

STUDY OF VILLAGE RESOURCES AND SERVICES MAPPING FOR RURAL SOCIO-ECONOMIC DEVELOPMENT OF SOUNDALGA VILLAGE, KARNATA, INDIA

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ABSTRACT

Cadastral-level resources and services mapping is an application based on Geo-Spatial technology, focusing on micro-level resource mapping, planning, and development. This research utilizes Geo-Spatial tools like Google Earth Pro and ERDAS IMAGIN Software to visualize the Soundalga village in Karnataka. Various aspects such as vegetation, road network, drainage system, water facilities, health services, land use, and demographic data are digitized and analyzed. The study emphasizes the role of Geo-Spatial technology in micro-level resource study, planning, and conservation. This research focuses on the application of Geo-Spatial technology, specifically for micro-level resource mapping and planning in the Soundalga village of Karnataka state. The study utilizes Google Earth Pro imagery from 2017, georeferenced using ERDAS IMAGINE software, to digitize various aspects related to VIS such as vegetation, road network, drainage system, water facilities, health facilities, built-up areas, land use, land cover, temples, and bus stops. Attribute data, including population and household size, types and names of land use and cover, and other aspects like temples, are associated with each layer. The results highlight the agricultural dominance in Soundalga, along with infrastructure and amenities such as health centers, banks, wells, temples, and road networks. The research underscores the importance of Geo-Spatial technology for micro-level resource study, planning, and conservation, emphasizing its role in socioeconomic and demographic studies. The results show that out of total area of Soundalga Village 2094.48 Ha area cover by Agriculture, 75.07 Ha cover by Built up and 557.87 ha area is fallow. Soundalga village have one Government Health Center, one ATM, two government banks, 121 wells, 13 temples, 04 medical stores & 02 petrol pumps. This research highlights the importance of Geo-Spatial technology (Remote Sensing, GIS & GPS) to visualize all aspects related to VIS for micro-level resource study, planning and its conservation.

Keywords: VIS, Geo-Spatial technology, Remote Sensing, Q-GIS, GPS, Google Earth Pro imagery.

1. Introduction

Cadastral level resource planning is essential for village level mapping and its effective planning for the sustainable development. It outlines the role of various technologies, including Geoinformatics, in enhancing rural life. The Village Information System (VIS) is introduced as a GIS-based application facilitating spatial planning at the grassroots level. The study focuses on village level land and utility service mapping, covering aspects like vegetation, road networks, drainage, water facilities, health facilities, built-up areas, land use, land cover, temples, and bus stops. An Information System can support monitoring procedures as it provides current and changing patterns of land use in the area (Dale, 1999). In the absence of updated and accurate information about all kind of resources at village level, the government and people of the nation are handicapped in planning and controlling their own destiny (Khan et al, 2005).

2. Role of Geo-spatial Technology

Geospatial technology plays a crucial role in cadastral level resource and services mapping and planning. Cadastral mapping involves the identification, delineation, and recording of land parcels and property boundaries, along with associated information. Here's how geospatial technology contributes to cadastral mapping and planning:

- Accurate Spatial Presentation
- Parcel Identification and Delineation
- Integration of attribute data
- Decision support system
- Efficient land management
- Spatial Planning and zoning
- Disaster preparedness and response
- Public access and transportation etc.

3. Aim and Objectives

The main aim of this study is to develop Soundalga village VIS using Geo-Spatial technology. This database will be helpful for rural planners to implement different development plans of the village.

- 1) To prepare base map of Soundalga village at the scale of 1:5000 using all necessary layers related to VIS.
- 2) To Visualize present status of various utility services in the village
- 3) To study the relationship between village resources and infrastructure distribution.

4. Study Area

Soundalga Village is located in Chikkodi tahasil of Belgavi District, Karnataka State, India. Soundalga Village falls under longitude between $74^{\circ}21'47.845''\text{E}$ to $74^{\circ}19'45.016''\text{E}$ and latitudes between $16^{\circ}29'58.271''\text{N}$ to $16^{\circ}27'15.141''\text{N}$. The Northern Boundary of Soundalaga bounded by 'Adimallayya Hill' and southern boundary by Ved Ganga River.

