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WEB GIS BASED DECISION SUPPORT SYSTEM FOR INTEGRATED WATER SUPPLY DISTRIBUTION- A CASE STUDY OF ONGOLE MUNICIPAL CORPORATION, ANDHRA PRADESH

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Abstract: Water resources and watershed management has to be dealt with in an integrated context and on a basin wide level. Integrated watershed management of the available water resource, hydropower and water quality and flood protection constitutes major challenges. It focuses on understanding the conditions of the water resources in order to meet requirements of various usages in the watershed. Numerous aspects have to be considered in order to respond to changes in natural phenomena and provision of adequate and good quality water at a reasonable cost to the public. Increased focus on watershed protection and sound use of water requires that scientists, planners, managers and decision makers are able to quickly produce reliable estimates, assess impacts and efficiency of potential strategies. Use and integration of sophisticated web based and GIS enabled graphical user interfaces with relational databases, visualization techniques, analysis tools and decision logic greatly enhances and promotes the decision process. It enables users and decision makers focus on transparency and accessibility of results to a broad range of the public including governmental institutions, private and public stakeholders and communities involved/interested in environmental and water resources issues.

Decision support systems (DSS) that integrate the above components have proven reliable and effective tools in the integrated management and also in the communication of conditions and decisions. The main objective of the paper is to demonstrate the advantages of integrating data base management systems, water modelling and decision support tools in deriving a holistic management approach that is sustainable and viable. Keywords Integrated Water Resources Management, Decision Support Tools, Modelling.

An attempt was made of adopting the GIS tools to develop web based geographical information system for Ongole Municipal Corporation is situated in between $15^0$28'E to $15^0$32'E Longitude and 80^0 00' N to $80^0$05' N Latitude. It is the District head quarters of Prakasam District. The National Highway No.5 i.e., Chennai to Kolkatha and Railway Line Chennai to Howrah is passing through Ongole city. Since the Granite Quarries are located surrounding the Ongole city, the city is growing industrially, and commercially. The geo database layers i.e Base map, Administrative Boundaries, Road network, Water Supply Pipe lines from source to service reservoirs, water distribution pipe line network, drainage/Stream line network, Land use/Land cover, Geomorphology, Lithology and type of Soils were generated using toposheets, satellite Imageries, published data and collect oral data. Further this database was used to develop a web enabled multi layer information system using QGIS 2.14 /QGIS_Plugin:qgis2leaf. It enables the users to know the information about above said thematic layers and take better decisions, in implementation of infrastructure development programs and in operation and maintenance works of the drinking water supply system.

Index Terms - QGIS software -2.14, Toposheets, LISS-III satellite image QGIS_Plugin,HTML.

1. INTRODUCTION

In a developing country like India where 73% of the population resides in rural area and 27% in urban areas, we need a very structured planning procedure such that the development activities and infrastructure facilities are available at both urban and rural area. However, in such a condition where majority of people live in rural area and are provided with the least infrastructure facilities, creates a regional imbalance in development, causing shift in population from rural to urban areas. Hence administrators or decision-makers require an efficient GIS based tool which will assist them to get the updated scenario of the region, with web reference http://www.gisdevelopment.net/application/index.html and www.qgis.org.

The present study emphasizes the strength of Geo-informatics technology which will help the decision makers at block level to better understand and evaluate spatial data by creating graphic displays using information stored in the database. As GIS does more than just displaying the data, it enables the user to dynamically analyze and update the information linked to those locations spatially. The geographic information system has been an effective tool for implementation and monitoring of infrastructure. The use of GIS has been in vogue primarily due to the advantage of (1) Planning of project (2) Make better decisions (3) Visual analysis and (4) Improve organizational integration.

Planning of Project

Advantage of GIS is often found in detailed planning of project having a large spatial component, where analysis of the problem is a pre requisite at the start of the project. Thematic maps generation is possible on one or more than one base maps, example: the generation of a land use map on the basis of a soil composition, vegetation and topography. The unique combination of certain features facilitates the creation of such thematic maps. With the various modules within GIS it is possible to calculate surface, length, width and distance.

Making decisions

The adage "better information leads to better decisions" is as true for GIS as it is for other information systems. A GIS, set tools to query, analyze, and map data in support of the making decisions with ease. GIS technology has been used to assist in tasks such as presenting information at planning inquiries, helping resolve many spatial issues such a way as to minimize visual intrusion. The information can be presented briefly and clearly in the form of a map and associated report, enable decision makers to focus on the real issues rather than trying to understand the data. GIS products can be produced quickly; multiple scenarios can be evaluated efficiently and effectively with web reference http://data.geocomm.com/helpdesk/general.html.

Decisions making is very critical at strategic level, which involves the consideration of multiple parameters. For example, In regional planning at grass root level one need to consider the physical features as well as cultural features, as these features are interrelated and they cannot be study in isolation. GIS provides the better way to present multiple features simultaneously. It provides opportunity to do qualitative as well as quantitative analysis.

Improving Organizational Integration

Now-a-days GIS is important tool for Oil and Gas Companies, Transport companies, Shipping Companies. GIS with GPS provides wide range of the solution to take mobile or static object. It also helps to do business analysis, like time required for transportation, money and resource utilization. Hence the same GIS information improves the productivity and reduces the redundancy and cost to handle that precious information. GIS has the ability to link non spatial data to the spatial data, it facilitates information sharing among the inter departments. As communication increases among departments, redundancy is reduced, productivity is enhanced, and overall organizational efficiency is improved, with web reference http://www.sfu.ca/rdl/GIS/tour/gis_do.html.

