A REVIEW OF IDENTIFICATION OF GROUND WATER POTENTIAL ZONE USING GIS TECHNIQUE

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ABSTRACT

The purpose of the present study is to use Geographical Information System (GISs) for determining the best area having ground water potential zone. To achieve the objective, parameters such as precipitation, slope, fault, vegetation, land cover and lithology is used. After developing informational layers in GIS and weighing each of them, a model is developed. The final map of ground water potential
Will be calculated through above mentioned model. After applying our developed model, the areas having high, average, low potential and without required potential distinguished. The obtained results Can be useful in management plan of ground water resources and preventing excessive exploitation. So to overcome the problem of depletion of ground water, it is necessary to assessing the potential zone of the ground water recharge for the protection of the water quality and the management of the ground water systems. Remote Sensing and the geographic information system is used to demark the ground water potential Zone. A standard methodology is proposed to determine the ground water potential zone using integration of Remote Sensing and GIS. A composite map is generated using GIS tools.

Keywords- GROUND WATER, REMOTE SENSING, GIS, COMPOSITE MAP, SATELLITE DATA

1 INTRODUCTION

Ground water is most valuable resource for industries, communities and agriculture consumptions in the world and due to its freshness, chemical compounds, constant temperature, lower pollution coefficient and higher reliability level, considered as a basic source of supplying reliable fresh water in urban and rural areas. Now a days, about 34% of the world's water resources belongs to ground water and is an important source of drinkable water. Ground water is a natural resources which support human health, economic development and ecological diversity.

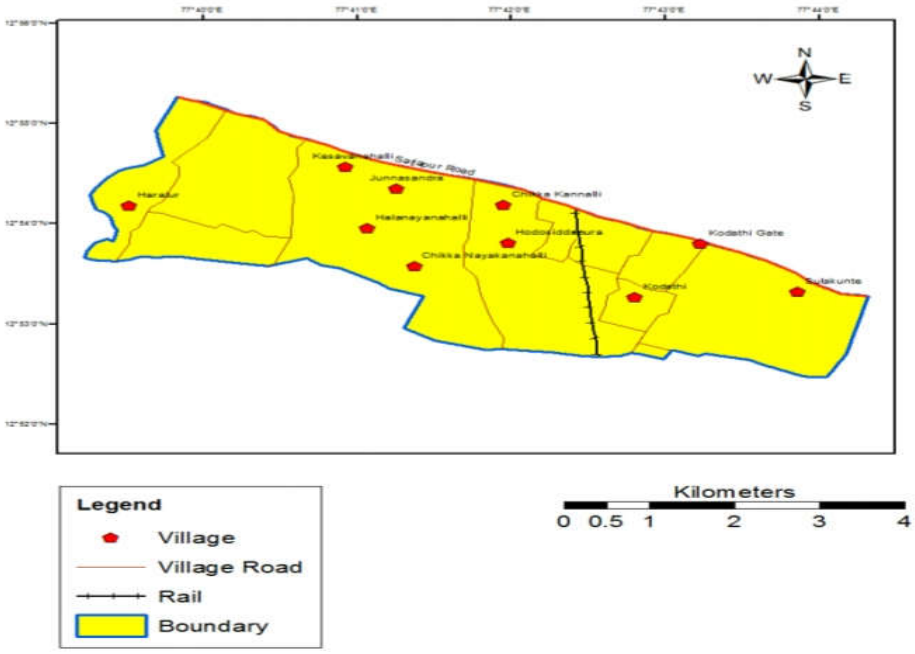
1.1 CASE STUDY- A CASE STUDY OF GROUND WATER POTENTIAL ZONE IN SOUTHERN PART OF BANGLORE EAST TALUK USING REMOTE SENSING AND GIS.

1.1.1 Need for Study

According to above case study, the existing methods of ground water exploration using geophysical and geo electrical techniques are expensive and time consuming. With the advent of powerful and high speed remote sensing and GIS has the capability to identify the factor which influences the ground water occurrence such as geological condition of the study area, structural features, soil type, rainfall slope, vegetation etc. GIS is helpful to prepare various thematic maps and their integration based on weightage and ranking of each theme influencing ground water occurrence.

1.1.2 BASE MAP

The base map of the above mentioned study area



1.1.3 SOFTWARE USED

a) ArcGIS 10.2.1

b) Microsoft Excel

c) ERDAS Imagine 9.0

2 WHAT IS GIS?

A Geographic Information System is system designed to capture, store, manipulate, analyze, manage, and present spatial or geographic data. GIS applications are tools that allow users to create interactive queries, analyze spatial information, edit data in maps, and present the results of all these operations.

2.1 APPLICATIONS OF GIS

There are various important applications of GIS-

I GIS in mapping

II Telecom and network services

III Accident analysis and hot spot analysis

IV Transportation planning

3 OBJECTIVES FOR IDENTIFICATION OF GROUND WATER POTENTIAL ZONES

Specific objectives are

a) To identify influencing factors of ground water potential zone.

b) To prepare various thematic maps such as slope, drainage, geology, geomorphology, soil etc.

c) To validate the ground water potential zones with existing well location data.

4 NEED FOR IDENTIFICATION OF GROUND WATER POTENTIAL ZONES

a) Despite the extensive research and technological advancement, the study of ground water has remained more risky, as there is no direct method to facilitate observation of water below the surface.

b) Protection of water quality in the study region.

c) Management of ground water system.

d) Regular depletion of ground water level has affect the geology of area.

