केंद्रीय भूमि जल बोर्ड

जल संसाधन, नदी विकास और गंगा संरक्षण मंत्रालय

भारत सरकार

Central Ground Water Board

Ministry of Water Resources, River Development and Ganga Rejuvenation

Government of India

Report

on

AQUIFER MAPPING AND GROUND WATER MANAGEMENT

Parts of Nalgonda District (Phase-II), Telangana

दक्षिणी क्षेत्र, हैदराबाद

Southern Region, Hyderabad

भारत सरकार
जल संसाधन नदी विकास एवम् गंगा संरक्षण मंत्रालय
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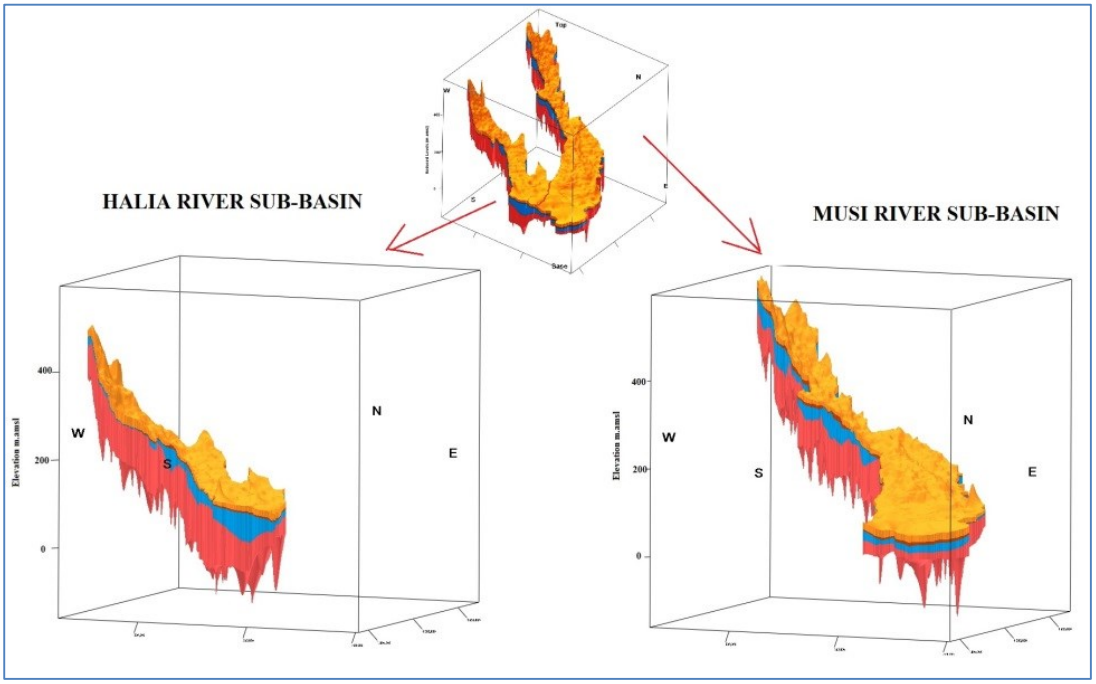
GOVERNMENT OF INDIA
MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT AND GANGA REJUVENATION

REPORT ON
AQUIFER MAPPING FOR SUSTAINABLE MANAGEMENT OF GROUNDWATER RESOURCES IN PARTS OF NALGONDA DISTRICT TELANGANA STATE (Phase-II)



CENTRAL GROUND WATER BOARD
SOUTHERN REGION
HYDERABAD
JUNE-2016

REPORT ON
AQUIFER MAPPING FOR SUSTAINABLE MANAGEMENT OF GROUNDWATER RESOURCES IN PARTS OF NALGONDA DISTRICT TELANGANA STATE

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REPORT ON
AQUIFER MAPPING FOR SUSTAINABLE MANAGEMENT OF GROUNDWATER RESOURCES IN PARTS OF NALGONDA DISTRICT TELANGANA STATE

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AQUIFER MAPPING FOR SUSTAINABLE MANAGEMENT OF GROUNDWATER RESOURCES IN PARTS OF NALGONDA DISTRICT TELANGANA STATE

AT A GLANCE

S.No.	Item		Particulars
1	Districts	:	Nalgonda
2	Mandals	:	35 (Fully:24 and Partially:11)
2.1	Fully covered Mandal's (24 no's)	:	Alair, Atmakur(S), Chilkur, Chivvemla, Dameracherla, Garidepalle, Gundala, Huzurnagar, JajireddiGudem, Kanagal, Kodad, Mattampalle, Mellacheruvu, Mothey, Munagala, Nadigudem, Nampalle, Neredcherla, Nuthankal, Penpahad, Rajapet, Suryapet, Thirumalagiri, Thungathurthi
2.2	Partially covered Mandal's (11 no's)	:	Atmakur(M), Chandur, M.Turkapalle, Marriguda, Miryalguda, Mothkur, Nalgonda, Nidamanur, Tripurarm, Vemulapally, Yadagirigutta
3	Revenue villages	:	549
4	Geographical area	:	6764 Km^2
5	Population	:	~15.64 lakhs (80 % Rural and 20 % urban)
6	Locations	:	North Latitude 16°37'22.8"-17°49´55.2" East Longitude 78°45´18"-80°04´26.4"
7	River Basin	:	Krishna River
7.1	Sub-basin	:	Musi River (70% area), Halia River (Lower Krishna) (30 % area)
7.2	Watersheds	:	32(Musi:23, Halia:9)
7.3	Minor Irrigation tanks	:	2000 (270km^2water spread including PT's)
7.4	No of ARS	:	PT:1072, CD's:214 and 1757 Farm Ponds:
8	Geomorphology	:	Pedi plains (70 %), pediments , Denudational hills etc.
9	Major crops (Khariff season)	:	Paddy, Cotton, Jowar, maize etc.
10	Soils	:	loamy, calcareous, gravelly loam andgravelly clay soils
11	Geology	:	Granites and Gneisses with intrusive rocks (dolerite,and Gabbro 's) and 10 % sedimentary rocks (quartzite,limestone, shale and dolomite)
12	Rainfall	:	581-914 mm (avg: 752) (SW-74% & NE 19%) During 2014 it received 510 mm (avg) (-27% than normal)

13	Depth to water Table Elevations (m amsl)	:	35.7-576.8(pre-13) and 45-578.9 (post). The flow gradient in Musi basin is 2.6 m/km and Halia basin 3.4 m/km.		
14	Depth to water levels (2014) (m bgl)	:	Pre-monsoon:0.9-40.8 (avg:7.15) Post-monsoon:0.15-55.9(avg:7.6)		
15	Majority of water levels	:	Pre-monsoon:2-5 mbgl (43 % of area) Post-monsoon:2-5 mbgl (42 % of area).		
16	Water Level Fluctuations (m)	:	53 % wells shows rise in water levels 47 % shows fall in water levels		
17	Ground water yield (lps)	:	0.1 to 7.4		
18	Number of ground water structures (as on 2011 March)	:	105021 (DW:43777, BW:58511)		
19	Conceptualization		**Weathered zone**	**Fractured zone**	
20	Depth (m bgl)	:	Up to 25	Up to 185	
21	Dynamic GW Resources-2013 **(MCM)**	:	Musi Sub-basin	Halia Sub-basin	Total
21.1	Net dynamic groundwater availability	:	637	291	928
21.2	In-storage groundwater availability	:	67.7	33	100.9
21.3	Gross GW Draft	:	382	160	542
21.4	Provision for Domestic &Industrial (2025)	:	55.32	17.65	72.97
21.6	Stage of Ground water development (%)		68	60	64
22	Transmissivity (m^2/day)	:	1- 213		
23	Specific yield (%)	:	2	-	
24	Storativity	:	-	2 x 10^{-5} to 0.001	
25	In storage GW Resources	:	68	33	101
26	**Groundwater Quality 2014**				
26.1	EC (Ω Siemen's/cm)	:	Pre-monsoon: 220-8500, Pre-monsoon: 150-6620		
26.2	Nitrate (mg/L)		Pre-monsoon: 0-627, Pre-monsoon: 0-132		
26.3	Fluoride (mg/L)		Pre-monsoon: 0.06-9.4, Pre-monsoon:0.1-7.22		

27	Sustainable Groundwater management Plan	:	**Supply side measures** 1728 ARS with ~129.6 crores. Water Conservation measures (WCM) Farm Ponds 10980 nos with total cost of 27.45 crores which will contribute net 1.64 MCM to ground water. Repair Renovation and Restoration of 351tanks with ~136 crores cost and created additional 6.26 MCM of storage capacity. The net ground water recharge will be 3.13 MCM. Remaining ~1650 tanks are recommended for desilting under mission Kakatiya. Mission Bhagiratha will bring additional ~53 MCM of surface water into the basins. **Demand side measure** Adaptation of micro-irrigations practices in 41700 ha area saved ~ 80 MCM of ground water from the basin. Additional 54900 ha of additional land can be brought under micro-irrigation with 329.4 crores cost. This will save ~110 MCM of GW in comparison with traditional practices. **Regulatory measures** Change in cropping pattern from paddy to other ID crops during kharif season in non-command areas. Compulsory rain water harvesting in proportionate to withdrawal. Intermittent pumping of adjoining bore wells. Restricted power supply in two spells. Complete ban on paddy crop cultivation during rabi season. **Institutional measures** A participatory groundwater management (PGWM) approach. Other measures include providing calcium and phosphorous rich food to the children below the ages of 14 years in fluorosis endemic areas.
28	Expected Results and Out come	:	Stage of GW Development will come down by 15 % with one time investment of 486.45 crores.

ABBREVATION:

2D	:	2 Dimentional
3D	:	3 Dimentional
ARS	:	Artificial Recharge Structures
Avg	:	Average
BW	:	Bore Well
CD	:	Check dam
CGWB	:	Central ground water board
Cr	:	Crore
DTW	:	Depth to water
DW	:	Dug well
EC	:	Electrical conductivity
EL	:	East Longitude
F	:	Fluoride
FP	:	Farm Pond
GEC	:	Ground Water Estimation commite
GW	:	Ground Water
Ha	:	Hector
Ha.m	:	Hector meter
Km2	:	square kilometer
LPS	:	Liter per second
M	:	meter
M^3	:	Cubic meter
max	:	Maximum
M bgl	:	Miters below ground leval
MCM	:	Milian cubic meter
Mg/L	:	Milligram per liter
min	:	Minimun
MPT	:	Mini perculation tank
NL	:	North Lattitude
NO_3	:	Nitrate
OE	:	Over Explouted
PGWM	:	Particapated ground water management
WCM	:	Water conservation measures

EXECUTIVE SUMMARY

An integrated study including hydrometeorology, geophysics, hydrogeology and hydrochemistry was taken up to develop comprehensive aquifer maps (2-D & 3-D) and to suggest suitable groundwater management plans for Musi and Halia rive sub-basins of river Krishna basin. Area experiences semi-arid climate with 752 mm annual normal rainfall with ~15.64 lakh populationis part of32watersheds covering 764 km2areain Nalgonda district, Telangana State. Pediplains are major geomorphic features followed by pediments and hills. The area is underlain by granites and gneisses with basic intrusive rocks at places.

Main aquifers constitute, weathered zone (~25 m) at the top followed by a discrete anisotropic fractured/fissured zone at the bottom (~25-185 m). Groundwater occurs under unconfined and semi-confined conditions and flows downward from the weathered zone into the fracture zone. In general ground water yield varies from 0.1-7.5 lps. As per GEC report, there is 21% decrease in functional dug wells from 2011 to 2013 and an increase of 8 in bore wells is noticed. Majority of fractures (97 %) occur within 100 m depth.

The DTW varies from 0.9 to 40.8 meter below ground level (m bgl) (average: 7.15 m) and 0.15-55.9 m bgl (average: 7.6) during pre and post-monsoon season respectively and majority of the area (53% area) there is rise of 0-2 m during the year.

Geophysical data reveals resistivity < 100 ohm (Ω) for weathered zone, 60-350 ohm (Ω) for fractured zone and > 350 ohm (Ω) for massive granite.

High incidence of fluorosis (maximum F up to 9.4 mg/L and 7.2 mg/L) during pre and post-monsoon season respectively is due to geogenic contamination and is the major problem faced by people in the area while high concentrations of nitrate is due to anthropogenic contamination (as high as 627 mg/L). About 65% and 50% of the samples are unfit for human consumption during pre and post-monsoon season of 2014. Overall the groundwater quality is suitable for irrigation purposes excluding 12 % area (mainly canal command).

As per 2013 GEC (Provisional Data), net annual ground water availability is 928 MCM and the gross ground water draft is 542 MCM and net available balance for future irrigation use is 401 MCM with stage of ground water development of 64 %. The in-storage ground water resources which can be utilized in draught period are 101 MCM.

Major issues identified are pollution (both geo-genic (F) and anthropogenic (NO_3), over-exploitation in 740 km2 area covering 117 villages, deep water levels (20 m) in 3 % of the area during post-monsoon season, water logging in 8 % area, declining water levels and well sustainability.

The management strategies include supply side, demand side, regulatory and institutional measures. The supply side measures includes construction of 1728 ARS with ~129.6 crores, 10980 water conservation measures (WCM) (farm ponds) with 27.45 crores cost, Repair Renovation and Restoration of all tanks under Mission Kakatiya, providing drinking water needs under Mission Bhagiratha. Demand side measure includesbringing 54900 ha of additional land under micro-irrigation with 329.4 crores. Regulatory measuresincludes **c**hange in cropping pattern from paddy to other ID crops during kharif season in non-command areas, ccompulsory rain water harvesting in proportionate to withdrawal, iintermittent pumping of adjoining bore well, restricted power supply in two spells, complete ban on paddy crop cultivation during rabi season. Institutional measures includes participatory groundwater management (PGWM) approach and other measures include providing calcium and phosphorous rich food to the children below the ages of 14 years in fluorosis endemic areas. With above measures the stage of GW Development will come reduce by 15 % with one time investment of 486.45 crores.

NUMBEROF DATA POINTS USED FOR PREPARATIONOF VARIOUS MAPS/FIGS-6764 Km2 area, Nalgonda District, Telangana State.

S. No.	Data	Aquifer	Total Data Points	Source		
				CGWB	SGWD	Others
1	Panel Diagram (3-D)	Combine	1054	EW 76: VES:249 Well Logging 20	115	594 (Irrigation wells, DWMA wells etc)
2	Hydrogeological Sections	4 no's	1054	EW:76 VES:249 Well Logging 20	115	594 (Irrigation wells, DWMA wells etc)
3	Fence/panel Diagrams	2 no's	1054	EW 76: VES:249 Well Logging 20	115	594 (Irrigation wells, DWMA wells etc)
4	Depth of weathering	1 no's	1242	EW:76 VES:249 Well Logging 20	115	858(Irrigation wells, DWMA wells etc)
5	Depth of fracturing	1 no's	1318	EW 76: VES:249 Well Logging 20	115	858 (Irrigation wells, DWMA wells etc)
6	Groundwater Yield	Weathered zone	689	EW:76	115	498 (Irrigation wells, DWMA wells etc)
		Fractured zone	689	EW:76	115	498 (Irrigation wells, DWMA wells etc)
7	Transmissivity (m^2/day)	Weathered zone	76	EW:76		
		Fractured zone	76	EW:76		
8	Depth to Water Level Maps (2014)	Combine	419	67 NHS wells	115	237
9	Water Level Fluctuations	Combine	419	67 NHS wells	115	237
10	Water quality (2014) (EC, F and NO_3)	Combine	115	17	98	

Abb:CGWB-Central Ground Water Board, SGWD:State Ground Water Department,DWMA-District Water Management Agency.

1. INTRODUCTION

Aquifer mapping is a process wherein a combination of geologic, geophysical, hydrologic and chemical analyses is applied to characterize the quantity, quality and sustainability of ground water in aquifers. In recent past, there has been a paradigm shift from "**groundwater development**" to "**groundwater management**". As large parts of India particularly hard rocks have become water stressed due to rapid growth in demand for water due to population growth, irrigation, urbanization and changing lifestyle. Therefore, in order to have an accurate and comprehensive micro-level picture of groundwater in India, aquifer mapping in different hydrogeological settings at the appropriate scale is devised and implemented,to enable robust groundwater management plans. This will help in achieving drinking water security, improved irrigation facility and sustainability in water resources development in large parts of rural and many parts of urban India. The aquifer mapping program is important for planning suitable adaptation strategies to meet climate change also. Thus the crux of NAQUIM is not merely mapping, but reaching the goal-that of ground water management through community participation.

Hard rocks (Granites/Gneisses) lack primary porosity, and groundwater occurrence is limited to secondary porosity developed by weathering and fracturing. Weathered zone is the potential recharge zone for deeper fractures and excessive withdrawal from this zone lead to drying up in places and reducing the sustainability of structures. Besides these quantitative aspects, groundwater quality also represents a major challenge which is threatened by both geogenic and anthropogenic pollution. In some places, the aquifers have high level of geogenic contaminants, such as fluoride, rendering them unsuitable for drinking purposes. High utilization of fertilizers for agricultural productions and improper development of sewage system in rural/urban areas lead to point source pollution viz., nitrate and chloride.

1.1 Objectives: In view of the above challenges, an integrated hydrogeological study was taken up to develop a reliable and comprehensive aquifer map and to suggest suitable groundwater management plan on 1: 50,000 scale.

1.2 Scope of the study: The main scopeof study is summarised below.

1. Compilation of esisting data (exploration, geophysical, water level and water quality with georeferncing)
2. Periodic long term monitoring of ground water regime (for water levels and water quality) for creation of time series data base and ground water resource estimation.
3. Quantification of groundwater availability and assessing its quality.
4. To delineate aquifer in 3-D along with their characterization on 1:50, 000 scale.
5. Capacity building in all aspects of ground water development and management through information, education and communication (IEC activities), information dissemination, education, awareness and training.
6. Enhancement of coordination with concerned central/state govt. organizations and academic/research institutions for sustainable ground water management.

1.3 Area Details: The NW-SE trending study area covering 6764 km2, lies between north latitude 16°37′22.8"-17°49′55.2" and east longitude 78°45′18"-80°04′26.4". It forms part of the Musi river sub-basin (4715 km^2: 70 %) covering 23watersheds and Halia river sub-basin (Lower Krishna) (2049 km^2: 30 %) covering 9 watersheds of the Krishna river basin falling in Nalgonda district, Telangana State (**Fig.1.1**). The non-command area is 55% and rest is command area (45%) and ~97 % is rural and ~3 % is urban. Administratively it is governed by 35 revenue mandals (partly and fully) covering 549 villageswith a population of ~15.64 lakhs (2011 census)(urban: 20%, rural: 80 %).

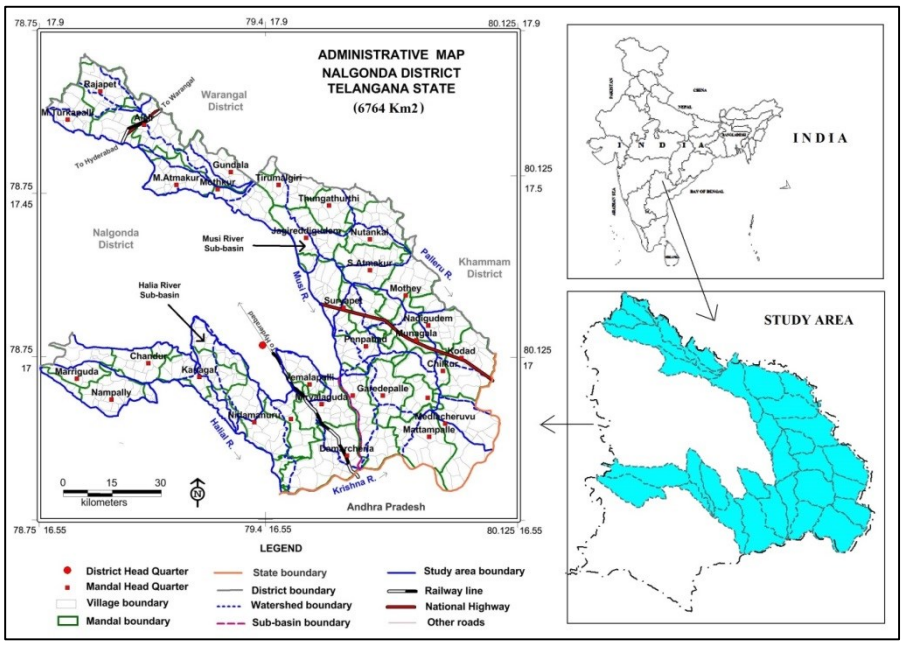


Fig.1.1: Location of study area.

1.4 Climate and Rainfall: The area experiences semi-arid and tropical climate with annual precipitation varying from 581-914 mm (average: 752) and during 2014, the area received average precipitation of 510 mm (**27 % less than normal**).

1.5Geomorphological Set up: Pediplain is the major landform covering about 4767 km2 (70%) area, the other landforms observed are pediment, denudation hill, flood plain, residual hill, channel fill, etc. (**Fig.1.2**).

1.6 Drainage and Structures: The drainage is controlled by lineaments trending NW-SE, E-W, NE-SW and N-S directions and are drained by many streams with rivulets having dendritic, sub-dendritic to parallel drainage pattern (**Fig.1.3**). In Musi sub-basin the general trend of lineament follows the NW-SE direction, whereas in Halia basin the trend of lineaments is NS and NW-SE direction.

1.7Land use and cropping pattern: In the area, the land use can be grouped into 20 classes and main area is under kharif cultivations (paddy, cotton, jowar, arhar, bajra, maize, sea sum and chillies) and during rabi paddy, horse gram, maize etc.

1.8 Soils: The area is mainly occupied by loamy, calcareous, gravelly loam and gravelly clay soils (**Fig.1.4**). Soil infiltration results from adjoining areas with similar type shows 0.3 to 28 cm/h infiltration rate.

1.9 Prevailing Water Conservation/Recharge Practices: There are ~2000minor irrigation tanks, 1072 mini percolation tanks, 214 Check dams and 1757 farm ponds, having combined 270 km^2 water spread area.

1.10Geology: Geologically the area is covered with crystalline rocks (Granites and Gneisses-Banded Gneissic complex-BGC) with basic intrusive rock (Dolerite and Gabbro's) at places (90 %). Sedimentary formations, which include limestone, shale, quartzite and dolomite, occupy remaining 10 % of the area (**Fig.1.5**). In Telangana State, the BGC is the principle aquifer system (65 %) of which 17.6 % is spread in the district and presently 8.2 % is covered under the aquifer mapping programme. The unconsolidated deposits comprising alluvial

sands, clay, occur in isolated narrow patches along the Musi and Halia rivers and major streams.

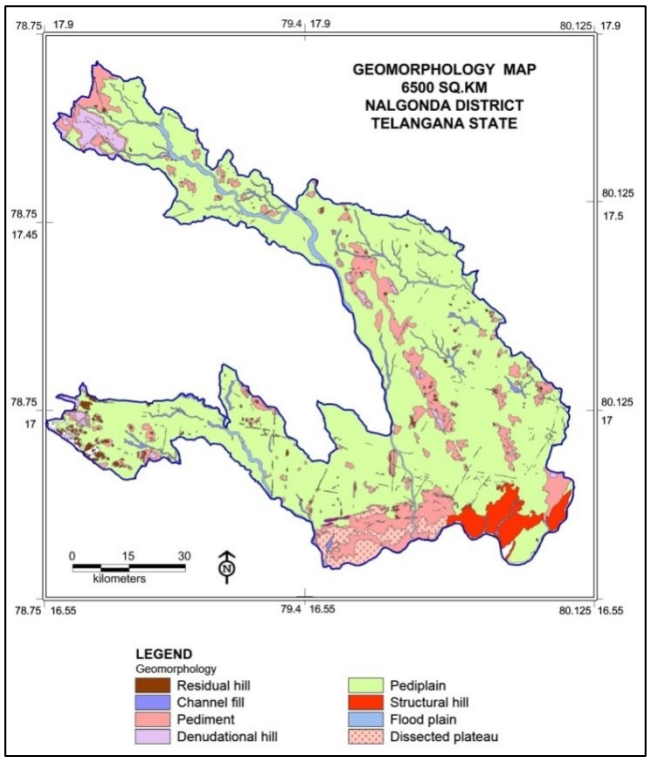


fig.1.2: Geomorphology of Study area.

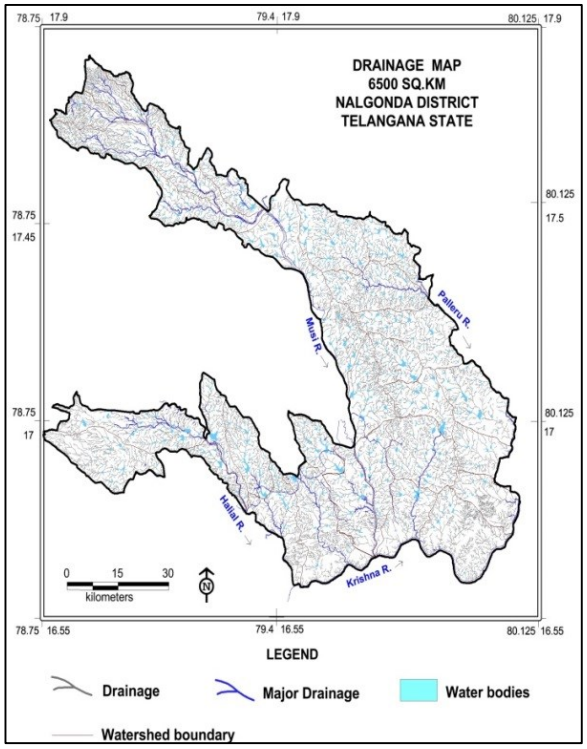


Fig.1.3: Drainage with watershed boundaries.

