GROUNDWATER & ITS VOLUME DETECTION USING GEOGRAPHICAL INFORMATION SYSTEM AND REMOTE SENSING

Abstract

Today, groundwater is the only source of water for most Indians and provides the majority of water for agriculture and domestic use. Today, ground water has decreased and hence the demand for water has increased. This study aims to identify potential zones of groundwater and estimate the volume of groundwater using Geographic Information System (GIS) and Remote Sensing (RS). RS and GIS methods are fast and cheap natural resource management. The identification and location of groundwater is based on features such as geological and geomorphic features and their hydrological properties. Satellite remote sensing enables continuous observation and analysis of various geomorphic units and contour features with the help of GIS to identify groundwater potential zones.

Keywords: Geographical Information System (GIS), Remote Sensing (RS), Groundwater Potential Zones, Storage Volume.

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I. INTRODUCTION

Groundwater is the main source of drinking water in urban and rural India. It is also an important resource for agriculture and industry. Groundwater is stored below the surface in natural resources such as soil and rock. Interior, irrigation, etc. Various industries such as those that depend on groundwater can tap into groundwater resources.

Determining groundwater is an expensive task because wells must be drilled and tested to determine suitability for various uses. Another way to save costs and effort is to use remote sensing technology and geographic information systems to create large databases for large areas.

The study shows that using GIS, thematic maps produced by conventional and remote sensing methods provide accurate results in the groundwater potential zone.

1. **Remote Sensing and GIS:** Remote sensing is used to obtain information without contacting the surface. This is done by capturing and recording, processing, analyzing and using the emitted energy.

   The geographic information system is a system for obtaining, storing, verifying, integrating, processing, analyzing, and displaying spatially related data.

   GIS technology is used to classify remote sensing results and assign appropriate weights to existing maps. These maps are used to identify groundwater flow and recharge zones.

2. **Contains Groundwater:** Groundwater retention is determined by comparing the amount of water entering the system with the amount of water leaving the system..

II. LITERATURE SURVEY

There are several methods used to determine groundwater:

1. **Standard Method:** Dowsing is the only way to find ground water. These are some of the oldest forms of diving practiced by ancient people for centuries.

2. **Water Magic:** Water magic is a traditional method adopted by people to find wells. Over a hundred years of scientific research has proven that this method does not work.

3. **GPR Method:** Ground-penetrating radar (GPR) is used to detect groundwater. Water is a water detection and detection technology that requires more time to collect data.

4. **Modern Techniques:**

5. **Topography:** Analysis of the map and local vegetation shows that there is water. When conducting large-scale surveys, global geological analysis can be performed by interpreting satellite images or aerial photographs.

6. **Hydrogeophysics:** Geophysical techniques are now the main method for investigating and discovering groundwater aquifers. The method chosen is highly dependent on the geological context.

III. METHODOLOGY

GIS and RS methods, The use of RS and GIS methods to study and evaluate the location, depth and nature of groundwater has been widely used to identify or identify promising areas for groundwater zones. Remote sensing data combined with geographic information system is very effective in determining the groundwater potential of any area. The researchers concluded that combining thematic maps produced using conventional and remote sensing methods using GIS provides more accurate results. This involves mapping the various features that affect groundwater recharge in various areas of the region. Drainage, lithology, land use/land cover, slopes and thematic maps of the study area were obtained from various sources and integrated and analyzed using GIS systems to obtain final results.