5 SCOPES OF GIS IN IDENTIFICATION OF GROUND WATER

a) Ground water prospects maps may be used by the field officers of the departments concerned in the Respective states to select the sites at appropriate places.

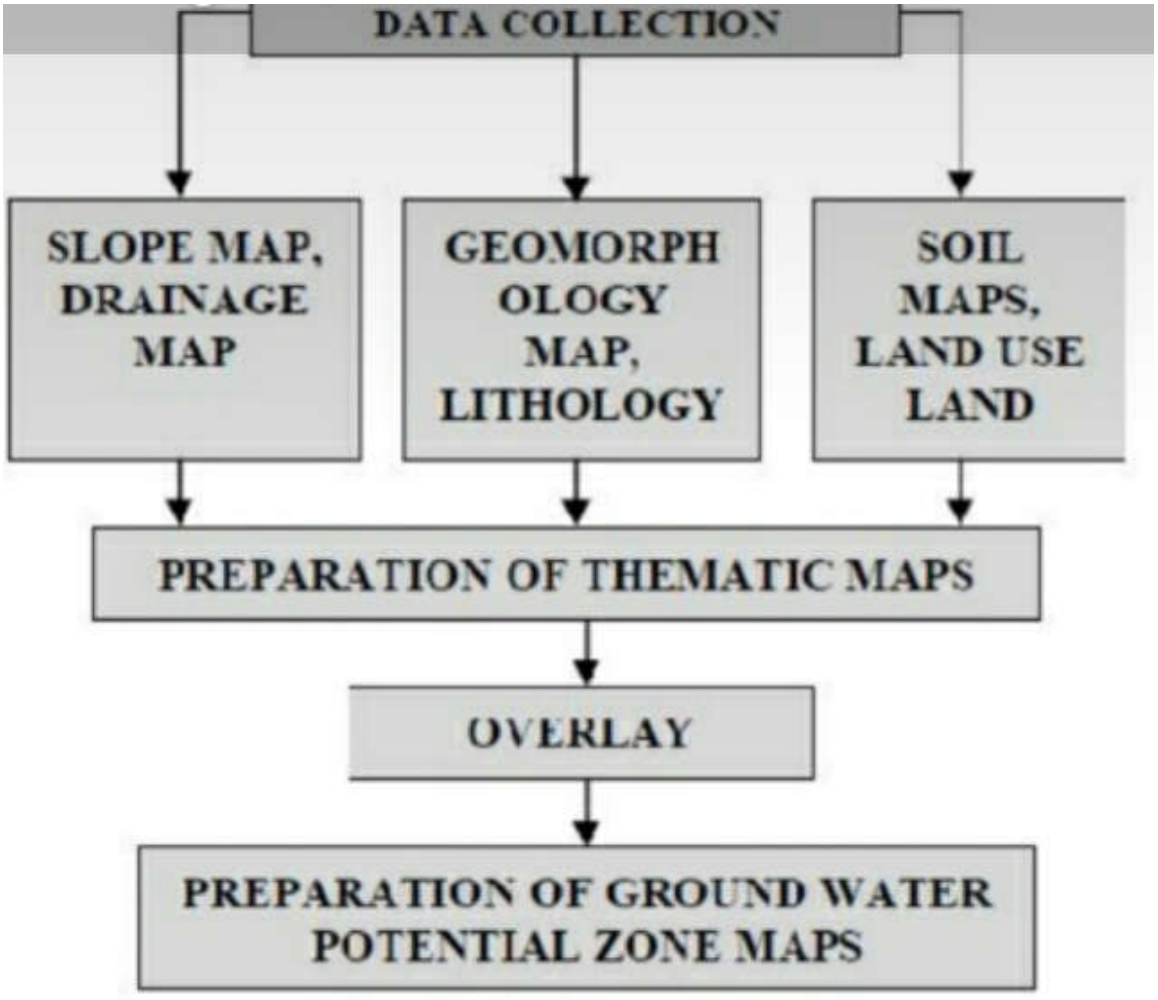
b) It helps mainly in identification of prospective locations for narrowing down target zones for follow up Detailed hydrogeological and geophysical surveys at appropriate places for drilling.

c) These maps are the good inputs for aquifer mapping.

d) One of the input for resource estimation for future ground water development for the given drilling.

6 METHODOLOGY

The methodology adopted to generate ground water potential mapping is shown in figure-



7 CONCLUSION

In the present study, GIS technique has been successfully adopted and used for the evaluation ground water potential zones. Use of weighted overlay method was found to be very useful in mapping of ground water potential zones of the study area. In the present case, four categories of ground water potential zones have been identified by the above said method with the help of GIS.

8 REFERENCES

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c) PRABIR MUKHERJEE et al., (2012) made an attempt to determine the ground water potential zones within an arid region of KACHAHH district, Gujarat.

d) DEEPESH MACHIWAL et al., (2010) proposed standard methodology to delineate ground water potential zones using integrated RS, GIS and multi-criteria decision making (MCMD) techniques.

e) JOBIN Thomas et al., (2011) determined ground water potential zone in tropical river basin (Kerala India) using remote sensing and GIS techniques.