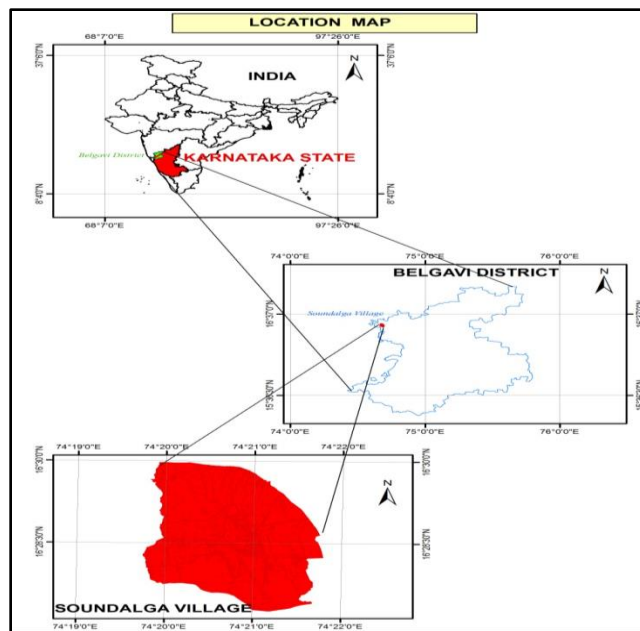


Figure 1: Location Map of Study Area

5. Data Used

Table. 1 (a, b)Data types and sources.

Spatial Data			
Sr. No.	Used Data	Spatial Referance	Data Source
1	Google Earth Pro Imagery	1:10,000	Google Earth Pro Software
2	Village Boundary	JPEG image	Website: http://www.censusindia.gov.in
3	DEM- Cartosat 1	30 M Resolution	http://bhuvan.nrsc.gov.in/data/download/index.php
Non Spatial Data			
Sr. No.	Used Data	Data Source	
1	All Attribute Data	http://www.censusindia.gov.in	
2	Village Boundary	Website: http://www.censusindia.gov.in	

6. Methodology

In this study, both primary and secondary data are used to develop the information system. At first take the boundary map of Soundalga village in JPEG format through <http://www.censusindia.gov.in> Web site & georeference to JPEG map using ERDAS Imagine software & Create a boundary map of Soundalga village in shape format which is supported format to Q GIS. For satellite data download Google Earth images from Google Earth Pro & georeference to them using ERDAS Imagine software. Google Earth Pro Imageries are georeferenced using datum WGS, 1984 and Northern UTM zone 44. To correct distorted or degraded image data to create a more faithful representation of the original scene, image rectification and restoration process is needed which is always termed as preprocessing. The image of the study area was clipped by overlaying Village boundary over the geo-referenced image and extract the image using the Extraction Tools of Q GIS software.

Create GIS data layers like Vegetation, water facility, Builtup, Land Use & Land Cover etc. layers in polygon. Temples, Health Centers, Wells, Schools, Banks, Shops, ATM & Bus Stop etc. layers in Point. Road Network, Drainages, Canal networks etc. layers in line. Join attribute data to each GIS layers like population and household size, types and name of Land Use-Land Cover & other each aspect like Bus Stop, Temples etc