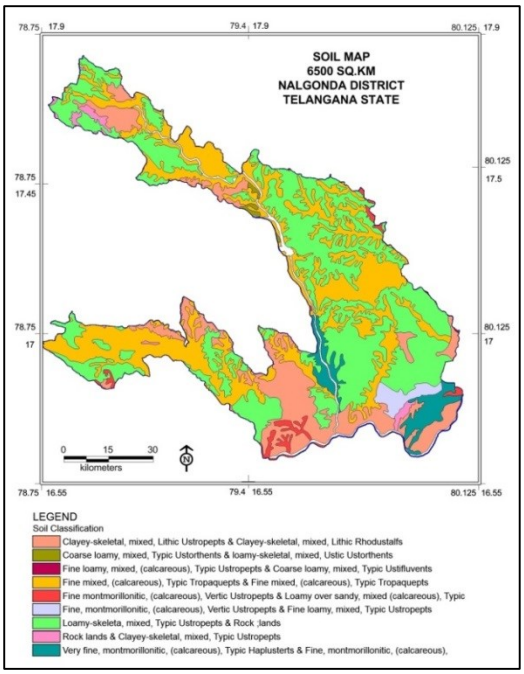


Fig.1.4: Soils of Study area.

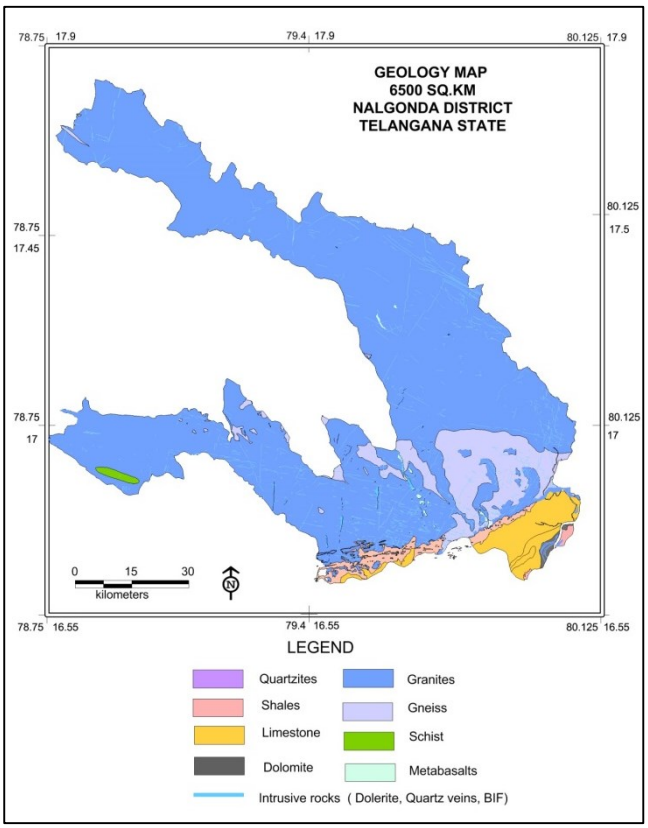


Fig.1.5: Geology of Study area.

2. DATA COLLECTION and GENERATION

Collection, compilation and integration for aquifer mapping studies is carried out in conformity with EFC document of XII plan of CGWB encompassing various activities **(Table-2.1)**.

Table-2.1: Brief activities showing data compilation and generations.

S. No.	Activity	Sub-activity	Task
1	Compilation of existing data/ Identification of Principal Aquifer Units and Data Gap	Compilation of Existing data on groundwater	Preparation of base map and various thematic layers, compilation of information on Hydrology, Geology, Geophysics, Hydrogeology, Geochemical etc. Creation of data base of Exploration Wells, delineation of Principal aquifers (vertical and lateral) and compilation of Aquifer wise water level and draft data etc.
		Identification of Data Gap	Data gap in thematic layers, sub-surface information and aquifer parameters, information on hydrology, geology, geophysics, hydrogeology, geochemical, in aquifer delineation (vertical and lateral) and gap in aquifer wise water level and draft data etc.
2.	Generation of Data	Generation of geological layers (1:50,000)	Preparation of sub-surface geology, geomorphologic analysis, analysis of land use pattern.
		Surface and sub-surface geo-electrical and gravity data generation	Vertical Electrical Sounding (VES), bore-hole logging, 2-D imaging etc.

		Hydrological Parameters on groundwater recharge	Soil infiltration studies, rainfall data analysis, canal flow and recharge structures.
		Preparation of Hydrogeological map (1:50, 000 scale)	Water level monitoring, exploratory drilling, pumping tests, preparation of sub-surface hydrogeological sections.
		Generation of additional water quality parameters	Analysis of groundwater for general parameters including fluoride.
3.	Aquifer Map Preparation (1:50,000 scale)	Analysis of data and preparation of GIS layers and preparation of aquifer maps	Integration of Hydrogeological, Geophysical, Geological and Hydro-chemical data.
4.	Aquifer Management Plan	Preparation of aquifer management plan	Information on aquifer through training to administrators, NGO's, progressive farmers and stakeholders etc. and putting in public domain.

2.1 Hydrogeology

Hydrogeology is concerned primarily with mode of occurrence, distribution, movement and chemistry of water occurring in the subsurface in relation to the geological environment. The occurrence and movement of water in the subsurface is broadly governed by geological frameworks i.e., nature of rock formations including their porosity (primary and secondary) and permeability. The principal aquifer in the area is granites and gneisses and the occurrence and movement of ground water in these rocks is controlled by the degree of interconnection of secondary pores/voids developed by fracturing and weathering. Based on 958 data availability, hydrogeology map of area is prepared and presented in **Fig.2.1**.

2.1.1 Ground Water Occurrences and Movement:Ground water occurs under unconfined and semi-confined conditions and flows downward from the weathered zone (saprolite and sap rock) into the fracture zone. The main aquifers constitute the weathered zone at the top, followed by a discrete anisotropic fractured/fissured zone at the bottom, generally extending down to 200 m depth. The storage in granite rocks is primarily confined to the weathered zone and its overexploitation, mainly for irrigation purposes, has resulted in desaturation of weathered zone at many places. At present, extraction is mainly through boreholes of 60-90 m depth, with yield between <0.1 and 7.4 litres/second (lps). ~97% of fractures occur within 100 m depth and deepest fracture is encountered at the depth of 183 m depth (Mushampally). The hydrogeological map of the area is presented in **Fig. 2.2**.

2.1.2 Exploratory Drilling: In the area 76 exploratory wells are drilled (EW and OW) in the depth range of 32-200 m for determination of hydraulic properties of the aquifers and discussed detailed in **chapter -3**.

2.1.3 Ground water Yield: There are 102288 existing wells (43777 dug wells and 58511 bore wells (as on 31st March 2011) and dug wells are mostly functional in command area. In general the ground water yield varies from <0.1 to 7.5 lps (avg: 1.83 lps). Wells located in the command area have higher yield and sustains for 4-6 hrs of pumping as compared to non-command area where yields are relatively low with sustainability of 2-3 hrs(**Fig.2.3).**There is 21 % decrease in function dug wells (DW) on account of reduction in yields/drying up and an increase of 8 % in bore wells during 2013 (Total wells:98007-BW: 63043& DW:34964).

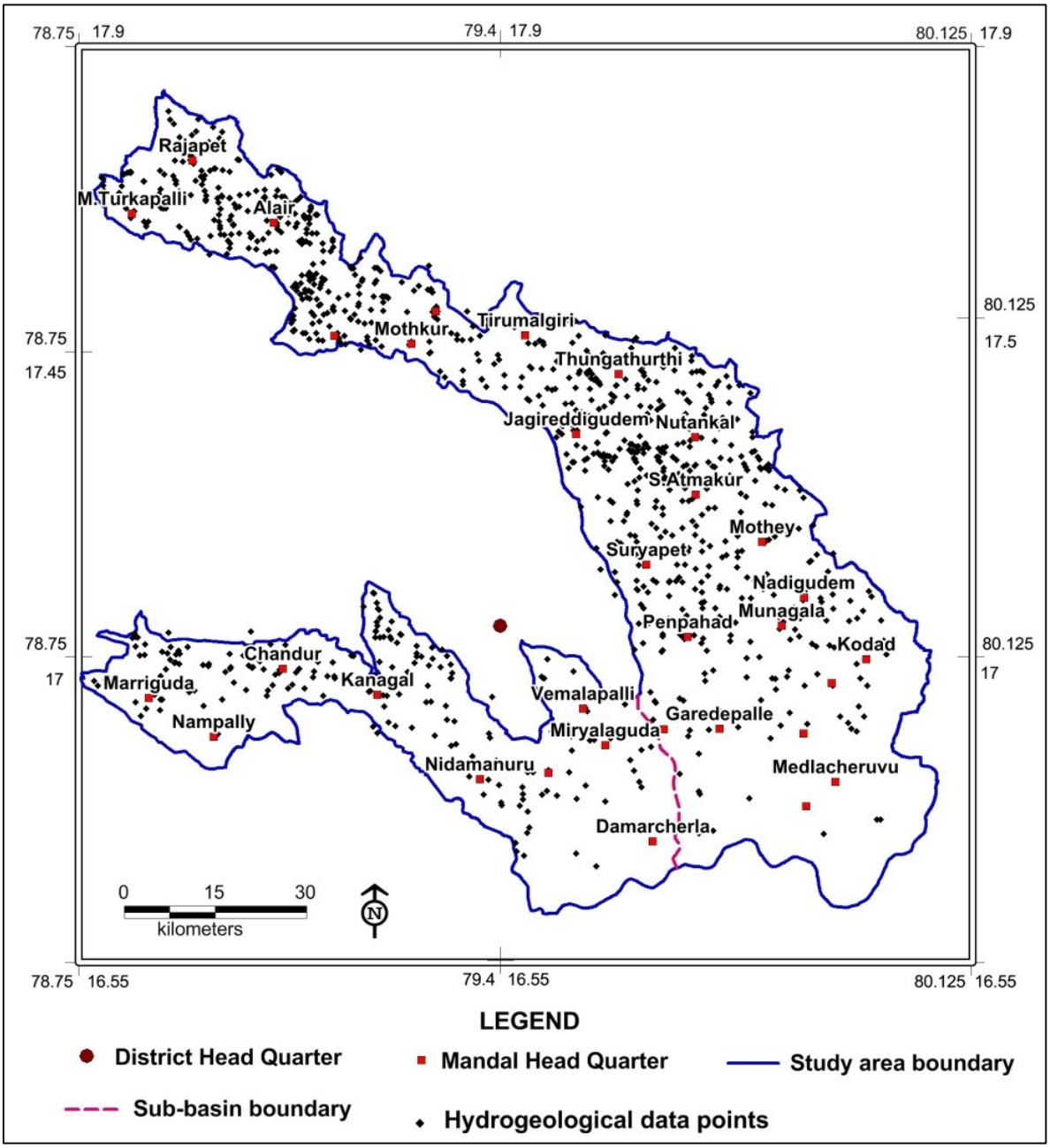


Fig. 2.1: Hydrogeological data Availability.

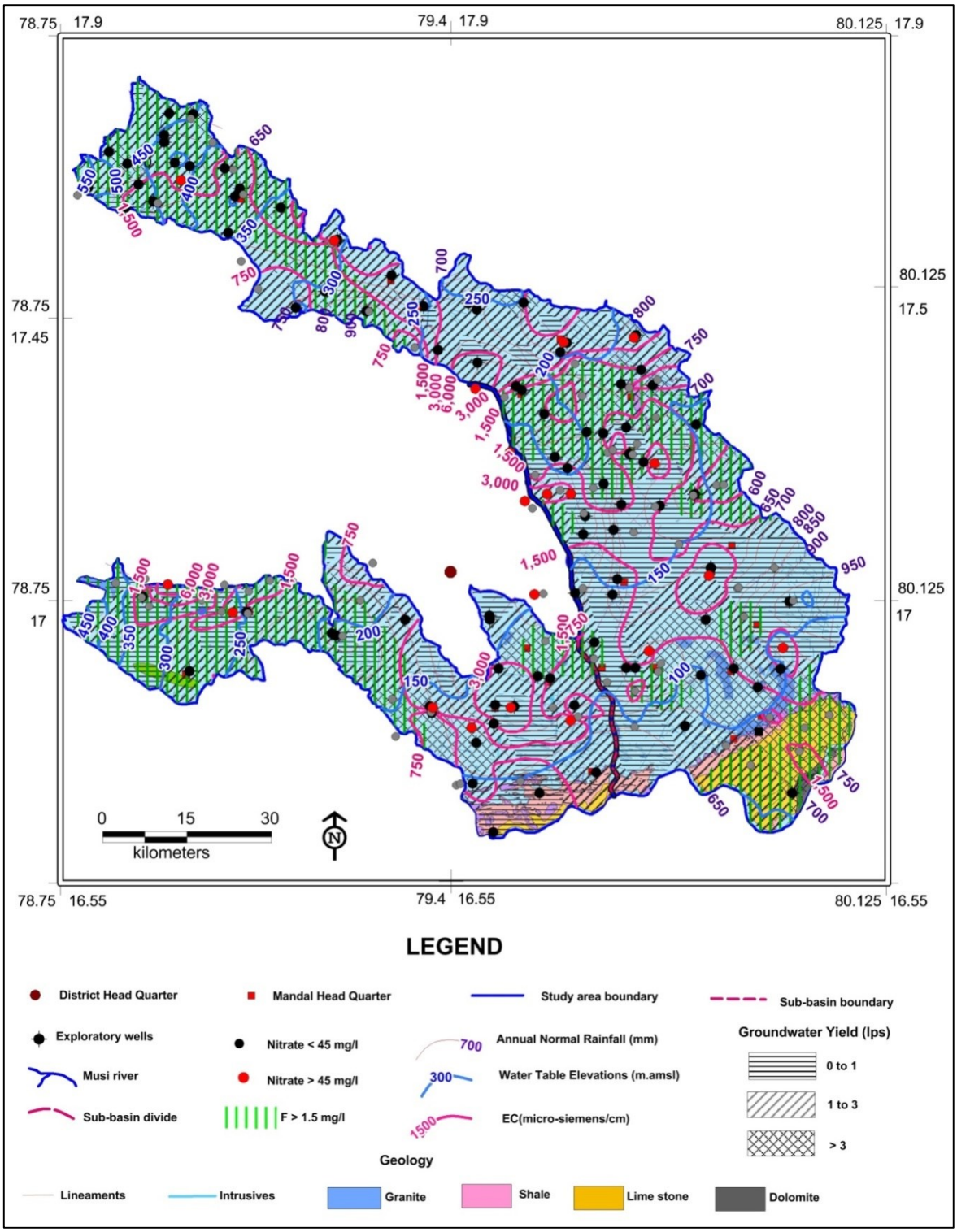


Fig.2.2: Hydrogeological map of study area.

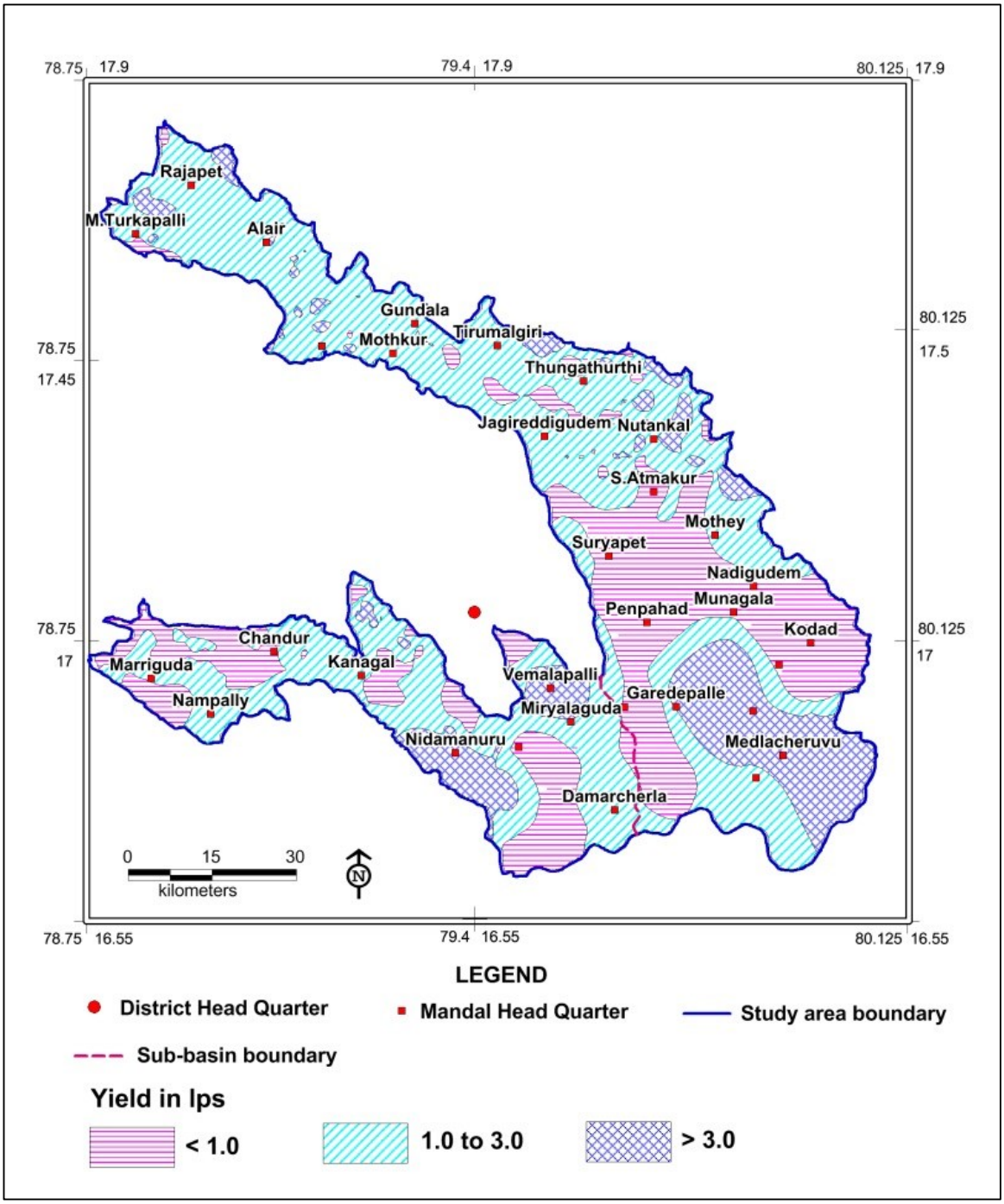


Fig 2.3: Ground water Yield

2.2 Water Levels (2014): Water levels from 419 wells (dug wells and bore wells) were monitored for pre and post-monsoon water levels during the year 2014.

2.2.1 Water Table Elevations: During pre and post-monsoon season (May and November) of 2014, the water-table elevation ranges from 35.7-576.8 and 45-578.9 meter above mean sea level (m amsl) respectively and in general, groundwater flow is in NW-SE in upper part and N-S direction in lower part of Musi basin and W-E direction in western part and NW-SE in

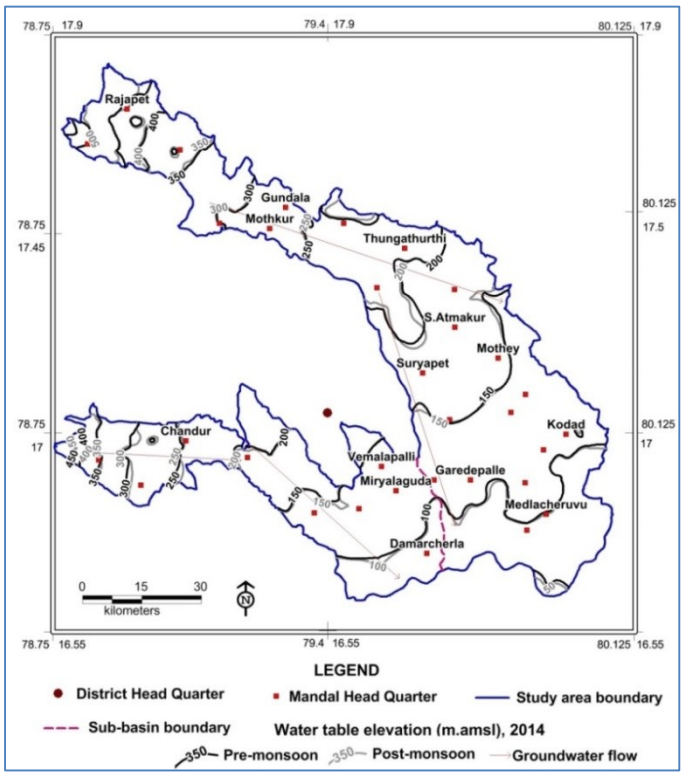
eastern part of Halia basin and follows the surface topography (**Fig.2.4**). The flow gradient in Musi basin is ~2.6 m/km and in Halia basin it is 3.4 m/km.

2.2.2 Depth to Water Levels (DTW): The DTW varies from 0.9 to 40.8 meter below ground level (m bgl) (average: 7.15 m) and 0.15-55.9 m bgl (average: 7.6) during pre and post-monsoon season respectively.

Pre-monsoon season: Majority of the water levels during this season are in the range of 2-5 m (43 % area) covering mostly the command area in south-eastern part, followed by 5-10 m bgl (38 %) and deep water levels in the range of 10-20 m bgl and > 20 mbgl occupy about 16 % and 1% of the area respectively falling in Rajapet, M. Turkapally, Alair and Marriguda mandals (**Fig.2.5**).

Post-monsoon season: Majority of the water levels during this season are in the range of 2-5 m (42%) covering mostly the command area in south-eastern part, followed by 5-10 m bgl (29 %) and deep water levels in the range of 10-20 m bgl and > 20 m bgl occupy about 19 % and 2% of the area falling in Rajapet, M. Turkapally, Alair and Marriguda mandals. Shallow water levels (< 2) m occupies about 7% of the area covering command area (**Fig.2.6**).

2.2.3 Water Level Fluctuations: The water level fluctuations vary from -15.85 to 12.75 m with average fall of -0.5 m (**Fig.2.7**).In majority of the area (53%) water levels shows rise of 0-2 m occupying ~43% of area, 2-5 m (9 % area) and > 5 m (1% area) mostly covering command area. The fall in water levels is mostly observed in Musi river basin and Marriguda mandals of Halia basin. Maximum negative WLF of 0-2 m is observed in 27% of the area followed by 2-5 m (17%), 5-10 m (3%) and >10 m in 1% of the area.



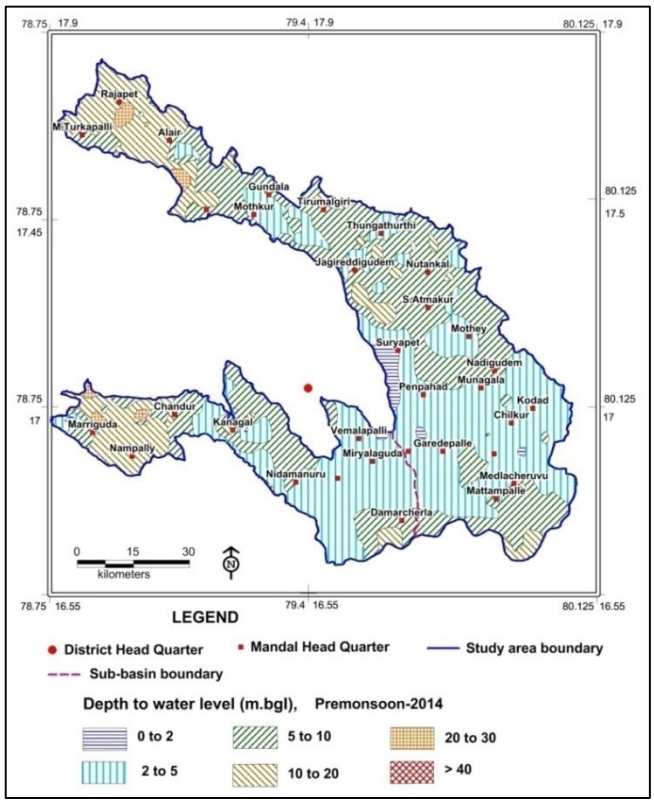


Fig.2.4: Water table elevations (Pre and Post-monsoon-2014).

Fig.2.5: Depth to water levels Pre-monsoon (May-2014).

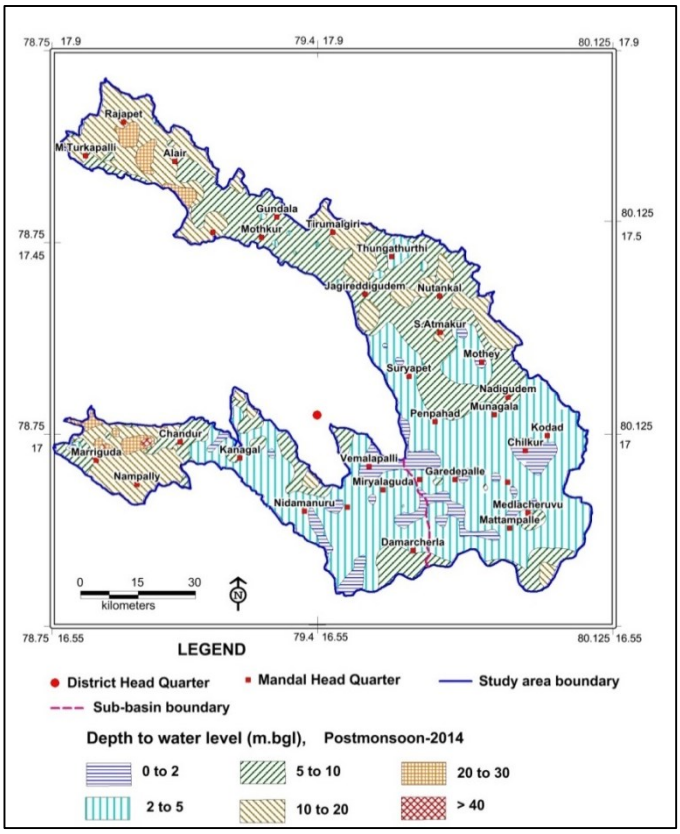


Fig.2.6: Depth to water levels Post-monsoon (Nov-2014).