GIS applications

The GIS technology is rapidly becoming a standard tool for management of natural resources. The effective use of large spatial data volumes is dependent upon the existence of an efficient geographic handling and processing system to transform this data into usable information, with web reference *www.forests.tn.nic.in/geomatics/overviewofgis.html.* The GIS technology is used to assist decision-makers by indicating various alternatives in development and conservation planning and by modelling the potential outcomes of a series of scenarios, with reference to GIS application in Planning.

Web based GIS Applications

Information technologies have gained importance in the worldwide organizations due to their efficiency with low costs. Naturally, developments in computer and information systems, especially data management systems, directly affect GIS. Data management is the most important part of GIS. Various data structures and exchanging different types of data cause serious problems at the beginning phase of GIS. Although organizations and individuals involved with GIS have developed many different solutions, data exchange still remains as one of the main problems. However, development of computers and data systems linked with some problems, they also have opened new perspectives of creating and managing data systems easily and economically. Furthermore, expansion of the computer systems and advances in internet related technologies extend GIS in a new horizon. Due to development of the internet technologies; collecting data, delivering materials (maps), manipulating and updating data becomes easier. The recent technologies provide lots of tools for spatial technologies and data modelling.

II. STUDY AREA

Ongole city is situated in between $15^0$28'E to $15^0$32'E Longitude and $80^0$00' N to $80^0$05' N Latitude. It is the District head quarters of Prakasam District and hasbecame Municipal Corporation as per G.O. No. 29 Municipal Adiminsitration & Urban Development (Elec.II) Department Dt : 21.01.2012. The National Highway No.5 i.e., Chennai to Kolkatha and Railway Line Chennai to Howrah is passing through Ongole city. Since the Granite Quarries are located surrounding the Ongole city, The city is growing industrially, and commercially.

Existing Water Supply System

Presently the town is being supplied 34.20 MLD with 2 GLSRs, 12 ELSRs considering as entire erst while town as 7 zones. The source of the water is Ongole branch canal fed by Nagarjuna Sagar Right canals and by filling S.S.Tanks . *Capacity of S.S.* Tank – 1 is 1950 ML is fed by Koppolu Major canal near Gandhi Nagar through 1000 mm dia RCC gravity main. Capacity of S.S.Tank – 2 is 3850 ML is fed by Ongole branch canal fed by Nagarjuna Sagar Right canals at Ethamukkala main regulator through 1200 mm dia PSC gravity main. Rangarayudu Cheruvu tank is of capacity 196 ML initially feeding from Gundlakamma river long back by pumping at present fed from S.S.TANK -I. Water Treatment Plant (WTP) **(**1) It is located at 16.00 MLD in the premises of S.S.Tank – II. (2) It is located at 14.30 MLD near PH Office which is fed from S.S.Tank – I and (3) It is located at 3.90 MLD near R&B Guest house which is fed from Rangarayudu cheruvu.

Clear water pumping/gravity main

Clear water from 16.00 MLD& 14.30 MLD WTPS is being pumped to ELBR of capacity500 KL on Hill lock with 600 mm DI Pumping mains. From the ELBR two individual gravity mains of one branch of which with diameter of PSC 600MM to 400mm pipes gravity main connected to ELSRs of 1500KL at BhayaNagar , 1200 KL at Ramnagar , 1150 KL at Santhapet ,1000 KL & 600KL at Kothapatnam Bus stand, 800 KL at Islam Pet and another branch of which with diameter of PSC 500MM to 400mm pipes gravity main connected to ELSRs of 1150 KL at Gaddalagunta , 500 KL at Gandhi Nagar ,1200KL at Dibbla Road , 1000 KL at Sujatha nagar, 1150 KL at Addanki Bus stand. 500 KL ELSR AT NSP Guest house is feeding with sump at ELBR by pumping with 350 mm DI pipes. Another 2 GLSR's of capacity 1350 KL AND 450 KL fed by 3.90 MLD plant and they are serving the areas of Sanjay Gandhi colony and Hill lock towers etc. Based on the requirement the town is divided into 7 Zones .

Distribution system

The existing distribution system is inadequate to proposed zones the AC and HDPE pipes the diameters are in adequate it has to be changed where ever necessary considering existing and proposed base demand. The designs will be finalize on the EPANET software derivations. In included villages also no proper safe sources for drinking water and also the existing scheme are with 40 LPCD long back and all ELSRS are 10 m staging and hence this will not serve properly. Hence redesign for 135 LPCD with assured raw water source from Gundlakamma reservoir.

