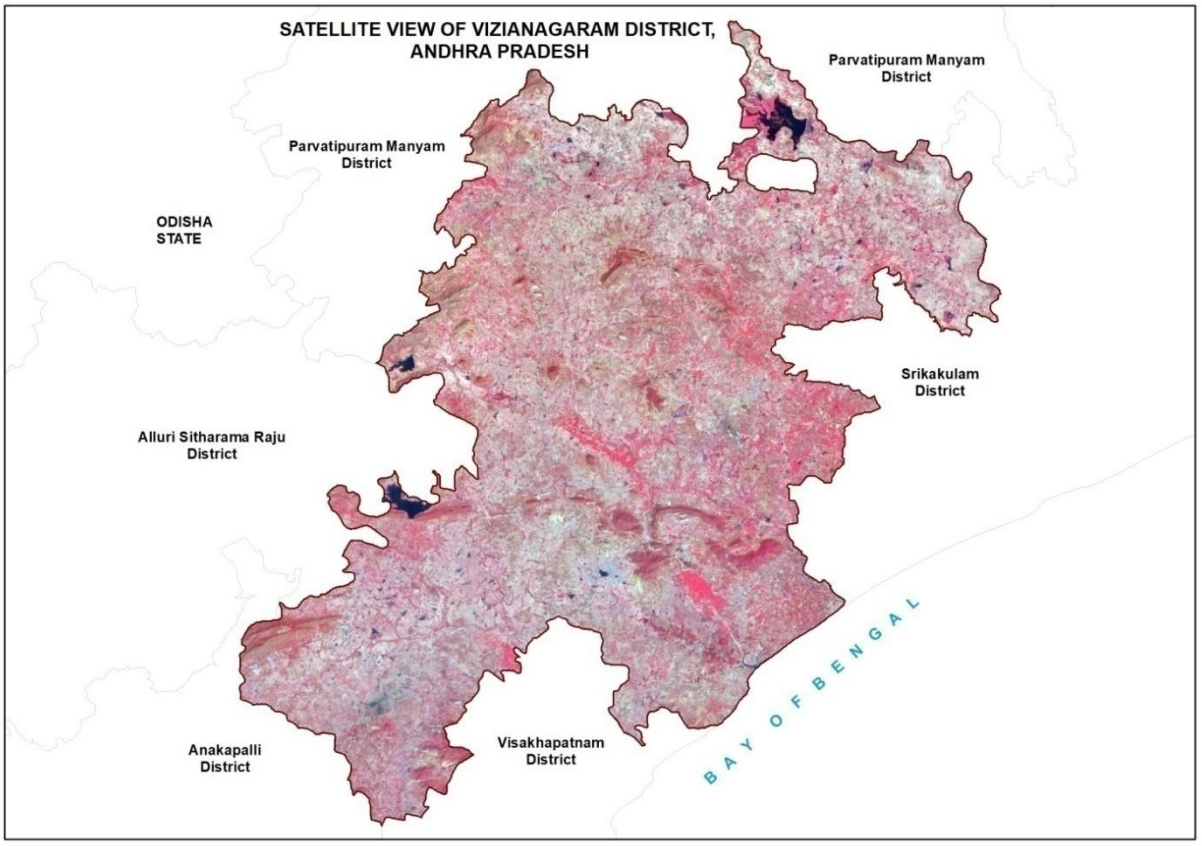
DISTRICT SURVEY REPORT
FOR SAND AND OTHER MINOR MINERALS
VIZIANAGARAM DISTRICT

(FOR THE DEPARTMENT OF MINES AND GEOLOGY, GOVT. OF AP)

As per Notification No. S.O. 141 (E), 15.01.2016, S.O. 3611(E), 25.07.2018, and Enforcement and Monitoring Guidelines for Sand Mining 2020 of MOEF and CC, GoI



Prepared by

ANDHRA PRADESH SPACE APPLICATIONS CENTRE (APSAC)
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Government of Andhra Pradesh

December 2023

Andhra Pradesh Space Applications Centre
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PREFACE

The Natural resource inventory is the assessment of the status of a given natural resource of an area at a given point in time. Population pressure results in over- exploitation of resources. The baseline information on the resources would help the administration for better planning and decision making. The main purpose of the report is to disseminate data on the natural resource up to the lowest administrative functionary to facilitate micro level planning and development. The efforts have been made to assess and document the information on land use land cover, crop, surface water resource, soils, slope, groundwater prospects, groundwater quality, geological information, and minerals resources in Vizianagaram District, Andhra Pradesh, based on the satellite remote sensing data and socioeconomic information.

The Department of Mines and Geology (DMG), Government of Andhra Pradesh (AP) requested the Andhra Pradesh Space Applications Center (APSAC) to update the district survey reports with availability of sand mineral information, major and minor mineral details, and river morphology for all the districts in the State. The District Survey report emphasizes and updated the major and minor minerals in the districts of AP. The District Survey reports are updated following the "Sustainable Sand Mining guidelines" issued in 2016 and 2020 and SO 741 of 2016 of the Ministry of Environment, Forests and Climate Change provided by the DMG. The comments received from the public, if found fit, shall be incorporated in the report. A list of leases in the district will be provided by the concerned Assistant Directors of Mines and Geology.

The report is an outcome of the efforts of the Scientists and Project Associates at APSAC. I heartily congratulate the team for compiling the report.

(Dr. Sundar Balakrishna, IFS)
Vice-Chairman
APSAC

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We would like to express our sincere gratitude to **Dr. Sundar Balakrishna, IFS**, **Special Secretary to Government,** Information Technology, Electronics and Communications (ITE&C), Govt. of Andhra Pradesh and the **Vice-Chairman, APSAC** Govt. of Andhra Pradesh, for his meticulous guidance and supervision.

We are grateful to the **Sri. V.G. Venkata Reddy**, **Director**, Department of Mines and Geology, Govt. of Andhra Pradesh for entrusting the work for the preparation of District Survey Reports of Andhra Pradesh.

We owe a great deal to **Sri. P Raja Babu, Joint Director,** Department of Mines and Geology for his overall support and guidance during the execution of this work.

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We are also thankful to the **District Mines and Geology Officer,** Vizianagaram District for their support in providing information

Our sincere thanks are due to the scientific staff of APSAC who has generated all the thematic maps for District Survey Reports.

APSAC

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List of Abbreviations

APSAC	: Andhra Pradesh Space Applications Centre
APMMC	: Andhra Pradesh Minor Mineral Concession
AMSL	: Above Mean Sea Level
AWiFS	: Advanced Wide Field Sensor
APWALTA	: Andhra Pradesh State Water, Land and Trees Authority
APMDC	: Andhra Pradesh Mineral Development Corporation
Bgl	: Below ground level
BT Road	: Bituminous Road
Cl	: Chlorine
CC Road	: Cement concrete
CRZ	: Coastal Regulatory Zone
CPSU	: Central Public Sector Undertaking
CGWB	: Central Ground Water Board
cu.m/day	: Cubic meter per day
DSR	: District Survey Report
DMF	: District Mineral Fund
DMG	: Directorate of Mines and Geology
DM&GO	: District Mines and Geology Officer
DES	: Directorate of Economics and Statistics
DEM	: Digital Elevation Model
dS/m	: Decisiemens per meter
EIA/EMP	: Environmental Impact Assessment
F	: Fluorine
FAC	: Full Additional Charge
FASAL	: Forecasting Agricultural output using Space, Agrometeorology and Land-based observations
Fe	: Iron
Ft	: feet
GD	: Geosciences Division
GIS	: Geographical Information System
GSI	: Geological Survey of India
Ha	: Hectare
Km	: Kilometer
IRS	: Indian Remote Sensing Satellite
ITE and C	: Information Technology Electronics and Communications
LISS	: Linear Imaging Self Scanning
LULC	: Land Use / Land Cover

Lps	: Litres per second
M	: meter
Mi	: mile
mm	: millimetre
MT	: Million Tonne
MERIT	: Mineral Exploration Research Innovation Trust Fund
MoEF	: Ministry of Environment and Forests
MSL	: Mean Sea Level
NIRD	: National Institute of Rural Development
NH	: National Highway
$NaNO_3$	: Sodium nitrate
NRSA	: National Remote Sensing Agency
NRSC	: National Remote Sensing Centre
PESA	: Panchayats Extension to Scheduled Areas
pH	: Power of hydrogen
PSD	: Performance Security Deposit
PSU	: Public sector Undertakings
R2	: ResourceSat-2
RGNDWM	: Rajiv Gandhi National Drinking Water Mission
RWS and S	: Rural Water Supply and Sanitation
SAR	: Synthetic Aperture Radar
SEB	: Special Enforcement Bureau
SO_4	: Sulfate
Sq.Km	: Square Kilometre
Sq.m	: Square metre
TA	: Tantalum
TIN	:Triangular Irregular Network
TGA	: Total Geographical Area
TIS	: Tank Information System
TTD	: Tirumala Tirupati Devasthanams
WBM	: Water Bound Macadam

Chapter I – Introduction &General Profile

1.1 Administrative Setup

Vizianagaram district is situated in the north-eastern part of the state of Andhra Pradesh. It is one of the six districts in the Uttarandhra region with its headquarters located at Vizianagaram.

Geographically, Vizianagaram district is bounded on the east by the district of Srikakulam, north by Parvathipuram Manyam, south by Visakhapatnam, Anakapalli, south-east by the Bay of Bengal, and west by Alluri Sitharama Raju district. The total geographical area of the district is 4,122 Sq.km. It is covered with 3 Revenue divisions namely Bobbili, Cheepurupalle and Vizianagaram. The district comprising of 27 Revenue mandals and 982 Revenue villages. The maximum number of villages (52) are covered in Santhakaviti mandal and minimum number of villages (21) in Bhogapuram mandal. Out of 27 mandals of the district, the maximum area (225 Sq.km) is occupied by Bobbili mandal and minimum area in Bhogapuram mandal (110 Sq.km). The mandals covered in each Revenue division are shown in Table-1 and its spatial distribution is depicted in the Figure-1. The Satellite View of Vizianagaram District is also shown in Figure-2.

Table 1 List of mandals covered in each Revenue division

Sl. No	Bobbili Revenue Division	Sl. No	Cheepurupalle Revenue Division	Sl. No	Vizianagaram Revenue Division
1	Badangi	9	Cheepurupalle	18	Bhogapuram
2	Bobbili	10	Garividi	19	Denkada
3	Bondapalle	11	Gurla	20	Gantyada
4	Dattirajeru	12	Merakamudidam	21	Jami
5	Gajapathinagaram	13	Nellimarla	22	Kothavalasa
6	Mentada	14	Rajam	23	Lakkavarapukota
7	Ramabhadrapuram	15	Regidiamadalavalasa	24	Pusapatirega
8	Therlam	16	Santhakaviti	25	Srungavarapukota
		17	Vangara	26	Vepada
				27	Vizianagaram

Data Source: APSAC, Vijayawada.