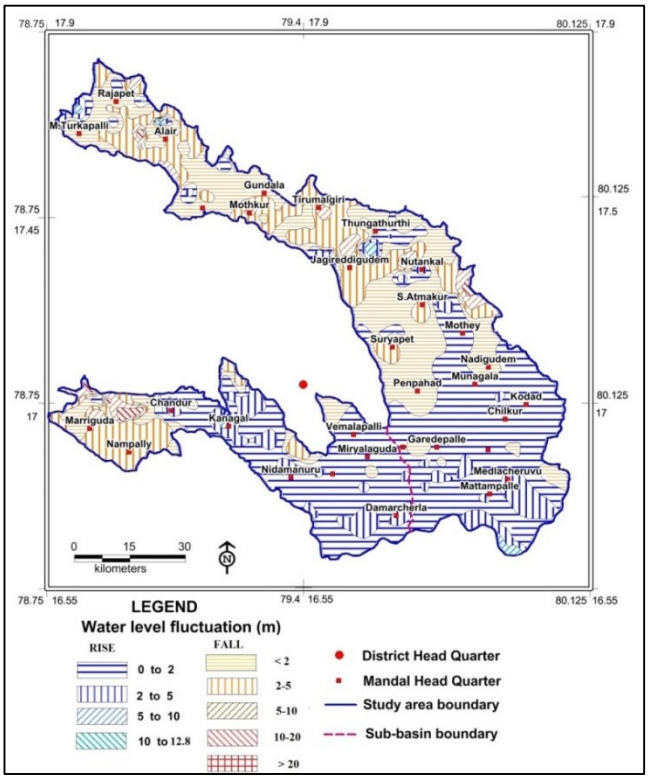


Fig.2.7: Water Level Fluctuations (m) (Nov with respect to May-2014).

2.3 Geophysical:A total from249 VES data along with 20 well logging data reveals resistivity < 100 ohm (Ω) m for the weathered granite (1-25 m) (Patelguda), 60-350 Ω m for underlying fractured granite with maximum thickness of 120 m (Rahimkhanpeta) and > 350 Ω for massive granite.

2.4 Hydro chemical:

To understand chemical nature of groundwater, total 115wells is utilized from ground water monitoring wells of CGWB and SGWD wells (mostly tapping combined aquifers) during the pre and post-monsoon season of 2014. Parameters namely pH, EC (in µS/cm at 25 ° C), TH, Ca, Mg, Na, K, CO_3, HCO_3, Cl, SO_4, NO_3 and F were analyzed.

Groundwater in the area is mildly alkaline to alkaline in nature in both seasons (pre-monsoon average pH 8.2 and post-monsoon average pH 8.3) with average EC of 1876 and 1580 µ Siemens/cm during pre and post-monsoon season respectively (**Fig.2.8 and Fig.2.9**). More than 3000 EC is detected in 12 % and 4.5 % of the area during pre and post-monsoon season. Average concentration of TDS and TH is 1175&464 and 1012&416 mg/L during pre and post-monsoon season respectively. The concentration of NO_3 ranges from 0-627 and 0-132 mg/L during pre and post monsoon season respectively (**Fig.2.10 and Fig.2.11**). Fluoride concentration varies from 0.06-9.4 and 0.1-7.22 mg/L during pre and post monsoon respectively (**Fig.2.12 and Fig.2.13**). It is found that about 65% and50 % of the samples during pre and post-monsoon season are unfit for human consumption (BIS, 2012).

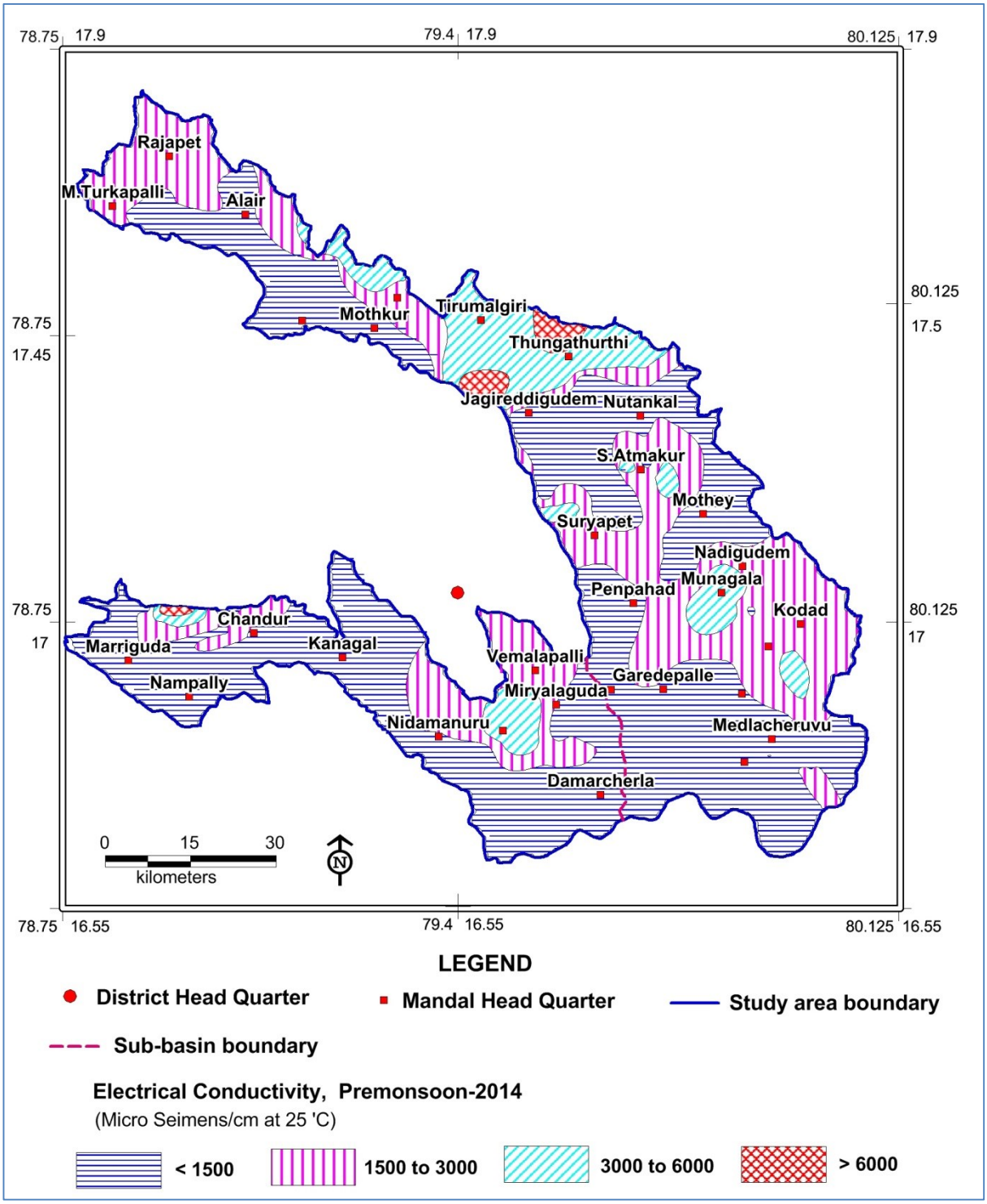


Fig.2.8: Distribution of Electrical conductivity (Pre-monsoon-2014).

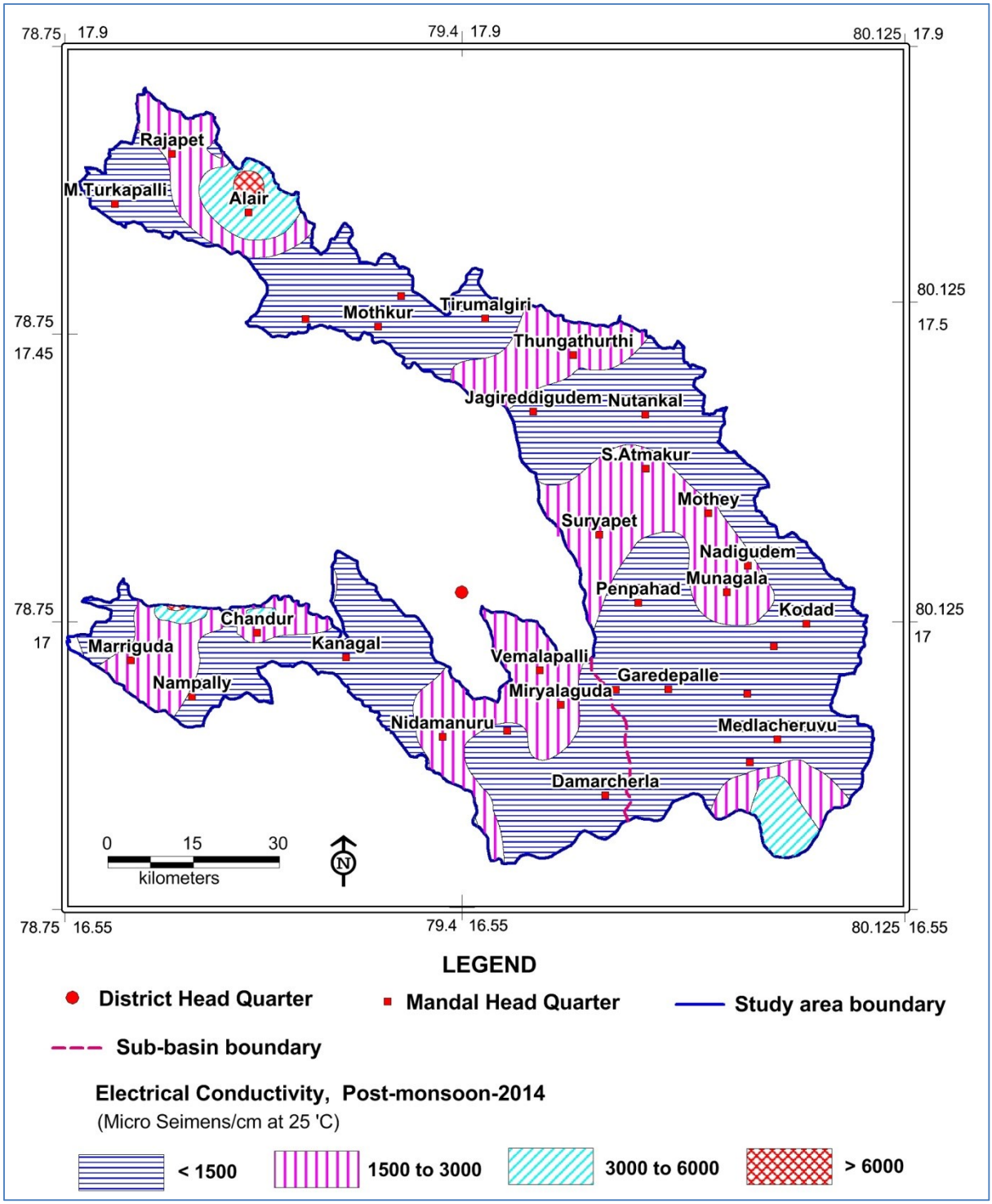


Fig.2.9: Distribution of Electrical conductivity (Post-monsoon-2014).

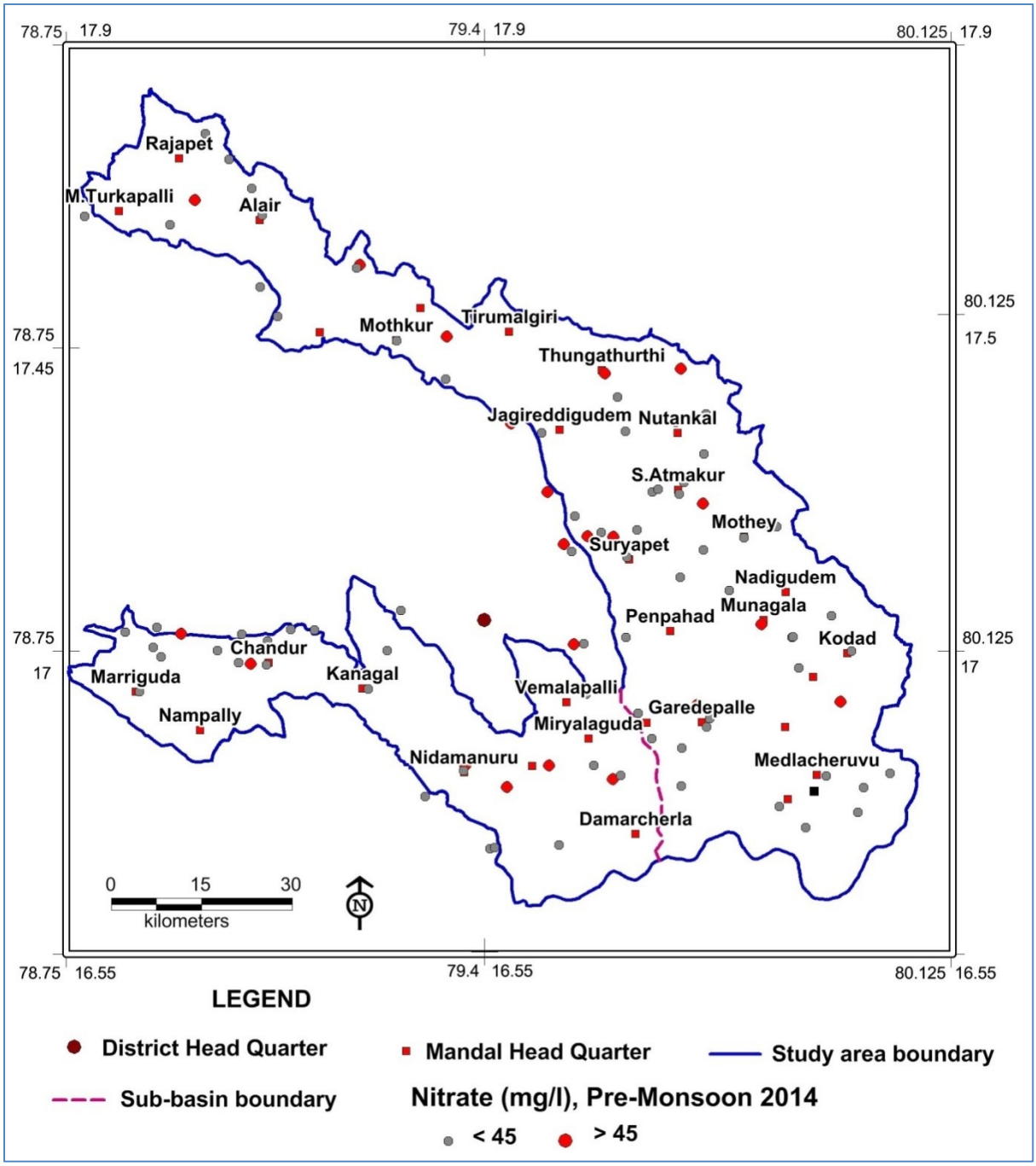


Fig.2.10: Distribution of Nitrate (Pre-monsoon-2014).

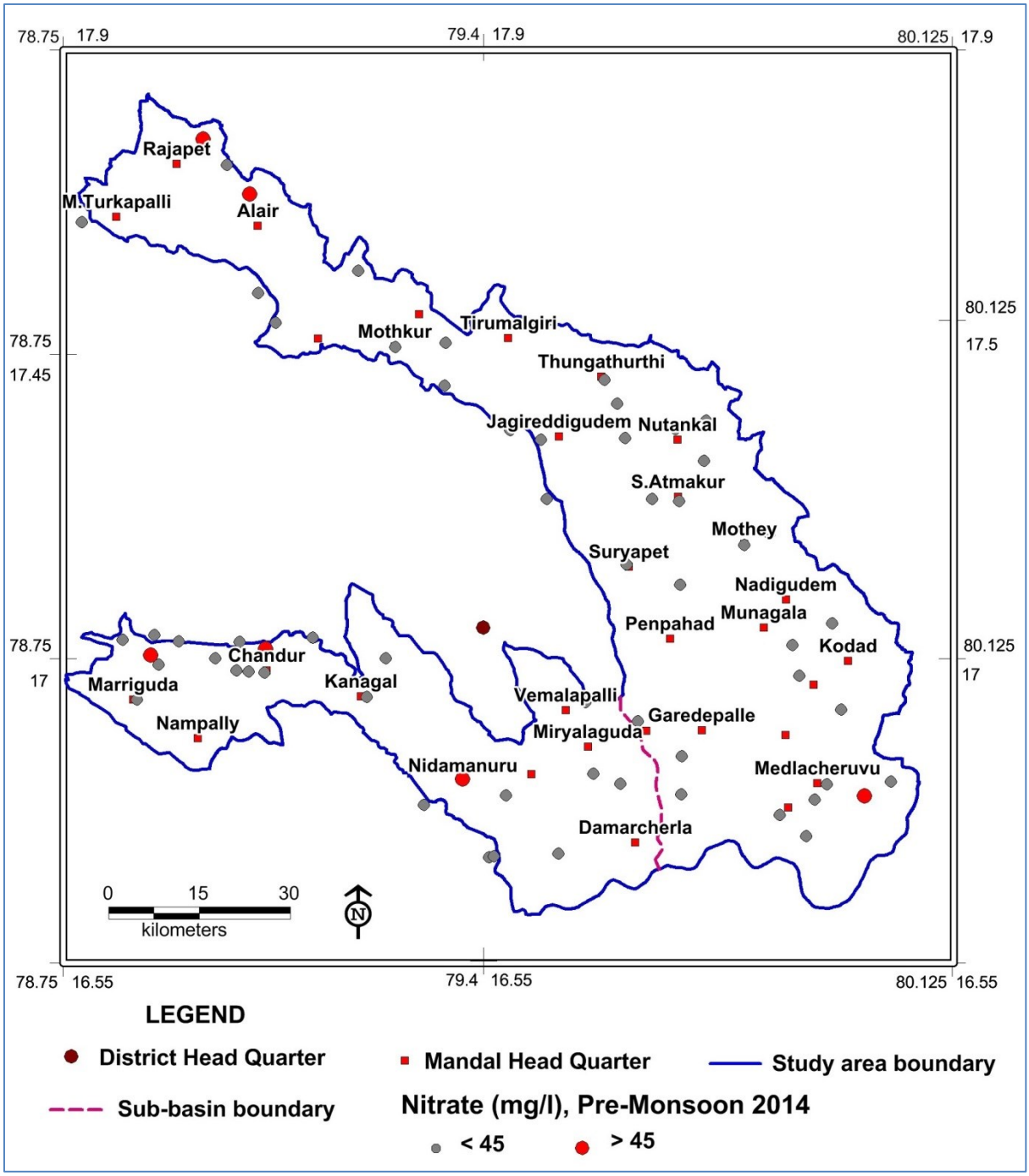


Fig.2.11: Distribution of Nitrate (Post-monsoon-2014).

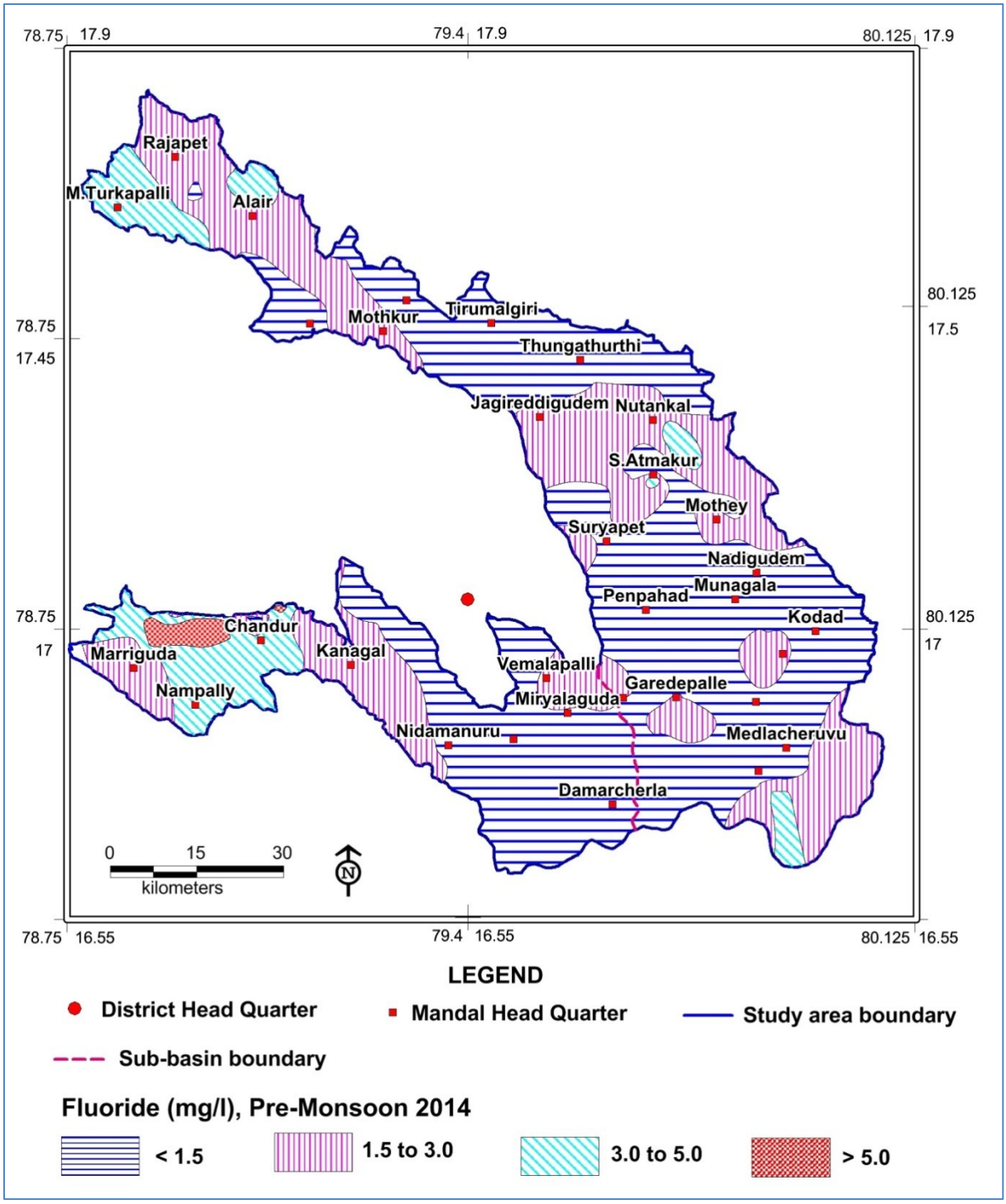


Fig.2.12: Distribution of Fluoride (Pre-monsoon-2014).

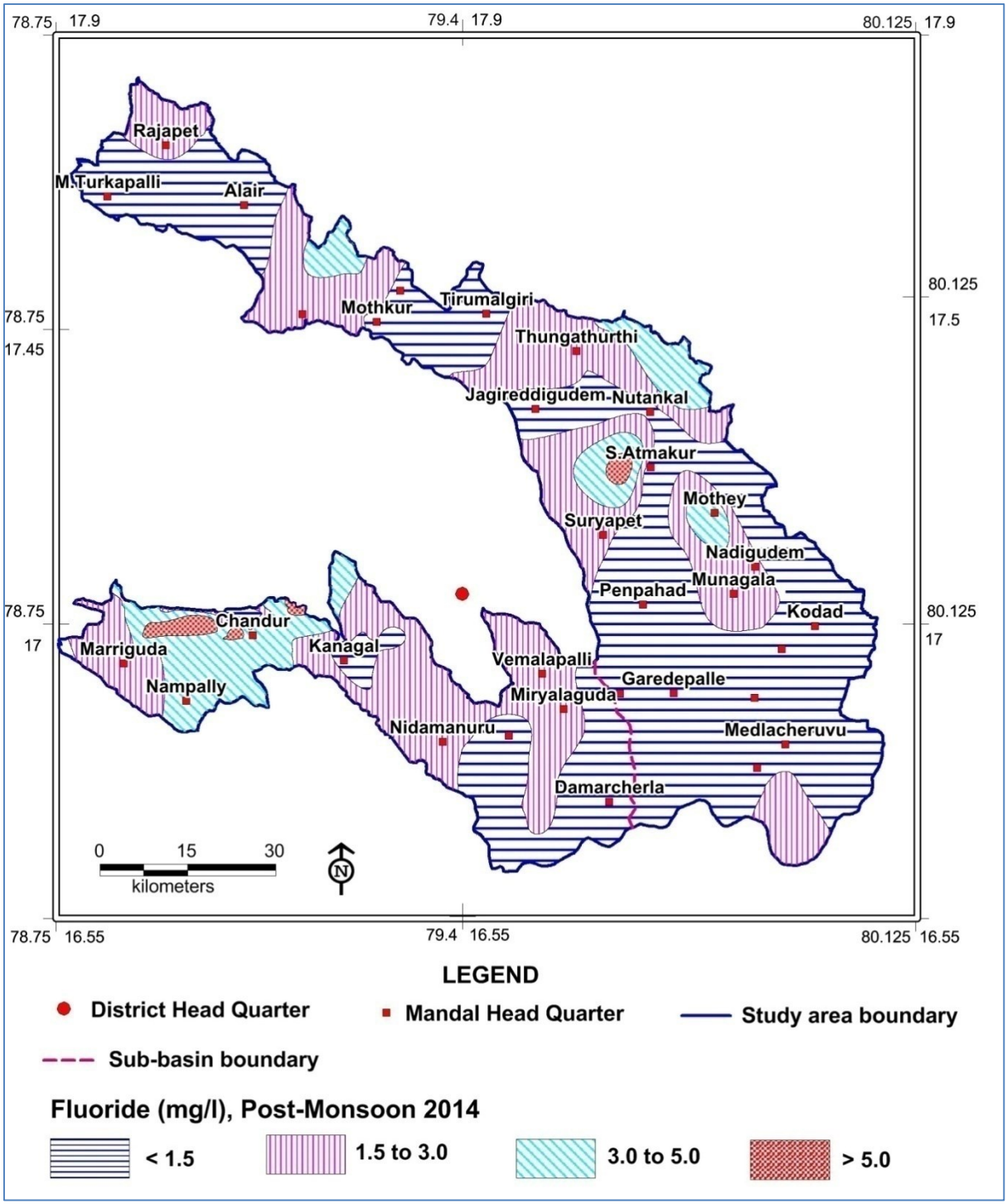


Fig.2.13: Distribution of Fluoride (Post-monsoon-2014).