Necessity for a Comprehensive Water Supply System

The well being of any community lies in the basic facilities that are provided. Basic amenities from engineering point of view are protected water supply, efficient waste water collection, treatment and disposal good housing, transportation, solid waste management and maintaining ambient air quality. Thus with 30% losses in the existing system, the local body is unable to supply135lpcd for present population of 202826. Hence there is every need for augmentation of the water supply to 135lpcd (excluding 15% towards transmission losses and 5%filtration losses) for the prospective and ultimate population as per CPHEEO guide lines and to strengthen the source, treatment and distribution network by giving connections to all including the poor. Thus in order to provide safe drinking water to the public and floating population, the effective and economic and comprehensive water supply system is considered as the town's first prioritized need. In included villages also no proper safe sources for drinking water and also the existing scheme are with 40 LPCD. They are also Revised for 135 LPCD with safe assured source and distribution. An efficient and high quality water supply system has a number of benefits- it achieves significantly better health, permits better system and through effective distribution net work and regular disinfection mechanism, the governing Urban local body can generate greater consumer satisfaction and a willingness to pay for improved services from the citizens.

- Fix alignment of pipe lines, location of distribution reservoirs, booster pumping stations etc for extensions of the system to the un-served or ill served areas.
- Existing ELSR/GLSR will be utilized wherever it is feasible and the condition is good.
- Re-establish boundaries of various water distribution zones to cover the unserved pockets.

Pipe network will cover the adjoining proposed areas likely to be added to the Municipality having map of the road network. In case Road network map is not Existing Situation and Design Basis Report OMC available off-take points will be left at suitable points from Based on the topography and also available sites for ELSRs.

- Complete design of water supply system using advanced and agreed technologies meeting the approved design norms.
- Promote maximum utilization of existing infrastructure.
- Adequate provision will be there for measurement and control of flow and pressure.
- All service connections will have provisions for meters. Standard drawings will be developed for different sizes of meters. The Consultant may recommend use of MDP pipes for house connection depending upon actual field condition. The cost of connection will be included in project cost with provision of recovery from consumers.
- It is proposed that flow meters will be installed at the principal locations.
- Ensure a minimum residual head as will be approved by the Client.
- Prepare BOQ, cost estimates, drawings and bid documents for all works including procurement of materials.

- Assess requirement of O&M staff for sustainable operations and their training needs for operation of the new plants and equipments.
- Prepare O&M cost and HR requirements duly considering the existing strength of HR.

III. PROCESS METHODOLOGY

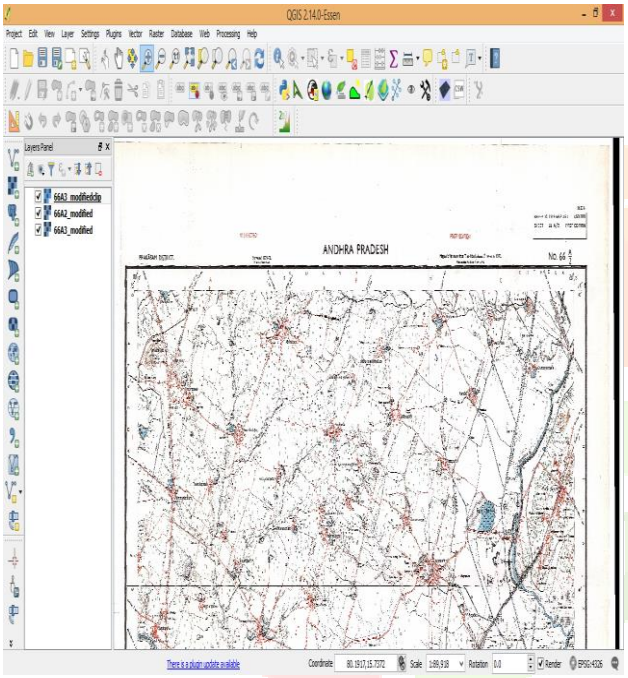
Ancillary Data were collected from different organizations like NRSC Images and SOI. 1:,50,000 scale of Ongole municipal corporation and the 1:50,000 scale toposheets were purchased from Survey of India (SOI) and locations of Head water works, Service Reservoirs, Water transmission pipelines and valve locations of distribution network were collected with GIS-Cloud mobile data collection and Trimble Juno SB GPS, also collected relevant data from Ongole municipal corporation. Valve_Locations_On_Gravity_Main.

Scanning of Analog Toposheets

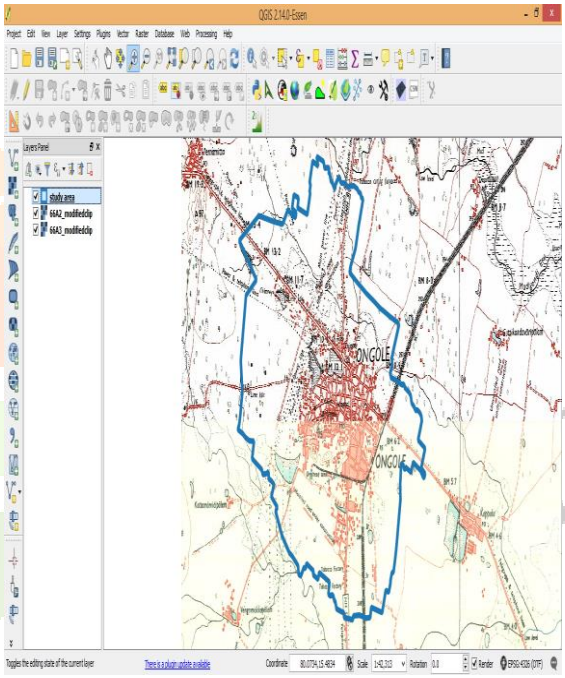
The Toposheets 66A2, 66A3 are covered for the Ongole municipal corporation area. These toposheets were scanned with A0 color scanner with a resolution of 300 dpi and saved as Tiff format.