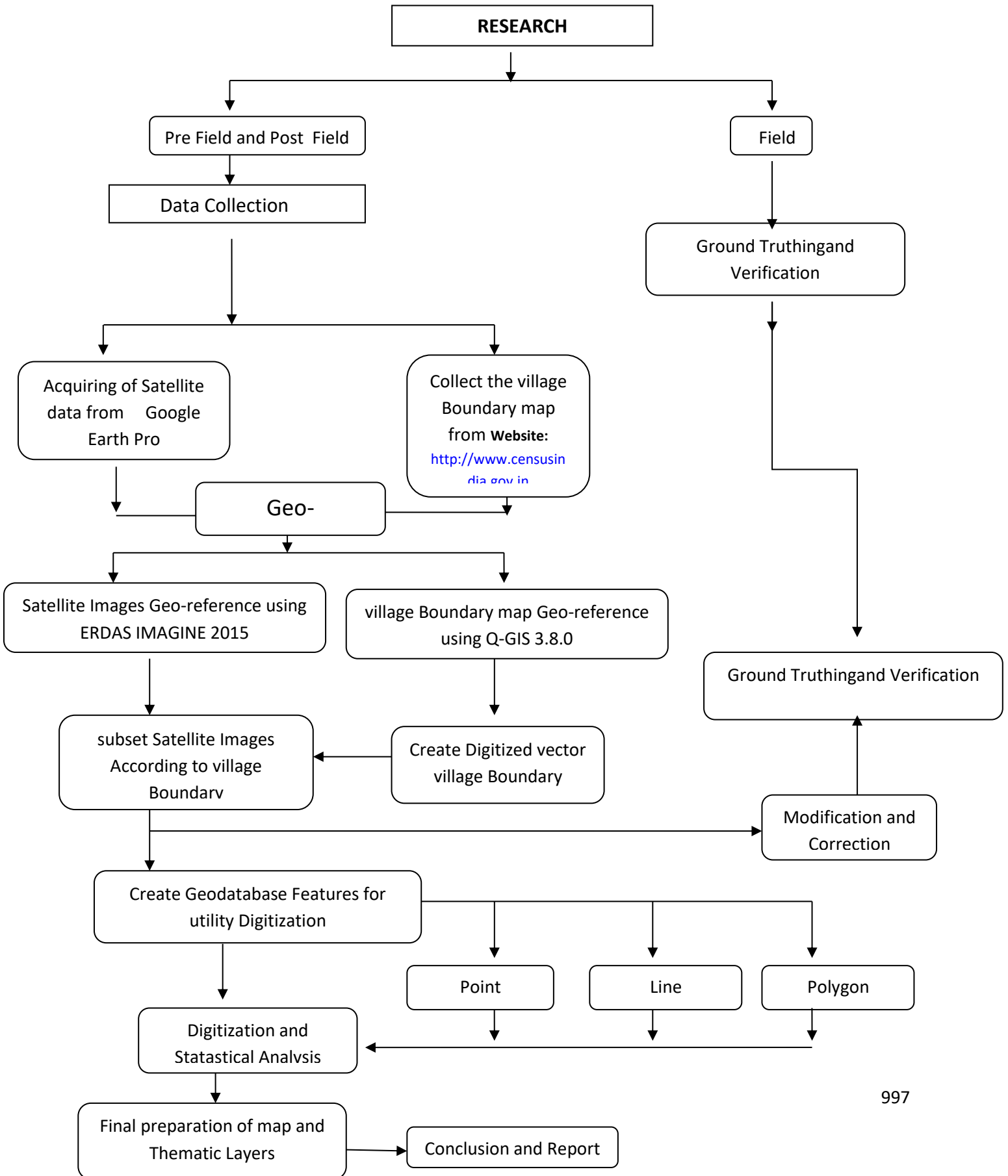


Figure 2: Research Methodology Chart**7. Software Used**

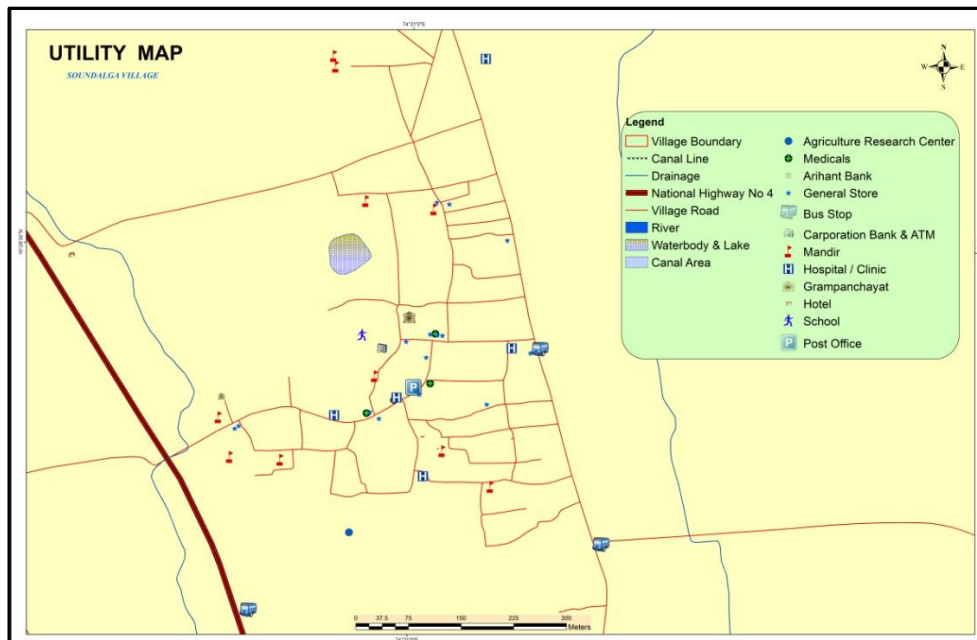
- a) **ERDAS imagine:** Used for georeference to images
- b) **Q GIS 7.2.2 :** Used for Area Digitization, Map Prepretion.
- c) **Microsoft office Excel 2007:**Is used for making tables and graphs
- d) **Microsoft office Word 2007:** Used for research paper writing

8. Result and Discussion

- **Utility Mapping**

Soundalga village located along National Highway No. 04 & along the cost of Wedganga river with 1394.3 ha. Land area & 7789 population. Agriculture is main occupation of the village. Approximately 847.60 ha land area falls under this category. Main crops grown in rabi season is Sugar Cane and Groundnut & Soybean in kharif season. land use of the vllage is followed by Built up area which covers 75.07 ha land.

Soundalga village have two Primary Schools, one High school with Name New English School, Two Government Banks (Corporation Bank & BDCC Bank), One ATM of Corporation Bank, four Private Banks Like Arihant Co-Op Society, Mahatma Basweshwara Co-Op Society, Bireshwara Bank LTD. & Arihant Co-Op- Society.