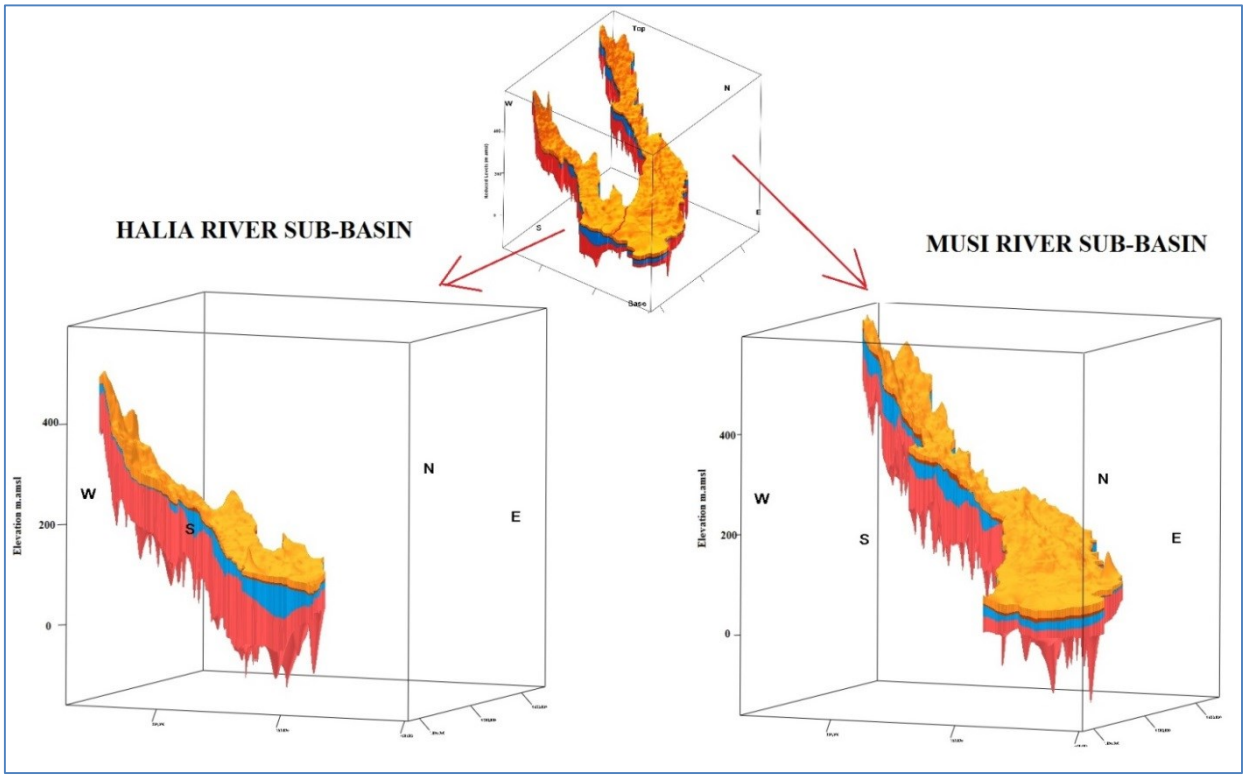
3. DATA INTERPRETATION, INTEGRATION and AQUIFER MAPPING

Conceptualization of 3-D hydrogeological model was carried out by interpreting and integrating representative 1054 data points (both hydrogeological and geophysical down to 200 m) for preparation of 3-D map, panel diagram and hydrogeological sections. The data is calibrated for elevations with Shuttle Radar Topography Mission (SRTM) data (**Fig.2.1**). The lithological information was generated by using the RockWorks-16 software and generated 3-

D maps for both sub-basins (**Fig.3.1)** along with fence diagram (**Fig. 3.2**)

and hydrogeological sections. The hydrogeological section layout is presented in **Fig.3.3.**

Fig.-3.1:3-D Model for study area.



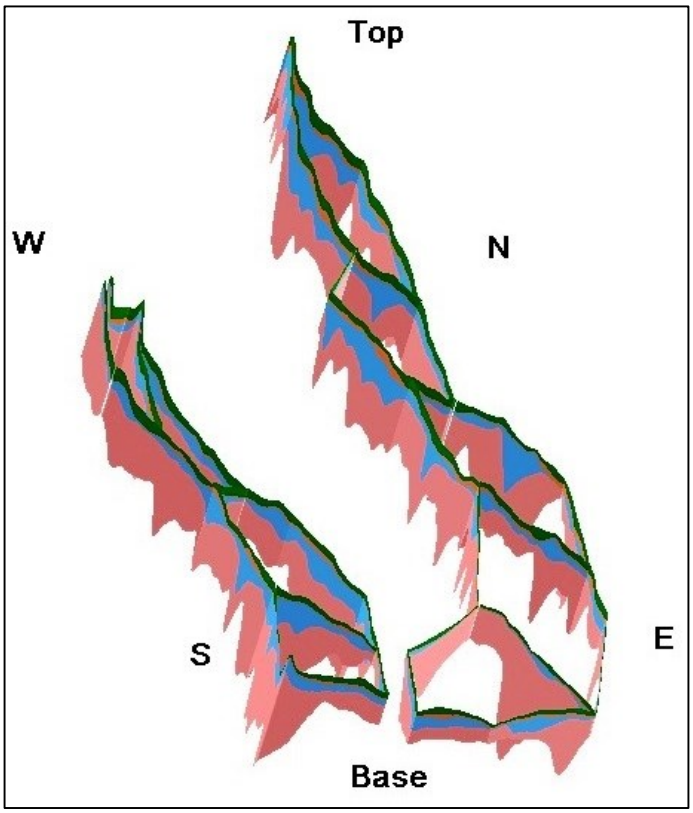


Fig.-3.2: Panel Diagram-Musi River sub-basin.

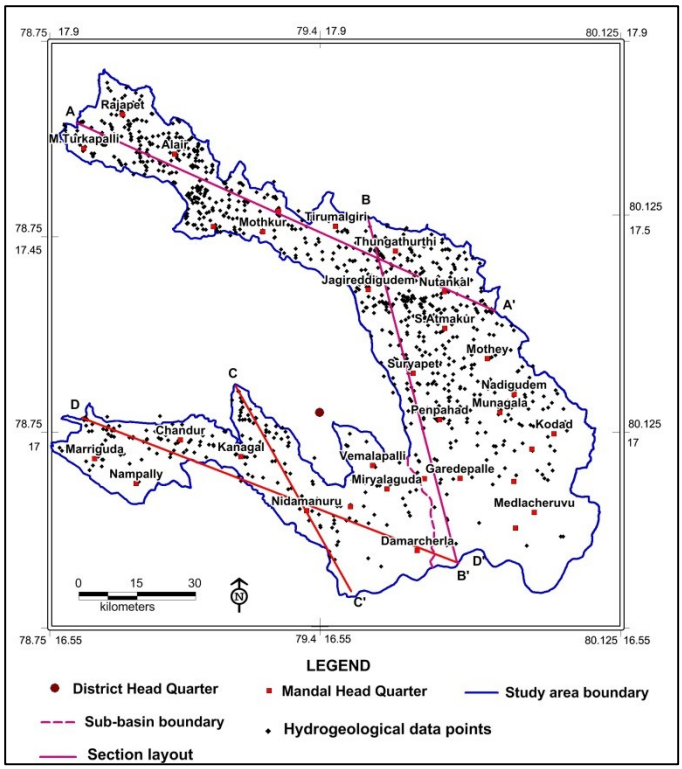
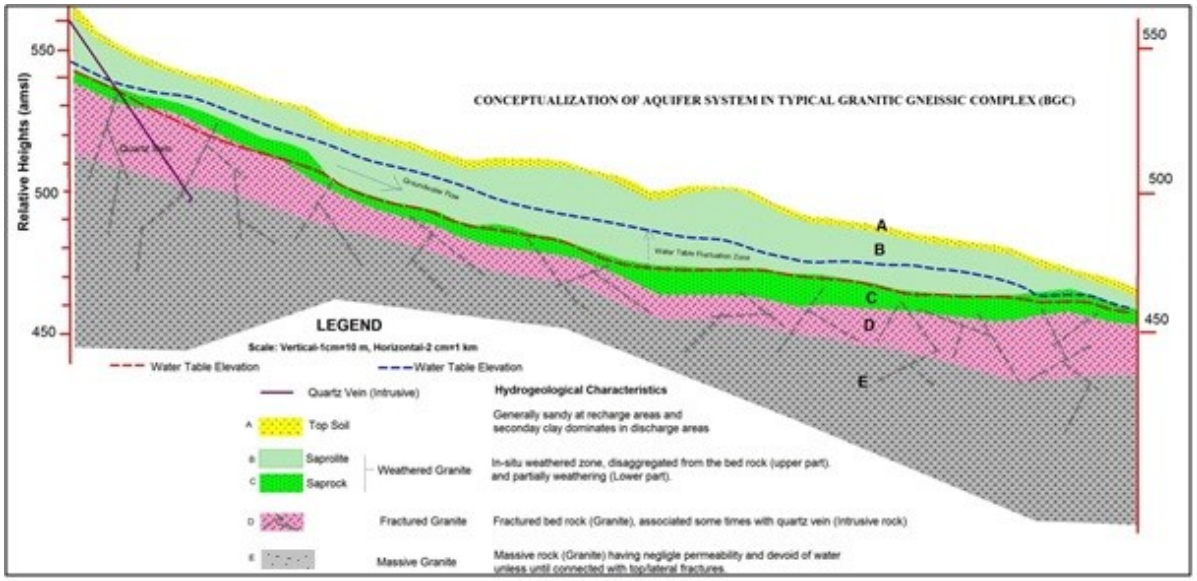


Fig.-3.3: Map showing orientation of various sections.

3.1 Conceptualization of aquifer system in 3D

Aquifers were characterized in terms of potential and quality based on integrated hydrogeological data and various thematic maps. Weathered zone is considered up to the maximum depth of weathering and first fracture encountered (below weathered depth) generally down to ~25 m depth and the fractured zone (fractured granite) is considered up to the depth of deepest fracture below weathered zone (~25-185 m) (**Fig. 3.4**).

Fig.3.4: Conceptualization of Aquifer systems in typical Granite-Gneissic Complex (BGC).



3.2 Hydrogeological Sections

Section-A-A' (NW-SE): The section drawn along the NW-SE parts of Musi sub basin covering distance of ~120 kms. It depicts almost uniform weathered zone thickness in most part except in central part (**Fig.3.5**). The thickness of fractured zone is uniform in central parts of the section while, it is more in NW parts than the SE parts of the section. The water table elevations of both pre and post monsoon period are almost intertwined all along the section.

Section-B-B' (N-S): The section drawn along the N-S parts of Musi sub basin covering a distance of ~80 kms. It depicts uniform weathered zone thickness except in central parts of the section. The weathering and fracture thickness in the central parts of the section is very minimum and increases from central parts towards both the sides. The fracture thickness is more in northern parts in comparison to south parts. (**Fig.3.6**). The water table elevations of both pre and post monsoon period are almost intertwined all along the section.

Fig-3.5: Hydrogeological section (A-A') of Musi (NW-SE) Sub-Basin.

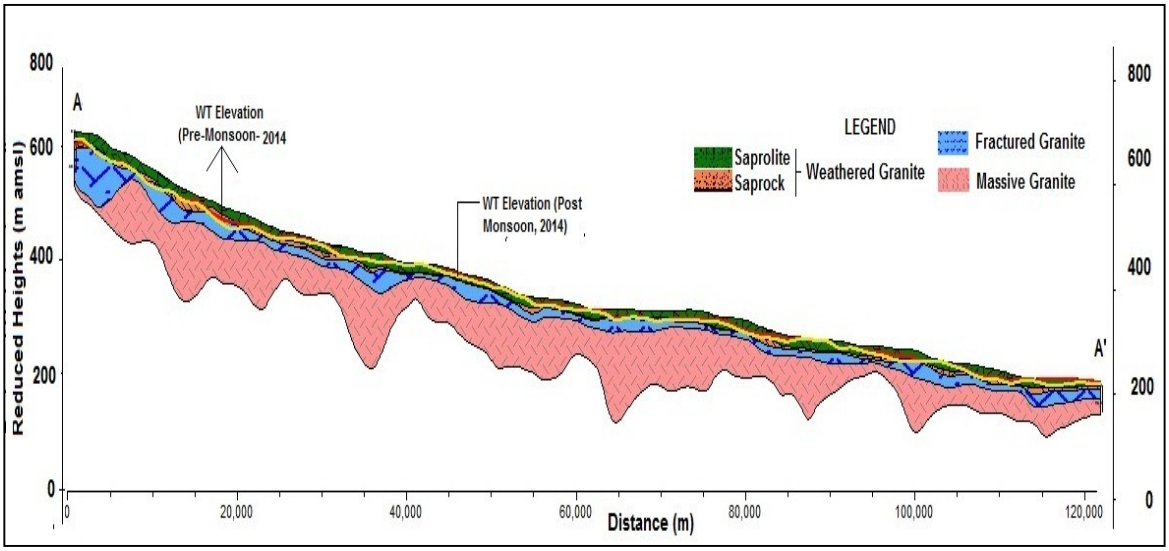


Fig-3.5: Hydrogeological section (A-A') of Musi (NW-SE) Sub-Basin.

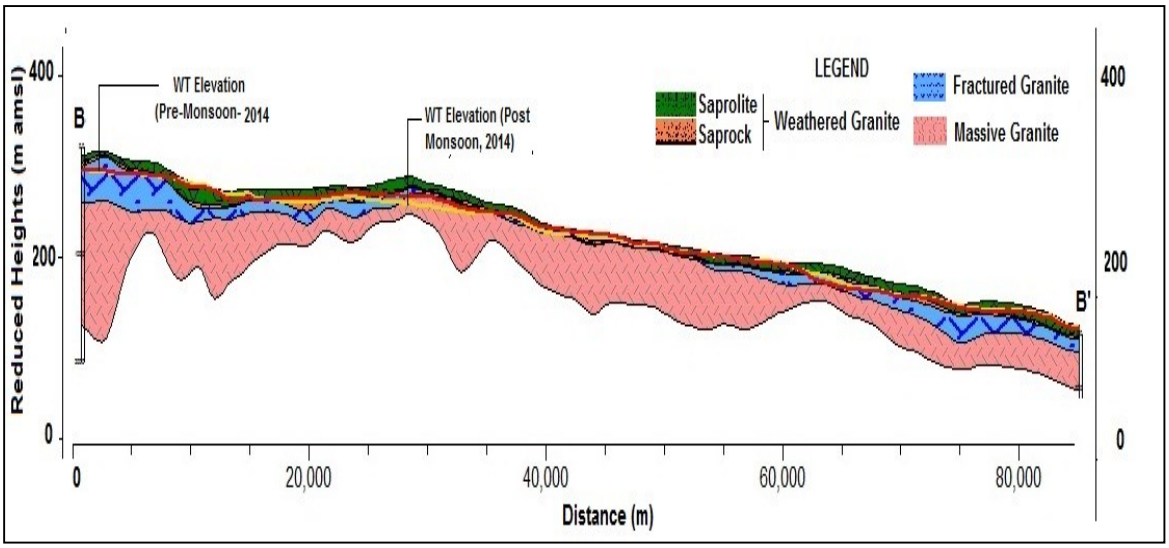
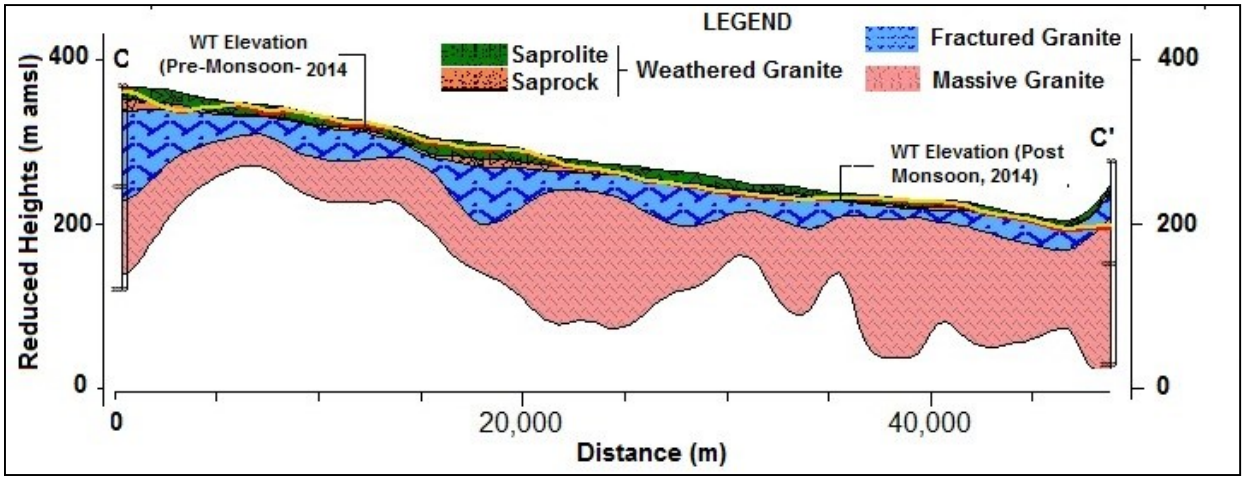


Fig-3.6: Hydrogeological section (B-B') of Musi (N-S) Sub-Basin.

Section-C-C' (N-S): The section drawn along the N-S parts of Halia sub basin, covering a distance of ~50 kms. It depicts uniform weathered zone thickness all along the section. The fracture thickness is more in central and northern parts in comparison to south parts (**Fig.3.7**). Water table elevations of both pre and post monsoon period are almost intertwined all along the section.

Section-D-D' (NW-SE): The section drawn along the NW-SE parts of Halia sub basin, covering a distance of ~100 kms. It depicts uniform weathered zone thickness all along the section. The fracture thickness is more in central and northern parts in comparison to southern parts (**Fig.3.8**).

Fig-3.7: Hydrogeological section (C-C') of Halia (N-S) Sub-Basin



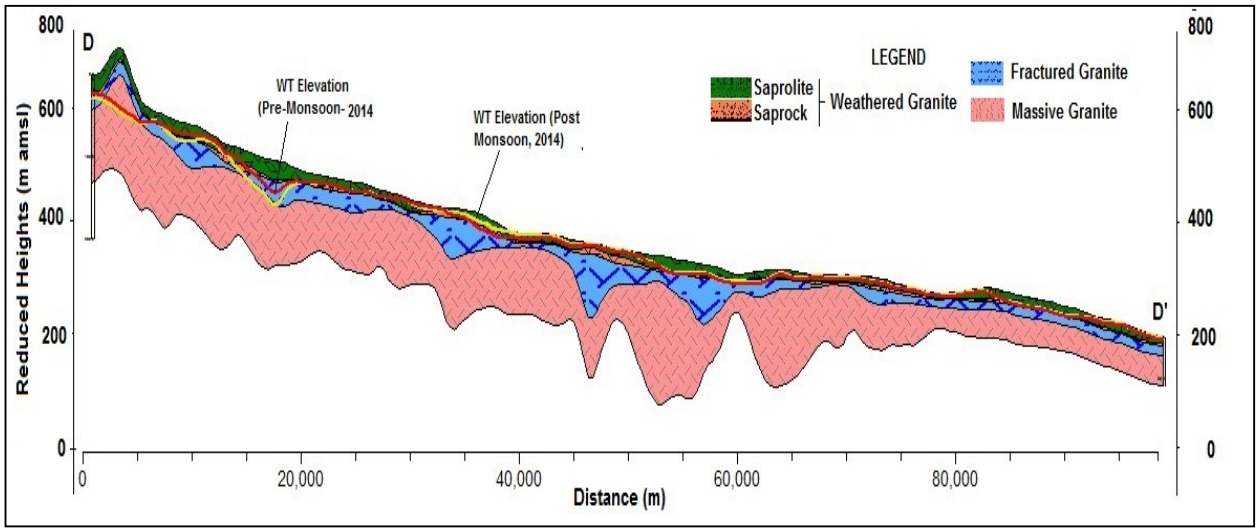


Fig-3.8: Hydrogeological section (D-D') of Halia (NW-SE) Sub-Basin.

3.3 Aquifer Characterization

Weathered zone: The Weathered zone wherever it is shallowconsisting of upper saprolite and lower sap rock has gone dry in significant part due to over-exploitation (excluding command area). Dug wells, which are in existence, have become defunct and wells located in command area have considerable water column. Thickness of weathered zone is shallow (< 10 m) in central part covering ~43% of area and in south eastern part and deep (>20 m) in north-western and south-western part and moderate (10-20 m) in 53 % of the area (**Fig.3.9**).

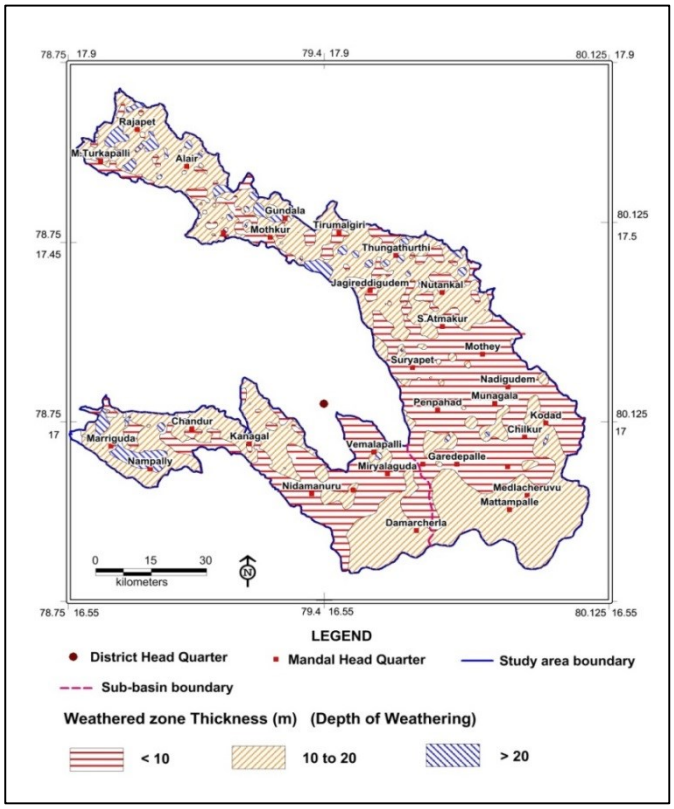


Fig.3.9: Thickness of Weathered zone.

Fractured zone: Ground water is extracted mainly through bore wells of 30 to 100 m depth from fractured zone (~25 to 185 m). Fractures in the range of < 30 m depth are more

predominant (64% of the area) covering central part, 30-60 m and 60-100 fractures occur in 28 % and 6 % of area respectively and deep fractures in the range of 100-183 m occur mainly in Halia sub-basin (**Fig.3.10**). Analysis of occurrences of fracture from bore wells (1242) reveal that majority of fractures (~97 %) occur within 100 m depth (**Fig. 3.11**).The transmissivity (T) varies from 1 to 213 m^2/day (avg:12 m^2/day) and storativity of 0.0002.

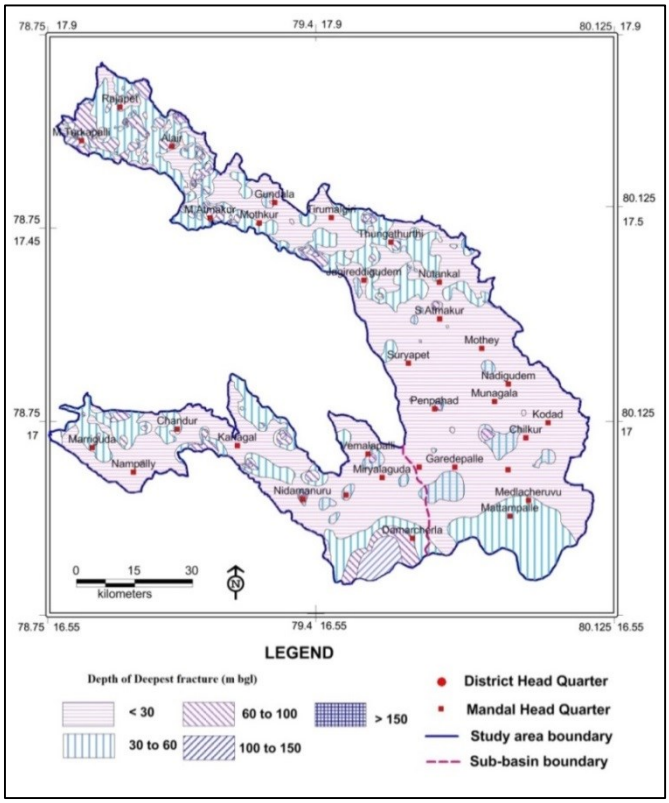


Fig.-3.10: Depth of Fractured zone (Maximum depth) (mbgl).