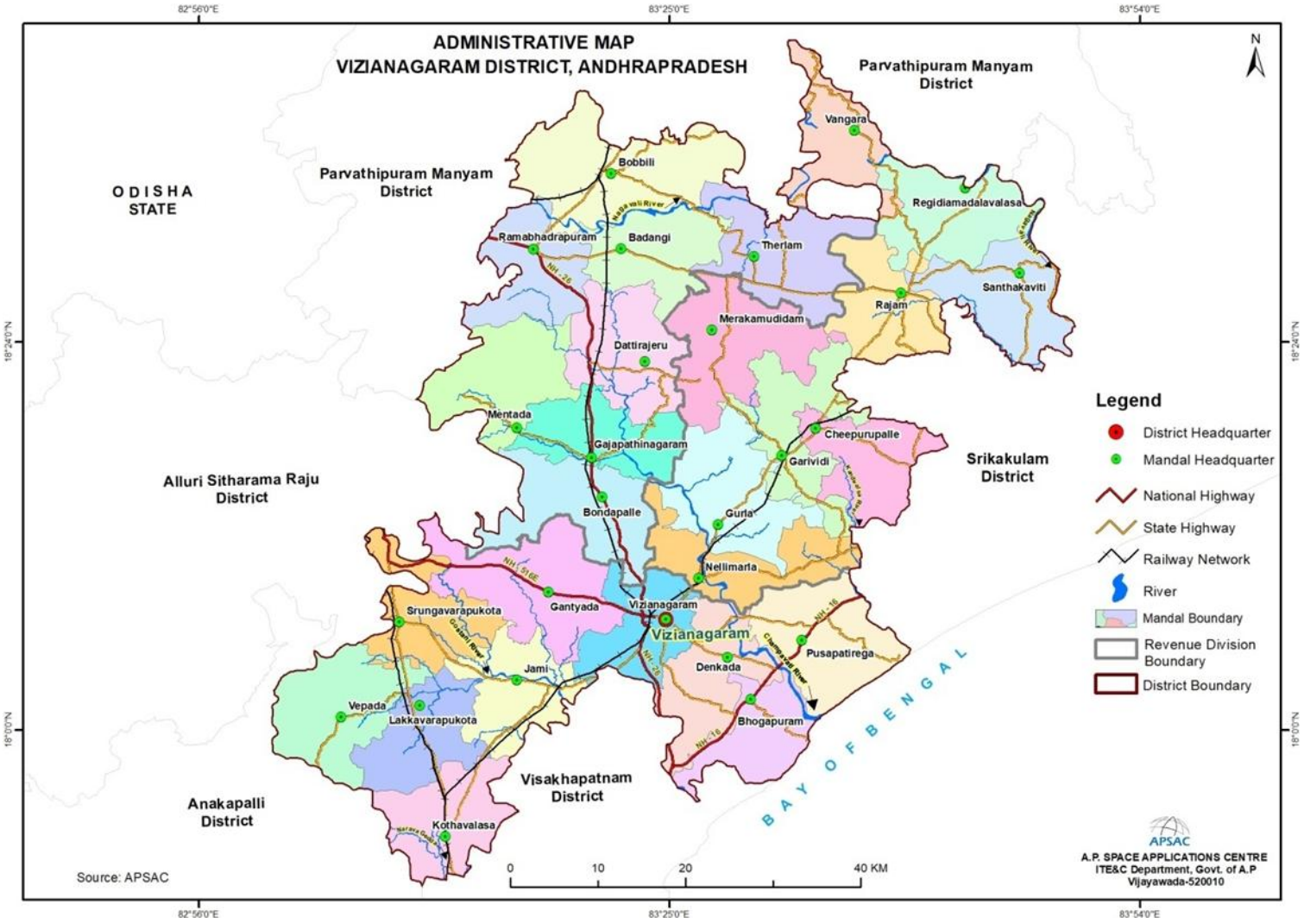


Figure-1: Administrative boundary map of Vizianagaram district, Andhra Pradesh

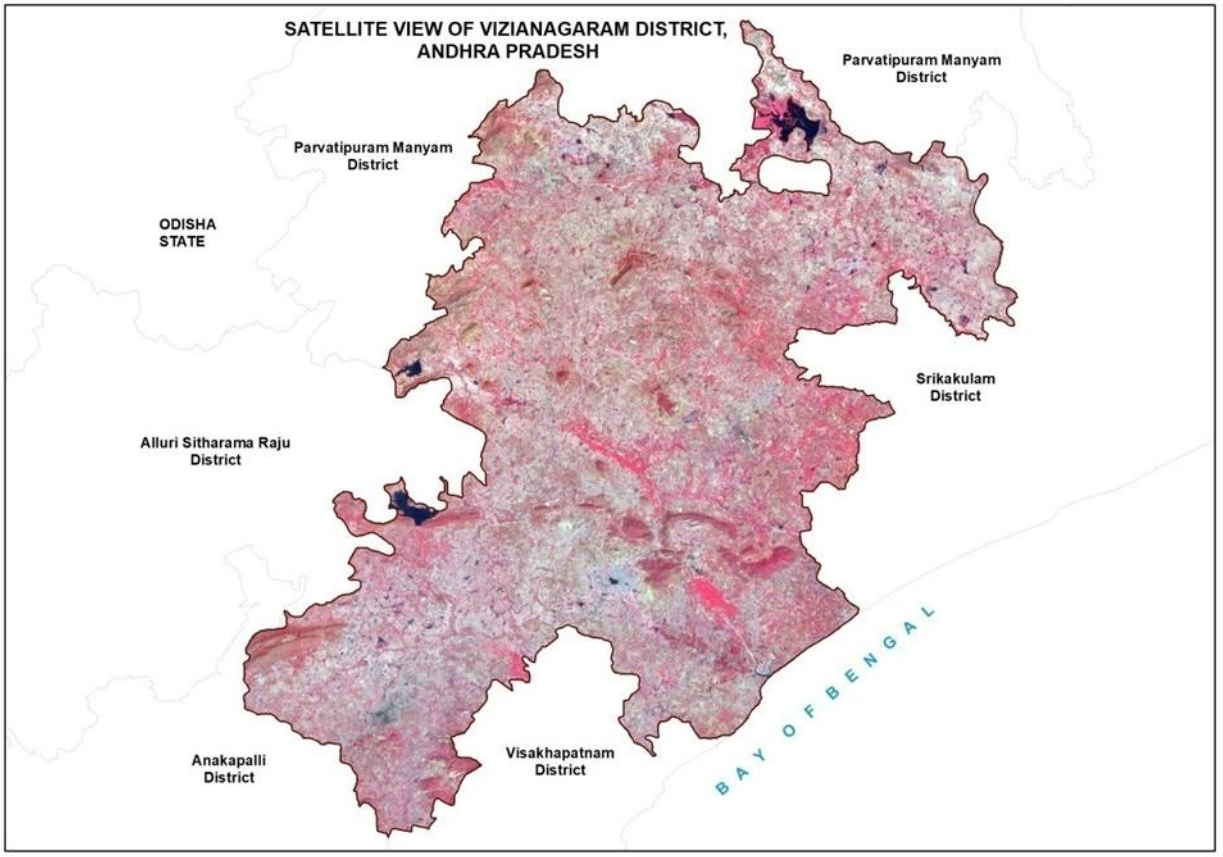


Figure-2: Satellite View of Vizianagaram District

1.2 Physiography

1.2.1 Physiography

The district can be divided into two distinct natural physical divisions i.e., plain and hilly regions. The hilly region is mostly covered with densely wooded forests and comes under Agency tract of the district. Since it is hilly tract, its elevation is also uneven. The plain portion of the district is a well cultivated tract. The areas transferred from Visakhapatnam district are mostly hilly and pictures one, especially in the north. The Agency tract mostly consists of the hilly regions covered by the Eastern Ghats which run parallel to the Coast from the North-East to the South-West. In the areas transferred from Srikakulam district, the hilly region consists, parts of the former Parvathipuram and Saluru taluks and they are known as Agency tracts. The main hill ranges are Dumakonda, Antikonda, Palakonda, Kodagandi and Gamatikonda. All these individual ranges form part of the Eastern Ghats. These ranges with their detached hills show a distinct North-West-South-East trend. In the Parvathipuram division the hills are lower than elsewhere and consists of steep and rugged lines devoid of plateau and hedging in the too broad and almost parallel.

1.2.2 Relief

The slope distribution clearly shows that the district terrain ranges from plains to hilly areas. The slope varies from nearly level to very steep slopes throughout the district (Figure-3). It is found that about 30% of the land is under nearly level (0-1%) sloping area and can be identified along the streams and plains. The very gently sloping areas are found along nearly level slopes and about 53% of the district land area is under very gently sloping varying from 1-3%. Gently sloping areas (3-5%) are found along scrub lands and account for about 9% of the district total. The hilly and forest regions have moderately sloping, strongly sloping, steeply sloping, and very steep slopes, which account for 1.68%, 2.30%, 2.03%, and 2.18% of the total area, respectively. These areas are concentrated in the western, central, and eastern parts of the district.

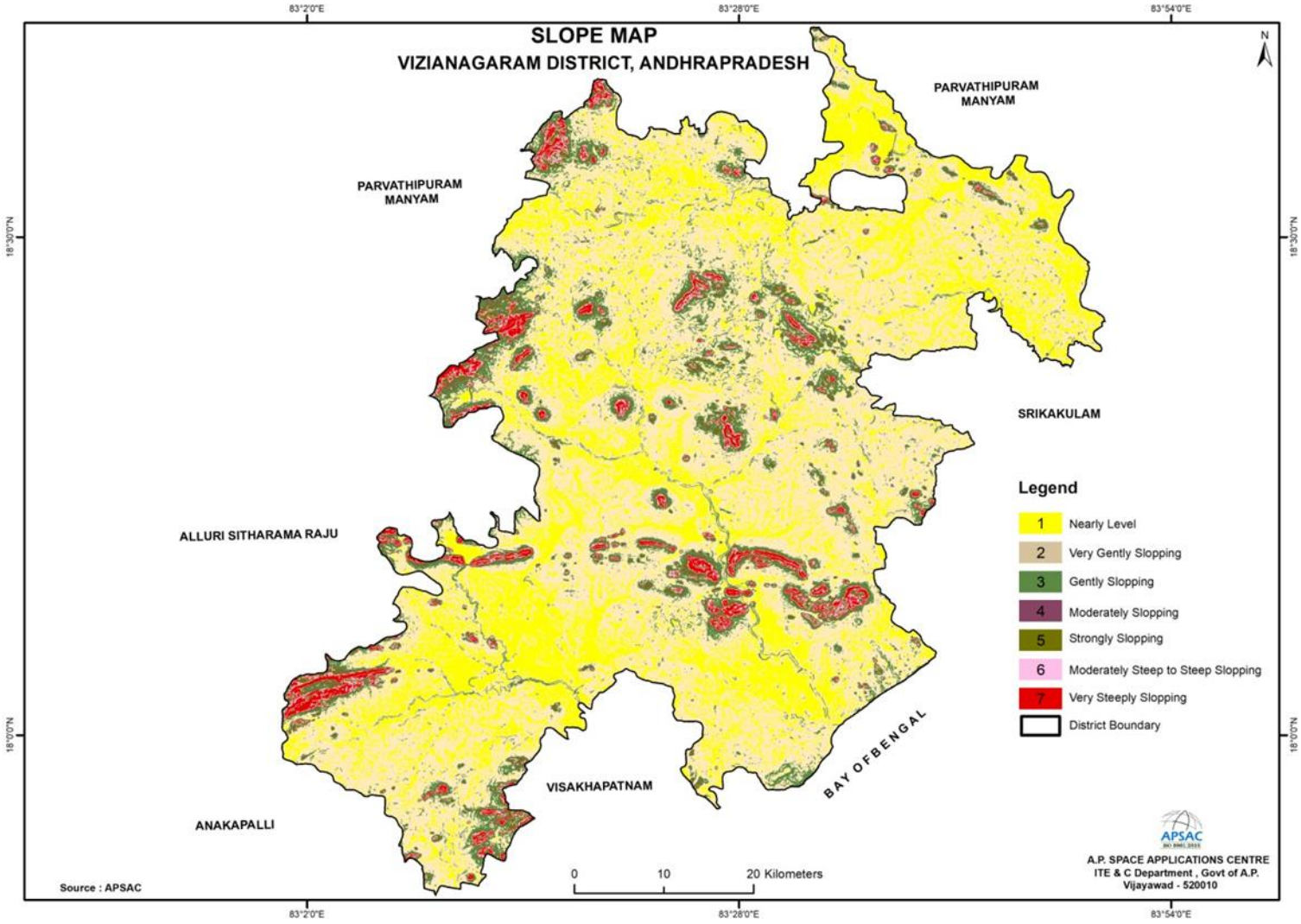


Figure-3: Slope Map of Vizianagaram District

1.2.3 Climate & Rainfall

1.2.3.1. Climate: The climate of the district is characterized as high humidity almost throughout the year with extreme summer and adequate seasonal rainfall. The summer is normally from the month of March to June. The rainy season is followed in the form of South-West monsoon till the middle of October. Retreating monsoon is followed till November. During the period from December to February the district experiences good weather with cool temperatures. The northern hilly parts are very cool than plains as they receive higher rainfall and also due to higher elevations. The maximum and minimum temperatures 19.4° C and 37.5° C are recorded in the month of May and December respectively. The Automatic weather stations (AWS) are established at all mandals by A.P. State Developmental Planning Society (APSDPS), Planning Department, Govt. of A.P. The Automatic Weather Stations (AWS) in Vizianagaram District shown in Figure-4.

1.2.3.2. Rainfall: The average annual rainfall of the district is 1070.98 mm, of which 691.22 mm falls as South-West (June-September) monsoon and 232.41mm as North-East (October-December) monsoon. The mean minimum and maximum temperatures recorded in the district are 19.4° C and 37.5° C in May, respectively. The average rainfall for the last 25 years is used for the analysis. The average annual rainfall is shown in Figure-4 and details is given in Table-2.

Table 2 Average Annual Rainfall (mm) in the district, during the year 1998-2021

S.No	Month	Average Annual Rainfall (mm)
1	January	6.81
2	February	10.35
3	March	16.50
4	April	32.23
5	May	81.46
6	June	135.07
7	July	162.15
8	August	191.25
9	September	202.75
10	October	162.10
11	November	58.27
12	December	12.05
Total		**1070.98**

