Identification of Mapping Ground water prospective zones by RS & GIS: A case study on Tumakuru taluk

Dr. Shivakumar R.1, Dr. Jagadeesha D. S.2, Thejesh T. N.3, Santhoshia T.4, Supriya T. J.5, Syeda Nikhat Fathima6
Professor & HOD1, Professor2, Assistant Professor3, Assistant Professor4, 5, 6
HMSIT, Tumkur, India1,2,4, 5, 6, Channabasaveshwara Institute of Technology, Tumkur, India3

Abstract:
A Tumakuru is situated in the eastern part of Kamataka 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 km3 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).

II. GENERAL

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 km3 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). The ground water is becoming critical economic tool in progressing Nations & can supply to the poor people at lower rates more efficiently (IWMI, 2001).

As the demarcation of ground water prospect zones consists of integration of various disciplines, the assimilated function of Geo-informatics methods has turned into a profitable instrument and the ground water exploration particularly in rocky terrain that entails over discerning of geology, geomorphology and features of a region, which are managed by the terrain’s features like weathering evaluation, break term, penetrability, slope, sewerage design, landforms, land use/land cover & environment.

In terrain of hard rock, available of the ground water are inadequate. A presence of ground water of rocky terrain is confusing to fragmented & hardened horizon (Binay Kumar & Uday kumar, 2010). Remote sensing assists the exploration of ground water prospect zones since it conveys the available geographic outlook of fundamental data of geology, soils, use of land, landforms, water bodies of surface, and others.
IV. STUDY AREA
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

V. GROUNDWATER PROSPECTIVE ZONE
The Land use and, Land cover pattern (LULC) is most favorable zone for identifying groundwater investigation and development. In this study, maximum area is marked as Poor and occupies 49% of the entire study region. The central part of the Tumakuru city is found to be settlement area which is marked as very poor zone and occupies 17% of the study area. Forest region and some of the tanks and major lineament area are marked as average potential zones for the entire study area and occupied 25%. Good zones were marked in Northeast and South-west part because the sandy soil, flat terrain and due to presence of Pedal plain area is occupied 8% of the entire investigation area. The excellent ground water potential is occupies the 1% of the study area. The percentage distribution of different groundwater potential zones is presented in pie chart

VI. CONCLUSION
In this investigation, Remote Sensing, GIS and Composite Suitability Index method have been used for assessment of groundwater potential zone. Clearly, this sort of investigation always has an additional influence over predictable survey. The integration of multiple layers such as the
“geomorphology, and land use, and geology, and lineament density and drainage density and depth to groundwater” gives smaller suitability units as a combined layer.

The groundwater potential zones are presented into following five zones:

a. Area with slope 3 to 5 %, lineament density 3.4 - 4 km2, drainage density 0.6 - 0.6 km is identified as excellent groundwater prospective zone and it covers an area of 12.28 km2.

b. Area with slope 5 to 10 %, lineament density 2.8-3.4 km2, drainage density 0.6 - 1.0 km is discerned as good to good groundwater potential zone with an area of 81.38 km2.

c. Region having slope 10-15 %, lineament density 2.2-2.8 km2, drainage density 1.0-1.47 km is demarcated as average groundwater potential zone covering an area of 258.74 km2.

d. Area having slope 15 to 35 %, lineament density 1.6-2.2 km2, drainage density 1.47-1.94 km is regarded as poor groundwater potential zone and its area is 503.88 km2.

e. Area having slope greater than 35 %, lineament density 1-1.6 km2, drainage density 1.94-3.20 km is ascertained as very poor groundwater prospective zone and it covers an area of 172.9 km2.

VII. REFERENCES