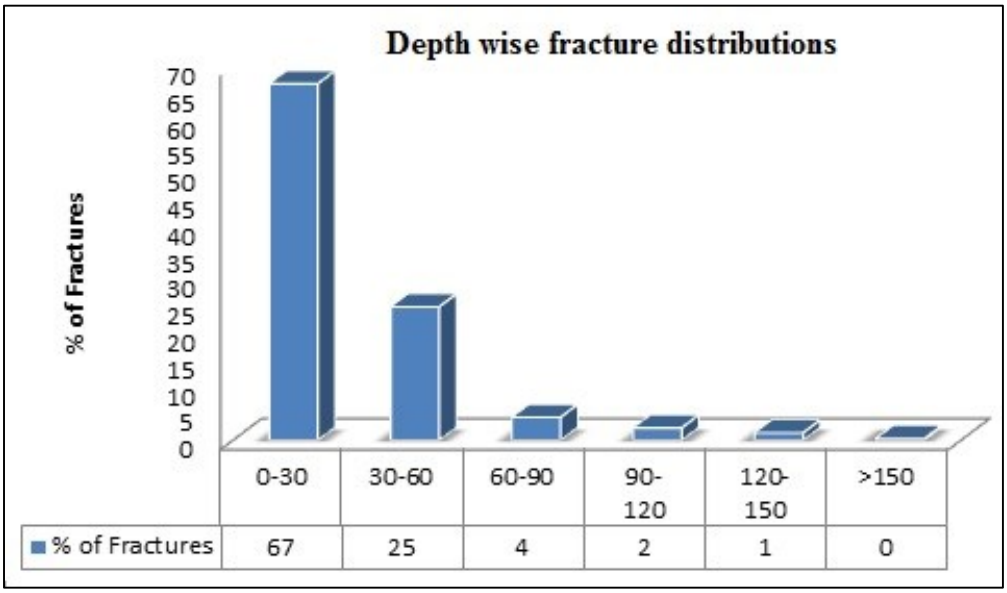


Fig.-3.11: Depth wise distribution of fractures.

4. GROUNDWATER RESOURCES

In hard rocks, for practical purpose it is very difficult to compute zone wise (aquifer wise) groundwater resources, because the weathered zone (WZ) and fractured zone (FZ) are inter connected with fractures/joints and fractured zone gets recharged through weathered zone. Therefore it is very difficult to demarcate the boundary between two aquifers; hence the resources are estimated considering entire area as a single aquifer system. Village wise dynamic and in-storage groundwater resources are computed and while computing dynamic resources, actual area of village (falling in study area),and averagewater levels of last 10 years, computed specific yield (2%) are considered. While computing the in-storage resources, the general depth of deepest fracture in the area, pre-monsoon water levels and 2 % of granular zone (i.e., 2% of zone below pre-monsoon water level and down to deepest fracture) and 3 % of specific yield is considered (**Table-4.1**).

As per 2011 GEC report, the dynamic replenishable groundwater resources are computed 1029 MCM, gross ground water draft for all uses 559 MCM and net annual ground water potential available for future irrigation needs is 469 MCM. With available resources, additional ~28,378 ha of land can be brought under irrigated dry crops. Basin wise stage of ground water development varies from 50-56 % and mandal wise it varies from 18-97 % (Average 63%).Ground water resources for the year 2013 were also computed as per GEC methodology.Based on 2011 resources, village wise utilizable ground water resource map is prepared and presented in **Fig. 4.1.**

As per 2013 estimates, the dynamic net ground water availability is928 MCM and draft is 542 MCM with average 64 % of stage of ground water development.

Table-4.1: Sub-basin wise computed Dynamic, In-storage ground water resources.

Parameters	**Musi basin**	**Halia basin**	**Total**
As per GEC 2011	**MCM**	**MCM**	**MCM**
Net GWR Availability	697	332	1029
Gross GW Draft	394	165	559
Balance (For Irr.)	302	167	469
Stage of GW development (%)	**56**	**50**	**54**
Additional area that can be brought under irrigation (ha)	19465	8913	28378
As per GEC 2013 (Provisional)			
Dynamic (Net GWR Availability)	637	291	928
Gross GW Draft	382	160	542
Provision for Drinking and Industrial use for the year 2025	55.32	17.65	72.97
Balance	263	138	401
Stage of GW development (%)	68	60	64
In-storage GW Resources	**67.7**	**33.2**	**100.9**

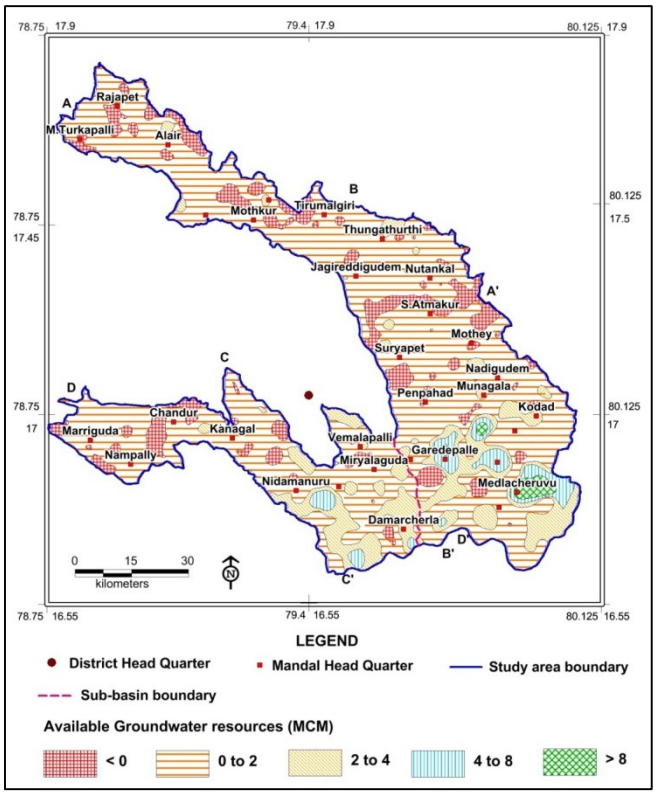


Fig.4.1: Utilizable Groundwater Resources.

5. GROUND WATER RELATED ISSUES and REASONS FOR ISSUES

5.1 Issues

Pollution (Geogenic and Anthropogenic)

1. The area is identified as **fluorosis endemic** area (geogenic) where fluoride as high as 9.4 mg/L during pre and 7.2 mg/L during post-monsoon season is found in groundwater. The high fluoride concentration (>1.5 mg/L) occur in 44% and 47% of the area during pre and post-monsoon season of 2014.

2. High nitrate (> 45 mg/L) due to anthropogenic activities is observed in 65 samples mostly from dug wells, command and urban areas.

3. The high concentration of EC (> 3000 micro-seimens/cm) in 12 % and 5 % of the area is observed mostly in canal command area.

Over-exploitation

4. ~ 740 Km^2 area covering117 villages are categorized as over-exploited.

Deep water levels

5. The shallow aquifer wherever the depth of weathering is less has gone dry due to over-exploitation and all dug wells which were in existence having become defunct and some are abandoned. In fact there is 21 % decrease in functional dug wells as per 2013, as compared to 2013.

6. Deep water levels (> 20 mbgl) are observed during pre and post-monsoon season in 1% and 3% of the area respectively. The high percentage is due to deficient rainfall during 2014 (-27%).

7. Declining water levels up to -0.58m/yr and -0.63 m/yr is observed during pre and post-monsoon season in the last 10 years.

8. 8% increase in number of bore wells is observed in 2013 as compared to 2011.

Sustainability

9. Low yield (<1 lps) occurs in ~30 % of area and yields of bore wells have reduced over a period of time and some bore wells which used to yield sufficient quantity of water have gone dry and due to this rich farmers are acquiring water from nearby places (if available) or transporting water from far off places (1-2 km) and saving the commercial crops (sweat lime, papaya etc) thereby incurring lot of financial expenses.

Water Logging

10. Water logging during post-monsoon season is observed in 8% of the area mostly in canal command area.

Water Marketing and other Issues

11. Water marketing is present in almost all over the area and people are buying bottled water from the market for drinking purposes as there is no sufficient supply of surface water.

12. Change in land use and cropping pattern from agricultural land to residential purposes and from traditional crops to cash crops (cotton) during Kharif seasonis observed.

13. Based on ground water paddy is grown during rabi season in most of the area leading to heavy withdrawal of ground water during non-monsoon period.

5.2 Reasons for Issues

Geo genic pollution (Fluoride)

1. Higher concentration of F in ground water is attributed due to source rock,which contains avg. 810 ppm of F (higher than surrounding Hyderabad granite rocks).
2. Rock water interaction where acid-soluble fluoride bearing minerals (fluorite, fluoro-apatite) gets dissolved under alkaline conditions.
3. Higher residence time of ground water in deeper aquifer.

Anthropogenic pollution (Nitrate)

4. Higher concentration is due to sewage disposal of treated and untreated effluents in urban and rural areas.Use of NPK fertilizers and nitrogen fixation by leguminous crops.

Over-exploitation and Deep water levels

5. Over-extraction, paddy cultivation during rabi season, ground water mining, limited artificial measures etc.

Sustainability

6. Absence of primary porosity, negligible development of secondary porosity, Low rainfall, desaturation of Weathered Zone and urbanization.

Water logging

7. Low development of ground water resources due to saline soils, shallow water table, semi-arid conditions and surface water irrigation.

6. MANAGEMENT STRATEGIES

High dependence on groundwater coupled with absence of augmentation measures has led to a steady fall in water levels and desaturation of weathered zone in some parts, raising questions on sustainability of existing groundwater structures, food and drinking water security. The studies revealed different behaviour of ground water in the weathered zone (~ 25 m) and fractured zone (25-185 m). The occurrence of fractures in fractured zone are very limited in extent, as the compression in the rock reduces the opening of fractures at depth and the majority of fractures occur within 100 m depth (95%) (**Fig.3.11**). Higher NO_3^- concentrations (> 45 mg/L) in weathered zone is due to sewage contamination and higher concentration of F- (>1.5 mg/L) in weathered zone and fractured zone is due to local geology (granite rock), high weathering, longer residence time and alkaline nature of groundwater.

6.1 Management Plan

The uneven distribution of groundwater availability and its utilization indicates that a single management strategy cannot be adopted and it requires integrated hydrogeological aspects along with socio-economic conditions to develop an appropriate management strategy. The study suggests notable measures for sustainable groundwater management, which involves a combination of various measures given below. Mandal wise aquifer maps and management plans for fully covered and partly covered mandals are given in **Annexure-1** and **Annexure-2** respectively.

1. Supply side measures
2. Demand side measures
3. Regulatory measures
4. Institutional measures

6.1.1 Supply side measures

Artificial Recharge structures:

Construction of 1728 artificial recharge structures (ARS) (117 villages: priority-1 and 432villages: priority-2 areas) are suggested by following standard methodology.

While formulating the village wise groundwater management plan, the unsaturated volume of aquifer is estimated by multiplying the area with specific yield (283 MCM) and unsaturated thickness (post-monsoon water levels below 3 m). Initially villagewise dynamic groundwater resources of 2011 are considered (**Fig.4.1**). Potential surface run off is estimated by following standard procedures. On conservative side 20 % runoff yield is considered as non-committed yield for recommending artificial recharge structures. The pre-monsoon

groundwater quality is considered for categorising contaminated area (F >1.5 mg/l &EC >3000). Nitrate is not considered here because it is point source pollution and localized. Based on above criteria, the area can be prioritized into **priority-1** which needs immediate intervention and **priority-2**. Based on hydrogeological characteristics, the area is further sub-divided into following 8 categories (**Table-6.1**).

Table-6.1: Hydrogeological characteristics of area.

Category	Hydrogeological characterizations
1	High EC with additional scope for artificial recharge.
2	High EC with no additional scope for artificial recharge.
3	High F with additional scope for artificial recharge.
4	High F with no additionalscope for artificial recharge.
5	High EC and F with additional scope for artificial recharge.
6	High EC and F with no additional scope for artificial recharge.
7	Groundwater quality within permissible limits for drinking and irrigation with scope for artificial recharge.
8	Groundwater quality within permissible limits for drinking and irrigation with no scope for artificial recharge.

6.1.1.1 Priority-1 (117 Villages, 743 Km^2) (Area where groundwater development is > 100 %)

Area consisting of 117 villages (partly and fully) covering ~743 Km2 (**Fig.6.1**) is considered as Priority-1 where immediate intervention is required because, here, the stage of groundwater development is > 100%. The area is again sub-divided into 8 categories based on hydrogeological conditions as mentioned above. For sustainable development and management of the groundwater resources the following recommendations are made and summarised in **Table-6.2**.

- 200 artificial recharge structures (100 CD's with 6 filling and 100 mini PT's with 1.5 fillings) with a total cost of 15 crores can be taken up.
- In 22 villages, where no unsaturated weathered thickness is available but 1.82 MCM utilizable yield is available, construction of surface storages are recommended and the water can be used for drinking and irrigating ID crops only.

6.1.1.2 Priority-2 (432 Villages, 5947 Km^2) (areas where ground water development < 100 %)

Area consisting of 432 villages (partly and fully) covering ~6021 Km2 (**Fig.6.2**) is considered as Priority-2, where there is scope for further groundwater development. The area is again further divided into 8 categories based on hydrogeological characteristics as mentioned above. For sustainable development and management of the groundwater resources the recommendations are made (**Table-6.3).**

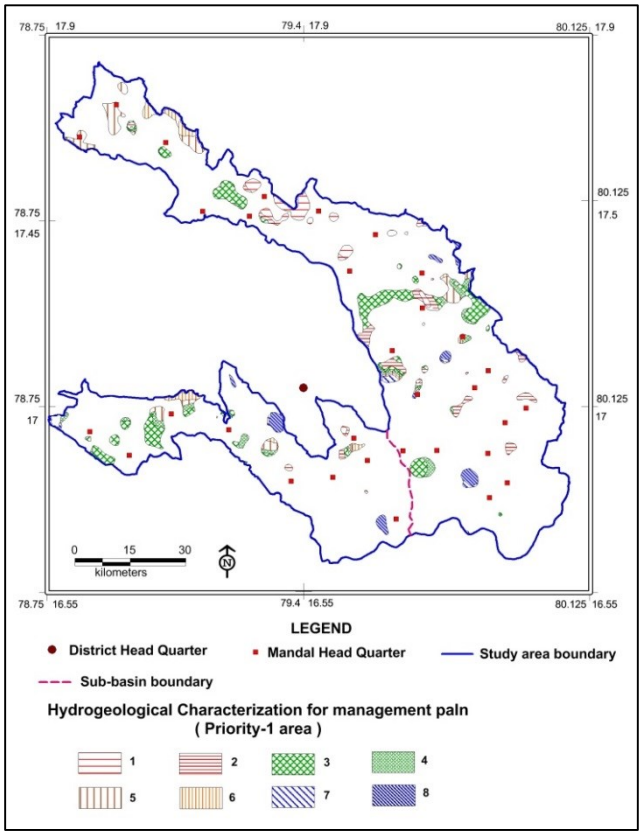


Fig.6.1: Priority-1 Area (Over-exploited).

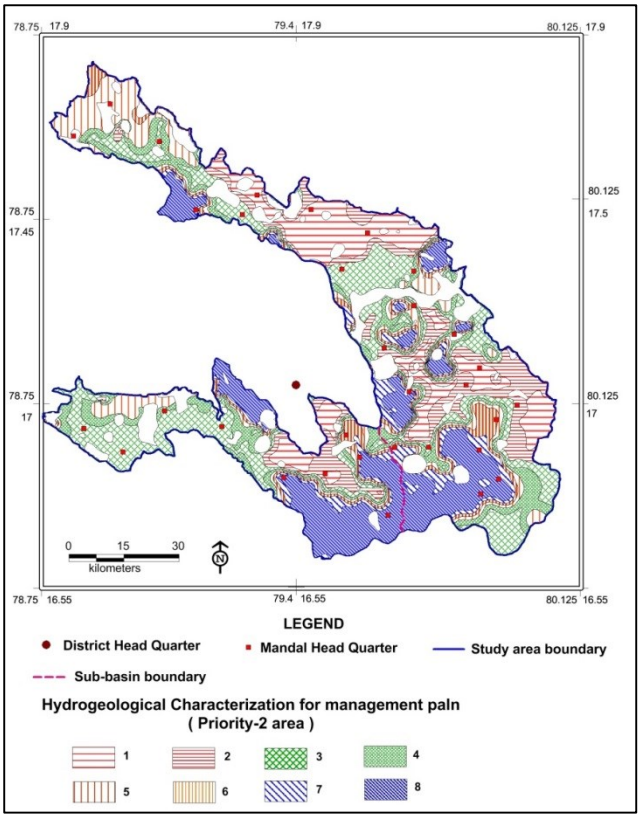


Fig.6.2: Priority-2 Area.

- 1528 artificial recharge structures (ARS) (764 CD's with 6 fillings and 764mini PT's with 1.5 fillings) can be taken up with a cost estimate of 114.6 crores.

In 77 villages, where no unsaturated weathered thickness is available but 8.4 MCM utilizable yield is available, there construction of surface storages are recommended and the water can be used for drinking and irrigating dry (ID) crops only.

Water Conservation Measures(WCM) (Farm Ponds):

The farm ponds are the ideal water conservation structures, which are constructed in the low lying areas of the farm. The ideal size of form ponds is 10 x 10 x3 m. In the area total 10980 farm ponds are recommended (20 in each village) with total cost of 27.45 crores. The expected storage from this will be ~3.29 MCM and this will contribute ~1.64 MCM (50 %).of recharge to the ground water.

Mission Kakatiya (Repair Renovation and Restoration of existing tanks):

- De-silting of existing minor tanks (351 no's) was taken under state Govt. sponsored Mission Kaktiya-Phase-1 to remove 9.6 MCM of silt, out of which till December 2015, 6.26 MCM is removed (with storage capacity of 175 MCM) costing ~136 crores and this has created additional surface storage. The net recharge to ground water will be 3.13 MCM and with this ~520 ha additional land can be brought under irrigated dry (ID) crops in tank ayacut. There is need to take remaining tanks (~1650 nos) in next phases for de-silting, this will greatly help in stabilisation of tank ayacut and groundwater augmentation.
- Remaining 1650 tanks, check dams and percolation tanks can be de-silted involving people's participation through the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) (NREGA 2005). This will also help in sustainable management of groundwater resources.
- Some of de-silted tanks along Musi river may be filled with treated Musi river water (free from heavy metals) during lean monsoon period as done in the upper parts of Musi basin.

Mission Bhagiratha (Drinking water supply to every house hold):

- Presently, out of ~15.64 lakh population, ~5.5 lakh population from 532 villages have been provided with protected water supply from surface water with per capita of 40 lpd/person. In the area ~8 MCM/year of water is provided under multi village scheme (MVS).
- Under Telangana Drinking Water Supply Project (TDWSP) also known as Mission Bhagiratha, all the villages are proposed to be covered from the 3 water grids segments AKBR(Ghanpur-Bhongir),Mallepally and Bhongir-Alair to provide protected water from surface reservoirs (the schemes are at various stages of completion). The scheme is to enhance the existing drinking water scheme and provide 100 lpd/persons and 135 lpd/person in rural and urban areas respectively. Thus all habitations (including fluoride affected) will be covered with the implementation of this project.
- Imported water to the tune of ~53MCM from surface sources into the basins will reduce the stress on groundwater, which can be effectively utilized to irrigate ~8800 ha of additional land under ID crops or the stage of ground water can be reduced by 6 %.

6.1.2 Demand side measures: In order to manage the available resources more effectively the following measures are recommended.

- Conjunctive use of ground water and surface water in the command area is recommended where water levels are in the range of 0-5 m.bgl.
- Demand side measures include adaptation of micro irrigation practices which saves ~25 % water as compared to traditional flooding irrigation. In the area till date 36,300 no's of drip and sprinklers are sanctioned which has irrigated ~41700 ha under ID crops saving ~80 MCM of groundwater from the basin. Additional areas need to be brought under micro irrigation.
- ~ 54900 ha of additional land that can be brought under micro-irrigation (@100 ha/village) costing about 329.4 crores (considering 1 unit/ha @0.6 lakh/ha). With this 110 MCM of ground water can be conserved over the traditional irrigation practices.

6.1.3 Regulatory measures

- Change in cropping pattern from water intensive paddy to other irrigated dry and drought resistant crops that have a short growing season is recommended, particularly in critical areas (Chandur mandal). If necessary some regulatory rules may be framed and implemented.

- To avoid the interference of cone of depression between two productive wells, intermittent pumping of borewells is recommended through regulatory mechanism.

- Complete ban on paddy cultivation during rabi season under ground water irrigation.
- Power supply should be regulated by giving power in 4 hour spells (two times a day, in the morning and evening)to increase the sustainability of structures.
- As mandatory measures power connection may be given to only those farmers who are adopting micro irrigation for all new bore well to be constructed.

6.1.4 Institutional measures

- A participatory groundwater management (PGWM) approach in sharing of groundwater and monitoring resources on a constant basis along with effective implementation of the existing Andhra Pradesh 'Water, Land and Trees Act' of 2002 (APWALTA 2002) are the other measures suggested.
- Subsidy/incentives on cost involved in sharing of groundwater may be given to the farmers involved.
- In the existing ground water areas sharing of ground water amongst the users is to be encouraged to increase the sustainability of wells by reducing well interference and to promote this the bore well owner should be suitably compensated for the cost of well by funding to farmers for adopting micro irrigation practices in the entire well command area to be born by the Govt.
- The other measures includes, supplementary calcium and phosphorous rich food should be provided to children in fluoride contaminated areas (Category-3 and 4), creating awareness about safe drinking water habits, side effects of high fluoride and nitrate rich groundwater, improving oral hygiene conditions are recommended. In urban and rural areas the sewerage line should be constructed to arrest leaching of nitrate. Going for salt tolerant plants like cheak pea, mustard etc where water levels are deep and in shallow water table areas (Category-1 and 5), where EC is high, the rice varieties like CSR-27, CSR-23, CSR-13 and CSR-10 are recommended in Category-2 and 6.

6.2 EXPECTED RESULTS AND OUT COME

With the above interventions costing Rs 486.45 crores (excluding the cost involved in Mission Kaktiya and Mission Bhagiratha), the likely benefit would be the net saving of 173 MCM of ground water. This will bring down the stage of ground water development by 15 % (from 64% to 49 %).

Acknowledgment

The authors thank Shri K.B. Biswas, Chairman, and Sri. D. Saha, Member (SAM), Sri. K.C.Naik, Member (ED & MM), of the Central Ground Water Board, Govt. of India and S/Shri A.D.Rao, Regional Director, and Dr.P.N.Rao and GRC Reddy of CGWB, for encouragement. The authors acknowledge State Ground Water Department and Rural Water Supply department, Govt of Telangana for making available of field data. Authors also thank the Executive Engineer and his drilling crew of CGWB, for carrying out the exploration activity.

Table-6.2: VILLAGE WISE AQUIFER MANAGEMENT PLAN FOR PRIORITY-1.

