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GROUND WATER QUALITY OF VISAKHAPATNAM AREA USING RS&GIS TECHNIQUES

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Abstract:-Remote sensing techniques that have been used in the study to delineate the hydrogeomorphology, and use/land cover and the lineaments of the area using SPOT and IRS-IB visual products. A GIS is an information system that is designed to work data referenced by spatial or geographic coordinates. The quality of ground water in Visakhapatnam town in Andhra Pradesh has been studied. Various parameters, viz., pH, conductance, total dissolved solids, alkalinity, hardness, chloride, sulfate, nitrate, sodium, potassium, calcium and magnesium have been determined to evaluate its suitability for irrigation and domestic applications.

The higher values of certain parameters at various locations indicate the influence of sea water and make the water unsuitable for domestic applications. The values of sodium adsorption ratio indicate that majority of samples fall under the category of low to high sodium hazards. The ground water has also been classified on the basis of Stiff, piper trilinear and U.S.Salinity classification schemes.

Keywords: GIS & Remote Sensing, Index overlay method and Multi class Maps

INTRODUCTION

The sources of water may be classified as surface sources and sub-surface sources. The surface sources of water are the sources in which the water flows over the earth's surface. These include rivers, lakes, streams, natural ponds, storage or impounded reservoirs. The water from these sources is known as surface water. The sub-surface or ground water sources are those which supply water from below the earth's surface. These include springs, infiltration galleries, wells and porous pipe galleries. Ground water is used for domestic supply, industries and agriculture in most parts of the world as it is a replenishable resource and has inherent advantages over surface water. In many instances the bleaching and dyeing wastes contaminated the groundwater sources and rendered it unit for domestic purposes. Improper solid waste disposal in the municipal area also affects the groundwater quality. Considering these factors, it was proposed to assess the ground water quality of Visakhapatnam to evaluate the impact of industrialization and improper waste disposal.

MATERIALS AND METHODS

To achieve objective of the present study suitable methodology was carried out and also it is inevitable to create a data which is equally compatible to the methodology. Thus it becomes mandatory to thoughtfully organize the database to enable smoother analysis and trying out every possibility of interthematic and inter class dependencies and variabilities operating in nature. This is an attempt to use the capabilities of GIS along with index overlay model to generate the output for groundwater exploration.

Thematic maps, which are geology, hydromorphogelogy, land use land cover, and lineament buffer map, were generated and digitized. The digitized maps were edited and restructured to suit as an input variable in GIS analysis. The whole process has given an output of digital database required for the study.

INDEX OVERLAY MODEL WITH MULTI-CLASS MAPS (IOM WITH MCM)

In this case the map classes occurring on each input map are assigned different scores, as well as the maps themselves receiving different weights as before. It is convenient to define the scores in an attribute table for each input map (some GIS provide specialized template for inserting values in especially attribute table for all the maps being combined). The averages scores is then defined by

$$S = \frac{\Sigma Sijwi}{S\,Wi}$$

Where S is the weighted score for an area object (polygan, pixel)
W is the weighted score for the i-th input map and
Sij is the score for the j-th class of the I-th map, the values of
j depending on the class actually occurring at the current location.

Each map must be associated with an editor, for access by the modeling procedure. The attribute table can then be modified without changing the procedure. Attribute table containing scores are shown in Table-5.1 to 5.4 for the groundwater potential zones.

DERIVATION WEIGHTS

The weights for the 4 input maps for groundwater potential zoning and 11 maps for pollution zoning has assigned and added together. The Table-5.1 and 5.4 are showing weights of individual class of the each map.

