The data deals with the preparation of the groundwater potential zone map of Gudur area, with the help of data like geology and geomorphology, structure/lineament, slope and drainage and the thematic layer were prepared through the Survey of India toposheet Nos. N/12, N/15, N/16 and IRS-P6 LISS-III (RESOURCESAT-2) satellite data. The groundwater potential zones were obtained and classified into four categories, viz., very poor, poor, good, and very good zones. The data explains lateritic plain moderate basement with poor potential zones whereas secondarily occupies alluvial plain contains the good prospecting zone. © 2018 Published by Elsevier Inc. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).
How data was acquired
LISS-III Satellite Imageries from www.BHUVAN.NRSA Website, toposheets (GSI) and field surveys

Data format
Raw, analyzed

Experimental factors
Toposheets and Satellite imageries are georeferenced and digitized by using Arc GIS 10.1 & ERADAS imagine software

Experimental factors
Ground water potential zones

Data source
long 79°42' 30"E–79°54'30"E and lat 13°0' N14°16'30"N.

Data accessibility
Data is within this articles

Value of the data

- This data can serve as the base line for studies of that area.
- The data is helpful for the geologist, hydro geologist and as well as irrigation water supply Engineers forecasting the ground water availability.
- The data can be used to provide details about the geology, land use/land cover slope drainage geomorphology and hydrogeomorphology of the study area.

1. Data

Data sets like geology, geomorphology, land use land cover were derived from IRS-P6 LISS-III (RESOURCESAT-2) satellite data and drainage, lineaments and slope data from toposheet (GSI), SRTM DEM data, respectively. Specification Table presents the source of dataset downloads and Table 1.1 presents the relationship between thematic layers.

1.1. Study area

Gudur area is the one of the Mandal in Nellore district of Andhra Pradesh. The area is situated in the coast on the Bay of Bengal, it is delimited by Balayapalli, Sydapuram, Manubole, Ozili, and Chillakuru mandal and possess world richest mica (muscovite) deposits in Nellore schist belt, and also quartz, feldspars deposits and covers an area of 247.29 km². It is located between longitudes 79°42’30”E–79°54’30”E and latitudes 14°13’00”N–14°16’30”N. The annual average rainfall contribution by the northeast monsoon, increases from west to east about 900 to 1300 mm (Fig. 1.0).

2. Experimental design, materials and methods

Thematic maps such as drainage, geology, geomorphology, land use/land cover, structural lineament and hydrogeomorphology maps have been generate [1–5]. A drainage map has been generated from the SRTM (shuttle radar terrain model) digital elevation model data from USGS EARTH EXPLORER. Geology map has been generated from the District Geology and Minerals resource map of Nellore district (2001) and Soil map has been generated from the soil maps of Gudur area, and Nellore districts published by the Andhra Pradesh state Agricultural Department (2002). The preparation of geomorphology, land use/land cover maps were prepared from -IRS-P6 LISS-III (RESOURCESAT-2) data. Lineaments were extracted from toposheet taking into consideration of drainage pattern. The output data was draped on to the satellite image for its extension and best fit [6]. In addition to that extensively field checks were done in the study area.