Data source: AWS & APSDPS, Vijayawada

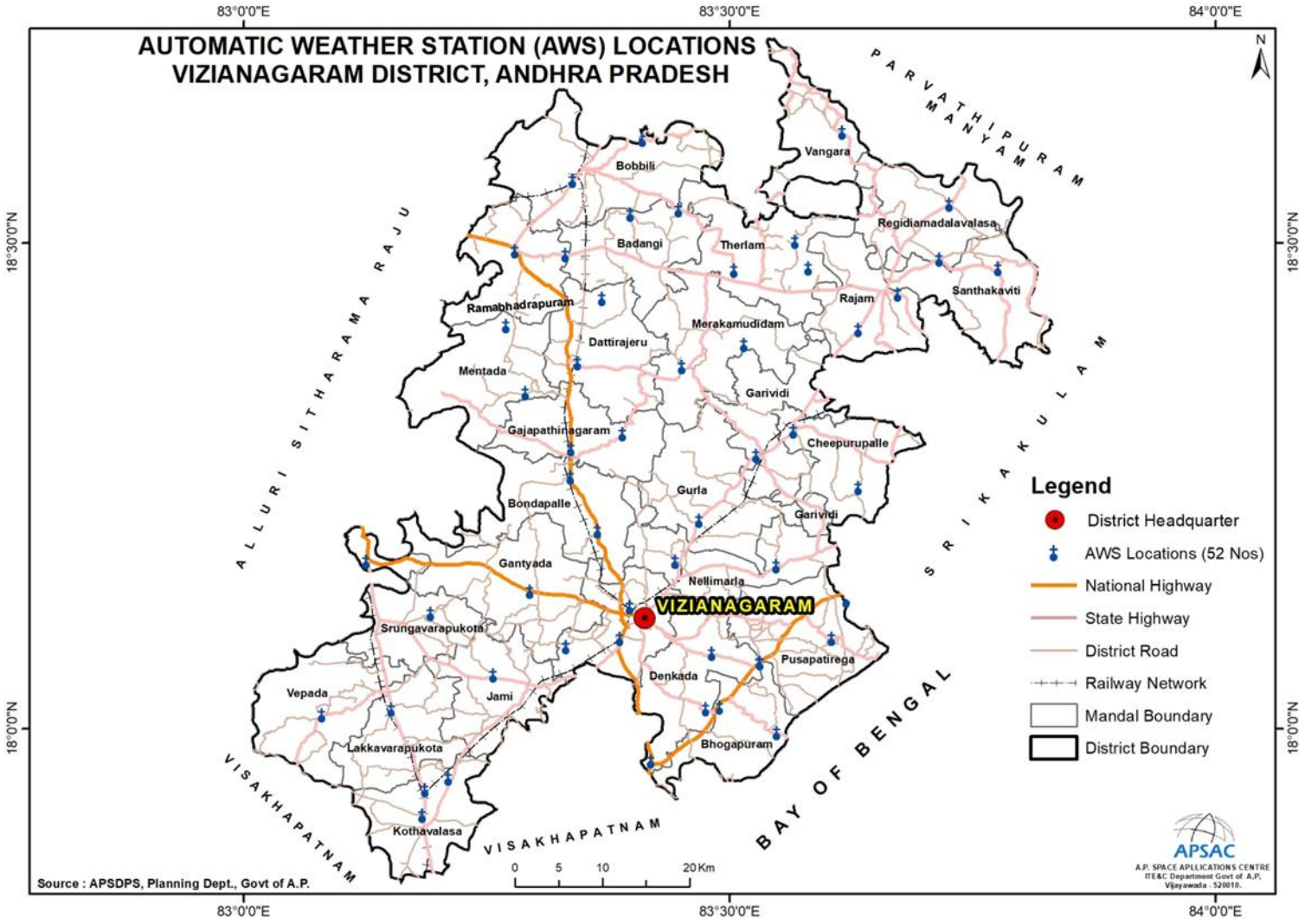


Figure-4: Locations of Automatic Weather Stations (AWS) in Vizianagaram District

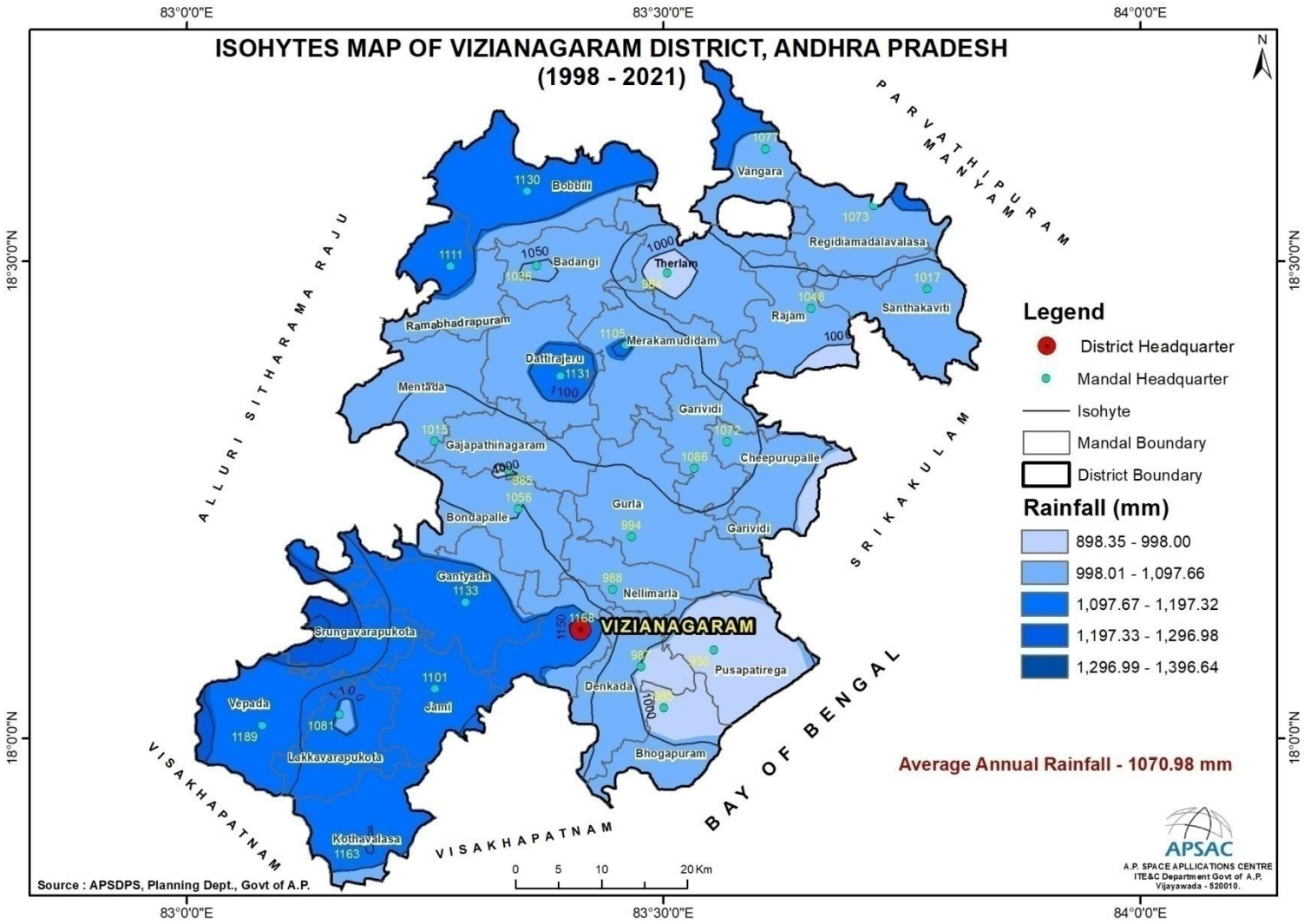


Figure-5: Rainfall distribution in Vizianagaram District

1.2.4 Drainage

There are four rivers draining the district, viz. Nagavali, Gosthani, Champavathi and Kandivalasa. They originate in the Eastern Ghats and after flowing through the district, finally joining Bay of Bengal.

The Nagavali is the main river that flows towards south direction for 60 Km in east side border of the vizianagaram district and the catchment area is 1,136 Sq.km in the district. It is also known as Langulya river. The Nagavali river originates in the Eastern Ghats near Lakhbahal, located at an altitude of 1,300 metres in the Kalahandi district of the Indian state Odisha and joining to Bay of Bengal near Mofuzbander in Srikakulam district. The important tributaries are Suvarnamukhi river and Vegavathi river in the district. The Vegavathi river starts from Pachipenta hills of Pachipenta mandal, flows parallel to Suvarnamukhi before joining Nagavali river.

The Gostani River originates in the Ananthagiri forest area of Srungavarapukota near Borra caves. It flows towards south direction through Jami mandal before entering Visakhapatnam district and joining to Bay of Bengal near Bheemunipatnam in Visakhapatnam district.

The Champavathi River originates from Eastern Ghats, Ananthagiri hills, Aruku Valley in Alluri Sitharama Raju dsitrict, passes through Saluru mandal and Vizianagaram mandal. It finally joins Bay of Bengal near Konada village, Pusapatirega mandal of the district.

1.3 Population and Literacy

1.3.1. Population:

The total population of the district is 19,30,811 as per the 2011 Census of India. Of which male and female population are 9,60,450 and 9,70,361 respectively. Among all mandals, Vizianagaram mandal is having maximum population of 2,83,550; whereas Vangara mandal is having minimum population of 41,133.

The total Schedule Caste (SC) population in the district is 2,07,333; of which male and female population are 1,02,002 and 1,05,331 respectively. The Schedule Tribe (ST) population is 46,884; of which male and female are 23,246 and 23,638 respectively.

The mandal wise population details are given in the Table - 3, and are pictorially depicted in the Figure-6.

1.3.2. Literacy:

The total literacy in the district is 10,21,894; of which male and female are 5,83,953 and 4,37,941 respectively. The total number of illiterates is 9,08,917; of which male and female are 3,76,497 and 5,32,420 respectively.

1.3.3. Details of the Occupational Health issues in the District (Last five-year data of number of patients of Silicosis): No cases were reported during last 5 years due to mining activity.

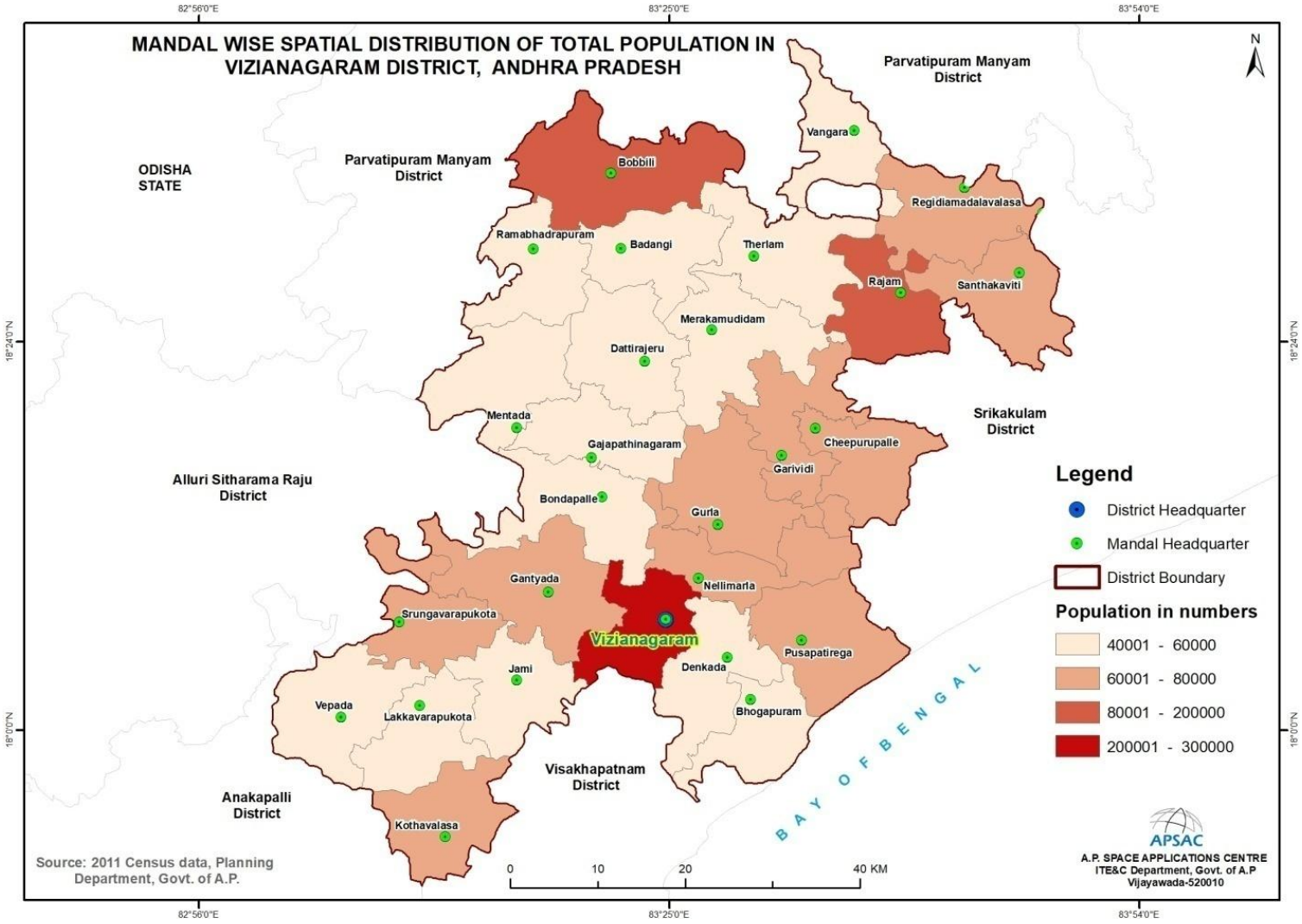


Figure-6: Mandal wise Spatial Distribution of Population in Vizianagaram district, Andhra Pradesh

Table 3 Mandal wise Population Statistics

S.No	Mandal Name	House Holds	Total Population	Male Population	Female Population	SC Population	Male SC Population	Female SC Population	ST Population	Male ST Population	Female ST Population
1	Badangi	12225	49384	24881	24503	6577	3579	2998	1760	885	875
2	Bhogapuram	13644	54891	27403	27488	3657	1793	1864	106	39	67
3	Bobbili	31566	122964	61092	61872	14502	7206	7296	3914	1915	1999
4	Bondapalle	13049	51146	25254	25892	6123	3000	3123	1563	766	797
5	Cheepurupalle	15047	63408	31498	31910	6500	2957	3543	571	271	300
6	Dattirajeru	13391	54499	27124	27375	6358	3123	3235	778	383	395
7	Denkada	13975	54382	27211	27171	5317	2691	2626	428	193	235
8	Gajapathinagaram	14358	57529	28450	29079	5477	2690	2787	781	377	404
9	Gantyada	17255	65579	32696	32883	7581	3778	3803	2238	1189	1049
10	Garividi	16838	68289	34217	34072	6523	3258	3265	1005	492	513
11	Gurla	15571	64695	32341	32354	5869	2927	2942	758	351	407
12	Jami	14855	58066	28987	29079	7091	3512	3579	522	266	256
13	Kothavalasa	17472	68579	33776	34803	6609	3025	3584	1732	776	956
14	Lakkavarapukota	13671	53039	26531	26508	4635	2300	2335	114	47	67
15	Mentada	11856	46855	23234	23621	5365	2681	2684	5465	2691	2774
16	Merakamudidam	13788	57237	28656	28581	5967	2952	3015	1335	668	667
17	Nellimarla	19037	77031	38225	38806	7371	3401	3970	962	465	497
18	Pusapatirega	17848	71955	36508	35447	6292	3385	2907	451	225	226
19	Rajam	23493	94039	47017	47022	10972	5392	5580	1091	551	540
20	Ramabhadrapuram	12772	50464	24867	25597	4961	2420	2541	4225	2111	2114
21	Regidiamadalavalasa	17237	70493	35385	35108	8310	4135	4175	655	309	346
22	Santhakaviti	16863	65419	32881	32538	7509	3790	3719	190	87	103
23	Srungavarapukota	19622	75917	37123	38794	6659	3212	3447	7078	3665	3413
24	Therlam	15123	59688	29882	29806	8557	4276	4281	1420	692	728
25	Vangara	10410	41133	20381	20752	7056	3330	3726	1181	585	596
26	Vepada	12720	50580	24930	25650	4871	2188	2683	3062	1646	1416
27	Vizianagaram	71570	283550	139900	143650	30624	15001	15623	3499	1601	1898
	Grand Total	485256	1930811	960450	970361	207333	102002	105331	46884	23246	23638

Data Source: 2011 Census data, Planning Department & DES.