GEOLOGY

Table-1.1

S.no.	Class	Scores
1	Beach sand	5.0
2	Chamockite	2.0
3	Khondalite	4.0
4	Khondalite & Leptynite	3.0
5	Marshy land	7.0
6	Residual soil	10.0
7	River alluvium	9.0
8	Water body	0.0

HYDROMORPHOGEOLOGICAL MAP

Table-1.2

S.no.	Class	Scores
1	Alluvial plains	9.0
2	Beach sand	6.0
3	Colluvial fan	7.0
4	Deeply weathered pediment	10.0
5	Desected slope	4.0
6	Insellberg	0.0
7	Marshy area& Marine clay	5.0
8	Moderately weathered pediment	9.0
9	Pediment	2.0
10	Red sediment/Bad land	7.0
11	Residual hill	2.0
12	Residual hill	2.0
13	Shallow weathered pediment	8.0
14	Structural hill	1.0
15	Water body	0.0

LAND USE/LAND COVER CLASSES

Table-1.3

S.no.	Class	Scores
1	Barren soil & barren rock	5.0
2	Built-up land	5.0
3	Cropland & Follow land	10.0
4	Degraded forest & Shrubs	6.0
5	Forest plantation	9.0
6	Marshy/Salt effected area	5.0
7	Red sand soil & Beach sands	6.0
8	Scrubs/Shrubs	7.0
9	Water	0.0

LINEAMENTS BUFFER

Table-1.4

S.no.	Class	Scores
1	Major lineament	4.0
2	Minor lineament	3.0
3	Macro lineament	2.0
4	Micro lineament	1.0

MAP WEIGHTS

M1=5*(Class (geology)
M2= 9*(Class (Hydromorphogeology)
M3=6*(Class (Land use/land cover)
M4= 7*(Class (Lineament buffer)

RESULT AND DISCUSSION

Lineaments are found to have impact on the ground water occurrence and ground water table configuration and fluctuations. The influence of high density lineament is prominent on the wells in the plain areas. The low density lineaments are associated with moderately deep and deep wells with poor ground water occurrence. Calculate sum of scores and divided by normalization, factor New= (*M1+*M2 + *M3 + *M4 + *M5 + *M6)/Sum. After integrating the scores of geology, hydromorphological, land use/land cover classes and lineament suffers, the study determined groundwater potential zones, categorized on the basis of above mentioned parametric scores- into 6 zones such as excellent, very good, moderate, poor moderate and poor. The details of the groundwater potential zones are presented in fig.1.1.

It can be noticed from the fig.1.1 that the excellent groundwater potential is existing along lineaments particularly in the North Western and South Western zones. Similarly, the very good category exist in and around buffer zones while the good category are found in pediment zones of Kailasa and Yarada hill ranges. The poor and moderate groundwater potential zones are found in the central portion of the city while moderate potential zones are found along the foot hill zones of kailasa and Yarada hill ranges.

REFERENCES

1.Chen Y., J. Yu, K. Shahbaz and E. Xevi, 2009, “A GIS-Based Sensitivity Analysis of Multi-Criteria Weights”, on the WWW, February. See also URL http://mssanz.org.au/modsim09.
2.Subagunasekar M and M.C. Sashikkumar, 2012, “GIS for the assessment of the groundwater recharge potential zone in Karunkulam block, Thoothukudi district, Tamil Nadu, India”, ISSN 2250-1770, Int. Journal of Current Science , pp 159-162
3.P.Jagadeeswara Rao, P.Harikrishna, S.K.Srivastav, P.V.V.Satyanarayana and B.Vasu Deva Rao, 2009, "Selection of groundwater potential zones in and around Madhurawada Dome, Visakhapatnam District - A GIS approach", J. Ind. Geophys. Union, October, Vol.13, No.4, pp.191-200.
4.Balajpal, V.N. and Gokhale, K.V.G.K.,(1986). Hydrogeomorphic classification of the marginal gangetic alluvial plain in Uttara Pradesh, Indai, Using satellite imageries. Journal of geological society of India, vol.28, pp.9-20.

5.Fowler,L.C.,(1964). Groundwater management for the nation's future ground water basin operation ,jour. Hydrautics Div., Amer .Soc.Civil Engrs., V.90, No.HY4,pp.51-57.
6.Holland, T.H.,(1971). Agnigundala Lead –Copper Deposits-A.p.,(Airbrone geophysical survey in Mineral Exploration). Journal of Geological Society of India, Vol.2.No.6.
7.Madhava Rao, A.,(1957). The geology of parts of Guntur, Kurnool and Nellore districts M.Sc. thesis, Andhra University.
8.Visher, G.S.,(1965), Use of vertical profile in environmental reconstruction. Bull.Amer.Assoc.petrol.Geol., Vol.49, pp-41-61.

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