Geo-referencing of Scanned maps

Scanned maps were registered with using QGIS2.14software in order to have real world coordinates. The intersecting points of longitudes and latitudes are to be considered as GCPs (Ground control points) to develop a GCP model with mean residual error. Each toposheet on 1:50,000 scale to be registered separately. The additional portions were clipped out using QGIS. After registration of individual toposheets a mosaic was prepared for the entire study area.



Study area Toposheets



Overlay Municipal boundary on Toposheet

Registration of Satellite Images

Geo-referencing process has to be carried out using QGIS software. The permanent features like rail-road intersections (junctions), tank bunds, bridges were taken as GCP reference points. Care was taken during image geometric correction process to distribute all GCPs evenly over the whole area. After assigning all GCPs transformation model was calculated. GCPs with maximum residual errors should was deleted. The calculation process was repeated to check the minimum mean residual error. Image orientation has been verified with reference to toposheets.

Projection

Projection is the process of transformation of three dimensional space onto the two dimensional process. The geo-database thus generated from rectified toposheets through digitization process is to be projected into real world coordinates by adopting standard projection procedure for the purpose of integration during spatial analysis.

Geo-database Preparation

Different layers namely base map, drainage, contour are extracted form toposheets. The thematic map land use/land cover has prepared from the two season multi spectral IRS P6 LISS III MX data. The structure and geomorphology were prepared from toposheets, satellite imageries and geology map. From these finally ground water potential map was derived.

After generating the Geo-data base layers, the web enabled application was developed with the help of QGIS 2.14.QGIS for qgis2leaf software gives the ability to create, manage, and distribute GIS services over the Web to support desktop, mobile and Web mapping applications.

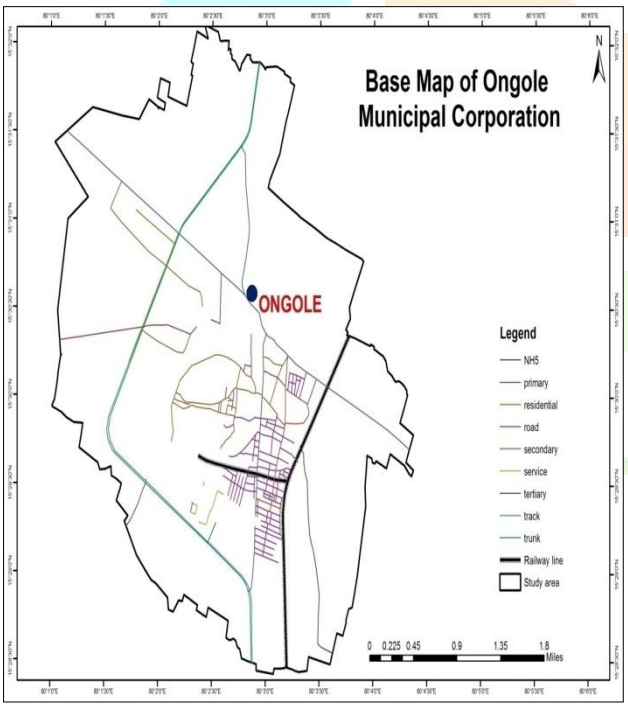
Base Map

The Base map was prepared from Survey of India toposheets on 1:50,000 scale comprising drainage system, settlements, village administrative boundaries and road network for the study area. The toposheets used in the study area are 66A2, 66A3. The various types of roads constructed in the study area are metalled and un-metalled roads, cart –tracks and foot paths shows road network. Metalled and un-metalled roads connect all the settlements in the study area.

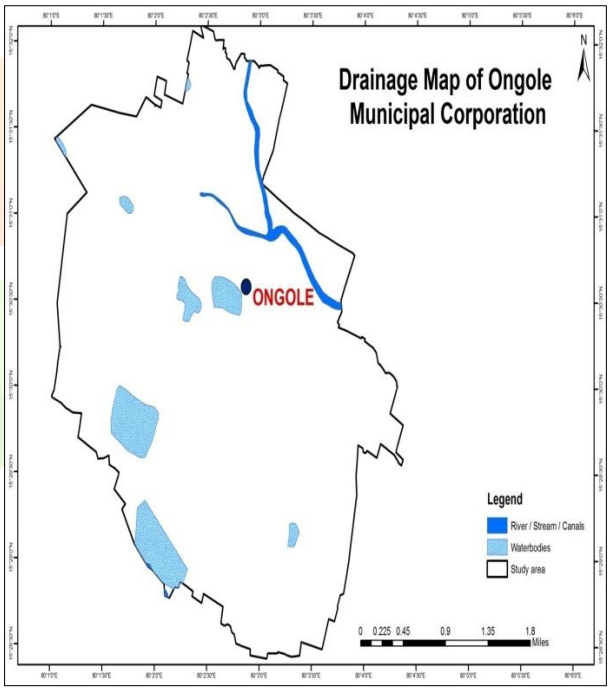
Drainage network map

A drainage basin is a natural unit draining run-off water to a common point. The drainage map consists of all water bodies, rivers, tributaries, perennial & ephemeral streams, reservoirs, tanks, ponds and the entire drainage network from first order originating in the area to the last order joining the rivers, tributaries and tanks based on topography. Drainage network helps in delineation of watersheds. Drainage density and type of drainage gives information related to runoff, infiltration relief and permeability.