Table 4 Mandal wise Literacy statistics

S.No	Mandal Name	Total Literacy	Male Literacy	Female Literacy	Total Illiterates	Male Illiterates	Female Illiterates
1	Badangi	23853	14531	9322	25531	10350	15181
2	Bhogapuram	24838	14169	10669	30053	13234	16819
3	Bobbili	70768	40248	30520	52196	20844	31352
4	Bondapalle	24912	14589	10323	26234	10665	15569
5	Cheepurupalle	32261	17990	14271	31147	13508	17639
6	Dattirajeru	23776	14202	9574	30723	12922	17801
7	Denkada	26963	15265	11698	27419	11946	15473
8	Gajapathinagaram	27653	15849	11804	29876	12601	17275
9	Gantyada	33590	19657	13933	31989	13039	18950
10	Garividi	34462	19932	14530	33827	14285	19542
11	Gurla	28229	16825	11404	36466	15516	20950
12	Jami	29868	17510	12358	28198	11477	16721
13	Kothavalasa	41334	23152	18182	27245	10624	16621
14	Lakkavarapukota	27827	16410	11417	25212	10121	15091
15	Mentada	19323	11681	7642	27532	11553	15979
16	Merakamudidam	25719	15409	10310	31518	13247	18271
17	Nellimarla	41265	23529	17736	35766	14696	21070
18	Pusapatirega	31154	18261	12893	40801	18247	22554
19	Rajam	51554	29379	22175	42485	17638	24847
20	Ramabhadrapuram	23570	13864	9706	26894	11003	15891
21	Regidiamadalavalasa	32772	19569	13203	37721	15816	21905
22	Santhakaviti	31304	18700	12604	34115	14181	19934
23	Srungavarapukota	44206	24631	19575	31711	12492	19219
24	Therlam	27340	16694	10646	32348	13188	19160
25	Vangara	19250	11405	7845	21883	8976	12907
26	Vepada	25738	14989	10749	24842	9941	14901
27	Vizianagaram	198365	105513	92852	85185	34387	50798
	Grand Total	1021894	583953	437941	908917	376497	532420

Data Source: 2011 Census data, Planning Department & DES

1.4 Land Utilization Pattern

1.4.1 Land Use / Land Cover

The Land Use / Land Cover (LULC) pattern of any region is an outcome of various physical and cultural factors and their utilization by man in time and space. Land use refers to the type of utilization to which man has put the land. It also refers to the evaluation of the land with respect to various natural characteristics. But land cover describes the vegetal attributes of the land. For a proper understanding of the influence of the various human-induced land-use practices on environmental change, it is essential to help simulate the land-use changes.

1.4.2 Spatial Distribution of Land Use / Land Cover

Under level 3 classification, various land use/land cover categories have been delineated using three seasons (Kharif, Rabi, and Zaid) satellite data. Visual image interpretation techniques i.e. size, shape, color, tone, texture, association, and pattern have been considered for the land use/land cover classification (NRSA, 2006). This data is used for general planning at the district or municipal levels. The broad categories are built-up, agricultural land, forest, wastelands, wetlands, and water bodies. The major part of the district is arable land with substantial forest cover in the northwest, southwest, and southeast of the district. The spatial distribution of land use/land cover of the Vizianagaram district is shown in Figure-7 and area statistics are presented in Table-5.

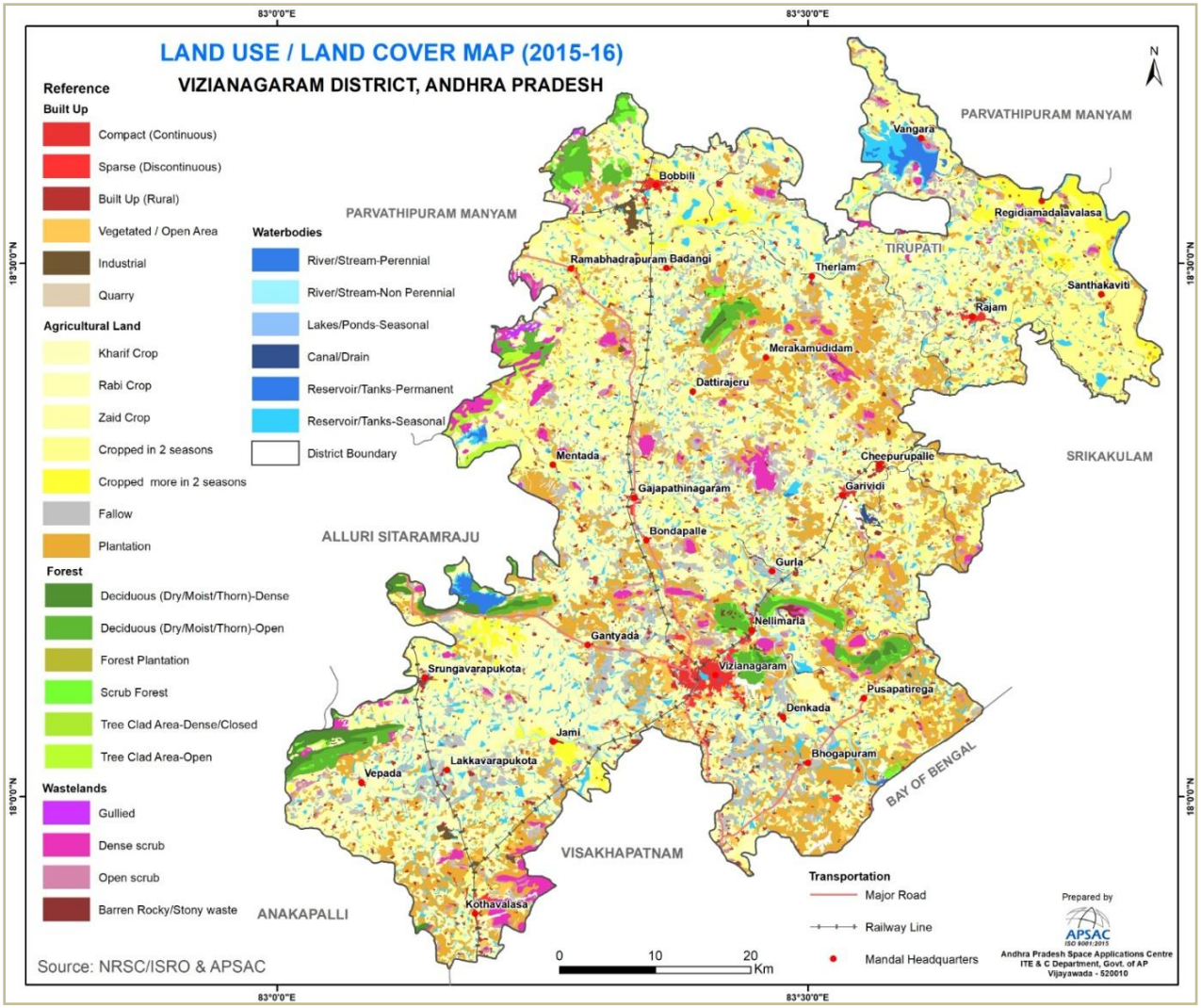


Figure-7: Land use / land cover map of Vizianagaram District 2015-16

Table 5 Category-wise distributions of Land Use/Land Cover during 2015-16

S. No	LULC categories	Area in sq. km	% to total
Built-up		**175.28**	**4.25**
1	Compact (Continuous)	19.48	0.47
2	Sparse (Discontinuous)	15.56	0.38
3	Vegetated / Open Area	28.33	0.69
4	Rural	84.95	2.06
5	Industrial	12.15	0.29
6	Mining - Active	2.81	0.07
7	Mining - Abandoned	0.12	0.00
8	Quarry	11.89	0.29
Agricultural Land		**3292.58**	**79.88**
9	Kharif Crop	1490.06	36.15
10	Rabi Crop	22.97	0.56
11	Zaid Crop	2.19	0.05
12	Cropped in 2 seasons	743.08	18.03
13	Cropped more in 2 seasons	91.94	2.23
14	Fallow	271.90	6.60
15	Plantation	669.65	16.25
16	Aquaculture	0.79	0.02
Forest		**182.76**	**4.43**
17	Deciduous (Dry/Moist/Thorn)-Dense	35.83	0.87
18	Deciduous (Dry/Moist/Thorn)-Open	92.40	2.24
19	Forest Plantation	5.87	0.14
20	Scrub Forest	30.19	0.73
21	Tree Clad Area-Dense	2.54	0.06
22	Tree Clad Area-Open	15.93	0.39
Wastelands		**168.41**	**4.09**
23	Gullied land	3.53	0.09
24	Ravinous land	15.55	0.38
25	Dense scrub	95.28	2.31
26	Open scrub	45.95	1.11
27	Sandy area- Coastal	1.89	0.05

28	Barren Rocky/Stony waste	6.20	0.15
Wetlands		**1.71**	**0.04**
29	Inland Natural	0.66	0.02
30	Coastal - Saltpans	1.05	0.03
Water bodies		**301.26**	**7.31**
31	River/Stream-Perennial	4.66	0.11
32	River/Stream-Non Perennial	48.95	1.19
33	Canal/Drain	15.03	0.36
34	Lakes/Ponds-Permanent	0.02	0.00
35	Lakes/Ponds-Seasonal	0.14	0.00
36	Reservoir/Tanks-Permanent	25.50	0.62
37	Reservoir/Tanks-Seasonal	206.96	5.02
Total		**4122.00**	**100.00**

Data source: NR Census 3rd cycle mapping, NRSC/ISRO & APSAC, GoAP

1.4.2.1. Built-up

These are human habitation areas with buildings, transportation, and communication, utilities associated with water, vegetation, and vacant lands. It consists of built-up (Compact and Sparse), Vegetated / Open Areas, Rural, Industrial, and Mining/Quarry. It covers 175.28 sq. km, which is about 4.25% of the district's total geographical area.

1.4.2.2. Built up - Compact (Continuous)

The majority of the land is covered by buildings, roads, and artificially surfaced areas that cover nearly the entire area. The built-up (compact) class is assigned when urban structures and transportation networks (i.e. impermeable surfaces) occupy more than 80% of the surface area. This category occupies 19.48 sq. km., and is found in the urban areas of Vizianagaram, Bobbili, and Rajam.

1.4.2.3. Built up - Sparse (Discontinuous)

Most of the land is covered by structures such as buildings, roads, and artificially surfaced areas, which are associated with vegetated areas and bare soil and occupy discontinuous but significant surfaces. Between 30 to 80 % of the total surface should be impermeable. Scattered blocks of residential flats, hamlets, and small villages are delineated under this category. It covers an area of 15.56 sq. km and is located in the peri-urban areas of Vizianagaram, Bobbili, and Rajam towns.

1.4.2.4. Vegetated / Open Area

These are vegetated areas within urban agglomeration (situated within or in contact with urban areas). The vegetation cover of trees, shrubs, and herbs covers the surface area, and it has been delineated. Open areas used as Parks, sports and leisure facilities, camping grounds, sports grounds, leisure parks, golf courses, race courses, including formal parks, etc are considered in this category. This category occupies an area of 28.33 sq. km.

1.4.2.5. Built up – Rural

These are the lands used for human settlement of size comparatively less than the urban settlements of which more than 80% of the people are involved in the primary agriculture activity and associated with non-commercial and allied classes are identified as built-up (rural) category. The rural area contribution is about 84.95 sq. km and is distributed throughout the district.

1.4.2.6. Industrial

Non-linear impervious surfaces are included in this class, which is related to trade, manufacturing, distribution, and commerce. These are areas where human activity is observed in the form of manufacturing along with other supporting establishments for maintenance. The industrial area occupies an area of 12.15 sq. km, which is observed in and around towns. The industrial areas are located closer to the major towns of Vizianagaram, Bobbili, and Rajam.

1.4.2.7. Mining – Active

Mining areas encompass areas under surface operations. The recognizable impacts of these activities on the landscape are unmistakable giant pit mines covering vast areas. The active mining areas are currently undergoing large-scale surface operations for the removal of economically important ores and are currently going on. The active mining area covers an area of 2.81 sq. km.

1.4.2.8. Mining – Abandoned

These are the areas where large-scale surface operations of removal of economically important ores were carried out in the past but presently kept abandoned due to various reasons like economic, operational, viability, disturbances, etc. Only 0.12 sq. km falls under this category.

1.4.2.9. Quarry

These are manifestations of surface mining operations, in which small-scale excavation of land surfaces is carried out for sand, gravel, clay-phosphate

mines, limestone quarries, and so on. They are primarily distinguished by their proximity to urban areas. It contributes an area of about 11.89 sq. km.

1.4.2.10. Agricultural Land

The land use category is primarily used for the production of food, fiber, and other commercial and horticultural crops. It includes land under crops, namely cropland, fallow land, agricultural plantations, and aquaculture. The agricultural category is found as the major category, covering 3,292.58 sq. km during 2015-16. Rain-fed farming is the characteristic feature of agriculture in the district; most of its area is cultivated purely under rain-fed conditions. Agriculture is the major economic activity, and the major crops grown in the district are paddy, groundnut, mesta, sugarcane, cotton, maize, ragi, bajra, and pulses. It is also found that Kharif cropland is the predominant category of the district.

1.4.2.11. Kharif Crop

Agricultural area cultivated between June/July to September/October coinciding with the SW monsoon season is considered a Kharif crop. It is associated with rain-fed crops under dry land farming with limited or no irrigation and areas of rain-fed paddy and other dry crops. Kharif is found to be the major agricultural category with an extension of1490.06 sq. km (36.15%) in the district. Most of the Kharif cropland is in rain-fed areas and is seen throughout the district.

1.4.2.12. Rabi Crop

These areas are cultivated between November/December to February/March. It is associated with areas under assured irrigation, irrespective of the source of irrigation. However, Rabi-cropped areas also occur in rain-fed regions, under residual soil moisture conditions, especially in black soil areas with high rainfall during the Kharif season. The extent of the Rabi cropped area is about 22.97 sq. km (0.56%). The Rabi-cropped areas are found along the irrigated areas of canals and reservoirs.

1.4.2.13. Zaid Crop

These are the areas that are grown during the summer (April to May), and they are only found in plains and delta regions. They are mostly connected to irrigated areas with fertile soils. This category occupies an area of 2.19 sq. km during the period.

1.4.2.14. Cropped in two seasons

These are the areas that are cropped during two cropping seasons that are often associated with irrigated areas. Normally Kharif + Rabi and Kharif + Zaid combination is possible in double-cropped areas. It is found that this is

the second major agricultural category with an extent of 743.08 sq. km (18.03%). This category can be found along the river's course and is grown using groundwater in the district.

1.4.2.15. Cropped in more than two seasons

These are the areas that are cropped in more than two cropping seasons. It includes triple-cropped areas (Kharif, Rabi and Zaid), and areas under multiple cropping. Long-duration crops like sugarcane, cotton, banana, etc., are considered under this category. It contributes an area of 91.94 sq. km (2.23%).