S.No	District	Mandal	Category	Village	Area (Sq.Km)*	Ec> 3000	F > 1.5	Unsaturated Thickness (m)	Recharge Potential (MCM)	Utilizable Yield (MCM)	No. Of Cd	No. Of Mpt	Total Cost Cd (Lakhs)	Total Cost Mpts (Lakhs)	Total Cost (Lakhs)
1	Nalgonda	Alair	3	Bahadurpet	3.57	1500	3	10	0.4	0.03	1	1	5	10	15
2	Nalgonda	Alair	3	Manthapuri	4.94	1500	3	10	0.5	0.04	1	1	5	10	15
3	Nalgonda	Alair	6	Srinivasa Puram	1.38	3000	5	4	0.1	0.01	0	0	0	0	0
4	Nalgonda	Alair	5	Tangutoor	10.27	3000	3	4	0.5	0.09	2	2	10	20	30
5	Nalgonda	Anumula	4	Kummarikunta Kalva	1.89	1500	3	2	0.0	0.02	0	0	0	0	0
6	Nalgonda	Atmakur (S)	5	Bopparam	7.09	3000	5	9	0.7	0.04	1	1	5	10	15
7	Nalgonda	Atmakur (S)	5	Dacharam	4.02	3000	3	5	0.2	0.02	0	0	0	0	0
8	Nalgonda	Atmakur (S)	3	Gattikal	5.18	1500	3	4	0.2	0.03	1	1	5	10	15
9	Nalgonda	Atmakur (S)	1	Isthalapur	3.57	3000	1.5	3	0.1	0.02	0	0	0	0	0
10	Nalgonda	Atmakur (S)	3	Kandagatla	25.54	1500	3	5	1.3	0.13	3	3	15	30	45
11	Nalgonda	Atmakur (S)	3	Maktha Kotha Gudem	6.51	1500	3	9	0.6	0.03	1	1	5	10	15
12	Nalgonda	Atmakur (S)	3	Midthan Palle	0.96	1500	3	10	0.1	0.00	0	0	0	0	0
13	Nalgonda	Atmakur (S)	2	Narayanappa Guda	1.8	6000	1.5	2	0.0	0.01	0	0	0	0	0
14	Nalgonda	Atmakur (S)	1	Naseempet	4.99	3000	1.5	3	0.2	0.03	0	0	0	0	0
15	Nalgonda	Atmakur (S)	5	Setti Gudem	5.23	3000	3	6	0.3	0.03	1	1	5	10	15
16	Nalgonda	Chandur	5	Angadipeta	14.13	3000	5	18	2.8	0.09	2	2	10	20	30
17	Nalgonda	Chandur	3	Bangarigadda	10.52	1500	5	19	2.2	0.07	1	1	5	10	15
18	Nalgonda	Chandur	3	Gundrepalle	11.97	1500	5	16	2.1	0.08	1	1	5	10	15
19	Nalgonda	Chandur	5	Idikuda	13.54	3000	5	19	2.8	0.09	2	2	10	20	30
20	Nalgonda	Chandur	3	Thummalapalle	10.11	1500	5	17	1.9	0.06	1	1	5	10	15
21	Nalgonda	Chivvemla	2	Tuljarao Pet	1.62	3000	1.5	2	0.0	0.01	0	0	0	0	0
22	Nalgonda	Dameracherla	8	Narsapur	7.75	1500	1.5	3	0.3	0.05	1	1	5	10	15
23	Nalgonda	Dameracherla	8	Thalla Veerappa Gudem	5.73	1500	1.5	5	0.3	0.03	1	1	5	10	15
24	Nalgonda	Gundala	3	Ambala	8.83	1500	3	11	1.1	0.08	2	2	10	20	30
25	Nalgonda	Gundala	1	Masan Palle	3.96	6000	1.5	5	0.2	0.04	1	1	5	10	15
26	Nalgonda	Gundala	3	Palle Pahad	5.24	1500	3	12	0.7	0.05	1	1	5	10	15

27	Nalgonda	Gundala	3	Paru Palle	11.42	1500	3	11	1.4	0.11	2	2	10	20	30
28	Nalgonda	Gundala	3	Suddala	6.32	1500	3	7	0.5	0.06	1	1	5	10	15
29	Nalgonda	Gundala	1	Vangala	5.27	3000	1.5	5	0.3	0.05	1	1	5	10	15
30	Nalgonda	Huzurnagar	8	Amara Varam	6.18	1500	1.5	2	0.1	0.07	1	1	5	10	15
31	Nalgonda	Jaji Reddi Gudem	1	Devaraneni Kotha Palle	9.81	6000	1.5	4	0.4	0.04	1	1	5	10	15
32	Nalgonda	Kangal	3	Derveshpur	7.32	1500	3	2	0.2	0.02	0	0	0	0	0
33	Nalgonda	Kangal	3	Gouraram	9.39	1500	3	2	0.2	0.03	1	1	5	10	15
34	Nalgonda	Kangal	7	Jangamai Guda	1.96	1500	1.5	2	0.0	0.01	0	0	0	0	0
35	Nalgonda	Kangal	7	Mangena Palle	1.78	1500	1.5	2	0.0	0.01	0	0	0	0	0
36	Nalgonda	Kangal	4	Mularam	2.6	1500	3	1	0.0	0.01	0	0	0	0	0
37	Nalgonda	Kangal	3	Regatla	15.45	1500	3	13	2.2	0.05	1	1	5	10	15
38	Nalgonda	Kangal	4	Serilingotam	4.23	1500	3	1	0.0	0.01	0	0	0	0	0
39	Nalgonda	Kodad	2	Khana Puram	2.98	3000	1.5	1	0.0	0.05	0	0	0	0	0
40	Nalgonda	Kodad	2	Komarabanda	7.58	3000	1.5	0	0.0	0.13	0	0	0	0	0
41	Nalgonda	Kodad	2	Yerraram	9.36	3000	1.5	0	0.0	0.16	0	0	0	0	0
42	Nalgonda	M Turkapalle	5	Mannevari Turkapalle	5.18	3000	5	5	0.3	0.03	1	1	5	10	15
43	Nalgonda	M Turkapalle	5	Mulakala Palle	9.76	3000	5	6	0.6	0.06	1	1	5	10	15
44	Nalgonda	Marri Guda	3	Marriguda	6.51	1500	3	9	0.6	0.03	1	1	5	10	15
45	Nalgonda	Marri Guda	4	Tammad Palle	4.79	1500	3	-3	-0.1	0.02	0	0	0	0	0
46	Nalgonda	Marri Guda	7	Tirgandla Palle	8.08	1500	0	-3	-0.2	0.04	0	0	0	0	0
47	Nalgonda	Mattampalle	7	Allipuram	2.29	1500	1.5	1	0.0	0.01	0	0	0	0	0
48	Nalgonda	Mattampalle	3	Mattapalli	21.45	1500	3	6	1.4	0.12	2	2	10	20	30
49	Nalgonda	Mattampalle	3	Raghunadha Palem	15.26	1500	5	2	0.3	0.08	2	2	10	20	30
50	Nalgonda	Miryalaguda	2	Annaram	3.7	3000	1.5	0	0.0	0.03	0	0	0	0	0
51	Nalgonda	Miryalaguda	2	Ilapuram	3.8	6000	1.5	0	0.0	0.03	0	0	0	0	0
52	Nalgonda	Mothey	3	Bumkachrla	12.55	1500	3	4	0.6	0.06	1	1	5	10	15
53	Nalgonda	Mothey	3	Kudali	2.98	1500	3	8	0.3	0.01	0	0	0	0	0
54	Nalgonda	Mothey	4	Mothey	9.48	1500	3	-1	-0.1	0.04	0	0	0	0	0
55	Nalgonda	Mothey	8	Namavaram	22.41	1500	1.5	1	0.2	0.10	2	2	10	20	30
56	Nalgonda	Mothey	3	Singarneni Palle	1.78	1500	3	4	0.1	0.01	0	0	0	0	0
57	Nalgonda	Mothey	3	Urlugunda	16.77	1500	3	6	1.1	0.07	1	1	5	10	15

58	Nalgonda	Mothkur	1	Chinnapadishala	7.33	3000	1.5	5	0.4	0.13	2	2	10	20	30
59	Nalgonda	Mothkur	3	Konda Gadapa	10	1500	3	6	0.7	0.18	3	3	15	30	45
60	Nalgonda	Mothkur	1	Sadarshapur	8.59	3000	1.5	4	0.4	0.15	3	3	15	30	45
61	Nalgonda	Munagala	2	Ganapavaram	5.66	6000	1.5	0	0.0	0.05	0	0	0	0	0
62	Nalgonda	Munagala	1	Kalakova	10.14	3000	1.5	1	0.1	0.09	2	2	10	20	30
63	Nalgonda	Munagala	2	Kokkireni	8.28	3000	1.5	0	0.0	0.07	0	0	0	0	0
64	Nalgonda	Nadigudem	2	Chan Palle	4.1	3000	1.5	0	0.0	0.03	0	0	0	0	0
65	Nalgonda	Nadigudem	2	Eklashkhan Pet	3.76	3000	1.5	0	0.0	0.03	0	0	0	0	0
66	Nalgonda	Nadigudem	1	Ratna Varam	5.59	3000	1.5	1	0.1	0.04	1	1	5	10	15
67	Nalgonda	Nalgonda	8	Kanchanppalle	11.98	1500	1.5	2	0.3	0.07	1	1	5	10	15
68	Nalgonda	Nalgonda	8	Musham Palle	11.57	1500	1.5	3	0.4	0.06	1	1	5	10	15
69	Nalgonda	Nampalle	3	Brahmana Gouraram	2.18	1500	5	13	0.3	0.00	0	0	0	0	0
70	Nalgonda	Nampalle	3	Chamala Palli	4.49	1500	5	15	0.7	0.01	0	0	0	0	0
71	Nalgonda	Nampalle	3	Ganugu Palli	4.78	1500	5	14	0.7	0.01	0	0	0	0	0
72	Nalgonda	Nampalle	3	Hydelapur	1.6	1500	5	16	0.3	0.00	0	0	0	0	0
73	Nalgonda	Nampalle	3	Kundella Tirumalagiri	2.35	1500	5	16	0.4	0.00	0	0	0	0	0
74	Nalgonda	Nampalle	3	Mallapraj Palli	2.65	1500	3	12	0.3	0.00	0	0	0	0	0
75	Nalgonda	Nampalle	3	Tungapathi Gouraram	9.43	1500	3	11	1.1	0.02	0	0	0	0	0
76	Nalgonda	Nered Cherla	3	Dirsencherla	29.66	1500	3	2	0.7	0.39	7	7	35	70	105
77	Nalgonda	Nidamanur	5	Marpaka	14.73	3000	3	1	0.2	0.10	2	2	10	20	30
78	Nalgonda	Nidamanur	1	Mupparam	14.44	3000	1.5	1	0.2	0.10	2	2	10	20	30
79	Nalgonda	Nuthankal	8	Bhikumalla	4.74	1500	1.5	12	0.6	0.06	1	1	5	10	15

80	Nalgonda	Nuthankal	8	Dirisana Palle	2.82	1500	1.5	14	0.4	0.03	1	1	5	10	15
81	Nalgonda	Nuthankal	3	Gundla Singaram	2.66	1500	3	4	0.1	0.03	1	1	5	10	15
82	Nalgonda	Nuthankal	5	Lingam Palle	4.29	3000	3	12	0.6	0.05	1	1	5	10	15
83	Nalgonda	Nuthankal	8	Mamindla Madava	4.88	1500	1.5	13	0.7	0.06	1	1	5	10	15
84	Nalgonda	Nuthankal	5	Mediguda	0.5	3000	5	10	0.1	0.01	0	0	0	0	0
85	Nalgonda	Nuthankal	4	Mujahidpuram	6	1500	3	10	0.0	0.07	0	0	0	0	0
86	Nalgonda	Nuthankal	3	Venke Palle	6.32	1500	3	6	0.4	0.08	1	1	5	10	15
87	Nalgonda	Nuthankal	8	Yerra Pahad	2.88	1500	1.5	14	0.4	0.04	1	1	5	10	15
88	Nalgonda	Penpahad	1	Mohammadapuram	5.71	3000	1.5	1	0.1	0.05	1	1	5	10	15
89	Nalgonda	Penpahad	8	Penpahad	12.25	1500	1.5	1	0.1	0.10	2	2	10	20	30
90	Nalgonda	Rajapet	5	Basanthapur	5.22	3000	3	12	0.7	0.04	1	1	5	10	15
91	Nalgonda	Rajapet	5	Burugu Palle	4.02	3000	3	6	0.3	0.03	1	1	5	10	15
92	Nalgonda	Rajapet	5	Challur	4.85	3000	3	13	0.7	0.04	1	1	5	10	15
93	Nalgonda	Rajapet	6	Lakshmakka Palle	3.57	3000	3	1	0.0	0.03	0	0	0	0	0
94	Nalgonda	Rajapet	1	Raghunathpur	1.47	3000	1.5	15	0.2	0.01	0	0	0	0	0
95	Nalgonda	Rajapet	5	Rajapet	7.98	3000	3	8	0.7	0.06	1	1	5	10	15
96	Nalgonda	Rajapet	5	Renikunta	6.51	3000	3	8	0.6	0.05	1	1	5	10	15
97	Nalgonda	Suryapet	2	Bechiragdacharam	4	6000	1.5	-1	0.0	0.07	0	0	0	0	0
98	Nalgonda	Suryapet	7	Circle Pet (Ui)	1.6	1500	1.5	0	0.0	0.03	0	0	0	0	0

99	Nalgonda	Suryapet	2	Imampet	11.34	3000	1.5	0	0.0	0.21	0	0	0	0	0
100	Nalgonda	Suryapet	2	Kasarabad	9.64	3000	1.5	0	0.0	0.18	0	0	0	0	0
101	Nalgonda	Suryapet	2	Kesaram	9.07	3000	1.5	-1	-0.1	0.17	0	0	0	0	0
102	Nalgonda	Suryapet	2	Pinnai Palem	5.65	3000	1.5	0	0.0	0.10	0	0	0	0	0
103	Nalgonda	Suryapet	3	Ramachandra Puram	5.99	1500	3	2	0.1	0.11	2	2	10	20	30
104	Nalgonda	Suryapet	3	Ramavaram	7.35	1500	3	1	0.1	0.13	3	3	15	30	45
105	Nalgonda	Suryapet	2	Tekumatla	4.5	6000	1.5	0	0.0	0.08	0	0	0	0	0
106	Nalgonda	Suryapet	7	Thalla Khammampadu	8.98	1500	1.5	-1	-0.1	0.16	0	0	0	0	0
107	Nalgonda	Suryapet	3	Yerkaram	17.71	1500	3	3	0.6	0.32	6	6	30	60	90
108	Nalgonda	Thirumalagiri	1	Anantharam	4.06	6000	1.5	4	0.2	0.03	1	1	5	10	15
109	Nalgonda	Thirumalagiri	1	Mali Puram	8.01	6000	1.5	3	0.3	0.06	1	1	5	10	15
110	Nalgonda	Thripuraram	2	Narlakantiguda	1.54	6000	1.5	0	0.0	0.02	0	0	0	0	0
111	Nalgonda	Thunga Thurthi	1	Ganugubanda	5.67	6000	1.5	1	0.1	0.07	1	1	5	10	15
112	Nalgonda	Thunga Thurthi	1	Kunta Palle	2.81	6000	1.5	4	0.1	0.03	1	1	5	10	15
113	Nalgonda	Thunga Thurthi	1	Ramachandrapur	1.98	6000	1.5	3	0.1	0.02	0	0	0	0	0
114	Nalgonda	Vemulapalle	6	Annapareddiguda	3.12	3000	3	0	0.0	0.08	0	0	0	0	0
115	Nalgonda	Vemulapalle	1	Buggabari Guda	4.37	3000	1.	3	0.1	0.11	2	2	10	20	30

							5								
116	Nalgonda	Vemulapalle	6	Itikyala	3.78	3000	3	0	0.0	0.10	0	0	0	0	0
117	Nalgonda	Yadagirigutta	5	Sadu Velle	7	3000	3	14	1.1	0.07	1	1	5	10	15
				Total	**816.93**	**300000**	**302**	**629**	**46.6**	**7.25**	**100**	**100**	**500**	**1000**	**1500**

*Actual area falling in study area (not the total area of village).

Table-6.3: VILLAGE WISE AQUIFER MANAGEMENT PLAN FOR PRIORITY-2.

S.No	District	Mandal	Village	Category	Area (Sq.km)	EC> 3000	F > 1.5	Unsaturated thickness (m)	Recharge potential (MCM)	Utilizable yield (MCM)	No. of CDS	No. of MPTS	Total cost CD (Lakhs)	Total cost MPTS (Lakhs)	Total Cost of CDS & MPTS (Lakhs)
1	Nalgonda	Alair	Alair	3	29.42	1500	3	10	3.2	0.26	5	5	25	50	75
2	Nalgonda	Alair	Amman Bole	3	11.2	1500	3	4	0.5	0.1	2	2	10	20	30
3	Nalgonda	Alair	Dilawarpur	3	4.78	1500	3	7	0.4	0.04	1	1	5	10	15
4	Nalgonda	Alair	Golankonda	5	17.35	3000	3	4	0.8	0.15	3	3	15	30	45
5	Nalgonda	Alair	Ikkurthi	3	9.93	1500	3	9	1	0.09	2	2	10	20	30
6	Nalgonda	Alair	Kolanupaka	3	42.19	1500	5	4	1.9	0.37	7	7	35	70	105
7	Nalgonda	Alair	Kollur	5	23.84	3000	3	6	1.6	0.21	4	4	20	40	60

S.No	District	Mandal	Village	Category	Area (Sq.km)	EC> 3000	F > 1.5	Unsaturated thickness (m)	Recharge potential (MCM)	Utilizable yield (MCM)	No. of CDS	No. of MPTS	otal cost CD (Lakhs)	Total cost MPTS (Lakhs)	Total Cost of CDS & MPTS (Lakhs)
8	Nalgonda	Alair	Matoor	3	15.18	1500	3	13	2.2	0.13	3	3	15	30	45
9	Nalgonda	Alair	Patelguda	5	8.35	3000	5	4	0.4	0.07	1	1	5	10	15
10	Nalgonda	Alair	Sharajpet	5	15.51	3000	3	4	0.7	0.14	3	3	15	30	45
11	Nalgonda	Anumula	Ambatpalli	3	6.18	1500	3	1	0.1	0.06	1	1	5	10	15
12	Nalgonda	Anumula	Ibrahim Peta	3	15.32	1500	3	1	0.2	0.15	3	3	15	30	45
13	Nalgonda	Anumula	Kupaspalli	3	4.7	1500	3	1	0.1	0.05	1	1	5	10	15
14	Nalgonda	Anumula	Marepalli	3	13.69	1500	3	2	0.3	0.13	3	3	15	30	45
15	Nalgonda	Anumula	Narayana Puram	4	2.19	1500	3	2	0	0.02	0	0	0	0	0
16	Nalgonda	Anumula	Palem	3	4.75	1500	3	1	0.1	0.05	1	1	5	10	15
17	Nalgonda	Anumula	Pulimamidi	3	11.28	1500	3	1	0.1	0.11	2	2	10	20	30
18	Nalgonda	Anumula	Ramadugu	3	19.28	1500	3	1	0.2	0.19	4	4	20	40	60
19	Nalgonda	Anumula	Sreenadhapur	3	14.45	1500	3	1	0.2	0.14	3	3	15	30	45
20	Nalgonda	Atmakur (S)	Aipur	5	28.64	3000	5	10	3	0.15	3	3	15	30	45
21	Nalgonda	Atmakur (S)	Atmakur	5	26.41	3000	5	7	2	0.14	3	3	15	30	45
22	Nalgonda	Atmakur (S)	Enubamla	3	7.3	1500	3	5	0.4	0.04	1	1	5	10	15
23	Nalgonda	Atmakur (S)	Gollaguda	3	1.76	1500	3	5	0.1	0.01	0	0	0	0	0
24	Nalgonda	Atmakur (S)	Kota Pahad	1	9.33	6000	1.5	2	0.2	0.05	1	1	5	10	15
25	Nalgonda	Atmakur (S)	Mukkudeu Devi Palle	5	9.73	3000	3	3	0.3	0.05	1	1	5	10	15

S.No	District	Mandal	Village	Category	Area (Sq.km)	EC> 3000	F > 1.5	Unsaturated thickness (m)	Recharge potential (MCM)	Utilizable yield (MCM)	No. of CDS	No. of MPTS	otal cost CD (Lakhs)	Total cost MPTS (Lakhs)	Total Cost of CDS & MPTS (Lakhs)
26	Nalgonda	Atmakur (S)	Nammikal	8	29.72	1500	1.5	4	1.3	0.15	3	3	15	30	45
27	Nalgonda	Atmakur (S)	Patharla Pahad	5	15.14	3000	3	4	0.6	0.08	1	1	5	10	15
28	Nalgonda	Atmakur (S)	Thummala Penpahad	1	19.24	6000	1.5	2	0.4	0.1	2	2	10	20	30
29	Nalgonda	Atmakur (S)	Venkatapur	5	1.44	3000	5	6	0.1	0.01	0	0	0	0	0
30	Nalgonda	Atmakur (M)	Chada	8	46.97	1500	1.5	8	4.1	0.47	9	9	45	90	135
31	Nalgonda	Atmakur (M)	Chamapur	3	2.53	1500	3	13	0.4	0.03	0	0	0	0	0
32	Nalgonda	Atmakur (M)	Chande Palle	8	8.55	1500	1.5	4	0.4	0.09	2	2	10	20	30
33	Nalgonda	Atmakur (M)	Dursagani Palle	8	2.91	1500	1.5	4	0.1	0.03	1	1	5	10	15
34	Nalgonda	Atmakur (M)	Kalwapalle	8	4.51	1500	1.5	11	0.5	0.05	1	1	5	10	15
35	Nalgonda	Atmakur (M)	Khaprai Palle	3	14.87	1500	3	15	2.5	0.15	3	3	15	30	45
36	Nalgonda	Atmakur (M)	Koratikal	8	12.94	1500	1.5	18	2.6	0.13	2	2	10	20	30
37	Nalgonda	Atmakur (M)	Moripirala	8	9.99	1500	1.5	15	1.6	0.1	2	2	10	20	30
38	Nalgonda	Atmakur (M)	Rahimkhanpet	3	15.63	1500	3	17	2.9	0.16	3	3	15	30	45
39	Nalgonda	Atmakur (M)	Raipalle	8	3.75	1500	1.5	12	0.5	0.04	1	1	5	10	15
40	Nalgonda	Atmakur (M)	Sarvepalle	8	9.29	1500	1.5	12	1.2	0.09	2	2	10	20	30

S.No	District	Mandal	Village	Category	Area (Sq.km)	EC> 3000	F > 1.5	Unsaturated thickness (m)	Recharge potential (MCM)	Utilizable yield (MCM)	No. of CDS	No. of MPTS	Total cost CD (Lakhs)	Total cost MPTS (Lakhs)	Total Cost of CDS & MPTS (Lakhs)
41	Nalgonda	Atmakur (M)	Singaram	8	6.29	1500	1.5	8	0.6	0.06	1	1	5	10	15
42	Nalgonda	Chandur	Chandur	3	11.08	1500	5	17	2.1	0.07	1	1	5	10	15
43	Nalgonda	Chandur	Donipamula	5	13.21	3000	8	19	2.8	0.08	2	2	10	20	30
44	Nalgonda	Chandur	Kasthala	3	15.63	1500	5	14	2.4	0.1	2	2	10	20	30
45	Nalgonda	Chandur	Nermata	5	14.31	3000	8	19	3	0.09	2	2	10	20	30
46	Nalgonda	Chandur	Sirdepalle	5	7.25	3000	3	17	1.4	0.05	1	1	5	10	15
47	Nalgonda	Chandur	Udathala Palle	3	8.05	1500	5	15	1.3	0.05	1	1	5	10	15
48	Nalgonda	Chilkur	Betha Vole	2	51.06	3000	1.5	0	0	0.84	0	0	0	0	0
49	Nalgonda	Chilkur	Chilkur	6	44.5	3000	3	-1	-0.5	0.73	0	0	0	0	0
50	Nalgonda	Chilkur	Kondapuram	6	8.4	3000	3	0	0	0.14	0	0	0	0	0
51	Nalgonda	Chilkur	Paleannaram	6	10.9	3000	3	0	0	0.18	0	0	0	0	0
52	Nalgonda	Chintha Palle	Malle Palli P.K.Kurthi	3	6.62	1500	3	9	0.7	0.02	0	0	0	0	0
53	Nalgonda	Chinthapalli	Takatlapalli	4	0	0	3	-3	0	0	0	0	0	0	0
54	Nalgonda	Chivvemla	Ailapur	4	7.41	1500	3	0	0	0.05	0	0	0	0	0
55	Nalgonda	Chivvemla	Beebiguda	7	6.21	1500	1.5	0	0	0.04	0	0	0	0	0
56	Nalgonda	Chivvemla	Chendupatla	1	18.37	3000	1.5	1	0.2	0.12	2	2	10	20	30
57	Nalgonda	Chivvemla	Chivvemla	8	16.83	1500	1.5	2	0.4	0.11	2	2	10	20	30
58	Nalgonda	Chivvemla	Duraj Palle	1	10.25	3000	1.5	1	0.1	0.07	1	1	5	10	15
59	Nalgonda	Chivvemla	Gayamvari Guda	3	5.75	1500	3	1	0.1	0.04	1	1	5	10	15
60	Nalgonda	Chivvemla	Gumpula	1	5.71	3000	1.5	2	0.1	0.04	1	1	5	10	15

S.No	District	Mandal	Village	Category	Area (Sq.km)	EC> 3000	F > 1.5	Unsaturated thickness (m)	Recharge potential (MCM)	Utilizable yield (MCM)	No. of CDS	No. of MPTS	Total cost CD (Lakhs)	Total cost MPTS (Lakhs)	Total Cost of CDS & MPTS (Lakhs)
61	Nalgonda	Chivvemla	Gunjaluru	8	11.31	1500	1.5	2	0.2	0.08	1	1	5	10	15
62	Nalgonda	Chivvemla	Kudakuda	7	10.17	1500	1.5	-1	-0.1	0.07	0	0	0	0	0
63	Nalgonda	Chivvemla	Thimma Puram	1	8.54	3000	1.5	2	0.2	0.06	1	1	5	10	15
64	Nalgonda	Chivvemla	Thirumalagiri	8	3.25	1500	1.5	2	0.1	0.02	0	0	0	0	0
65	Nalgonda	Chivvemla	Undrugonda	1	11.62	3000	1.5	2	0.3	0.08	2	2	10	20	30
66	Nalgonda	Chivvemla	Vallabhapur	1	6.14	3000	1.5	2	0.1	0.04	1	1	5	10	15
67	Nalgonda	Chivvemla	Vattikhammam Pahad	8	25.49	1500	1.5	3	0.8	0.17	3	3	15	30	45
68	Nalgonda	Dameracherla	Adavi Devula Palli	8	42.09	1500	1.5	1	0.5	0.25	5	5	25	50	75
69	Nalgonda	Dameracherla	Baleen Palli	8	9.4	1500	1.5	2	0.2	0.06	1	1	5	10	15
70	Nalgonda	Dameracherla	Chityala	7	0	1500	1.5	1	0	0	0	0	0	0	0
71	Nalgonda	Dameracherla	Dameracherla	8	46.49	1500	1.5	1	0.5	0.28	5	5	25	50	75
72	Nalgonda	Dameracherla	Dilawarpur	2	16.79	3000	1.5	0	0	0.1	0	0	0	0	0
73	Nalgonda	Dameracherla	Irkigudem	8	7.76	1500	1.5	5	0.4	0.05	1	1	5	10	15
74	Nalgonda	Dameracherla	Kalle Pally	8	18.94	1500	1.5	1	0.2	0.11	2	2	10	20	30
75	Nalgonda	Dameracherla	Kesawapur	8	19.64	1500	1.5	1	0.2	0.12	2	2	10	20	30
76	Nalgonda	Dameracherla	Kondrapolu	1	19.86	3000	1.5	1	0.2	0.12	2	2	10	20	30