The drainage map is prepared using projected toposheets of Survey of India in 1:50,000 scale and updated using latest satellite data wherever deviations and new developments are observed. The water bodies which did not exist at the time of survey of toposheets, if any are also captured based on satellite imagery.



Base map of Study area



Drainage Map of study area

Land Use / Land Cover

Land use is a primary indicator of the extent and degree to which man has made an impression on the earth's landscape. In one sense, it is an account of impact that man has made on the ecology, the growth and relevance of the ancient civilization. Wherever agricultural resource management is positive in consonance with the contemporary and future needs of mankind, civilization has flourished. In the pastoral age, land use was developed and modified over centuries when man tried to create a particular environment suited to his requirement. As long as a discernible complimentary between environment and programmed human effort existed, the ecological system as well as civilization on which the farmers rested and in turn contributed have flourished. When man tried to over exploit the one or the other, a competitive situation arose resulting in a vicious circle of ecological imbalance and degradation of agriculture's most eminent natural resource.

LULC map of study area

Land use / land cover classification

A detailed description of each of the land use / land cover class is described in the following sub sections.

S.No	Level -2	Level -1	Area (hectares)
1	Agriculture	Cropland	1231.371
2	Wetlands / Water bodies	River	35.384
3	Built-up	Rural	28.525
4	Barren / uncultivable / Wastelands	Scrub land	86.152
5	Built-up	Urban	1183.727
6	Wetlands / Water bodies	Water bodies	127.468

Built-Up Land

These are the areas of human habitation developed due to intensive non-agricultural use. The urban and rural area of Ongole Municipal Corporation. The settlements cover an area of 1212.252 ha.

Crop Land

These lands are primarily used for production of food, fiber, commercial and horticultural crops. This category is by and large is dependent on agro-climatic conditions and it is the dominant category in the study area. The cropland land 1231.371 ha.

Waste Lands

It is described as degraded land which can be brought under vegetative cover with reasonable effort and which is currently under utilized and land which is deteriorating for lack of appropriate water and soil management or on account of natural causes (NRSA. 1991). Three categories of wasteland have been identified and mapped in the study area.

Scrub Land

The land with scrub are the lands with soils that are too shallow; skeletal or chemically degraded lands with moderate to steep slope and are mostly covered with scrubs of different densities and varying height. Land without scrub is the counter part of the previous category, but with out any vegetation cover on the land. The total area under this category is 86.152 ha.

Water Bodies

The streams/rivers, tanks, and reservoirs are included in this category. The major stream passing through the Ongole Municipal Corporation. These are being used for irrigation and drinking purposes. Water bodies cover an estimated area of 162.852.

IV. WEBGIS APPLICATION DEVELOPMENT

Introduction QGIS

QGIS is an Open Source Geographic Information System. The project was born in May of 2002 and was established as a project on SourceForge in June of the same year. We've worked hard to make GIS software (which is traditionally expensive proprietary software) a viable prospect for anyone with basic access to a personal computer. QGIS currently runs on most Unix platforms, Windows, and OS X. QGIS is developed using the Qt toolkit (http://qt.digia.com) and C++. This means that QGIS feels snappy and has a pleasing, easy-to-use graphical user interface (GUI). QGIS aims to be a user-friendly GIS, providing common functions and features. The initial goal of the project was to provide a GIS data viewer. QGIS has reached the point in its evolution where it is being used by many for their daily GIS data-viewing needs. QGIS supports a number of raster and vector data formats, with new format support easily added using the plugin architecture.

QGIS is released under the GNU General Public License (GPL). Developing QGIS under this license means that you can inspect and modify the source code, and guarantees that you, our happy user, will always have access to a GIS program that is free of cost and can be freely modified. You should have received a full copy of the license with your copy of QGIS, and you also can find it in Appendix GNU General Public License.

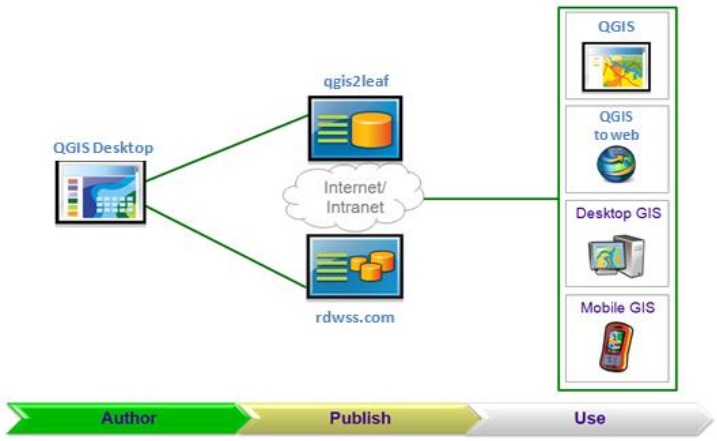
QGIS Plugins

QGIS has been designed with a plugin architecture. This allows many new features and functions to be easily added to the application. Many of the features in QGIS are actually implemented as plugins.

A **Qgis2leaf** plugin to export a qgis map to an open layers/leaflet based webmap.

