APPLICATION OF HYDROGEOLOGICAL AND LANDSCAPE INDICES IN MAPPING GROUNDWATER POTENTIAL USING GEOSPATIAL TECHNIQUES IN BARINGO COUNTY

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Introduction

- Increased demand for water due to increasing population and urbanization has necessitated groundwater exploitation.
- More boreholes have been drilled to meet the various demands due to the insufficiency of surface water.
- GIS has been used to delineate groundwater potential zones.

Materials and methods

- Collection of data such as drainage, slope, lineament density, soils, elevation, lithology and rainfall.
- Generation of thematic maps for the groundwater influencing factors using GIS.
- Assignment of rank and weights to the thematic maps.
- Overlaying the thematic maps.
- Delineation of groundwater potential zones.
- Assessment of fluoride concentration.
- Verification of the groundwater potential zone map.

Study Objectives

- To generate thematic maps for rainfall, soil texture, lithology, drainage density, lineament density, slope and landuse/cover data.
- To derive rank and weightage wise thematic maps.
- To delineate the groundwater potential zones.
- To assess the water quality – fluoride concentrations of the study area.
- To validate the groundwater potential zones.

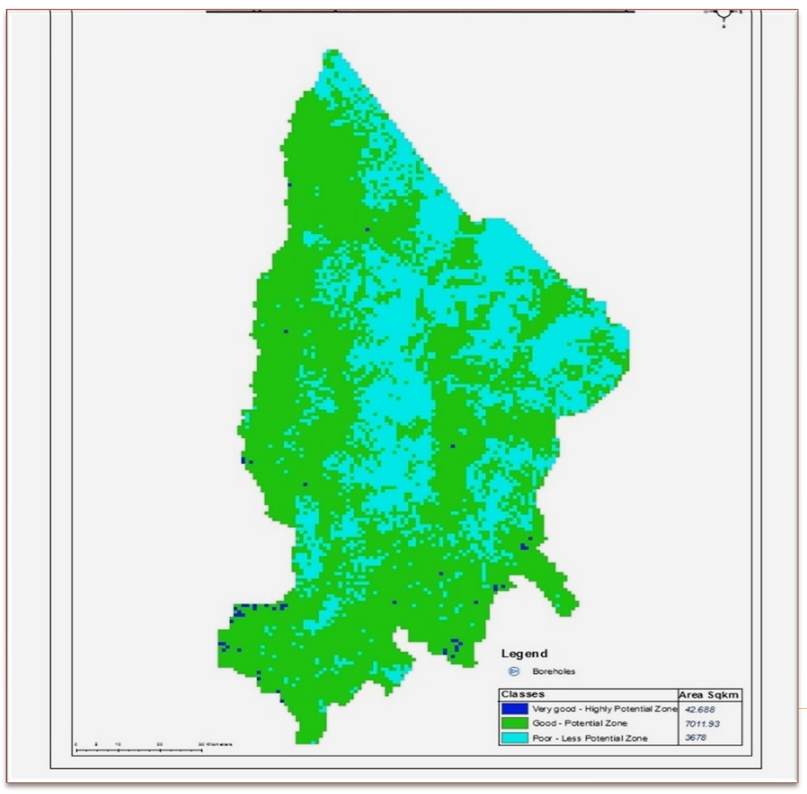
Conclusion & Recommendations

- The study found out that the septic tank effluent did not comply with some of the allowable TBS standards.
- It was further noted that the SSF designed and used to treat the effluent successfully purified the wastewater to the maximum allowable discharge and reuse standards..
- The SSF noted to be prone to frequent clogging if the septic Tank was not adequately designed. This however was solved through regular cleaning of the filter media.

