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Mapping of Geomorphology in ground water prospective zones by RS & GIS: A case study on Tumakuru taluk

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Abstract - A Tumakuru is situated in the eastern part of Karnataka state, which is west of Bangalore at around 65km. Tumakuru district is bounded by Mandya district towards south, towards northeast is chitradurga, Hassan and Chikmagalur, towards Southeast is Ananthpur District of AndraPradesh. Tumakuru region covers an area of 10596Sq.Kms. The region falls under three watersheds, the Krishna Watershed covers North and Western part, the Cauvery Watershed covers South and Southwestern part and the Pennar watershed covers East and North-Eastern part of District. Tumakuru taluk has an average elevation of 822 meters (2696 feet). Tumakuru Town is the chief administrative, commercial and business centre of the district. Database is prepared on 1:50,000 scale satellite data interpretation has been done for preparation of land-use/land-cover map.

Keywords — Land use, Land Cover, Geomorphology, Remote Sensing, Ground water prospective zone, Drainage mapping

I. INTRODUCTION

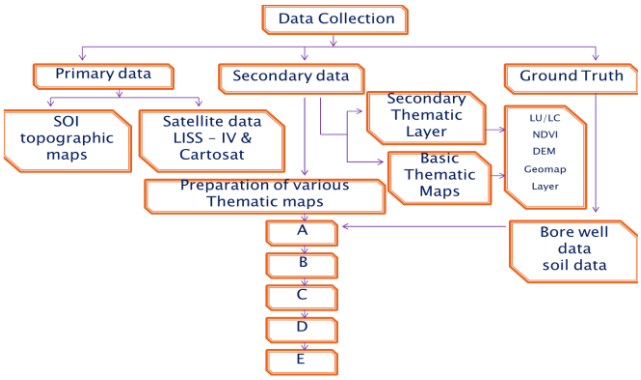
The Ground water is a most valued universal wealth supporting the human well-being, along with ecosystem. It has become a significant and reliable cause of water supplies in both urban and rural areas under varying climatic conditions across the countries (Todd and Mays, 2005), due to its intrinsic qualities. Out of 37 M km^3 of freshwater anticipated to be available on the earth, the ground water is about 22%, which represents around 97% of freshwater that is accessible for domestic use (Foster, 1998). In India, over 91% and 29% of population of rural, and urban respectively, depending on the ground water for the drinking and domestic purpose (1996, Reddy).

1.1 . GENERAL

To monitor and preserve this vital resource and for targeting ground water prospective zone, ground water studies have become crucial now a days, though, such methods for ground water investigation are expensive, time-taking and involve skilled human resource. In difference, the emerging Geo-informatics technology is extremely helpful tool for assessing observing and managing the ground water resources. Surface features like water bodies, geography, soils ,features of land, usage of land, etc., the ground water presence can be obtained from satellite images "(Tod, 1979; Jah and Peiffer, 2005)". Finally, complete content and organizational editing before formatting. Please take note of the following items when proofreading spelling and grammar:

1.2 METHODOLOGY

Irjet Template sample paragraph .Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, sc, dc, and rms do not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable.



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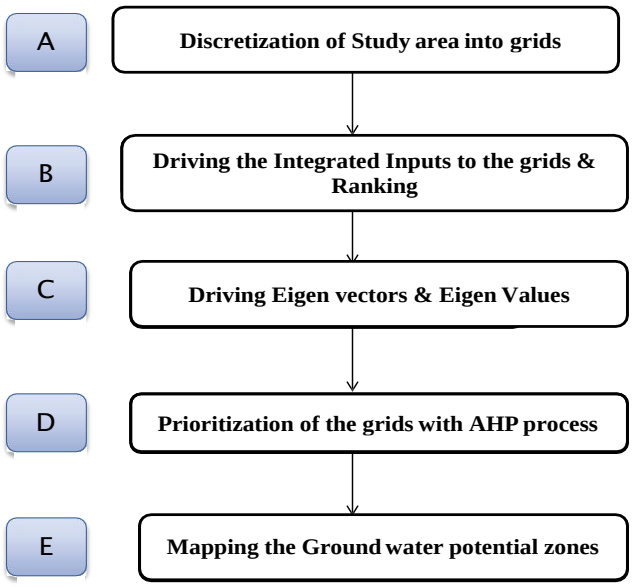

Fig.1.2.1: Methodology applied in RS & GIS

II. STUDY AREA

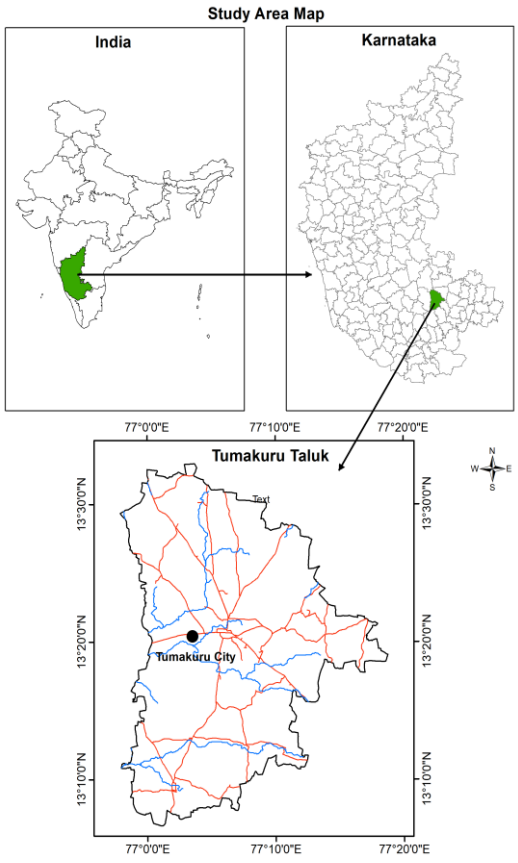

Fig. 2.1: Study area of proposed research

The Tumakuru district consisting of ten taluks and Tumakuru Taluk is selected in the present study. Tumakuru is one of the developing city in India, and is one of the fast developing urban areas of Karnataka. The schematic representation of study area is shown in, Figure