1.4.2.16. Fallow land

The agricultural land which is being used for cultivation but is temporarily allowed to rest or un-cropped for one or more seasons, but not less than a year and for not more than five years is referred to as fallow land. The fallow land occupies an area of 271.90 sq. km, which is due to non-availability of water resources in the district.

1.4.2.17. Agricultural Plantation

These are the areas where agricultural tree crops are planted using agricultural management techniques. These also include areas of land use systems and practices wherein the cultivation of herbs, shrubs, and vegetable crops are deliberately integrated with crops, mostly in irrigated conditions, for ecological and economic reasons. These areas are separable from cropland, especially with the data acquired during the Rabi/Zaid season. Plantations appear in dark-red to red tones of different sizes with regular and sharp edges indicating the presence of a fence around them. It is found in an area of 669.65 sq. km. Banana, mango, cashew, oil palm, eucalyptus, teak, and other tropical fruits and nuts are found in the district.

1.4.2.18. Aquaculture

These are the locations used for the commercial breeding and rearing of fish and shrimp. The majority of aquaculture ponds are situated near the coast or in estuaries, lakes, and rivers. This category is mostly found along the coast, with an area of 0.79 sq. km.

1.4.2.19. Forest

Land with a tree canopy cover of more than 10% and a size of more than 0.5 ha is referred to as a forest. The notified forest boundaries are considered to contain a forest if there are both trees and no other dominant land uses there. Within the notified forest boundaries, the trees must be capable of growing to a minimum height of 5 meters. Around 182.76 sq. km

(4.43%) of the land area is covered by forest. The important species are teak, nalla maddi, rosewood, devadari, etc.

1.4.2.20. Deciduous (Dry/Moist/Thorn)-Dense

Most of the species in this category only lose their leaves once a year, usually in the summer. The majority of these tropical forests are broad-leaved and have a yearly leaf-falling tendency. This category includes all the areas where the canopy cover/density is more than 40% and contributed 35.83 sq. km.

1.4.2.21. Deciduous (Dry/Moist/Thorn)-Open

This category is predominantly composed of species, which shed their leaves once a year, especially during summer. These are mostly broad-leaved tropical forests with a tendency to shed their leaves annually. This category includes all the forest areas where the canopy cover/density ranges between 10 - 20 percent. An area of 92.40 sq. km is attributed to this category.

1.4.2.22. Forest Plantation

These are the areas of tree species of forestry importance, raised and managed, especially in notified forest areas. Most of these are located in uplands, coastal areas within notified areas. Many of these can be identified based on the sharp boundaries exhibited by them. Forest plantations, mainly teak, bamboo, casuarinas, etc have been delineated with an area of 5.87 sq. km during the period.

1.4.2.23. Scrub Forest

These are the forest areas that are generally seen at the fringes of dense forest cover and settlements, where there is biotic and abiotic interference. Most times, they are located closer to habitations. Forest blanks which are the openings amidst forest areas, devoid of tree cover, observed as openings of assorted sizes and shapes as manifested in the imagery are also included in this category. Most of the scrub forests are found in fringe areas of reserved forests and account for 30.19 sq. km (0.73%), which are generally prone to the conversion of forest plantations and other development activities within the notified forest.

1.4.2.24. Tree Clad Area-Dense

Areas with tree cover lying outside the notified forest area have a woody perennial plant with a single, well-defined stem carrying a more-or-less-defined crown and being at least 3 m tall. Plants essentially herbaceous but with a woody appearance (e.g. Bamboos and ferns) are also classified as trees if the height is more than 5 m and as shrubs if the height is less than 5 m. This category includes all the areas where the canopy cover/density is

greater than 40%. It occupies an area of 2.84 sq. km, which is found along with notified forest areas.

1.4.2.25. Tree Clad Area-Open

Areas with tree cover lying outside the notified forest area have a woody perennial plant with a single, well-defined stem carrying a more-or-less-defined crown and being at least 3 m tall. Plants essentially herbaceous but with a woody appearance (e.g. Bamboos and ferns) are also classified as trees if the height is more than 5 m and as shrubs if the height is less than 5 m. This category includes all the forest areas where the canopy cover/density ranges between 10 - 40%. It covers an area of 15.93 sq. km.

1.4.2.26. Wastelands

Wasteland is described as degraded land which can be brought under vegetative cover with reasonable effort and which is currently underutilized and land which is deteriorating due to lack of appropriate water and soil management or on account of natural causes. Wastelands can result from inherent/imposed disabilities such as location, environment, chemical and physical properties of the soil, or financial or management constraints. The area under the wasteland category was mapped at 168.41 sq. km (4.09%) during the study, which consists of further subcategories of gullied land, ravinous land, dense scrub, open scrub, coastal sand, and barren rocky/stony waste.

1.4.2.27. Gullied land

Gullies are formed as a result of localized surface run-off affecting the unconsolidated material, resulting in the formation of perceptible channels that undulate the terrain. Gullies develop from rills which are tiny water channels a few centimeters deep, formed as a resultant impact of heavy rainfall and the wearing action of runoff generated there from. They are commonly found on sloping lands, developed as a result of concentrated runoff. Further classification of this category is possible based on the depth, width, bed slope, frequency, and morphology of the bed material of the ravines. They appear in light yellow to bluish-green, depending on the surface moisture and depth of erosion. They vary in size and shape with irregular broken network patterns. The gullied lands are mapped in the areas of pediment and the foothill zones, accounting for 3.53 sq. km (0.09%).

1.4.2.28. Ravinous land

The word ravine is usually associated not with an isolated gully but an intricate network of gullies formed generally in deep alluvium and entering a nearby river, flowing much lower than the surroundings. Ravines are

extensive systems of gullies developed along the river course. It covers an area of 15.55 sq. km.

1.4.2.29. Dense scrub

The scrub is usually confined to topographically elevated areas, on hill slopes generally surrounded by agricultural lands. These areas possess shallow and skeletal soils, at times chemically degraded, extreme slopes, severely eroded lands, and lands subjected to excessive aridity with scrubs dominating the landscape. It is found with varying sizes of small to large areas having a contiguous or dispersed pattern. The dense scrub is mostly identified on the hills and occupies an area of 95.28 sq. km.

1.4.2.30. Open scrub

This category has a similar description as mentioned in the dense scrub except that they possess sparse vegetation or devoid of scrub and have a thin soil cover. The open scrub areas are found at the foothills and moderate to gentle slopping areas are surrounded by agricultural lands. The open scrub category occupied an area of 45.95 sq. km.

1.4.2.31. Coastal Sand

Coastal sands are the sands that are accumulated as a strip along the sea coast. Very high reflectance exhibited by this category, especially in the near-infrared region of the spectrum enables their separation with the salt-affected land. It is found along the coast and occupies an area of 1.89 sq. km.

1.4.2.32. Barren Rocky/Stony waste

The barren rock exposures are especially confined to hilly terrain with down slopes with rock outcrops, stony waste, and fragments. Barren rocky areas have been observed as rocky outcrops in the forest and scrubland. It is found that most of the barren rocky areas are being quarried for various construction activities in the district. The area under this category is 6.20 sq. km and it occupies 0.15 % of the district geographical area.

1.4.2.33. Wetlands

All submerged or water-saturated lands, natural or man-made, inland or coastal, permanent or temporary, static or dynamic which necessarily have a land-water interface, are defined as wetlands. The wetlands category has covered an area of 1.71 sq. km with two subcategories.

1.4.2.34. Inland - Natural

These are the areas that include ox-bow lakes, cut-off meanders, waterlogged, swamp, marsh, peat bogs, etc (with vegetation). This category contributes to 0.66 sq. km of the district total.

1.4.2.35. Coastal - Saltpans

Saltpans are flat expanses of areas covered with salt usually white under the Sum. Saltpans are manmade saline ecosystems from which crude salt is extracted during summer. These are un-drained, usually small and shallow, natural depressions or hollows in which brackish water accumulates and evaporates leaving behind salt deposits. This category is found nearer to coastal areas and occupies an area of 1.05 sq. km.

1.4.2.36. Water Bodies

This category includes locations with surface water, either flowing as streams, rivers, canals, etc., or being impounded in the form of ponds, lakes, and reservoirs. According to the water's depth, these are visible on the satellite image in a distinct blue to dark blue or cyan color. The water body category covers about 301.26 sq. km, which is 7.31% of the district's total area. The important rivers flown in the district are Gostani, Champavathi and Vegavathi.

1.4.2.37. River/Stream-Perennial

Rivers/streams are the natural course of water flowing on the land surface along a definite channel/slope regularly or intermittently towards a sea in most cases or a lake or an inland basin in desert areas or a marsh or another river. These are the rivers/streams that flow continuously throughout the year as considered perennial. It contributes an area of 4.66 sq. km. The major rivers flown in the district are the Gostani, Champavathi, and Vegavathi rivers. These rivers originate in the Eastern Ghats and flow through the district before joining the Bay of Bengal.

1.4.2.38. River/Stream-Non Perennial

The water covers the surface for less than nine months in each year considered as non-perennial. This also includes the dry part of the river generally characterized by the presence of sand or exposed rocks. It is found that most of the streams are under the non-perennial category and contribute an area of 48.95 sq. km.

1.4.2.39. Canal/Drain

Canals and drains are artificial watercourses constructed for irrigation, navigation or to drain out excess water from agricultural lands. It is found mostly in plains with an area of 15.03 sq. km.

1.4.2.40. Lakes/Ponds-Permanent

Perennial lakes/ponds are those that retain water in them either for more than one season (usually more than three months of a year, FAO, 2005) or throughout the year and are usually not subjected to extreme fluctuation in

water level. Ponds are the body of water limited in size, either natural or artificial, regular in shape, smaller in size than a lake, and generally located near settlements. This category occupies an area of 0.02 sq. km.

1.4.2.41. Lakes/Ponds-Seasonal

These are accumulation of water in a depression of various sizes either natural or saline. Areas of tailings and abandoned pits and quarries may remain recognizable for a long time due to presence of water is to be classified under this category. This category includes the above areas except that they remain dry either partially or totally throughout the year.This category occupies an area of 0.14 sq. km.

1.4.2.42. Reservoir/Tanks-Permanent

The reservoir is an artificial lake created by the construction of a dam across the river specifically for hydel power generation, irrigation, and water supply for domestic/ industrial needs, and flood control, either singly or in combination. Tanks are small lakes of impounded waterways constructed on land surface for irrigation. They are associated with croplands, low lands, and reservoirs surrounded by hills without vegetation. This includes all reservoirs/tanks with water spread seen at least during one season in a year is considered under the permanent category. This category occupies an area of 25.50 sq. km. The district's primary reservoirs are the Tatipudi and Andra reservoirs.

1.4.2.43. Reservoir/Tanks-Seasonal

Dry reservoirs/tanks are those which do not have water spread throughout the year and are considered seasonal. During the mapping period, where the water spread is not found in the three seasons, those areas are mapped in this category. It is found that many of the tanks fall under the seasonal category with an area of 206.96 sq. km.

1.4.3 Forest Cover Distribution

The interpretation of various topographical maps from different sources and satellite data were used to create the forest cover maps. Land with a tree canopy cover of more than 10% and a size of more than 0.5 ha is referred to as a forest. If there are both trees and no other dominant land uses within the notified forest boundaries, the area is considered a forest. The trees should be able to reach a minimum height of 5 m within the notified forest boundaries.

Based on IRS R2 LISS III data interpretation (2015-16), the district's forest cover is 182.76 sq. km, accounting for 4.43% of the district's geographical area. The district's forest cover can be found in the west, northwest, southwest, central, and south-eastern areas. The district has a fairly wide distribution of bamboo and timber species throughout the area. The forests are deciduous and spread throughout the district. The district's forests are divided into six forest classes according to the land use/land cover manual (NRSC 2016). The spatial distribution of forest cover and its statistics for the Vizianagaram district are shown in Figure - 8 and Table - 6. As per the Forest Department, Government of Andhra Pradesh the Forest boundary map is presented in Figure-9 and there is no wildlife sanctuaries in the District.

Table 6 Forest cover distribution in Vizianagaram District

S. No	Forest Category	Area in sq. km	% to district total
1	Deciduous (Dry/Moist/Thorn)-Dense	35.83	0.87
2	Deciduous (Dry/Moist/Thorn)-Open	92.40	2.24
3	Forest Plantation	5.87	0.14
4	Scrub Forest	30.19	0.73
5	Tree Clad Area-Dense	2.54	0.06
6	Tree Clad Area-Open	15.93	0.39
Total		**182.76**	**4.43**