S.No	District	Mandal	Village	Category	Area (Sq.km)	EC> 3000	F > 1.5	Unsaturated thickness (m)	Recharge potential (MCM)	Utilizable yield (MCM)	No. of CDS	No. of MPTS	otal cost CD (Lakhs)	Total cost MPTS (Lakhs)	Total Cost of CDS & MPTS (Lakhs)
77	Nalgonda	Dameracherla	Kotha Palli	8	9.63	1500	1.5	5	0.5	0.06	1	1	5	10	15
78	Nalgonda	Dameracherla	Mudimanikam	8	18.89	1500	1.5	3	0.6	0.11	2	2	10	20	30
79	Nalgonda	Dameracherla	Mulka Charla	8	22.39	1500	1.5	2	0.5	0.13	3	3	15	30	45
80	Nalgonda	Dameracherla	Timmapur	8	16.01	1500	1.5	2	0.4	0.1	2	2	10	20	30
81	Nalgonda	Dameracherla	Ulshaya Palem	8	12.61	1500	1.5	1	0.1	0.08	1	1	5	10	15
82	Nalgonda	Dameracherla	Vada Palli	8	29.64	1500	1.5	4	1.3	0.18	3	3	15	30	45
83	Nalgonda	Dameracherla	Veerla Palem	8	25.26	1500	1.5	3	0.8	0.15	3	3	15	30	45
84	Nalgonda	Garide Palle	Gaddi Palli	1	11.48	3000	1.5	1	0.1	0.17	3	3	15	30	45
85	Nalgonda	Garide Palle	Ganuga Banda	3	11.92	1500	3	1	0.1	0.17	3	3	15	30	45
86	Nalgonda	Garide Palle	Garide Palli	3	32.75	1500	3	1	0.4	0.48	9	9	45	90	135
87	Nalgonda	Garide Palle	Kalmala Chervu	7	24.8	1500	1.5	-1	-0.3	0.36	0	0	0	0	0
88	Nalgonda	Garide Palle	Kaluva Palle	8	7.33	1500	1.5	1	0.1	0.11	2	2	10	20	30
89	Nalgonda	Garide Palle	Kuthubsha Puram	1	13.21	3000	1.5	1	0.1	0.19	4	4	20	40	60
90	Nalgonda	Garide Palle	Ponugodu	1	34.8	3000	1.5	1	0.4	0.51	10	10	50	100	150
91	Nalgonda	Garide Palle	Raini Gudem	8	13.88	1500	1.5	1	0.2	0.2	4	4	20	40	60
92	Nalgonda	Garide Palle	Sarvaram	8	12.87	1500	1.5	2	0.3	0.19	4	4	20	40	60

S.No	District	Mandal	Village	Category	Area (Sq.km)	EC> 3000	F > 1.5	Unsaturated thickness (m)	Recharge potential (MCM)	Utilizable yield (MCM)	No. of CDS	No. of MPTS	Total cost CD (Lakhs)	Total cost MPTS (Lakhs)	Total Cost of CDS & MPTS (Lakhs)
93	Nalgonda	Garide Palle	Talla Makapuram	7	7.58	1500	1.5	0	0	0.11	0	0	0	0	0
94	Nalgonda	Garide Palle	Velidanda	2	19.92	3000	1.5	0	0	0.29	0	0	0	0	0
95	Nalgonda	Gundala	Anantaram	1	15.54	6000	1.5	5	0.9	0.15	3	3	15	30	45
96	Nalgonda	Gundala	Brahman Palle	1	9.5	3000	1.5	6	0.6	0.09	2	2	10	20	30
97	Nalgonda	Gundala	Gangapur	1	7.42	6000	1.5	5	0.4	0.07	1	1	5	10	15
98	Nalgonda	Gundala	Gundala	1	25.35	3000	1.5	4	1.1	0.24	5	5	25	50	75
99	Nalgonda	Gundala	Kommaipally	3	6.37	1500	3	4	0.3	0.06	1	1	5	10	15
100	Nalgonda	Gundala	Marpadaga	1	10.01	6000	1.5	5	0.6	0.09	2	2	10	20	30
101	Nalgonda	Gundala	Pedda Padishala	1	12.55	3000	1.5	4	0.6	0.12	2	2	10	20	30
102	Nalgonda	Gundala	Ramaram	1	11.55	3000	1.5	5	0.6	0.11	2	2	10	20	30
103	Nalgonda	Gundala	Seetarampur	1	12.06	6000	1.5	5	0.7	0.11	2	2	10	20	30
104	Nalgonda	Gundala	Teryala	3	14.99	1500	3	8	1.3	0.14	3	3	15	30	45
105	Nalgonda	Gundala	Turkala Shapur	1	6.97	3000	1.5	4	0.3	0.07	1	1	5	10	15
106	Nalgonda	Gundala	Velmajala	1	13.49	6000	1.5	5	0.7	0.13	2	2	10	20	30
107	Nalgonda	Gurrampode	Kondapur	3	1.47	1500	5	12	0.2	0.01	0	0	0	0	0
108	Nalgonda	Gurrampode	Mulkala Palli	3	4.85	1500	5	13	0.7	0.03	1	1	5	10	15
109	Nalgonda	Gurrampode	Pochampalli	3	9.68	1500	5	14	1.5	0.07	1	1	5	10	15
110	Nalgonda	Huzurnagar	Burugadda	8	16.18	1500	1.5	1	0.2	0.18	4	4	20	40	60
111	Rangareddy	Huzurnagar	Huzur Nagar	7	42.13	1500	1.5	0	0	0.48	0	0	0	0	0

S.No	District	Mandal	Village	Category	Area (Sq.km)	EC> 3000	F > 1.5	Unsaturated thickness (m)	Recharge potential (MCM)	Utilizable yield (MCM)	No. of CDS	No. of MPTS	Total cost CD (Lakhs)	Total cost MPTS (Lakhs)	Total Cost of CDS & MPTS (Lakhs)
112	Rangareddy	Huzurnagar	Lakka Varam	8	8.39	1500	1.5	2	0.2	0.1	2	2	10	20	30
113	Rangareddy	Huzurnagar	Lingagiri	8	23.35	1500	1.5	3	0.8	0.27	5	5	25	50	75
114	Rangareddy	Huzurnagar	Machavaram	5	6.21	3000	3	1	0.1	0.07	1	1	5	10	15
115	Rangareddy	Huzurnagar	Yapala Singaram	7	8.03	1500	1.5	0	0	0.09	0	0	0	0	0
116	Rangareddy	Jaji Reddi Gudem	Adivemula	3	14.57	1500	3	5	0.8	0.06	1	1	5	10	15
117	Rangareddy	Jaji Reddi Gudem	Bollam Palle	1	4.43	3000	1.5	4	0.2	0.02	0	0	0	0	0
118	Nalgonda	Jaji Reddi Gudem	Jaji Reddi Gudem	3	35.85	1500	3	4	1.6	0.16	3	3	15	30	45
119	Nalgonda	Jaji Reddi Gudem	Kasarla Pahad	3	9.72	1500	3	5	0.5	0.04	1	1	5	10	15
120	Nalgonda	Jaji Reddi Gudem	Kesaram	1	2.69	6000	1.5	4	0.1	0.01	0	0	0	0	0
121	Nalgonda	Jaji Reddi Gudem	Kodur	3	13.91	1500	3	8	1.2	0.06	1	1	5	10	15
122	Nalgonda	Jaji Reddi Gudem	Kommala	3	16.22	1500	3	7	1.2	0.07	1	1	5	10	15
123	Nalgonda	Jaji Reddi Gudem	Kunchamarthi	3	4.03	1500	3	4	0.2	0.02	0	0	0	0	0
124	Nalgonda	Jaji Reddi Gudem	Nagaram	1	9.85	6000	1.5	4	0.4	0.04	1	1	5	10	15
125	Nalgonda	Jaji Reddi Gudem	Parsai Palle	1	6.92	6000	1.5	4	0.3	0.03	1	1	5	10	15
126	Nalgonda	Jaji Reddi Gudem	Thimmapuram	3	14.19	1500	3	4	0.6	0.06	1	1	5	10	15
127	Nalgonda	Jaji Reddi Gudem	Uyyalawada	3	5.01	1500	3	3	0.2	0.02	0	0	0	0	0

S.No	District	Mandal	Village	Category	Area (Sq.km)	EC> 3000	F > 1.5	Unsaturated thickness (m)	Recharge potential (MCM)	Utilizable yield (MCM)	No. of CDS	No. of MPTS	Total cost CD (Lakhs)	Total cost MPTS (Lakhs)	Total Cost of CDS & MPTS (Lakhs)
128	Nalgonda	Jaji Reddi Gudem	Velpucherla	3	5.38	1500	3	5	0.3	0.02	0	0	0	0	0
129	Nalgonda	Jaji Reddi Gudem	Wardhamanu Kota	1	42.03	7000	1.5	4	1.8	0.18	4	4	20	40	60
130	Nalgonda	Kangal	Boinapalle	3	6.48	1500	3	6	0.4	0.02	0	0	0	0	0
131	Nalgonda	Kangal	Bommepalle	3	4.34	1500	3	2	0.1	0.01	0	0	0	0	0
132	Nalgonda	Kangal	Budemerla Palle	3	5.57	1500	3	5	0.3	0.02	0	0	0	0	0
133	Nalgonda	Kangal	Chennaram	3	5.87	1500	3	2	0.1	0.02	0	0	0	0	0
134	Rangareddy	Kangal	Cherla Gouraram	3	10.61	1500	3	1	0.1	0.03	1	1	5	10	15
135	Rangareddy	Kangal	Chetla Chennaram	3	11.44	1500	3	1	0.1	0.03	1	1	5	10	15
136	Rangareddy	Kangal	Chinna Madharam	3	11.45	1500	3	2	0.3	0.03	1	1	5	10	15
137	Nalgonda	Kangal	Dorepalle	3	9.44	1500	3	5	0.5	0.03	1	1	5	10	15
138	Nalgonda	Kangal	Gaddamvari Yadavally	3	24.16	1500	3	9	2.3	0.07	1	1	5	10	15
139	Nalgonda	Kangal	Iruganti Palle	8	4.86	1500	1.5	2	0.1	0.01	0	0	0	0	0
140	Nalgonda	Kangal	Kangal	3	36.28	1500	3	2	0.8	0.11	2	2	10	20	30
141	Nalgonda	Kangal	Narsimhapur	4	4.54	1500	3	1	0	0.01	0	0	0	0	0
142	Nalgonda	Kangal	Pagidi Marri	4	12.98	1500	3	6	0	0.04	0	0	0	0	0
143	Nalgonda	Kangal	Ponugode	3	12.4	1500	5	13	1.7	0.04	1	1	5	10	15
144	Nalgonda	Kangal	Shahabdulla Pur	3	3.54	1500	3	10	0.4	0.01	0	0	0	0	0

S.No	District	Mandal	Village	Category	Area (Sq.km)	EC> 3000	F > 1.5	Unsaturated thickness (m)	Recharge potential (MCM)	Utilizable yield (MCM)	No. of CDS	No. of MPTS	Total cost CD (Lakhs)	Total cost MPTS (Lakhs)	Total Cost of CDS & MPTS (Lakhs)
145	Nalgonda	Kangal	Thoragal	8	7.03	1500	1.5	1	0.1	0.02	0	0	0	0	0
146	Nalgonda	Kodad	Anantha Giri	2	40.37	3000	1.5	0	0	0.69	0	0	0	0	0
147	Nalgonda	Kodad	Chimiryala	1	24.4	3000	1.5	1	0.3	0.41	8	8	40	80	120
148	Nalgonda	Kodad	Dorakunta	1	9.92	3000	1.5	1	0.1	0.17	3	3	15	30	45
149	Nalgonda	Kodad	Ganapa Varam	2	11.96	6000	1.5	0	0	0.2	0	0	0	0	0
150	Nalgonda	Kodad	Gondriyala	1	16.91	3000	1.5	1	0.2	0.29	5	5	25	50	75
151	Nalgonda	Kodad	Gudibanda	1	10.21	3000	1.5	1	0.1	0.17	3	3	15	30	45
152	Nalgonda	Kodad	Kapugal	1	20.25	3000	1.5	2	0.4	0.34	7	7	35	70	105
153	Rangareddy	Kodad	Kodad	2	41.44	3000	1.5	1	0.5	0.7	13	13	65	130	195
154	Rangareddy	Kodad	Kuchipudi	1	8.63	3000	1.5	2	0.2	0.15	3	3	15	30	45
155	Rangareddy	Kodad	Lakma Varam	2	2.75	3000	1.5	1	0	0.05	0	0	0	0	0
156	Rangareddy	Kodad	Redlakunta	1	7.12	3000	1.5	2	0.2	0.12	2	2	10	20	30
157	Nalgonda	Kodad	T.B.Palem	1	12.72	3000	1.5	1	0.1	0.22	4	4	20	40	60
158	Nalgonda	Kodad	Thogarrai	2	11.26	6000	1.5	-1	-0.1	0.19	0	0	0	0	0
159	Nalgonda	Kodad	Tiru Annaram	1	4.66	3000	1.5	1	0.1	0.08	2	2	10	20	30
160	Nalgonda	M Turkapalle	Dattai Palle	3	9.75	1500	5	8	0.9	0.06	1	1	5	10	15
161	Nalgonda	M Turkapalle	Gandamalla	5	24.38	3000	5	5	1.3	0.15	3	3	15	30	45
162	Nalgonda	M Turkapalle	Ibrahimpur	5	8.08	3000	5	7	0.6	0.05	1	1	5	10	15
163	Nalgonda	M Turkapalle	Komatikunta	4	0.22	1500	5	7	0	0	0	0	0	0	0

S.No	District	Mandal	Village	Category	Area (Sq.km)	EC> 3000	F > 1.5	Unsaturated thickness (m)	Recharge potential (MCM)	Utilizable yield (MCM)	No. of CDS	No. of MPTS	Total cost CD (Lakhs)	Total cost MPTS (Lakhs)	Total Cost of CDS & MPTS (Lakhs)
164	Nalgonda	M Turkapalle	Konapur	5	16.07	3000	5	5	0.9	0.1	2	2	10	20	30
165	Nalgonda	M Turkapalle	Srinivasapur	5	4.79	3000	5	1	0.1	0.03	1	1	5	10	15
166	Nalgonda	M Turkapalle	Tirumalapur	5	8.08	3000	5	1	0.1	0.05	1	1	5	10	15
167	Nalgonda	M Turkapalle	Vasala Marri	5	15.92	3000	5	3	0.5	0.1	2	2	10	20	30
168	Nalgonda	M Turkapalle	Veerareddi Palle	5	12.89	3000	5	2	0.3	0.08	2	2	10	20	30
169	Nalgonda	M Turkapalle	Velpupalle	3	9.78	1500	5	8	0.9	0.06	1	1	5	10	15
170	Nalgonda	M Turkapalle	Venkatapur	3	11.08	1500	5	7	0.9	0.07	1	1	5	10	15
171	Nalgonda	Marri Guda	Bhatla Palle	3	8.08	1500	3	9	0.8	0.04	1	1	5	10	15
172	Nalgonda	Marri Guda	Damera Bheeman Palle	3	24.38	1500	5	14	3.3	0.12	2	2	10	20	30
173	Nalgonda	Marri Guda	Indurthi	5	32.48	3000	8	15	5.4	0.16	3	3	15	30	45
174	Nalgonda	Marri Guda	Khudabaksh Palle	3	24.24	1500	5	13	3.2	0.12	2	2	10	20	30
175	Nalgonda	Marri Guda	Kondur	3	14.88	1500	3	9	1.5	0.07	1	1	5	10	15
176	Medak	Marri Guda	Lenkala Palle	5	8.34	3000	8	18	1.7	0.04	1	1	5	10	15
177	Medak	Marri Guda	Metichandapur	1	9.72	6000	8	15	1.5	0.05	1	1	5	10	15
178	Nalgonda	Marri Guda	Namapur	4	13.78	0	3	-3	-0.5	0.07	0	0	0	0	0
179	Nalgonda	Marri Guda	Sarampet	5	12.89	3000	8	14	2	0.06	1	1	5	10	15
180	Nalgonda	Marri Guda	Vatti Palle	3	16.07	1500	3	9	1.5	0.08	1	1	5	10	15

S.No	District	Mandal	Village	Category	Area (Sq.km)	EC> 3000	F > 1.5	Unsaturated thickness (m)	Recharge potential (MCM)	Utilizable yield (MCM)	No. of CDS	No. of MPTS	Total cost CD (Lakhs)	Total cost MPTS (Lakhs)	Total Cost of CDS & MPTS (Lakhs)
181	Nalgonda	Marri Guda	Venkepalle	3	12.27	1500	5	12	0.7	0.06	1	1	5	10	15
182	Nalgonda	Marri Guda	Yergandla Palle	3	20.76	1500	3	9	1.6	0.1	2	2	10	20	30
183	Nalgonda	Mattampalle	Channaya Palem	7	5.86	1500	1.5	0	0	0.03	0	0	0	0	0
184	Nalgonda	Mattampalle	Choutapalli	7	26.08	1500	1.5	0	0	0.14	0	0	0	0	0
185	Nalgonda	Mattampalle	Gundla Palli	3	14.45	1500	3	5	0.8	0.08	1	1	5	10	15
186	Nalgonda	Mattampalle	Mattam Palli	8	19.02	1500	1.5	1	0.2	0.1	2	2	10	20	30
187	Nalgonda	Mattampalle	Pedda Veedu	8	43.66	1500	1.5	1	0.5	0.24	4	4	20	40	60
188	Nalgonda	Mattampalle	Vardha Puram	8	9.25	1500	1.5	1	0.1	0.05	1	1	5	10	15
189	Nalgonda	Mattampalle	Yatavakilla	7	19.34	1500	1.5	0	0	0.1	0	0	0	0	0
190	Nalgonda	Mellacheruvu	Adlur	3	10.28	1500	3	5	0.6	0.13	3	3	15	30	45
191	Nalgonda	Mellachervu	Chinthala Palem	3	29.41	1500	3	4	1.3	0.38	7	7	35	70	105
192	Nalgonda	Mellachervu	Chintriyala	3	20.03	1500	5	8	1.8	0.26	5	5	25	50	75
193	Nalgonda	Mellachervu	Donda Padu	3	28.64	1500	3	5	1.6	0.37	7	7	35	70	105
194	Nalgonda	Mellachervu	Gudimalkapuram	4	3.02	1500	3	1	0	0.04	0	0	0	0	0
195	Nalgonda	Mellachervu	Kandibanda	2	22.56	3000	1.5	0	0	0.29	0	0	0	0	0
196	Nalgonda	Mellachervu	Mella Chervu	7	57.97	1500	1.5	0	0	0.75	0	0	0	0	0
197	Nalgonda	Mellachervu	Nemalipuri	3	13.77	1500	3	3	0.5	0.18	3	3	15	30	45

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198	Nalgonda	Mellachervu	Reballe	3	6.39	1500	3	6	0.4	0.08	2	2	10	20	30
199	Nalgonda	Mellachervu	Revuru	4	52.22	1500	3	0	0	0.68	0	0	0	0	0
200	Nalgonda	Mellachervu	Thammaram	3	22.41	1500	3	5	1.2	0.29	6	6	30	60	90
201	Nalgonda	Mellachervu	Vajine Palli	3	8.09	1500	3	4	0.4	0.11	2	2	10	20	30
202	Nalgonda	Mellachervu	Vellatur	5	27.86	3000	3	4	1.2	0.36	7	7	35	70	105
203	Nalgonda	Mellachervu	Yapala Madharam	8	21.31	1500	1.5	2	0.5	0.28	5	5	25	50	75
204	Nalgonda	Miryalaguda	Alagadapa	7	21.39	1500	1.5	0	0	0.17	0	0	0	0	0
205	Nalgonda	Miryalaguda	Chillapuram	2	5.52	6000	1.5	0	0	0.04	0	0	0	0	0
206	Nalgonda	Miryalaguda	Chintha Palli	8	15.39	1500	1.5	4	0.7	0.12	2	2	10	20	30
207	Nalgonda	Miryalaguda	Goguvanigudem	6	3.66	3000	3	0	0	0.03	0	0	0	0	0
208	Nalgonda	Miryalaguda	Gudur	8	10.43	1500	1.5	1	0.1	0.08	2	2	10	20	30
209	Nalgonda	Miryalaguda	Hydla Puram	8	3.64	1500	1.5	2	0.1	0.03	1	1	5	10	15
210	Nalgonda	Miryalaguda	Kalva Palli	3	6.83	1500	3	1	0.1	0.05	1	1	5	10	15
211	Nalgonda	Miryalaguda	Kista Puram	8	3.82	1500	1.5	2	0.1	0.03	1	1	5	10	15
212	Nalgonda	Miryalaguda	Kothaguda	7	7.4	1500	1.5	0	0	0.06	0	0	0	0	0
213	Nalgonda	Miryalaguda	Miryalaguda	8	21.9	1500	1.5	2	0.5	0.17	3	3	15	30	45
214	Nalgonda	Miryalaguda	Mulkal Kalva	8	5.1	1500	1.5	1	0.1	0.04	1	1	5	10	15
215	Nalgonda	Miryalaguda	Nandi Pahad	5	11.78	3000	3	1	0.1	0.09	2	2	10	20	30
216	Nalgonda	Miryalaguda	Narsimhulaguda	4	2.54	0	3	-3	-0.1	0.02	0	0	0	0	0

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217	Nalgonda	Miryalaguda	Rayan Palem	8	8.22	1500	1.5	1	0.1	0.06	1	1	5	10	15
218	Nalgonda	Miryalaguda	Rudraram	8	13.46	1500	1.5	1	0.1	0.1	2	2	10	20	30
219	Nalgonda	Miryalaguda	Thunga Pahad	1	24.69	6000	1.5	1	0.3	0.19	4	4	20	40	60
220	Nalgonda	Miryalaguda	Venkatadri Palem	2	7.43	3000	1.5	0	0	0.06	0	0	0	0	0
221	Nalgonda	Miryalaguda	Vootla Palli	4	13.75	1500	3	0	0	0.11	0	0	0	0	0
222	Nalgonda	Miryalaguda	Yadgarpalli	3	3.66	1500	3	2	0.1	0.03	1	1	5	10	15
223	Nalgonda	Miryalaguda	Zaptiveerappa Guda	2	8.7	3000	1.5	0	0	0.07	0	0	0	0	0
224	Nalgonda	Mothey	Annarigudem	3	7.92	1500	3	5	0.4	0.03	1	1	5	10	15
225	Nalgonda	Mothey	Gopalapuram	8	1.87	1500	1.5	4	0.1	0.01	0	0	0	0	0
226	Nalgonda	Mothey	Hussainbad	8	10.93	1500	1.5	1	0.1	0.05	1	1	5	10	15
227	Nalgonda	Mothey	Mamillagudem	3	8.98	1500	3	4	0.4	0.04	1	1	5	10	15
228	Nalgonda	Mothey	Raghavapur	7	8.87	1500	1.5	0	0	0.04	0	0	0	0	0
229	Nalgonda	Mothey	Ravi Pahad	5	12.53	3000	3	4	0.6	0.06	1	1	5	10	15
230	Nalgonda	Mothey	Sarvaram	3	8.21	1500	3	6	0.5	0.04	1	1	5	10	15
231	Nalgonda	Mothey	Sirikonda	1	30.16	3000	1.5	1	0.3	0.13	3	3	15	30	45
232	Nalgonda	Mothey	Thummala Palle	3	5.04	1500	3	3	0.2	0.02	0	0	0	0	0
233	Nalgonda	Mothey	Vibhalapur	3	14.68	1500	3	4	0.6	0.06	1	1	5	10	15
234	Nalgonda	Mothkur	Adda Gudur	1	26.4	6000	1.5	5	1.5	0.47	9	9	45	90	135