Using QGIS

The following workflow of three steps to make geographic information available through the web page (1) **Author** the GIS resource using QGIS Desktop. (2) **Publish** the resource as a service using qgis2leaf. (3) **Use** the service through a client application.



Publishing the data structure

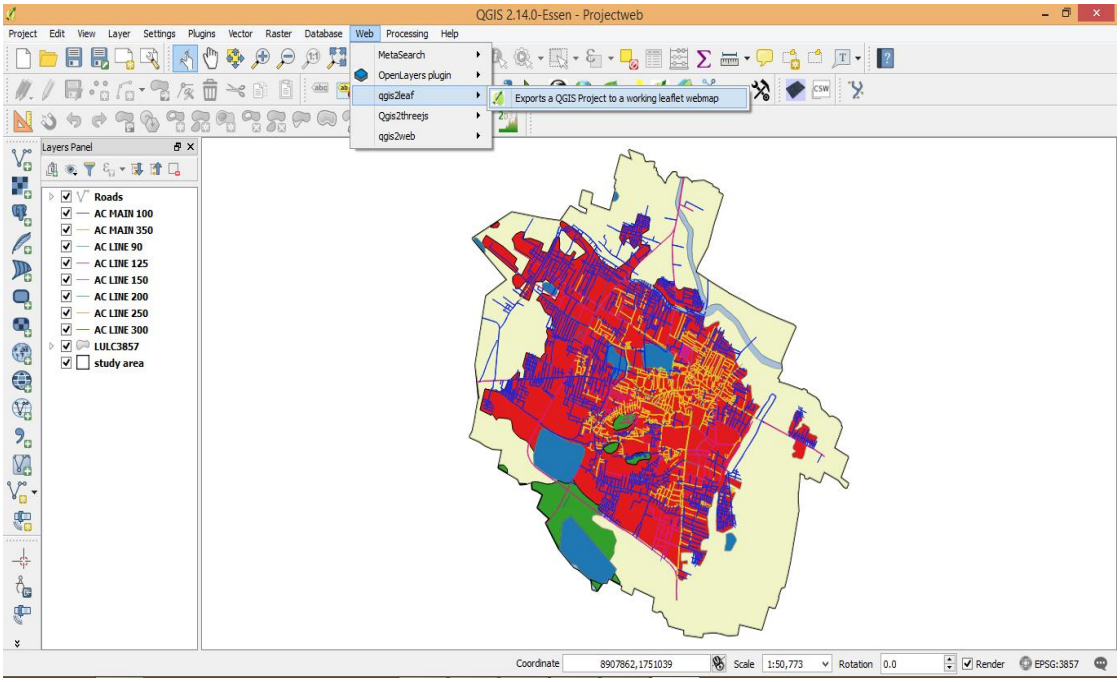
Authoring the GIS resource

QGIS software used to author the map resources we host on our GIS data in web application. QGIS can also function as a client application that simply consumes the resources running on the GIS data. For example, we can add layers to our map based on map services, find addresses based on geo-coding services, and perform data management tasks, such as geo-database synchronization using geo-data services.

To publish an interactive map on the Internet, then need to create a map document using qgis2leaf. GIS resources were created using QGIS 2.14. All the Geo-database layers are generated with the help of QGIS and saved as project file i.e (.qgs) Map document.

Publishing the GIS resource as a service

After creating the GIS resource, publish it as a service using qgis2leaf pluging. Qgis2leaf Manager to view existing services organizes them in folders, monitor their performance, and create applications that make use of services. Publishing a service requires some preparation to make sure GIS resource is accessible to all necessary components. We should reference the resource and its data in such a way that all thematic layers. Additionally, you must give the path appropriate permissions to the directory containing the resource and its data.



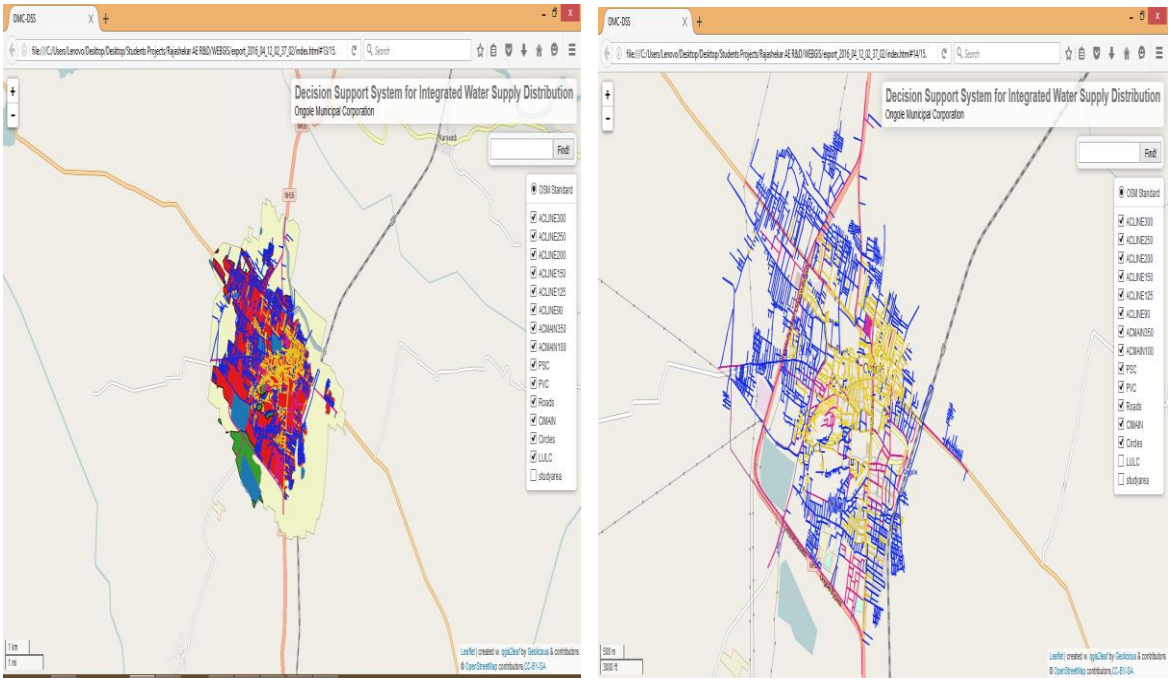
Display the Exports a QGIS Project to a working leaflet web map