Data source: NR Census 3rd cycle mapping, NRSC/ISRO & APSAC, GoAP

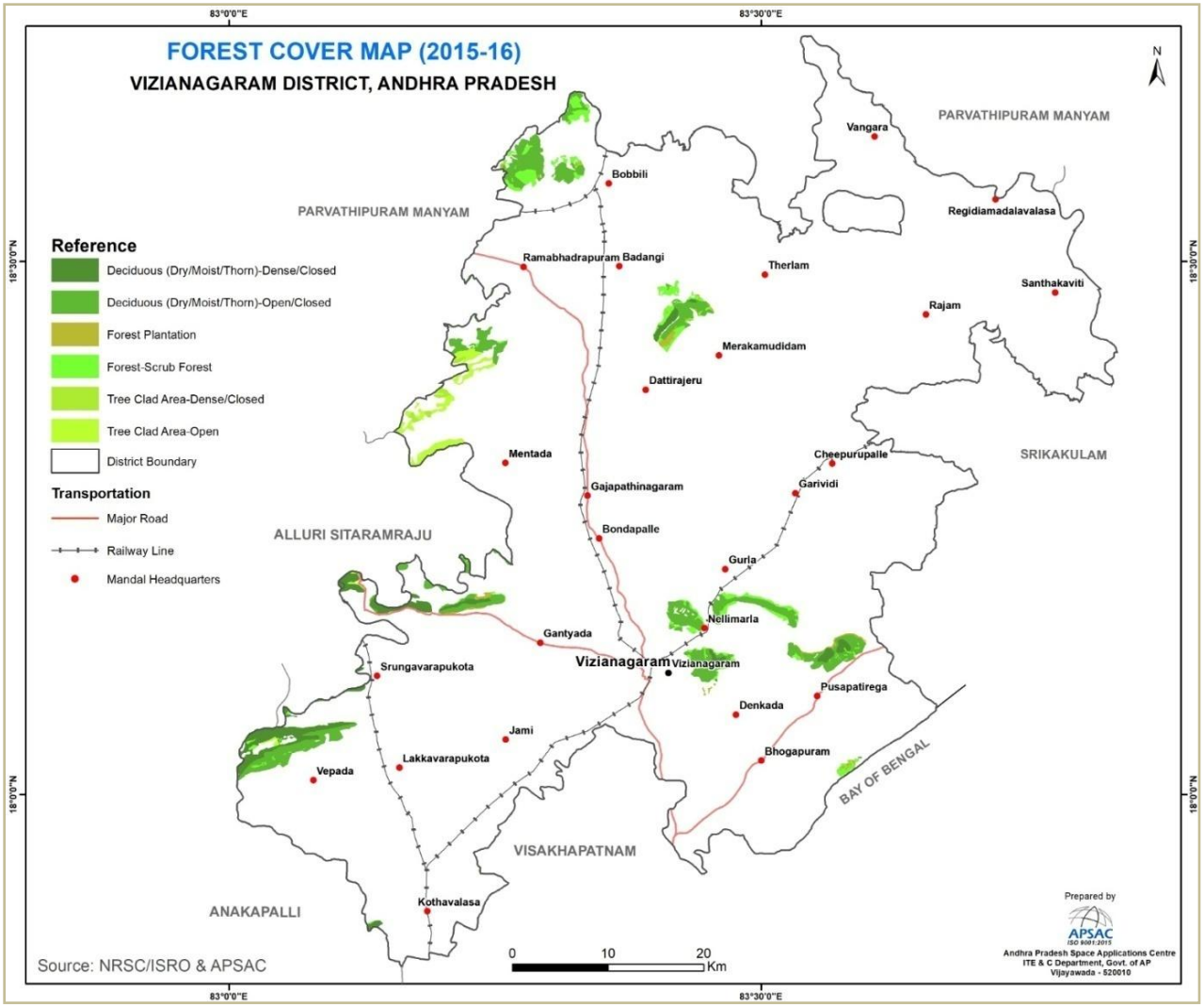


Figure-8: Forest cover map of Vizianagaram District

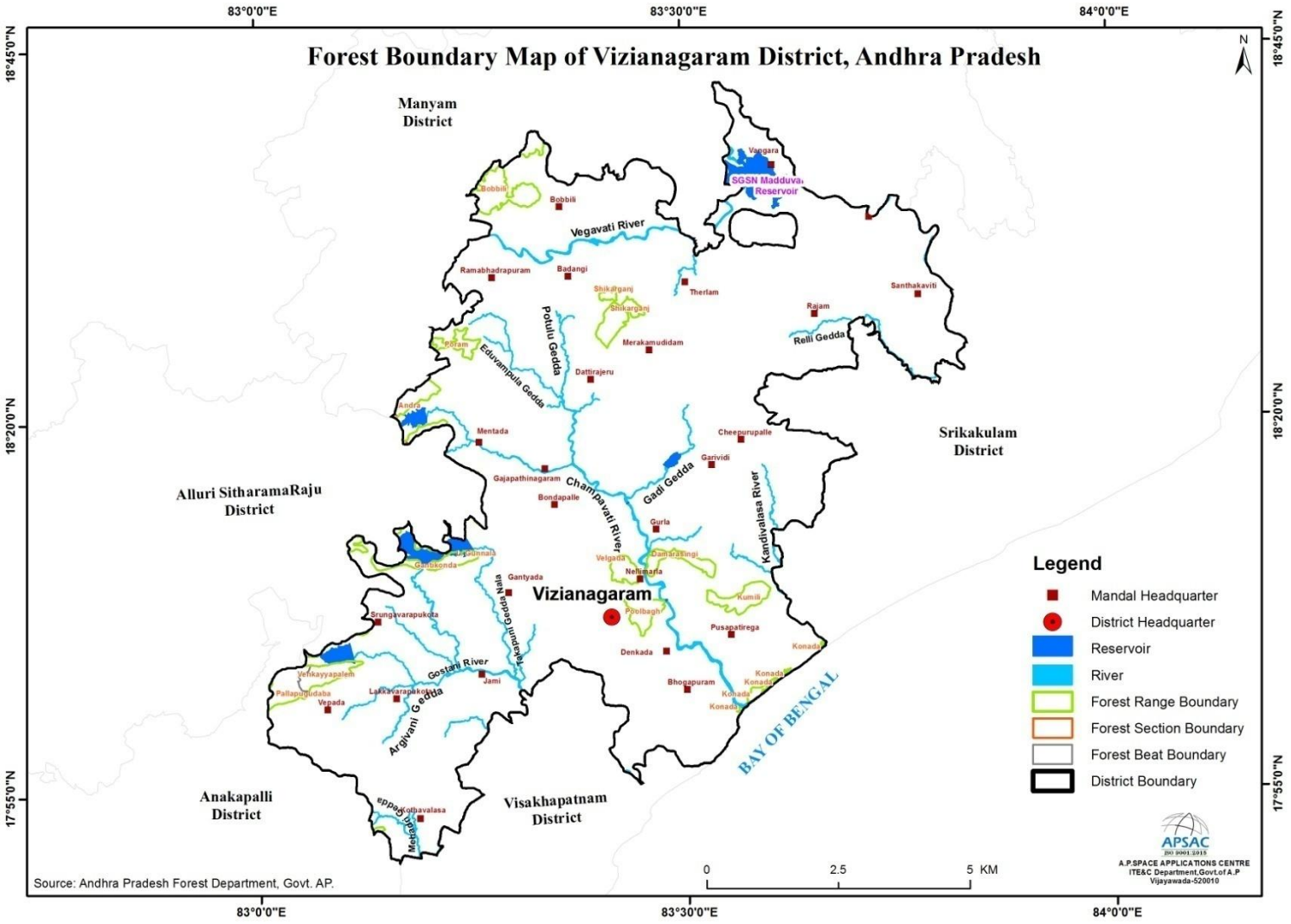


Figure-9: Forest boundary map of Vizianagaram District

1.4.4 Agricultural Resources in Vizianagaram District

Over the past two decades, APSAC has effectively employed remote sensing technology in agriculture, encompassing both spatial and temporal dimensions across various projects. The continuous evolution of satellite remote sensing technology has facilitated systematic monitoring of crop conditions and vigor across extensive regions. Within the realm of spectral vegetation indices derived from remote sensing data, the Normalized Difference Vegetation Index (NDVI) stands out as the most widely utilized for operational drought assessment. Its popularity stems from its straightforward calculation, ease of interpretation, and the capacity to mitigate the impacts of atmospheric conditions, illumination geometry, and other variables.

APSAC conducted in-season crop condition assessments at the Mandal level in Andhra Pradesh. This initiative aimed to provide administrators and planners with crucial insights for strategic decision-making regarding drought management, import-export policies, and trade negotiations. The NDVI is calculated using the formula (NIR–Red)/(NIR+Red), where NIR and Red represent the reflectance in the visible and near-infrared channels, respectively. Water, clouds, and snow exhibit higher reflectance in the visible region, causing NDVI to assume negative values for these features. Bare soil and rocks, with similar reflectance in both visible and near-infrared regions, yield index values close to zero. NDVI values for vegetation typically range from 0.2 to 0.6, with higher values associated with greater green leaf area and biomass. The Shortwave Infrared (SWIR) band is sensitive to soil and crop canopy moisture. Early in the cropping season, when soil background dominates, SWIR is sensitive to top 12 cm soil moisture. As crop growth progresses, SWIR becomes sensitive to leaf moisture content, providing surface wetness information.

The Normalized Difference Wetness Index (NDWI), computed using SWIR data, complements NDVI for drought assessment, especially in the early cropping season. NDWI is derived as follows: NDWI=(NIR-SWIR)/(NIR+SWIR), where NIR and SWIR represent reflected radiation in the Near-Infrared and Shortwave Infrared channels. Higher NDWI values indicate increased surface wetness.

For satellite-based crop condition anomalies indicating agricultural drought, the Vegetation Condition Index (VCI) of both NDVI and NDWI can be computed. When combining VCI values of NDVI and NDWI, the minimum of the two can be considered. For instance, if at least one is categorized as severe, the overall category is considered severe. If at least one is moderate, the overall category is taken as moderate. The vegetation conditions and corresponding ranges are detailed in Table-7.

Table 7 Vegetation condition and range in percentage

VCI range (%)	Vegetation Condition	Description
60-100	Normal	Crop condition is Normal
40-60	Moderate	Crop condition is Moderate
0-40	Severe	Crop condition is Severe

Data Source: APSAC, Vijayawada

1.4.4.1 Kharif Crop Condition Assessment

Andhra Pradesh Space Applications Centre (APSAC) conducted a crop condition assessment in Vizianagaram district during Kharif 2022-23 utilizing MODIS (Moderate Resolution Imaging Spectroradiometer) satellite data. The assessment revealed that out of the total mandals in the district, 25 were categorized as having a normal crop condition, 01 were classified as moderate, and 01 were identified as severe. Notably, urban and forest cover mandals were excluded from the vegetation condition assessment. This comprehensive evaluation provides valuable insights into the agricultural landscape of Vizianagaram district, aiding in targeted interventions and resource allocation to mitigate the impacts of varying crop conditions.

1.4.4.2 Rabi Crop Condition Assessment

During Rabi 2022-23, The assessment identified that the district has 01 mandal in normal, 07 mandals in moderate, and 19 mandals in the severe category. Notably, mandals predominantly covered by urban or forest areas were excluded from the vegetation condition assessment. This evaluation provides valuable insights into the agricultural status of Vizianagaram district during the Rabi season, facilitating informed decision-making and resource allocation to support agricultural sustainability and productivity.

1.4.5 Soil Resources of the Vizianagaram District

The Vizianagaram district of Andhra Pradesh features a variety of soil types. The predominant soil type is clayey to gravelly clayey moderately deep dark brown soil, covering 1,508.55 sq. km (39.59%). This is followed by loamy to gravelly clay deep dark reddish brown soil, which covers 868.46 sq. km (22.79%). Loamy to clayey skeletal deep reddish brown soil is present over 694.84 sq. km (18.24%), while moderately deep calcareous black soil extends across 514.8 sq. km (13.51%). Other soil types include gravelly clayey moderately deep grassland soils covering 85.74 sq. km (2.25%), fine loamy gravelly clayey shallow reddish brown soils over 70.94 sq. km, and gravelly loamy moderately deep grassland soils spanning 39.61 sq. km (1.04%). Additionally, very dark brown moderately deep wet silty soils cover 18.45 sq. km (0.48%) and 9.05 sq. km (0.24%). The soil resource map of the district is shown in Figure-10 and the soil category with area is shown in Table-9.

Table 8 Soil classes in Vizianagaram district

S.No	Classification	Area in Sq.km	Percentage (%)
1	Clayey to gravelly clayey moderately deep dark brown soils	1508.55	39.59
2	Fine loamy gravelly clayey shallow reddish brown soils	70.94	1.86
3	Gravelly clayey moderately deep grass land soils	85.74	2.25
4	Gravelly loamy moderately deep grass land soils	39.61	1.04
5	Light gray deep sandy soils	9.05	0.24
6	Loamy to clayey skeletal deep reddish brown soils	694.84	18.24
7	Loamy to gravelly clay deep dark reddish brown soils	868.46	22.79
8	Moderately deep calcareous black soils	514.8	13.51
9	Very dark brown moderately deep wet silty soils	18.45	0.48
	Total[#]	3810.44	100.00

Data Source: APSAC, Vijayawada

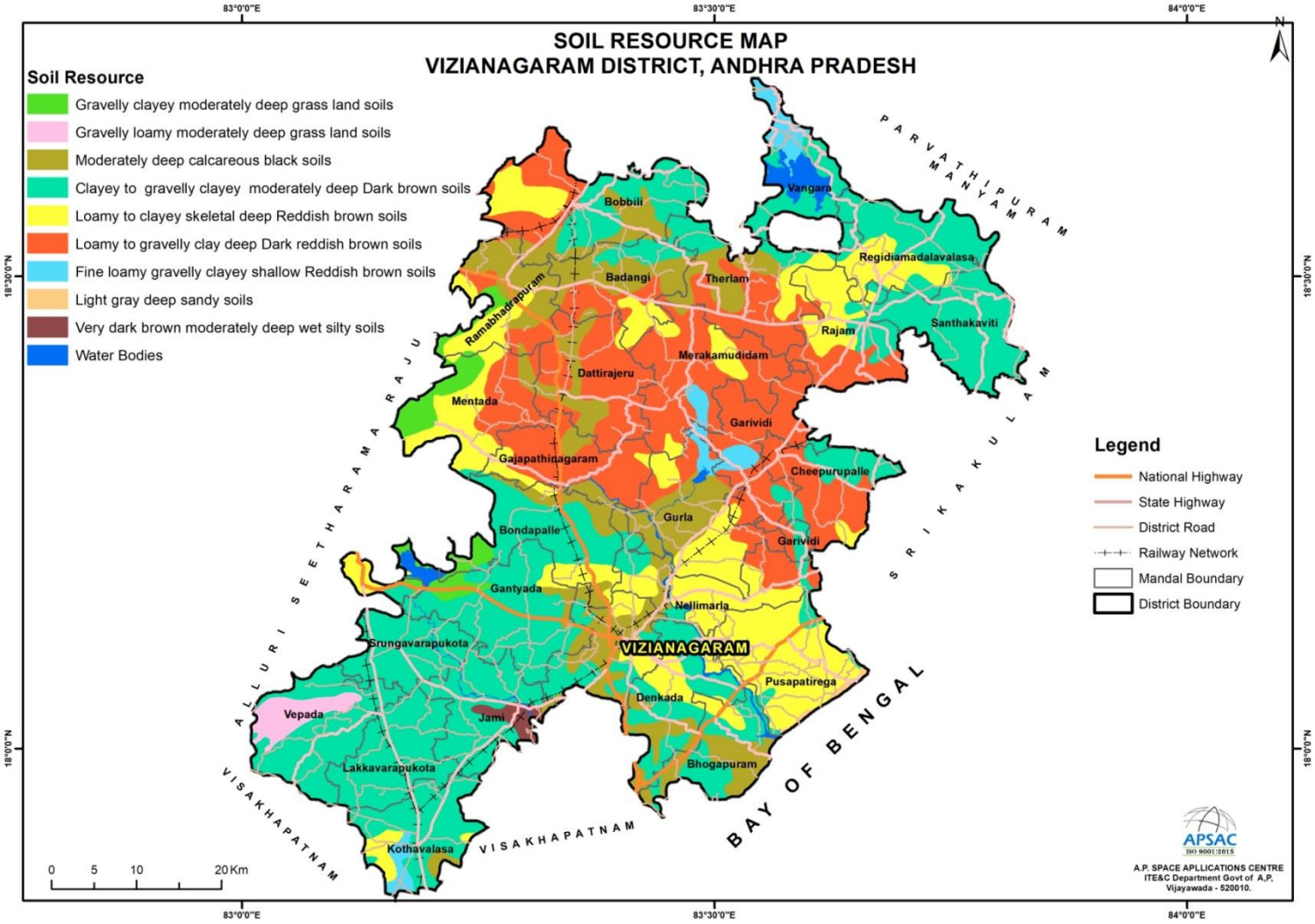


Figure-10: Soil resource map of Vizianagaram District

1.4.6 Horticulture

Horticulture is a science, as well as, an art of production, utilization and improvement of horticultural crops, such as fruits and vegetables, spices, ornamental, plantation, medicinal and aromatic plants. It also includes plant conservation, landscape restoration, landscape, garden design, construction, maintenance, arboriculture, ornamental trees and lawns.