**Figure 3: Utility map of Village**

• Resource Mapping

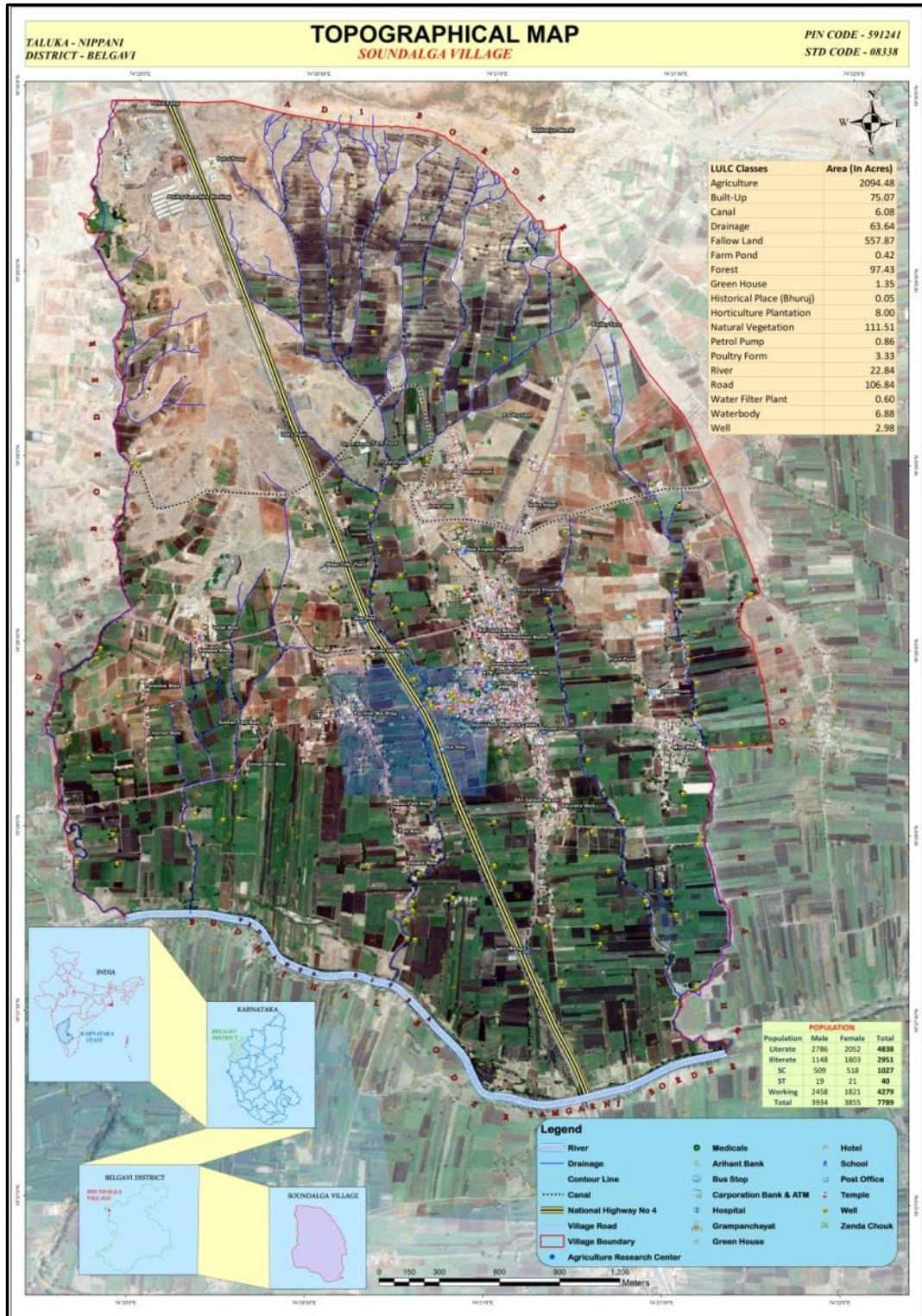


Figure 4: Resource map of Village

• **Water Resource Mapping**

Dendritic Drainage Pattern are found in Soundalga Village. Wedganga River is flowing from south of the village & delimit the southern boundary. Generally two Main drainages flowing from eastern and Western Side of the Village and delimit the both side boundaries respectively. A hill with 2409 feet height and 2083 meter length located to north side of the village and delimit the northern boundary.

Soundalga have three main drinking water sources that’s are River (Wedganga), Wells & tubwells. In the village 121 wells are found.

“Shree. Narshinh” is Gramdaivat of the village. There are 12 main Temples.

Good road network are found in the village. National Highway No. 04 is pass through the village. Approximately 27222.08 meter road constructed in the village. Roads Cover 43.23 Ha area out of total area of the village. .

Good Health Center & medicals are available in the village. There are one government health center, five privet health clinics like Nilekar Clinic, Sidhi Clinik, Magadum Clinic, Patil Clinic etc. & four Medical shops like Amit Medical, Suhas Medical, Sanjivani Medical, Shanta Medical & Nath Medical.