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235	Nalgonda	Mothkur	Chirra Gudur	1	5.08	6000	1.5	4	0.2	0.09	2	2	10	20	30
236	Nalgonda	Mothkur	Choulla Ramaram	1	9.76	3000	1.5	5	0.5	0.17	3	3	15	30	45
237	Nalgonda	Mothkur	Dharmaram	1	5.78	7000	1.5	5	0.3	0.1	2	2	10	20	30
238	Nalgonda	Mothkur	Janakipur	1	8.2	3000	1.5	5	0.5	0.15	3	3	15	30	45
239	Nalgonda	Mothkur	Kanchan Palle	8	10.85	1500	1.5	5	0.6	0.19	4	4	20	40	60
240	Nalgonda	Mothkur	Kotamarthi	1	17.66	6000	1.5	4	0.8	0.31	6	6	30	60	90
241	Nalgonda	Mothkur	Mothkur	3	34.18	1500	3	10	3.8	0.61	12	12	60	120	180
242	Nalgonda	Mothkur	Patimatla	3	7.75	1500	3	6	0.5	0.14	3	3	15	30	45
243	Nalgonda	Mothkur	Singaram (P)	1	22.86	7000	1.5	5	1.3	0.41	8	8	40	80	120
244	Nalgonda	Munagala	Akupamula	2	20.37	3000	1.5	0	0	0.18	0	0	0	0	0
245	Nalgonda	Munagala	Barakath Guda	1	11.37	6000	1.5	1	0.1	0.1	2	2	10	20	30
246	Nalgonda	Munagala	Madhavaram	8	6.21	1500	1.5	2	0.1	0.05	1	1	5	10	15
247	Nalgonda	Munagala	Munagala	2	20.79	6000	1.5	0	0	0.18	0	0	0	0	0
248	Nalgonda	Munagala	Nela Marri	1	15.55	3000	1.5	1	0.2	0.13	3	3	15	30	45
249	Nalgonda	Munagala	Repala	1	39.06	3000	1.5	1	0.4	0.34	6	6	30	60	90
250	Nalgonda	Munagala	Syedmujavarpet	8	6.67	1500	1.5	2	0.1	0.06	1	1	5	10	15
251	Nalgonda	Munagala	Tadvai	1	14.54	6000	1.5	1	0.2	0.13	2	2	10	20	30
252	Nalgonda	Munugode	Koratikal	5	23.7	3000	8	14	3.2	0.18	3	3	15	30	45
253	Nalgonda	Nadigudem	Brundavan Puram	1	13.21	3000	1.5	2	0.3	0.1	2	2	10	20	30

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254	Nalgonda	Nadigudem	Chakirala	1	10.04	3000	1.5	1	0.1	0.07	1	1	5	10	15
255	Nalgonda	Nadigudem	Kagitaramachandra Puram	3	7.47	1500	3	2	0.2	0.06	1	1	5	10	15
256	Nalgonda	Nadigudem	Karivirala	3	17.83	1500	3	2	0.4	0.13	3	3	15	30	45
257	Nalgonda	Nadigudem	Nadigudem	1	9.9	3000	1.5	2	0.2	0.07	1	1	5	10	15
258	Nalgonda	Nadigudem	Palaram	2	9.56	3000	1.5	0	0	0.07	0	0	0	0	0
259	Nalgonda	Nadigudem	Rama Puram	1	15.26	3000	1.5	1	0.2	0.11	2	2	10	20	30
260	Nalgonda	Nadigudem	Singavaram	1	9.47	3000	1.5	1	0.1	0.07	1	1	5	10	15
261	Nalgonda	Nadigudem	Siripuram	5	16.71	3000	3	1	0.2	0.12	2	2	10	20	30
262	Nalgonda	Nadigudem	Tellabali	1	14.7	3000	1.5	1	0.2	0.11	2	2	10	20	30
263	Nalgonda	Nadigudem	Tripuravaram	2	13.43	3000	1.5	0	0	0.1	0	0	0	0	0
264	Nalgonda	Nadigudem	Yasanta Puram	2	4.56	3000	1.5	0	0	0.03	0	0	0	0	0
265	Nalgonda	Nadigudem	Yella Puram	2	6.88	3000	1.5	0	0	0.05	0	0	0	0	0
266	Nalgonda	Nalgonda	Anantharam	8	7.51	1500	1.5	2	0.2	0.04	1	1	5	10	15
267	Nalgonda	Nalgonda	Annareddy Guda	8	4.8	1500	1.5	1	0.1	0.03	1	1	5	10	15
268	Nalgonda	Nalgonda	Budharam	8	9.94	1500	1.5	3	0.3	0.06	1	1	5	10	15
269	Nalgonda	Nalgonda	G.K.Annaram	8	10.69	1500	1.5	1	0.1	0.06	1	1	5	10	15
270	Nalgonda	Nalgonda	Gundla Palle	8	8.08	1500	1.5	2	0.2	0.05	1	1	5	10	15
271	Nalgonda	Nalgonda	Khudavanpur	4	3.61	0	3	-3	0	0.02	0	0	0	0	0

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272	Nalgonda	Nalgonda	Kotha Palle	8	6.6	1500	1.5	1	0.1	0.04	1	1	5	10	15
273	Nalgonda	Nalgonda	Medla Duppala Palle	8	9.58	1500	1.5	1	0.1	0.05	1	1	5	10	15
274	Nalgonda	Nalgonda	Rasoolpur	8	6.96	1500	1.5	2	0.2	0.04	1	1	5	10	15
275	Nalgonda	Nalgonda	Velugu Palle	8	4.7	1500	1.5	2	0.1	0.03	1	1	5	10	15
276	Nalgonda	Nampalle	Chittam Pahad	3	5.27	1500	5	14	0.8	0.01	0	0	0	0	0
277	Nalgonda	Nampalle	Damera	3	11.85	1500	5	15	2	0.02	0	0	0	0	0
278	Nalgonda	Nampalle	Kethpalli (P) Pasnoor	3	6.85	1500	5	14	1.1	0.01	0	0	0	0	0
279	Nalgonda	Nampalle	Nampalli	3	14.53	1500	5	15	2.4	0.02	0	0	0	0	0
280	Nalgonda	Nampalle	Neralla Palli	3	15.57	1500	5	16	2.7	0.02	0	0	0	0	0
281	Nalgonda	Nampalle	Peddapur	3	30.57	1500	5	15	5	0.05	1	1	5	10	15
282	Nalgonda	Nampalle	Swamulavari Lingotam	3	16.17	1500	3	11	2	0.03	0	0	0	0	0
283	Nalgonda	Nampalle	Tirumalagiri	3	9.94	1500	5	13	1.4	0.02	0	0	0	0	0
284	Nalgonda	Nampalle	Vadde Palli	3	10.42	1500	5	13	1.5	0.02	0	0	0	0	0
285	Nalgonda	Nampalli	Mohamadapur	3	14.05	1500	5	15	2.3	0.02	0	0	0	0	0
286	Nalgonda	Nered Cherla	Alanga Puram	7	5.49	1500	1.5	0	0	0.07	0	0	0	0	0
287	Nalgonda	Nered Cherla	Bodala Dinna	7	3.11	1500	1.5	1	0	0.04	0	0	0	0	0
288	Nalgonda	Nered Cherla	Bothalapalem	8	10.2	1500	1.5	1	0.1	0.13	3	3	15	30	45
289	Nalgonda	Nered Cherla	Chillepalli	7	10.18	1500	1.5	0	0	0.13	0	0	0	0	0

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290	Nalgonda	Nered Cherla	Dacharam	7	6.72	1500	1.5	0	0	0.09	0	0	0	0	0
291	Nalgonda	Nered Cherla	Fathepuram	1	8.85	3000	1.5	1	0.1	0.12	2	2	10	20	30
292	Nalgonda	Nered Cherla	Guduguntla Palem	8	7.89	1500	1.5	1	0.1	0.1	2	2	10	20	30
293	Nalgonda	Nered Cherla	Gundeboina Gudem	8	6.81	1500	1.5	2	0.1	0.09	2	2	10	20	30
294	Nalgonda	Nered Cherla	Gundla Pahad	8	15.96	1500	1.5	1	0.2	0.21	4	4	20	40	60
295	Nalgonda	Nered Cherla	Janala Dinne	1	5.08	3000	1.5	1	0.1	0.07	1	1	5	10	15
296	Nalgonda	Nered Cherla	Janapahad	8	29.62	1500	1.5	2	0.7	0.39	7	7	35	70	105
297	Rangareddy	Nered Cherla	Kallur	7	11.76	1500	1.5	0	0	0.16	0	0	0	0	0
298	Nalgonda	Nered Cherla	Kalvala Dinna	7	0.86	1500	1.5	2	0	0.01	0	0	0	0	0
299	Nalgonda	Nered Cherla	Komatikunta	8	9.45	1500	1.5	1	0.1	0.12	2	2	10	20	30
300	Nalgonda	Nered Cherla	Mahankali Gudem	8	10.22	1500	1.5	3	0.3	0.13	3	3	15	30	45
301	Nalgonda	Nered Cherla	Medaram	8	7.21	1500	1.5	1	0.1	0.1	2	2	10	20	30
302	Nalgonda	Nered Cherla	Musivoddu Singaram	8	6.1	1500	1.5	1	0.1	0.08	2	2	10	20	30
303	Nalgonda	Nered Cherla	Neredcherla	7	13.93	1500	1.5	0	0	0.18	0	0	0	0	0
304	Nalgonda	Nered Cherla	Palakeedu	7	11.6	1500	1.5	0	0	0.15	0	0	0	0	0

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305	Nalgonda	Nered Cherla	Penchikal Dinne	3	7.25	1500	3	1	0.1	0.1	2	2	10	20	30
306	Nalgonda	Nered Cherla	Sajjapuram	7	11.78	1500	1.5	0	0	0.16	0	0	0	0	0
307	Nalgonda	Nered Cherla	Somavaram	3	14.88	1500	3	5	0.8	0.2	4	4	20	40	60
308	Nalgonda	Nered Cherla	Sunya Pahad	8	6.62	1500	1.5	2	0.1	0.09	2	2	10	20	30
309	Nalgonda	Nered Cherla	Yella Puram	7	4.12	1500	1.5	0	0	0.05	0	0	0	0	0
310	Nalgonda	Nered Cherla	Yellaram	4	5.59	1500	3	-1	-0.1	0.07	0	0	0	0	0
311	Nalgonda	Neredcherla	Ravipahad	8	6.37	1500	1.5	3	0.2	0.08	2	2	10	20	30
312	Nalgonda	Nidamanur	Bankapur	7	6.86	1500	1.5	0	0	0.05	0	0	0	0	0
313	Nalgonda	Nidamanur	Bokkamanthula Pahad	1	5.17	3000	1.5	1	0.1	0.04	1	1	5	10	15
314	Nalgonda	Nidamanur	Guntipalle	1	14.3	3000	1.5	2	0.3	0.1	2	2	10	20	30
315	Nalgonda	Nidamanur	Nehatapur	8	12.63	1500	1.5	2	0.3	0.09	2	2	10	20	30
316	Nalgonda	Nidamanur	Nidamanur	8	9.58	1500	1.5	1	0.1	0.07	1	1	5	10	15
317	Nalgonda	Nidamanur	Regulagadda	8	11.88	1500	1.5	2	0.3	0.08	2	2	10	20	30
318	Nalgonda	Nidamanur	Sakhapur	8	6.28	1500	1.5	1	0.1	0.04	1	1	5	10	15
319	Nalgonda	Nidamanur	Surepalle	8	9.63	1500	1.5	1	0.1	0.07	1	1	5	10	15
320	Nalgonda	Nidamanur	Tummadam	8	36.77	1500	1.5	2	0.8	0.26	5	5	25	50	75
321	Nalgonda	Nidamanur	Vallabhapur	8	3.25	1500	1.5	2	0.1	0.02	0	0	0	0	0
322	Nalgonda	Nidamanur	Vempahad	1	15.54	3000	1.5	1	0.2	0.11	2	2	10	20	30
323	Nalgonda	Nidamanur	Venigandla	7	13.91	1500	1.5	0	0	0.1	0	0	0	0	0

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324	Nalgonda	Nidamanur	Vutkur	1	16.43	3000	1.5	1	0.2	0.12	2	2	10	20	30
325	Nalgonda	Nidamanur	Yerraballi	1	17.77	3000	1.5	3	0.6	0.12	2	2	10	20	30
326	Nalgonda	Nuthankal	Chandu Patla	1	8.7	3000	1.5	13	1.2	0.11	2	2	10	20	30
327	Nalgonda	Nuthankal	Chilpa Kunta	3	13.65	1500	3	4	0.6	0.17	3	3	15	30	45
328	Nalgonda	Nuthankal	Chinna Nemila	8	14.7	1500	1.5	13	2.1	0.18	3	3	15	30	45
329	Nalgonda	Nuthankal	Ganjivari Kothapalle	1	4.58	3000	1.5	11	0.6	0.06	1	1	5	10	15
330	Nalgonda	Nuthankal	Gorentla	1	20.75	3000	1.5	3	0.7	0.25	5	5	25	50	75
331	Nalgonda	Nuthankal	Machan Palle	3	12.22	1500	3	11	1.5	0.15	3	3	15	30	45
332	Nalgonda	Nuthankal	Maddirala	1	18.78	6000	1.5	5	1	0.23	4	4	20	40	60
333	Nalgonda	Nuthankal	Miryala	8	18.1	1500	1.5	13	2.6	0.22	4	4	20	40	60
334	Nalgonda	Nuthankal	Mukundapuram	1	10.46	3000	1.5	11	1.3	0.13	2	2	10	20	30
335	Nalgonda	Nuthankal	Nuthankal	3	16.54	1500	3	4	0.7	0.2	4	4	20	40	60
336	Nalgonda	Nuthankal	Pedanemila	8	6.9	1500	1.5	13	1	0.08	2	2	10	20	30
337	Nalgonda	Nuthankal	Polumalla	1	11.5	3000	1.5	8	1	0.14	3	3	15	30	45
338	Nalgonda	Nuthankal	Talla Singaram	3	12.19	1500	3	6	0.8	0.15	3	3	15	30	45
339	Nalgonda	Nuthankal	Yadavalli	3	6.84	1500	3	5	0.4	0.08	2	2	10	20	30
340	Nalgonda	Penpahad	Anajipuram	7	14.65	1500	1.5	-1	-0.2	0.12	0	0	0	0	0
341	Nalgonda	Penpahad	Anatharam	7	13.18	1500	1.5	0	0	0.11	0	0	0	0	0
342	Nalgonda	Penpahad	Bhakthalapuram	1	7.56	3000	1.5	1	0.1	0.06	1	1	5	10	15

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343	Nalgonda	Penpahad	Cheedella	1	25.3	6000	1.5	1	0.3	0.21	4	4	20	40	60
344	Nalgonda	Penpahad	Dharmapuram	1	7.4	3000	1.5	2	0.2	0.06	1	1	5	10	15
345	Nalgonda	Penpahad	Dosapahad	7	7.84	1500	1.5	-1	-0.1	0.06	0	0	0	0	0
346	Nalgonda	Penpahad	Dupahad	1	11.17	3000	1.5	1	0.1	0.09	2	2	10	20	30
347	Nalgonda	Penpahad	Gajulamalkapuram	1	15.86	3000	1.5	1	0.2	0.13	2	2	10	20	30
348	Nalgonda	Penpahad	Lingala	8	11.62	1500	1.5	1	0.1	0.1	2	2	10	20	30
349	Nalgonda	Penpahad	Macharam	8	13.15	1500	1.5	1	0.1	0.11	2	2	10	20	30
350	Nalgonda	Penpahad	N.Annaram	7	13.46	1500	1.5	0	0	0.11	0	0	0	0	0
351	Nalgonda	Penpahad	Potla Pahad	8	9.55	1500	1.5	1	0.1	0.08	1	1	5	10	15
352	Nalgonda	Penpahad	Rajpet	7	1.38	1500	1.5	0	0	0.01	0	0	0	0	0
353	Nalgonda	Penpahad	Singareddy Palem	8	9.22	1500	1.5	1	0.1	0.08	1	1	5	10	15
354	Nalgonda	Rajapet	Begumpet	5	9.68	3000	3	7	0.7	0.08	1	1	5	10	15
355	Nalgonda	Rajapet	Bondugula	5	24.13	3000	3	6	1.6	0.19	4	4	20	40	60
356	Nalgonda	Rajapet	Doodi Venkatapur	5	10.57	3000	3	9	1	0.08	2	2	10	20	30
357	Nalgonda	Rajapet	Jala	5	10	3000	3	7	0.8	0.08	2	2	10	20	30
358	Nalgonda	Rajapet	Kalapalle	5	14.88	3000	3	13	2.1	0.12	2	2	10	20	30
359	Nalgonda	Rajapet	Kurraram	5	10.3	3000	3	6	0.7	0.08	2	2	10	20	30
360	Nalgonda	Rajapet	Narsapur	5	8.55	3000	3	7	0.7	0.07	1	1	5	10	15
361	Nalgonda	Rajapet	Nemla	5	13.79	3000	3	8	1.2	0.11	2	2	10	20	30
362	Nalgonda	Rajapet	Pamukunta	5	19.61	3000	3	7	1.5	0.16	3	3	15	30	45
363	Nalgonda	Rajapet	Paru Palle	5	7.71	3000	3	6	0.5	0.06	1	1	5	10	15

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364	Nalgonda	Rajapet	Salvapru	6	0	3000	3	6	0	0	0	0	0	0	0
365	Nalgonda	Rajapet	Singaram	5	8.79	3000	3	7	0.7	0.07	1	1	5	10	15
366	Nalgonda	Rajapet	Somaram	5	8.18	3000	3	1	0.1	0.06	1	1	5	10	15
367	Nalgonda	Suryapet	Balemla	2	29.18	3000	1.5	0	0	0.53	0	0	0	0	0
368	Nalgonda	Suryapet	Bechirag Madharam	2	3.99	3000	1.5	0	0	0.07	0	0	0	0	0
369	Nalgonda	Suryapet	Konkathimmani Annaram	4	6.87	0	3	-3	-0.2	0.13	0	0	0	0	0
370	Nalgonda	Suryapet	Pillala Marri	2	30.43	6000	1.5	0	0	0.55	0	0	0	0	0
371	Nalgonda	Suryapet	Ramannaguda	2	2.72	3000	1.5	-1	0	0.05	0	0	0	0	0
372	Nalgonda	Suryapet	Solipet	3	9.4	1500	3	3	0.3	0.17	3	3	15	30	45
373	Nalgonda	Suryapet	Suryapet	2	23.65	3000	1.5	-1	-0.3	0.43	0	0	0	0	0
374	Nalgonda	Suryapet	Venkatrampur	2	4.86	6000	1.5	0	0	0.09	0	0	0	0	0
375	Nalgonda	Suryapet	Yendla Palle	7	14.49	1500	1.5	0	0	0.26	0	0	0	0	0
376	Nalgonda	Thipparthi	Indugula	1	16.87	3000	1.5	11	2	0.15	3	3	15	30	45
377	Nalgonda	Thipparthi	Madugula Palle	1	13.13	3000	1.5	11	1.6	0.12	2	2	10	20	30
378	Nalgonda	Thirumalagiri	Bandla Palle	1	7.28	6000	1.5	2	0.2	0.05	1	1	5	10	15
379	Nalgonda	Thirumalagiri	Chenna Puram	1	5.23	6000	1.5	3	0.2	0.04	1	1	5	10	11
380	Nalgonda	Thirumalagiri	Etoor	1	16.63	6000	1.5	4	0.7	0.12	2	2	10	20	30

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381	Nalgonda	Thirumalagiri	Gundepuri	1	7	7000	1.5	2	0.2	0.05	1	1	5	10	15
382	Nalgonda	Thirumalagiri	Mamidi Palle	1	6.16	6000	1.5	3	0.2	0.04	1	1	5	10	15
383	Nalgonda	Thirumalagiri	Nanda Puram	1	8.63	6000	1.5	4	0.4	0.06	1	1	5	10	15
384	Nalgonda	Thirumalagiri	Phanigiri	1	14.71	6000	1.5	4	0.6	0.11	2	2	10	20	30
385	Nalgonda	Thirumalagiri	Sidda Samudram	2	4.07	7000	1.5	1	0	0.03	0	0	0	0	0
386	Nalgonda	Thirumalagiri	Thati Pamula	7	10.7	0	1.5	-3	-0.4	0.08	0	0	0	0	0
387	Nalgonda	Thirumalagiri	Thirumalagiri	1	22.77	6000	1.5	4	1	0.17	3	3	15	30	45
388	Nalgonda	Thirumalagiri	Thonda	1	21.92	6000	1.5	3	0.7	0.16	3	3	15	30	45
389	Nalgonda	Thirumalagiri	Velchala	1	11.19	6000	1.5	2	0.2	0.08	2	2	10	20	30
390	Nalgonda	Thirumalgiri	Mondrai	2	14.9	6000	1.5	4	0	0.11	0	0	0	0	0
391	Nalgonda	Thripuraram	Abhanga Puram	1	6.93	3000	1.5	1	0.1	0.08	2	2	10	20	30
392	Nalgonda	Thripuraram	Anjana Palle	7	19.52	1500	1.5	0	0	0.23	0	0	0	0	0
393	Nalgonda	Thripuraram	Babasahebpet	2	5.96	6000	1.5	-1	-0.1	0.07	0	0	0	0	0
394	Nalgonda	Thripuraram	Bejjikal	1	12.25	6000	1.5	1	0.1	0.14	3	3	15	30	45
395	Rangareddy	Thripuraram	Borrai Palem	2	12	3000	1.5	0	0	0.14	0	0	0	0	0

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396	Nalgonda	Thripuraram	Dugge Palle	1	10.76	3000	1.5	1	0.1	0.12	2	2	10	20	30
397	Nalgonda	Thripuraram	Kampa Sagar	2	10	6000	1.5	0	0	0.12	0	0	0	0	0
398	Nalgonda	Thripuraram	Matur	7	11.87	1500	1.5	0	0	0.14	0	0	0	0	0
399	Nalgonda	Thripuraram	Narasimhula Gudem	2	1.7	6000	1.5	0	0	0.02	0	0	0	0	0
400	Nalgonda	Thripuraram	Pedda Devula Palle	2	18.78	6000	1.5	0	0	0.22	0	0	0	0	0
401	Nalgonda	Thripuraram	Ragadapa	7	19.95	1500	1.5	0	0	0.23	0	0	0	0	0
402	Nalgonda	Thripuraram	Thripuraram	1	7.03	6000	1.5	1	0.1	0.08	2	2	10	20	30
403	Nalgonda	Thunga Thurthi	Annaram	3	18.77	1500	3	2	0.4	0.23	4	4	20	40	60
404	Nalgonda	Thunga Thurthi	Bandaramaram	1	8.13	7000	1.5	1	0.1	0.1	2	2	10	20	30
405	Nalgonda	Thunga Thurthi	Gummadavally	1	10.67	6000	1.5	2	0.2	0.13	3	3	15	30	45
406	Nalgonda	Thunga Thurthi	Karivirala	1	8.86	6000	1.5	1	0.1	0.11	2	2	10	20	30
407	Nalgonda	Thunga Thurthi	Keshava Puram	3	9.85	1500	3	2	0.2	0.12	2	2	10	20	30
408	Nalgonda	Thunga Thurthi	Kukkadam	1	10.32	6000	1.5	2	0.2	0.13	2	2	10	20	30
409	Nalgonda	Thunga Thurthi	Laxmapur	1	6.96	6000	1.5	2	0.2	0.09	2	2	10	20	30
410	Nalgonda	Thunga Thurthi	Pasnur	1	10.81	6000	1.5	1	0.1	0.13	3	3	15	30	45

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411	Nalgonda	Thunga Thurthi	Pasthala	1	7.17	6000	1.5	1	0.1	0.09	2	2	10	20	30
412	Nalgonda	Thunga Thurthi	Reddiguda	1	6.8	6000	1.5	3	0.2	0.08	2	2	10	20	30
413	Nalgonda	Thunga Thurthi	Sangem	3	6.87	1500	3	5	0.4	0.08	2	2	10	20	30
414	Nalgonda	Thunga Thurthi	Thungathurthi	1	20.08	6000	1.5	1	0.2	0.25	5	5	25	50	75
415	Nalgonda	Thunga Thurthi	Velug Palle	1	15.04	6000	1.5	2	0.3	0.19	4	4	20	40	60
416	Nalgonda	Thunga Thurthi	Vempati	1	26.31	7000	1.5	1	0.3	0.32	6	6	30	60	90
417	Nalgonda	Vemulapalle	Gandravaniguda	1	3.12	3000	1.5	6	0.2	0.08	2	2	10	20	30
418	Nalgonda	Vemulapalle	Kamepalle	7	6.73	1500	1.5	-1	-0.1	0.17	0	0	0	0	0
419	Nalgonda	Vemulapalle	Kukkadam	1	9.37	3000	1.5	6	0.6	0.24	5	5	25	50	75
420	Nalgonda	Vemulapalle	Mundla Pahad	6	7.77	3000	3	0	0	0.2	0	0	0	0	0
421	Nalgonda	Vemulapalle	Settipalem	6	7.96	3000	3	0	0	0.21	0	0	0	0	0
422	Nalgonda	Vemulapalle	Thimmareddigud a	6	3.9	3000	3	1	0	0.1	0	0	0	0	0
423	Nalgonda	Vemulapalle	Thopucherla	1	25.24	3000	1.5	7	1.9	0.66	12	12	60	120	180
424	Nalgonda	Vemulapalle	Vemula Palle	6	16.2	3000	3	0	0	0.42	0	0	0	0	0
425	Nalgonda	Yadagirigutta	Chinnakandukur	3	11.05	1500	3	7	0.9	0.11	2	2	10	20	30
426	Nalgonda	Yadagirigutta	Gowrai Palle	1	7.87	3000	1.5	15	1.3	0.08	1	1	5	10	15

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427	Nalgonda	Yadagirigutta	Kacharam	5	15.09	3000	3	12	2	0.15	3	3	15	30	45
428	Nalgonda	Yadagirigutta	Mallapur	3	13.37	1500	5	8	1.2	0.13	3	3	15	30	45
429	Nalgonda	Yadagirigutta	Masaipet	3	27.06	1500	3	9	2.7	0.27	5	5	25	50	75
430	Nalgonda	Yadagirigutta	Peddakandukur	3	9.62	1500	3	7	0.7	0.1	2	2	10	20	30
431	Nalgonda	Yadagirigutta	Saidapur	3	14.43	1500	5	8	1.3	0.14	3	3	15	30	45
432	Nalgonda	Yadagirigutta	Vartoor	8	6.23	1500	1.5	5	0.3	0.06	1	1	5	10	15
			Total	**1761**	**5693.8**	**1096000**	**1019**	**1649**	**236.6**	**54.26**	**764**	**764**	**3820**	**7640**	**11456**