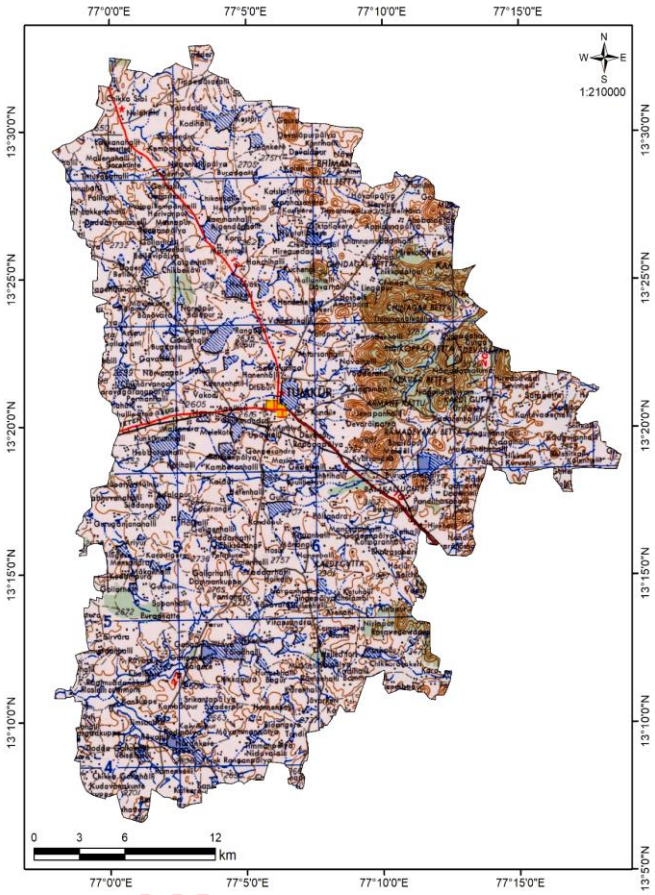

Fig. 2.2: Map showing study area extracted from Toposheet

III. GEOMORPHOLOGY

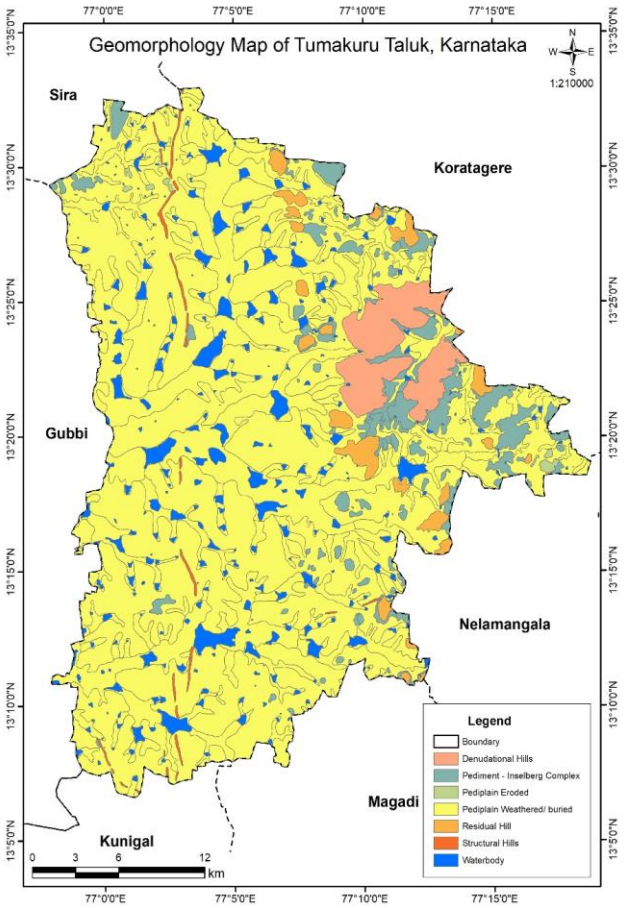

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Fig. 3.1: Geomorphology Map

Geomorphic units	Area covered in Sq.km	% of area covered
Denudation Hills	45.07	4.64
Pediment – Inselberg Complex	59.91	6.16
Pediment Eroded	2.1	0.22
Pediplain Weathered / Buried	835.83	85.97
Residual Hills	24.13	2.48
Structural Hills	5.18	0.53
Total		**100**

Table.3.1: Aerial extent of Geomorphologic units

Soil

Soil is most essential component for outlining the groundwater prospects zones. Red loamy and sandy soils, Laterite soils are significantly found in the study stretch. Figure 4.7 clearly emphasizes the soil map of the study region and Table 4.6 gives areal extent of different soil types.

Red loamy and sandy soils

This type of soil generally exists in uneven land slope on the granite and gneissic terrain. The soils are mild finished and are extremely drained in nature with great infiltration rate. It is ordinarily found along 'western, southern and northern parts of Tumakuru taluk'.

IV. CONCLUSIONS

• In this investigation, Remote Sensing, GIS and Composite Suitability Index method have been used for assessment of groundwater potential zone.

• The integration of multiple layers such as geomorphology, land use, geology, lineament density and drainage density gives smaller suitability units as a combined layer.

• A composite suitability index (CSI) is estimated for every composite unit by multiplying the weightage with rank of every parameter and summing up the values of all the parameters.

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