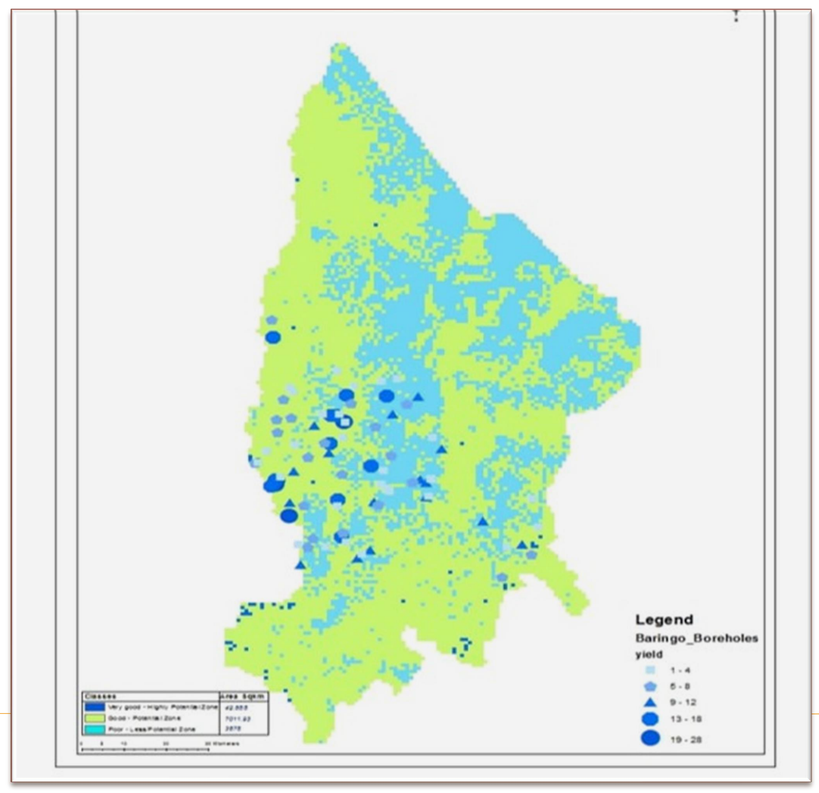
Study findings

Groundwater Potential Zone	Rank	Area covered in Km^2	% area
Very Good	1	42.688	0.39
Good	2	7011.93	65.33
Poor	3	3678	34.27

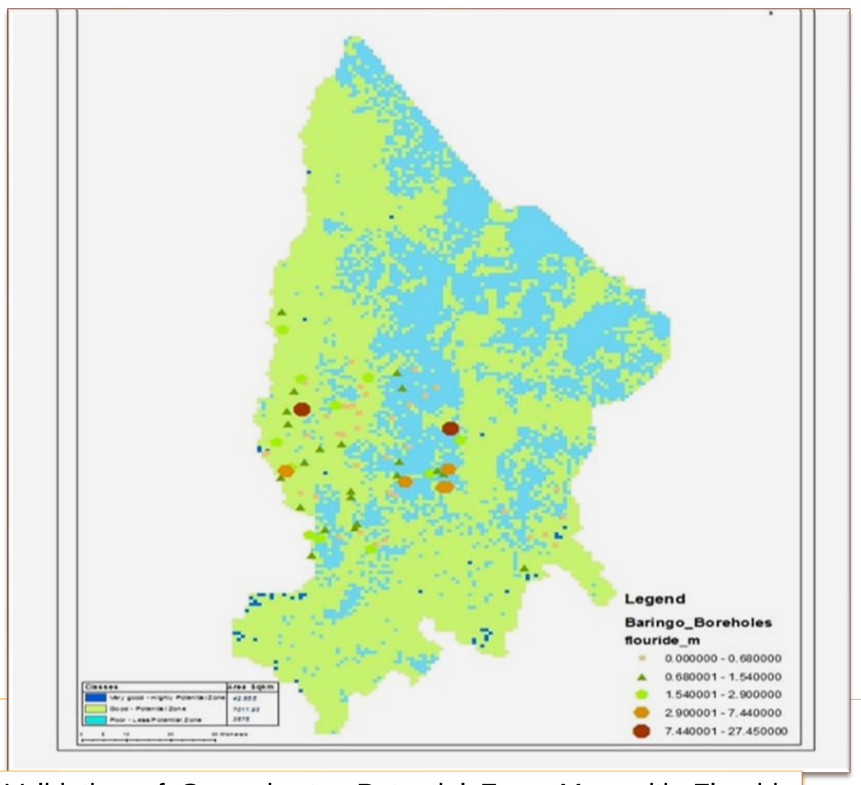
- The final groundwater potential map had three classes.
- Areas with very good and good class of groundwater map account for a large areal coverage. Hence it can be inferred that the study area has high groundwater potential suitability as compared to its total areal coverage.