It was also possible to publish a service qgis2leaf. Connecting to a GIS Web page is similar to connecting to a local folder on our computer or to a database server. Once connected, we have access to all the resources available on the web page. We can use these resources just as we would use any resource, for example, adding a map service as a layer in an QGIS map. If we also have administrative access to the Web gis, we'll also see additional tools that let us manage the web page. We'll be able to configure the qgis2leaf, add and remove resources, and monitor it to make sure it's working properly. When you create a service, we have to choose which capabilities of the GIS resource want to enable. All service types support a base capability that is closely related to the GIS resource type. For example, all map services support the Mapping capability. By default, services are automatically enabled for Web access when you create them. If desired, you can disable Web access or set limits on what clients

can do with the service through the Web. Additionally, you can specify which users on the network will have access to the services.

Creating Web application

Qgis2leaf includes a wizard for creating your own Web mapping application that uses your services. One can choose the layers that your map will display, configure tasks that will simplify the GIS workflow, and set the theme and appearance of the application. Manager maintains a list of the applications you've created, so you can view, edit, or remove them at any time. To create Web applications that contain functionality beyond that provided by Manager, one can use the **Web Application Developer Framework (ADF)**. The Web ADF contains the building blocks for creating GIS Web applications. One can use the Web ADF to build a Web application from scratch or customize an existing application that you created with Manager.



Display the Study area spatial information

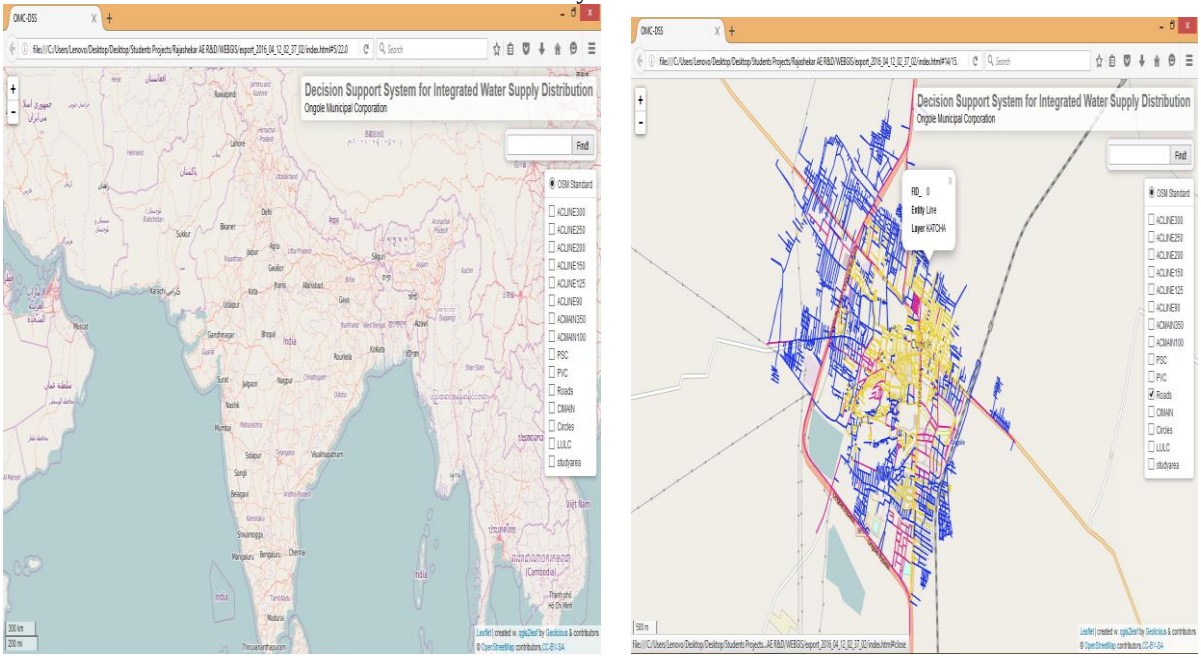
V. RESULTS AND CONCLUSIONS

Results

The resultant web application can be access using URL in web Browser.