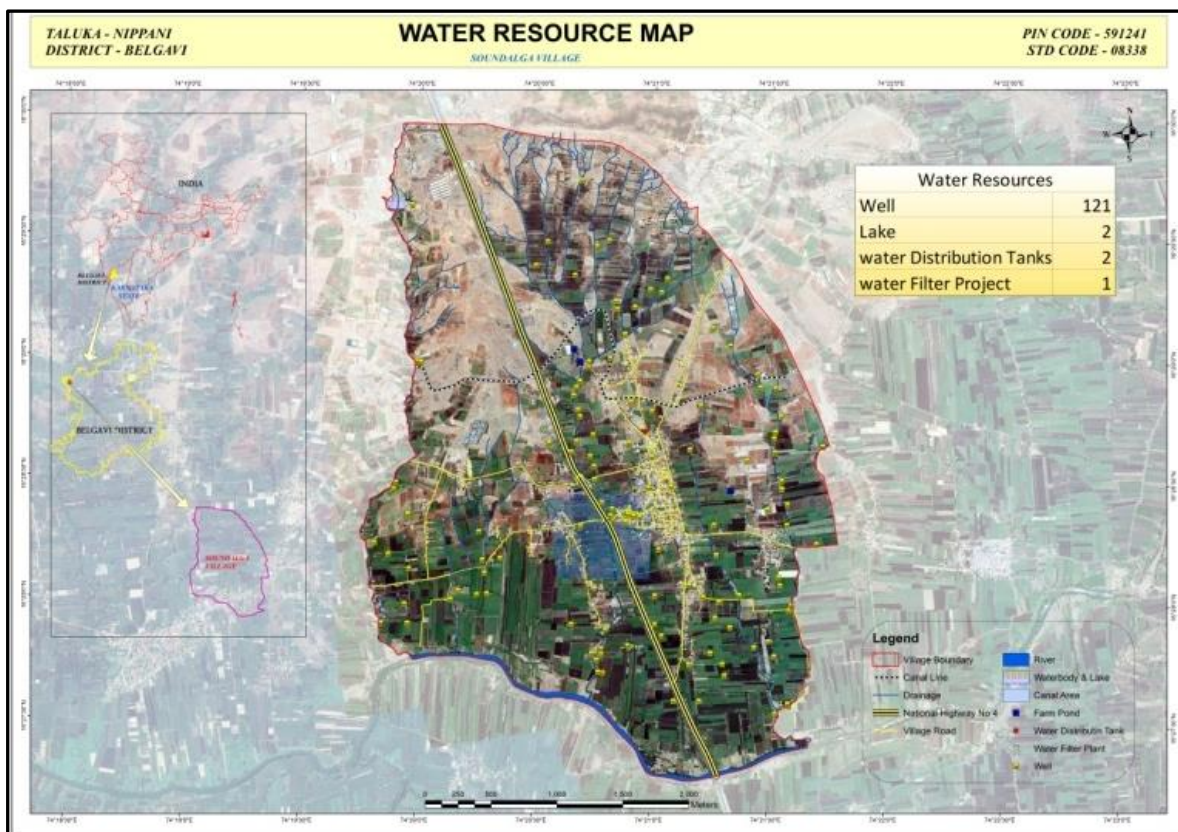


Figure 5: Water Resource Map of village**8. Conclusion**

Micro-level study tool for local resources and demography. It discusses the significance of natural resource development, conservation, and optimal utilization. The advanced Geo-Spatial techniques of remote sensing, GIS, and GPS are acknowledged for their precision. The study concludes by outlining the developmental potential of Soundalga village, especially in agriculture, employment, and integrated development, with the aid of Village Information System. In this present study we can conclude that Soundalga is a developing village with good road network, Health centers, Banking facilities & Schools. Economy of the Soundalga is mainly depending on agriculture. Approximately 75% area of the village comes under agriculture activities. Soundalga have a group gram panchayat with Bhivshi village which adjoining to Soundalga. The proximity of national highway NH-4 giving high potential to transportation of the agricultural goods, vegetable in the nearest cities like Nippani, Kagal and Kolhapur. Nearest MIDC area giving employment to soundalga youth and helps for socio-economic development of the village. In future Soundalga village have huge potential for agricultural development, better employment, watershed development and integrated development for the optimal utilization and sustainable development of the village resources.

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