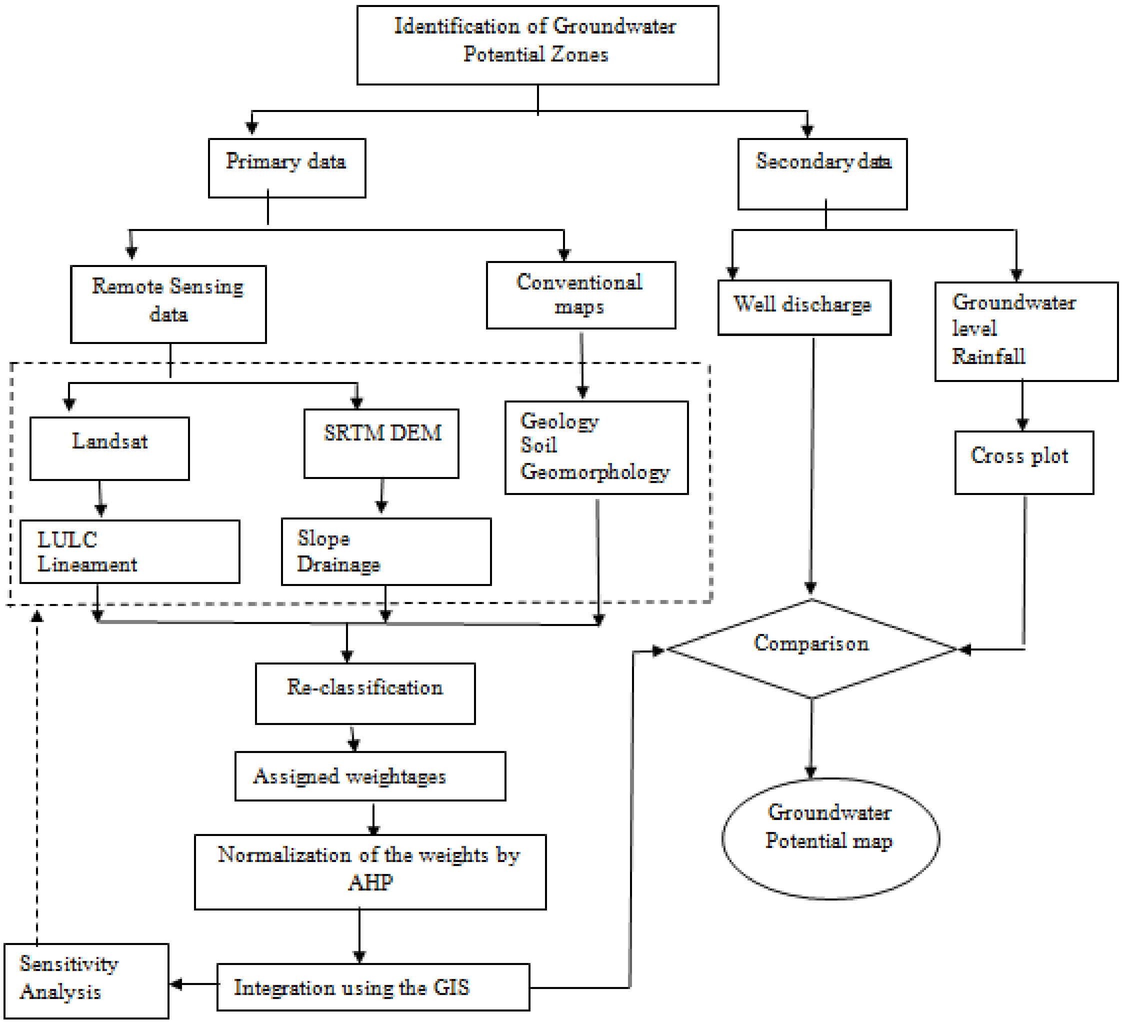

Figure 1: Architecture Diagram

Lithology maps of the area were digitized from existing vector maps and classified using an image classification grid. Land use is an important factor in surface water recharge. It includes soil type, habitat distribution and vegetation cover. These lines are often used to describe geological conditions. Lineaments are simple and complex linear features of geological structures, faults, fractures, fractures, and various surfaces of discontinuities revealed by remote sensing. Drainage density is significantly related to groundwater recharge; Groundwater with a high linear density is highly charged. Slope has a direct effect on rainfall penetration. A steep slope leads to low groundwater recharge because when it rains, water flows through the steep slope and does not have enough time to infiltrate the soil and fill the saturated zone.