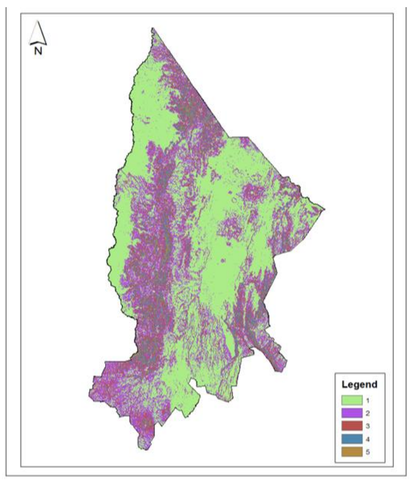
Groundwater potential zone map



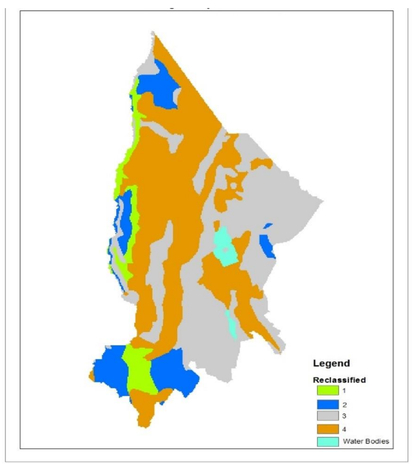
Validation of Groundwater Potential with Borehole Yield



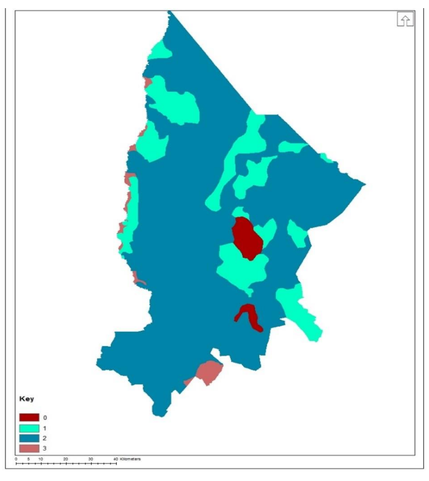
Validation of Groundwater Potential Zone Map with Fluoride Concentration Levels



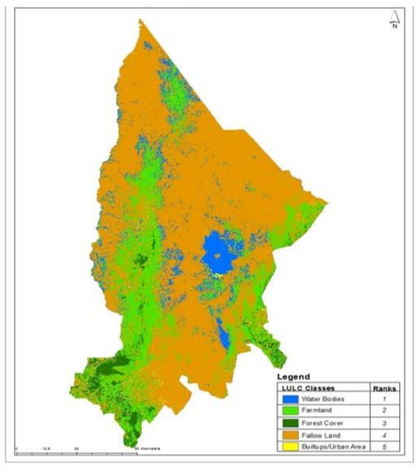
Slope



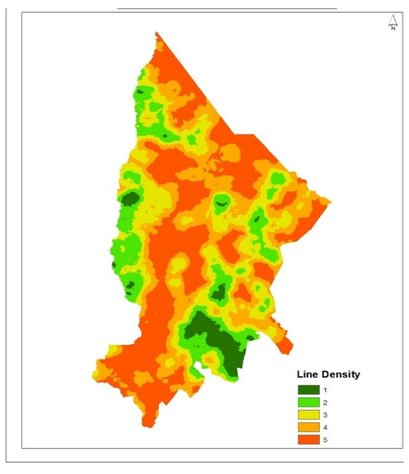
Soil



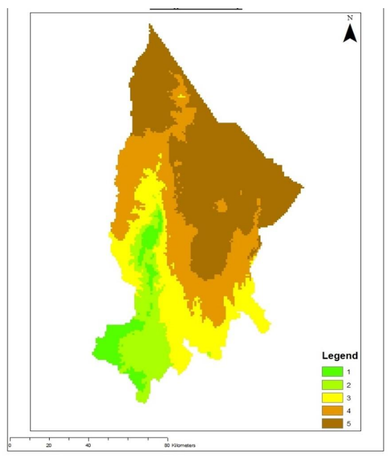
Lithology



Land use



Lineament



Rainfall