕೆಯಾದ ಕಾಮಗಾರಿಗಳನ್ನು ದೂರ ಸಂವೇದಿ ಮಾಹಿತಿ ಆಧಾರದಮೇಲೆ ಪರಿಶೀಲಿಸಿ, ಈಗಾಗಲೇ ಜಿಲ್ಲಾಧಿಕಾರಿಗಳ ಅಧ್ಯಕ್ಷತೆಯಲ್ಲಿ ರಚಿಸಿರುವ ಸಮಿತಿಯಲ್ಲಿ ಅನುಮೋದಿಸಿದ ಕಾಮಗಾರಿಗಳ ಅಗತ್ಯತೆ ಹಾಗೂ ಪ್ರಾಮಾಣಿಕತೆ ಬಗ್ಗೆ 23.07.2012 ರೊಳಗೆ ವರದಿ ಸಲ್ಲಿಸತಕ್ಕದ್ದು.
2. ಒಂದು ವೇಳೆ ಅಭಿಯಂತರರು ತಯಾರಿಸಿರುವ ಅಂದಾಜು ಪತ್ರದಲ್ಲಿ ಹಾಗೂ ದೂರು ಸಂವೇದಿ ಆಧಾರಿತ ಯೋಜನೆಯನ್ನು ಹೋಲಿಸಿದಲ್ಲಿ ವ್ಯತ್ಯಾಸ ಬಂದರೆ, ಎನ್.ಆರ್.ಡಿ.ಎಂ.ಎಸ್. ಪ್ರಾಜೆಕ್ಟ್ ಆಫೀಸರ್ ಮತ್ತು ಸ್ಥಳೀಯ ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು ಸ್ಥಳ ತನಿಖೆ ನಡೆಸಿ, ಅಂತಿಮ ವರದಿಯನ್ನು ಜಿಲ್ಲಾಧಿಕಾರಿಗಳಿಗೆ ಸಲ್ಲಿಸತಕ್ಕದ್ದು.
3. ಈಗಾಗಲೇ ಅನುಮೋದಿಸಿದ ಕಾಮಗಾರಿಗಳಲ್ಲಿ ಆದ್ಯತೆ ಮೇರೆಗೆ ಕೆರೆಗಳ ದಂಡೆ ರಿಪೇರಿ, Catchment clearance ಮತ್ತು desiltation ಅನ್ನು ತೆಗೆದುಕೊಳ್ಳತಕ್ಕದ್ದು. ಏಕೆಂದರೆ, ಬರುವ ಮಳೆ ನೀರನ್ನು ಯಾವುದೇ ಕಾರಣದಿಂದಲೂ ಕೆರೆಗಳಲ್ಲಿ ಸಂಗ್ರಹಣೆ ಆಗಲು ಬಿಡಬಾರದು.
4. ಪ್ರತಿ ವಿಧಾನ ಸಭಾ ಕ್ಷೇತ್ರದಲ್ಲಿ ರೂ. 5 ಕೋಟಿಯಷ್ಟು ಮೊತ್ತದ ಕಾಮಗಾರಿಗಳು ಈಗಾಗಲೇ ಆಯ್ಕೆಯಾಗದಿದ್ದ ಪಕ್ಷದಲ್ಲಿ ಅಂಶ (೧) ರಲ್ಲಿರುವಂತೆ Criteria ಮೇಲೆ ಹೆಚ್ಚಿನ ಕಾಮಗಾರಿಗಳನ್ನು ಸಮಿತಿಗೆ ಪ್ರಸ್ತಾಪಿಸತಕ್ಕದ್ದು

3ನೇ ಮಹಡಿ, 3ನೇ ಹಂತ, ಬಹುಮಹಡಿಗಳ ಕಟ್ಟಡ, ಬೆಂಗಳೂರು-560 001. 3rd Floor, 3rd Stage, M.S. Building, Bangalore-560 001.
Tel. : 2238 4574 / 2203 2941 Fax : 080-2238 9520 e-mail : secypr-rdpr@karnataka.gov.in / secyrdpr@gmail.com



ಮೇಲೆ ತಿಳಿಸಿದ ಕೆಲಸಗಳ ಮೇಲ್ವಿಚಾರಣೆಯನ್ನು ಮುಖ್ಯ ಇಂಜಿನಿಯರ್, ಪಿ.ಆರ್.ಇ.ಡಿ. ಶ್ರೀ ಪ್ರಭಾಕರ ಚಿಣಿ, ಹಾಗೂ ಶ್ರೀ ಹೇಮಂತ ಕುಮಾರ್, ಫೆಲೊ, ಕೆ.ಎಸ್.ಸಿ.ಎಸ್.ಟಿ. ಬೆಂಗಳೂರು, ಇವರು ನಿರ್ವಹಿಸತಕ್ಕದ್ದು.

ಆದರಗಳೊಡನೆ,

ತಮ್ಮ ವಿಶ್ವಾಸಿ,
ಸಹಿ/-

ಎಲ್ಲಾ ಜಿಲ್ಲಾಧಿಕಾರಿಗಳು/ಎಲ್ಲಾ ಮುಖ್ಯ ಕಾರ್ಯನಿರ್ವಹಣಾಧಿಕಾರಿಗಳು

ಪ್ರತಿ:
ಮುಖ್ಯ ಇಂಜಿನಿಯರ್, ಪಿ.ಆರ್.ಇ.ಡಿ. ಬೆಂಗಳೂರು.
ಫೆಲೊ, ಕೆ.ಎಸ್.ಸಿ.ಎಸ್.ಟಿ., ಬೆಂಗಳೂರು.
ನಿರ್ದೇಶಕರು, ಮೂಲಭೂತ ಸೌಕರ್ಯಗಳು, ಗ್ರಾ.ಅ. ಮತ್ತು ಪಂ.ರಾಜ್ ಇಲಾಖೆ
ಸಿಸ್ಟಮ್ ಮ್ಯಾನೇಜರ್, ಕಂಪ್ಯೂಟರ್ ಸೆಲ್, ಗ್ರಾ.ಅ. ಮತ್ತು ಪಂ.ರಾಜ್ ಇಲಾಖೆ.

(ಡಾ.ಶಾಲಿನಿ ರಜನೀಶ್)