In the Vizianagaram district, Oil palm is the major horticulture crop, cultivated in an area of 212.33 ha. followed by Coconut (119.73 ha.), Mangoes (31.4 ha.), and Banana (6.8 ha.). The total area under horticulture fruit crops is 386.99 ha. The horticulture crop-wise detail is shown in the Table-9.

Table 9 Area of horticultural crops in Vizianagaram district

S.No	Crop	Area in ha
1	Acid Lime	3.69
2	Banana	6.8
3	Dragon Fruit	5.05
4	Guava	3.24
5	Lime/Lemon/Citrus	0.28
6	Mangoes	31.4
7	Sapota	1.15
8	Cashew Nut	1.74
9	Coconut	119.73
10	Oil Palm	212.33
11	Mulberry	1.58
Total Area		**386.99**

Source: Government of Andhra Pradesh Rashtriya Krishi Vikas Yojana-2022-23

1.5 Ground Water Prospects in the District:

Groundwater occurs in almost all geological formations, and its potential depends on the nature of geological formations, geographical setup, incidence of rainfall, recharge, and other hydrogeological characteristics of the aquifer. In consolidated formations, groundwater occurs under unconfined to semi-confined conditions. Groundwater is developed in these formations by dug wells, dug-cum-bore wells, and bore wells tapping weathered and fractured zones. The yields range from 20 to 70 m^3/day. The occurrence of fractures in crystalline formations is limited to 30 to 40 meters below ground level (bgl) and occasionally extends down to 70-100 meters bgl. Bore wells constructed in the weathered and fractured zones of crystalline formations generally yield between 80 to 400 m^3/day. Higher yields are limited to the available thickness of the fractured and jointed zones.

In meta sediments, yields are very limited, ranging from 10 to 80 m^3/day, with higher yields occurring in limestone formations. Groundwater in semi-consolidated formations occurs under unconfined to confined conditions. Groundwater is developed in these formations by dug-cum-tube wells and tube wells. These formations are potential aquifers. The yields of dug-cum-tube wells range from 30 to 45 m^3/day. The granularity of the sandstone bed determines the yield potential, with higher yields recorded in the Rajahmundry sandstones tapping coarse sandstone beds. The yields of tube wells in Gollapalli sandstones and Rajahmundry sandstones range from 60 to 200 m^3/day and 600 to 1500 m^3/day, respectively. The groundwater prospects map of the Vizianagaram district is shown in Figure-11.

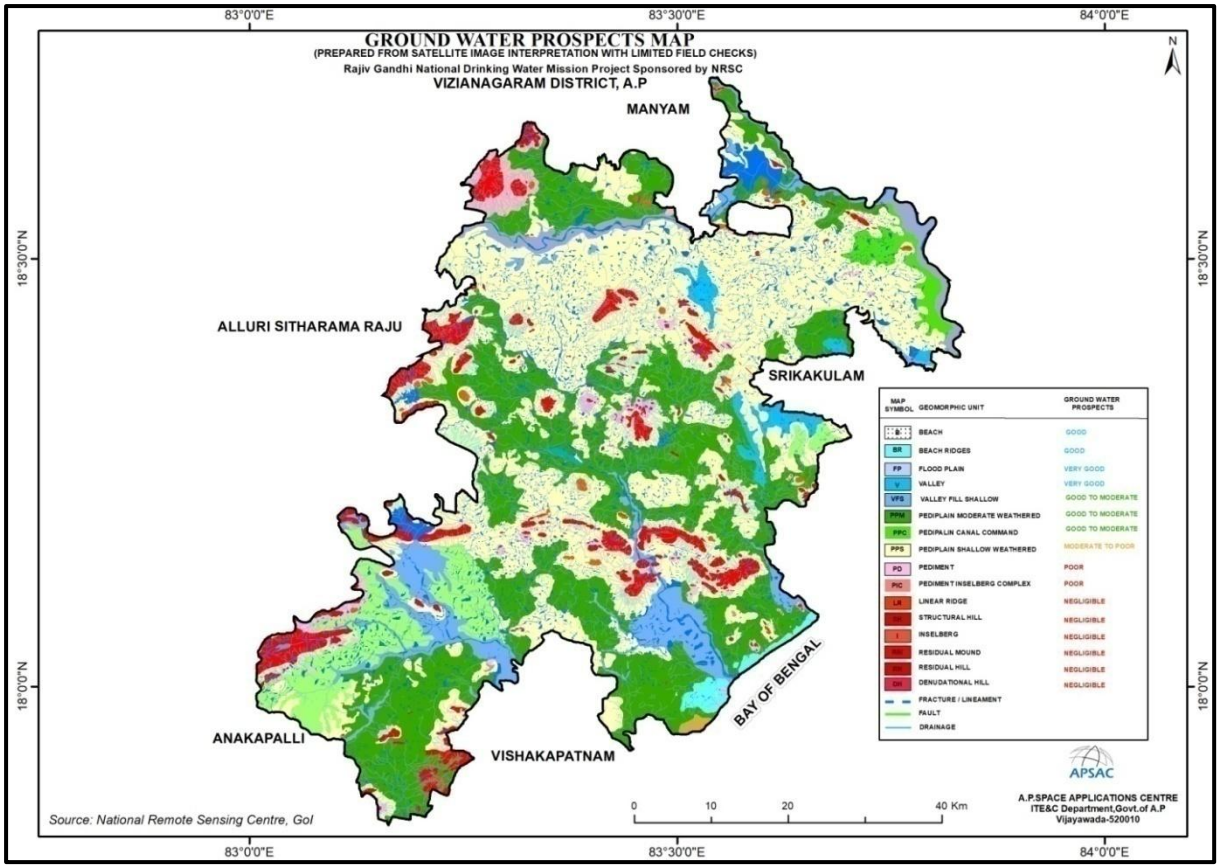


Figure-11: Ground Water prospects in Vizianagaram District, Andhra Pradesh

1.6 Infrastructure

1.6.1 Transport Network

Vizianagaram district is well-connected by various modes of transportation such as Road, Rail and Air. The connectivity of each category is also depicted in Figure- 12. The details of each transport network distribution in the district are as given below.

1.6.1.1. Road Transport: The road network of the district has been delineated by using high resolution satellite data under Space Based Information Support for Decentralized Planning (SIS-DP) project and arrived the lengths of each type of road network. It can be observed that Vizianagaram district has a well-developed road network that facilitates connectivity to all the towns within the district, and to other major cities and towns of nearby districts. The major road network includes National Highways (NH), State Highways (SH), and District Roads (DR). The rural

areas of the district also good connectivity by Panchayat Raj roads / village roads.

The total length of the road network in the district is about 8825.50 km. Of which, the length of the National Highways is about 133.92 km, State Highways connecting all major towns and cities in the district is having a length of about 575.69 km. The district roads connecting to all towns and mandals are having a length of 1126.68 km. The length of each road category covered in the district is shown in Table - 10.

Table 10 Road Category wise Lengths

S.No	Road Type	Length in Km
1	National Highway	133.92
2	State Highway	575.69
3	District Road	1126.68
4	Village Road	3865.31
5	Cart Track	2354.20
6	Foot Path	629.98
7	City Road	139.73
Total Length		**8825.50**

Data Source: R&B Department & APSAC, Vijayawada.

Vizianagaram district is traversed by Three National Highways. The traverse and description of each highway is as given below:

1.6.1.1.1. National Highway 16 (NH16): The NH16 is a major National Highway in India that runs along east coast of West Bengal, Odisha, Andhra Pradesh and Tamil Nadu states. It is a part of the Golden Quadrilateral project to connect India's major cities.

The National Highway starts at Odisha border which passes through the coastal districts in Andhra Pradesh and enters at Ichchapuram mandal in Srikakulam district and traverse through Vizianagaram district via Pusapatirega and Bhogapuram mandals. It passes through the Visakhapatnam, Anakapalli, Kakinada, East Godavari, Eluru, Krishna, Guntur, Palnadu, Bapatla, Prakasam, S.P.S.Nellore and Tirupati districts with covers major mandals namely Bhogapuram, Anandapuram, Pendurthi, Anakapalle, Tuni, Prathipadu, Rajahmundry, Devarapalli, Eluru, Gannavaram, Vijayawada, Mangalagiri, Guntur, Chilakaluripet, Martur,

Ongole, Kavali, Nellore, Gudur and Naidupet and connects at Tada in Tirupati district, Tamil Nadu Border.

1.6.1.1.2. National Highway 516E (NH516E): NH-516E traverses the state of Andhra Pradesh and It is a spur road of National Highway 16. The NH starts at Rajahmundry, East Godavari district in Andhra Pradesh, and passes through Korukonda and Gokavaram. It connects NH26 at Vizianagaram passess through Alluri Sitharama Raju district via Rampachodavaram, Addateegala, Rajavommangi, Koyyuru, Chintapalle, G.Madugula, Paderu, Hukumpeta, Araku Valley and Anantagiri. It traverses through Gantyada mandal in Vizianagaram district and connects NH26 at Vizianagaram.

1.6.1.1.3. National Highway 26 (NH26): NH 26 is a National Highway that connects Bargah in Odisha and passes through Odisha and Vizianagaram district of Andhra Pradesh. The NH enters in to Parvathipuram Manyam district and passes through Salur mandal. It traverses through Vizianagaram district via Ramabhadrapuram, Gajapathinagaram, Bondapalle and Vizianagaram mandals. It connects NH 16 at Komatisatram near Vizianagaram district .

1.6.1.2. Railways:

The Indian Railway line traversing from East to West in Vizianagaram district covering the various stations to cater the transportation needs of the people. The length of Rail network in the district is about 168 Km covering 18 railway stations. Among these, the important railway stations in the district are Alamanda, Bobbili Junction, Chipurupalle, Donkinavalasa, Gajapatinagaram, Garudubilli, Kantakapalle, Komatipalli, Korukonda, Kottavalasa Junction and Vizianagaram Junction; and the Train stations are Garividi, Gotlam, Lakkavarapukota, Mallividu, Narayanappavalasa Halt, Nellimarla, and Srungavarapukota.

Vizianagaram district is traversed by a significant railway line that connects various parts of the district and provides connectivity to neighbouring regions. The main railway line that passes through Vizianagaram district is

1.6.1.2.1. Howrah-Chennai Main Line: which is a major trunk route that connects Howrah (Kolkata) in West Bengal to Chennai in Tamil Nadu and facilitating passenger and freight transportation across the region. It

passes through Vizianagaram district, serving the Vizianagaram Junction railway station.

1.6.1.2.2. Vizianagaram-Raipur Line: This line connects Vizianagaram in Andhra Pradesh to Raipur in Chhattisgarh. It passes through important stations like Bobbili and Parvatipuram.

1.6.1.2.3. Kothavalasa-Kirandul Line: This line connects Vizianagaram to Kirandul in Chhattisgarh. It passes through important railway station Araku. It is primarily used for freight transport, especially for iron ore.

In addition to the main line, there is a branch lines and spur lines namely Bobbili Junction - Salur that extend from the main line to connect specific towns with in Vizianagaram district. These lines provide local connectivity and transportation services to different parts of the district.

1.6.1.3. Air Transport: Bhogapuram Airport is an international airport and a proposed greenfield project located near Bhogapuram at distance of 20 kilometres from the district headquarter i.e. Vizianagaram, Andhra Pradesh. It is expected to be a major international airport, serving both domestic and international flights. The airport project was being developed by the Andhra Pradesh Airports Development Corporation Limited (APADCL), a state government-owned entity.

Badangi airstrip is a historic airstrip near Badangi village. it is considered a strategic location for defence purpose by the authorities. It is at a distance of 7km from the NH and 3km from Donkinavalasa Railway Station.