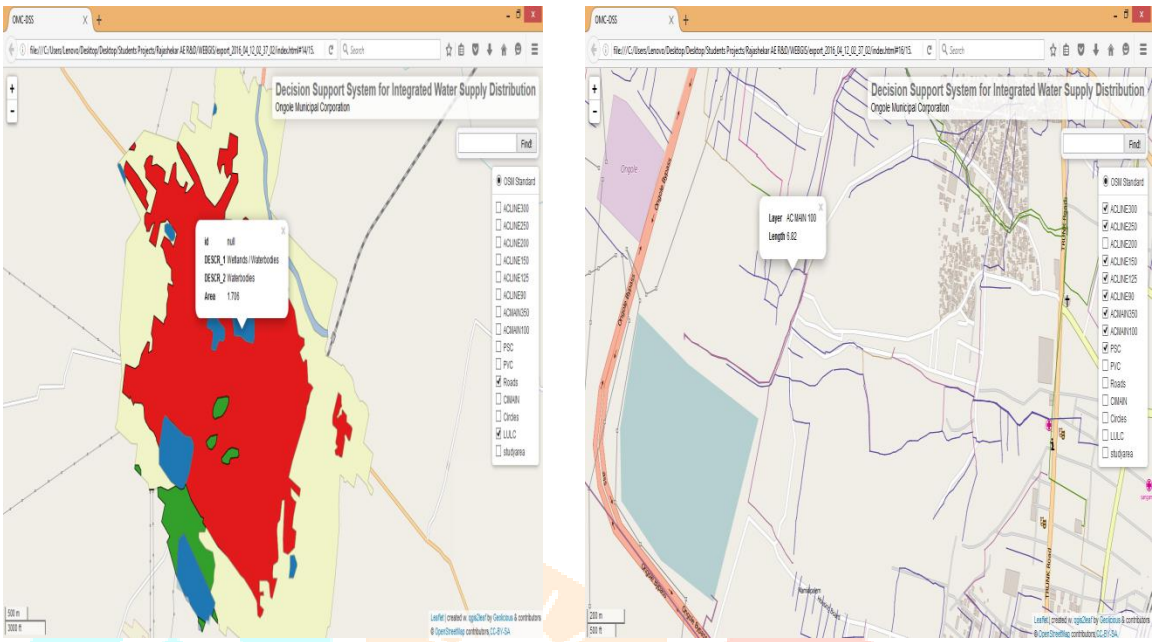
This application is having two services i.e. are all Thematic Layers and OSM slandered maps.

In Thematic service is consisting of existing locations of Tranmission mains pipieline, Roads, Land use/ land cover, Drainage. It was also consisting of implementation locations of Ongole Municipal corporation depends on Drinking water discussed in methodology section. This information about existing locations of infrastructure facilities useful to get information Tranmission mains pipeline passing network and getting water sources for tanks information system useful for persons who are working in different sectoral departments and even common people. The proposed locations of infrastructure are help to block administration for quick and easy planning under various Pipeline schemes. The Thematic layers give all information regarding scheme details and all other facilities available in study area.



Display the India OSM map

The thematic layers service contains different thematic layers like drainage, land use and cover, and roads. This information is very helpful to concerned departments like Soil conservation, Agriculture dept., and rural water Supply projects for optimum planning. The OSM image is an open service, which is incorporated in this application. Which allows the user can visualize image at larger scale. In this web application, added the functionalities like Search , Zoom in and Zoom out, identity. For searching a village, one has to click on the option Search village and then select village. Then application searches the village and lists it in the results panel. Then right side click on the village and then selects the option zoom to map.



Display the concerned layers will be displayed on the applications.

Click on feature classes on map contents, the concerned layers will be displayed on the applications.

Conclusions

The convergence of Geographic Information Systems (GIS) and online technology by using open source free software QGIS has led to a proliferation of easily accessible yet surprisingly powerful web-based mapping applications. These tools can help planners visualize, analyze, and share information on a wide range of topics. While these capabilities were previously reserved for highly skilled GIS technicians, today, any practitioner with access to the internet can easily produce attractive, informative maps on a wide range issues related to housing, transportation, the environment, and more. This document provides a practical overview of useful web-based GIS applications.

This resource is tailored to the needs of planners and those in planning-related professions. Planners must be able to convey where and to what degree their plans will affect the built environment and conduct analysis on spatial information – tasks intrinsically suited to the use of GIS and mapping tools.

The integration of information derived from QGIS technologies with other data sets, both spatial and non-spatial formats, provides tremendous potential for characterization and analysis of earth surface resources. Such derived information needs to be understood carefully in relation to the socio-economic situation for planning and development for sustainable growth employing GIS tool.

The present project emphasizes the power of GIS technology which will help the decision makers at block level to better understand and evaluate spatial data by creating graphic displays using information stored in the database. A GIS based planning will help the government in planning, implementation and monitoring of various projects for development in different fields at much faster rate which in turn will make the state technologically more developed.

This analysis has confirmed the need for spatial planning, which can achieve the desired results of economic, social interaction and overall development of a region. This study involves a methodology for rank ordering the various settlements, so that, priorities for linking the settlements can be worked out.

This GIS database will be customized to meet the requirements of stake holder departments/concerned in providing the digital resource databases and any other requirements of the block, based on their problems/ priority/ developmental programmes at Village/ Block/ Taluka level.

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