2.1. Geology

The Nellore schist belt extends parallel to the Eastern border of the cuddapah basin as an N-S trending actuate belt over a length of 180 km between Podili (Prakasam district) in the north and
| Geomorphic unit                        | Characteristics                                                                 | Hydro geology                               | Ground water potential |
|---------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------|------------------------|
| Pedi plain Moderate Weathered (PPM)  | It is a weathered, fractured rock                                              | Biotite granite gneisses weathered          | Good                   |
| Linear ridge (LR)                     | Intrusion of igneous body cutting across existing strata                       | Quartzite                                   | Negligible poor        |
| Lateritic plain deep basement (LPD)   | It is a weathered rock, fissured rock                                          | Migmatised granitiferous quartz mica schist with amphibolite bands | Poor to moderate       |
| Lateritic plain moderate Basement (LPM)| It is a weathered rock, fissured rock                                         | Migmatised granitiferous quartz mica schist with amphibolite bands | Poor to moderate       |
| Alluvial plain moderate (APM)         | Flat surface adjacent to stream/river, composed by Clay, Silt and Sand these are paleo channels, channel bars | Alluvium, sand, silt Clay dominated          | Very good              |
| Inselberg (I)                         | It is a massive isolated hill                                                  | Quartz sericite schist. chlorite schist, hornblende schist | Run off zone           |
| Pediment (PD),                        | It is a flat surface of Pedi plain of granite gneiss and schist with 20–60 m. thick weathered material and covered with soils. It covered commonly the topographically low areas near stream courses and associated with fractured/lineaments. | Calc silicate rock, quartzite               | Poor                   |
| Denudational hill (DH)                | Broad uplands of considerable elevation, steeply sloping on all                | Quartzite                                   | negligible              |
| Valley fill shallow weathered (VFS)   | Valley fill shallow weathered material sand, silt, clay                         | Unconsolidated Sediment(sand, silt, clay)    | Very good              |
Fig. 1.0. Location map of the study area.

Fig. 2.0. Geology map of the study area.
NAIDUPETA IN THE SOUTH, WITH WIDTH RANGING BETWEEN 5 KM AND 501 KM. HERE, GEOLOGY WAS COMPRised THE HORNBLende CHLORite SCHIST, QUARZITE’s, Gneisses, Granite Gneisses, gneisses granitoid complex, peninsular gneissic complex, Calc-silicate rocks and unconsolidated alluvial sediments (Fig. 2.0).

2.2. GEOMORPHOLOGY

The prominent geomorphic units have been identified in the area through interpretation of Satellite Imagery are Alluvial Plain Moderate (APM), Linear Ridge (LR), Pediment, inselberg, Lateritic plain deep basement (LPD), Valley fill shallow (VFS), Denudational1 hills (DH), Laterite plain moderate (LPM), Pedi plain Moderate weathered (PMW) and Water bodies. Among all geomorphic features, the valley fill contains high infiltration with a good groundwater potential zone (Fig. 3.0).

2.3. STRUCTURES/LINEAMENT

Lineaments were structural control of the groundwater movement and played a vital role in the infiltration run off into the ground. In that present study area, 81 lineaments have been mapped through analysis of satellite data9 (Fig. 4.0). The analysis reveals that the majority of lineaments area oriented in Southwest to Northeast direction.

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![Fig. 3.0. Geomorphology map of the study area.](image)
2.4. Slope

The slope map of the study area was prepared from SRTM Dem 30 m resolution to extract topographic information such as slope (Fig. 5.0). The analysis of slope map indicates that the study area covers five types of slope categories. The southern and south western parts of the study area has steep to gently slope and the remaining parts has nearly level to very gently slope [7].

2.5. Drainage

The drainage map shows a Dendritic and Sub-dendritic drainage pattern is the most common pattern existing in the area which is characterized by irregular branching of tributary streams in many directions and at less than right angles. The patterns are observed to be developed in the granitic gneissic denudation hills and rolling pediplains of the study area, where structural control is negligible (Fig. 6.0). In the study area, four stream orders have been calculated, and 304 first order streams, 209 second order streams, 116 third order streams and 75 fourth order streams were derived.

2.6. Relationship of the data in groundwater potential zone map

The hydro geomorphological map was prepared based on the specific tone, texture, size, shape and association characteristics of remotely sensed data. The purpose of elaborating a hydro geomorphological map intended to delineate the potential groundwater areas for the study region [8]. The occurrence of groundwater, based on the geomorphological units and its characteristics of the Gudur area is shown in the table 1.1 and shown Fig. 7.0.
Fig. 5.0. Slope map of the study area.

Fig. 6.0. Drainage map of the study area.
Fig. 7.0. Groundwater potential map of the study area.

Transparency document. Supporting information

Transparency data associated with this article can be found in the online version at doi:10.1016/j.

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