The slope analysis function in GIS is used to estimate slope changes in an area using digital elevation model data from Landsat data in Earth Explorer. Using satellite data, we can determine the water storage capacity for different geomorphological conditions. The Shuttle Radar Topography Mission (SRTM) measures the height of the Earth using two antennas. Digital hydrology application of elevation modeling (DEM) includes groundwater modeling, estimation of proposed reservoir volume, and determination of landslide probability.

IV. EXPECTED OUTCOME

In this approach, we will identify the groundwater zone (Chikodi, Karnataka) using GIS and RS. We can also determine to what extent the combination of remote GRACE water storage values can be used to estimate changes in groundwater storage..

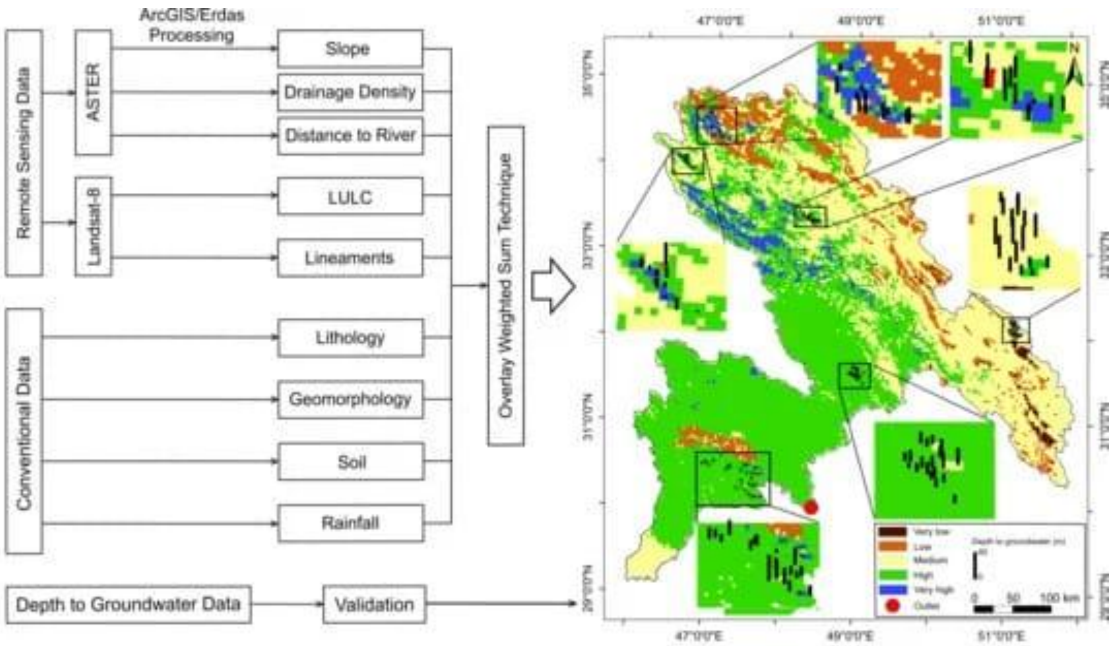

Figure 2: Identification of ground water potential zones using Remote sensing and GIS

V. CONCLUSION

GIS produces intelligent and useful spatial information that achieves important responses. The need of the day is to scientifically design landfill systems in Indian cities to protect them from GHG pollution.

We need spatial data entry, and many areas lack such data. Remote sensing can provide part of the input, especially when data from geological and hydrogeological surveys and geospatial surveys are collected using RS..

VI. FUTURE ENHANCEMENT

By combining satellite remote sensing technology with geographic information systems, potential areas of groundwater can be defined more precisely, allowing for better monitoring and more systematic analysis of various geomorphic units and contours.

GIS and remote sensing enable rapid and cost-effective monitoring and management of natural resources. In addition, remote sensing data is an important tool in groundwater studies.

Because it is a surface phenomenon, groundwater resources are indirectly identified and located by directly examining land features such as geological and geomorphological features and hydrological features.

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