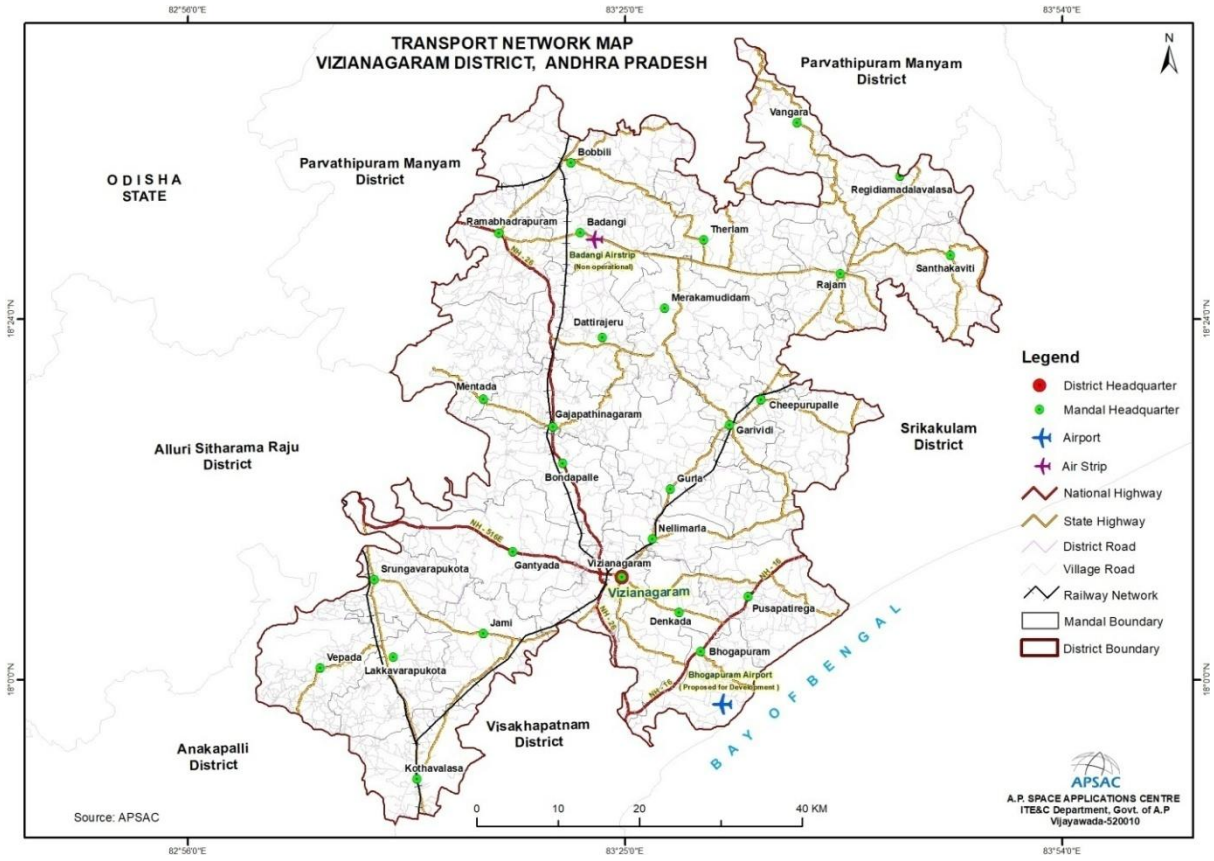


Figure-12: Transport Network of Vizianagaram District

1.6.2 Irrigation

Irrigation has assumed an increasing significance in agriculture in the context of new technology, where high yielding varieties and multiple cropping are being practiced. The main reasons for low yields are inadequate rainfall, uneven and uncertain rains during the period of crop growth. It is generally found that the introduction of irrigation is associated with changes in the cropping pattern. The shift from a traditional cropping pattern to the most advantageous cropping pattern is possible only in the presence of irrigation facilities. The new agricultural technology is highly based on sufficient moisture conditions. Thus, the development of irrigation is crucial for increasing agricultural production. The irrigation projects are classified as major, medium and minor irrigation details are shown in Table.11 and Figure-13.

1.6.2.1. Major Irrigation Projects:

In Vizianagaram district there are three major irrigation (Ongoing) projects i.e., Thotapalli Barrage Project, Gajapathinagaram Branch Canal (Thotapalli Barrage RMC), Babu Jagjeevana Ram Uttarandhra Sujala Sravathi (BJRUSS). The Thotapalli Barrage Project is covered an ayacut of 72,583 ac falling in two assembly constituencies namely as Bobbili, Cheepurupalle and Gajapathinagaram Branch Canal is covered an ayacut of 15,000 Ac under Thotapalli RMC. The Babu Jagjeevana Ram Uttarandhra Sujala Sravathi (BJRUSS) project is covered an ayacut of 4,01,601 Ac falling in three assembly constituencies namely as Vizianagaram, Bobbili and Cheepurupalle.

1.6.2.2. Medium Irrigation Projects:

In Vizianagaram district there are 12 medium irrigation (Completed-09 nos- Ongoing-03 nos) projects i.e., the completed projects are Madduvalasa Reservoir Project, Vengalarayasagaram Project, ThatipudiResrvoir, Pedda Gedda Reservoir Project, Andra Reservoir Project, Denkada Anicut, Narayanapur Anicut, Peddankalam Anicut, Paradhi Anicut and the ongoing projects are Tarakarama Thirtha Sagaram Reservoir Project, Andra High Level Canal and VengalarayaSagaram Project extension canal. There are 17 minor lift irrigation schemes in the district under Andhra Pradesh State Irrigation Development Corporation Limited (APSIDC), an ayacut of 4,845 Ac. The Water Resources Department 162 nos of minor irrigation tanks (above 100 Ac ayacut)

covered in the district an extent of 32,566 Ac. And 7,217 nos of minor irrigation tanks (bellow 100 Ac ayacut-combined district) covered in the district an extent of 1,38,415 Ac of combined Vizianagaram district.

Table 11 Major and Medium Irrigation Projects in Vizianagaram District

S.No	Project Type	Name of the Project	Status	Ayacut in Ac
1	Major	Thotapalli Barrage Project	Ongoing	72,583
2		Gajapathinagaram Branch Canal (Thotapalli RMC)		15,000
3		Babu Jagjeevana Ram Uttarandhra Sujala Sravathi (BJRUSS)		4,01,601
4	Medium	Madduvalasa Reservoir Project (Combined district)	Completed	24,700
5		Vengalarayasagaram Project (Combined district)		24,700
6		ThatipudiResrvoir (Providing drinking water supply to Visakhapatnam Municipal Corporation - 0.536 TMC)		15,280
7		Pedda Gedda Reservoir Project (Combined district)		12,000
8		Andra Reservoir Project		9,426
9		Denkada Anicut		5,203
10		Narayanapur Anicut		4,221
11		Peddankalam Anicut		7,693
12		Paradhi Anicut		8,188
13		Tarakarama Thirtha Sagaram Reservoir Project	Ongoing	24,710
14		Andra High Level Canal		4,100
15		Vengalarayasagar Project extension canal (Combined district)		5,000
16	Minor	Lift Irrigation Schemes under APSIDC (17 Nos)	Completed	4,845
17		Minor Irrigation Tanks - 162 nos (Ayacut above 100 Acres)		32,566
18		Minor Irrigation Tanks - 7217 nos (Ayacut bellow 100 Acres)		1,38,415
Total				8,10,231

Data source: WRD, APWRIMS, Govt. of A.P.

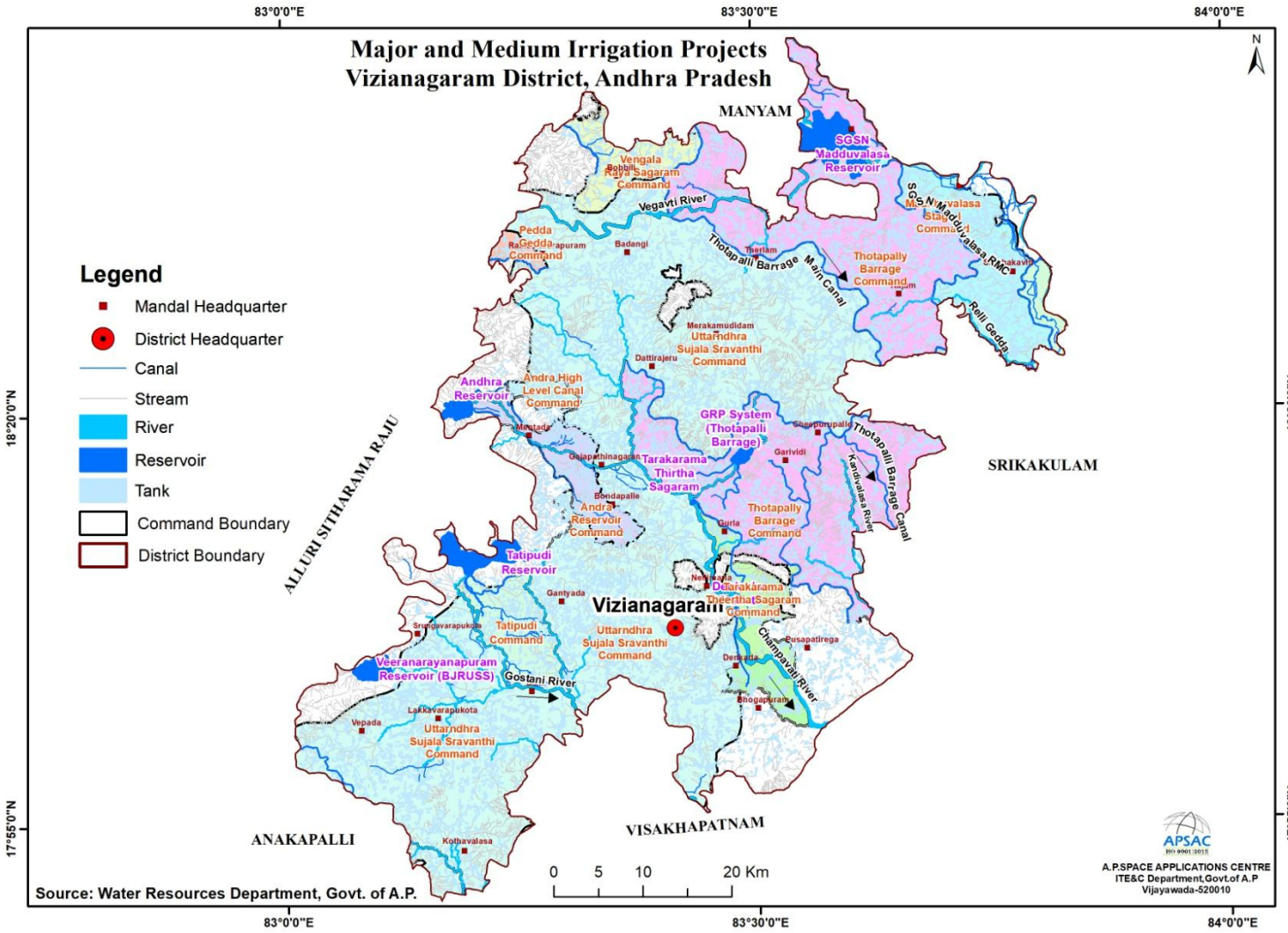


Figure-13: Major and Medium Irrigation Projects of Vizianagaram District

1.6.2.3. Tank Information System

As per the information of Water Resources Departmental portal, Andhra Pradesh Water Resources Information & Management System (APWRIMS) and the URL:https://apwrims.ap.gov.in/ in Vizianagaram District has 46 minor irrigation tanks covered in Addanki and Parchur Assembly Constituencies. The Designed Storage Capacity of minor irrigation tanks in Vizianagaram District is 951.82 mcft and Current Storage Capacity is 666.42 mcft. The mandal wise minor irrigation tanks details of Vizianagaram District are shown in Table.12.

Table 12 Mandal wise Minor Irrigation Tanks details of the district

S.No	Mandal	No. of MI Tanks	Designed Storage Capacity (mcft)	Current Storage Capacity (mcft)
1	BADANGI	319	945	862.83
2	BHOGHAPURAM	104	245.53	245.38
3	BOBBILI	306	2,059.37	1,873.86
4	BONDAPALLE	421	996.84	724.74
5	CHEEPURUPALLE	248	396.89	368.92
6	DATTIRAJERU	454	1,245.58	1,202.49
7	DENKADA	220	796.4	795.69
8	GAJAPATHINAGARAM	303	482.02	418.1
9	GANTYADA	397	1,222.46	908.04
10	GARIVIDI	299	528.12	478.63
11	GURLA	368	785.2	784.51
12	JAMI	167	474.32	408.8
13	KOTHAVALASA	257	383.25	357.89
14	LAKKAVARAPUKOTA	311	983.27	965.79
15	MENTADA	284	652.44	516.26
16	MERAKAMUDIDAM	324	645.39	621.86
17	NELLIMARLA	268	390.35	381.2
18	PUSAPATIREGA	257	684.08	657.46
19	RAJAM	298	512.2	352.1
20	RAMABHADRAPURAM	247	245.82	238.27
21	REGIDIAMADALAVALASA	484	477.22	417.87
22	SANTHAKAVITI	282	630.15	484.23
23	SRUNGAVARAPUKOTA	246	670.7	670.7
24	THERLAM	343	462.06	443.65
25	VANGARA	208	266.49	212.79
26	VEPADA	269	1,277.92	1,262.35
27	VIZIANAGARAM	254	762.39	525.27
TOTAL		7,938	19,221.47	17,179.68

Data source: WRD, APWRIMS, Govt. of A.P.

1.6.3 Eco-sensitive areas and important places

Vizianagaram district is blessed with several tourist attractions that offer a mix of historical, cultural and natural wonders. The important popular tourist, religious and cultural places to visit in the Vizianagaram district are shown in the Table - 13 and the geographical location of each place is depicted in Figure-14.

Table 13 Important places of Tourism in Vizianagaram district.

S.No	Name	Village	Mandal
1	Alakananda Palace	Cheluvuru	Vizianagaram
2	Bobbili Fort	Gollapalli	Bobbili
3	Bobbili Venugopalaswamy Temple	Bobbili	Bobbili
4	DwadasiJyothirlanga Temple	Vizianagaram	Vizianagaram
5	Geetha Mandiram	Govindapuram	Pusapatirega
6	Gurajada Heritage Home	Gajularega	Vizianagaram
7	Jnanasaraswati Temple	Vizianagaram	Vizianagaram
8	MadduvalasaReservior	Patuvardhanam	Vangara
9	Moti Mahal	Vizianagaram	Vizianagaram
10	Punyagiri	Kotarubilli	Gantyada
11	Raj mahal	Vizianagaram	Vizianagaram
12	Ramathirdam	Nellimarla	Nellimarla
13	Sita Rama Swamy Temple	Gullaseetharama Puram	Santhakaviti
14	Sri Daragangamma&Sivalayam Temple	Srungavarapukota	Srungavarapukota
15	Sri Endala Mallikarjuna Swamy	Korla Valasa	Regidiamadalavalasa
16	Sri Pyditalamma Vari Temple	Vizianagaram (M)	Vizianagaram
17	Sri Ramaswamy vari Devasthanam	Nellimarla	Nellimarla
18	Sri. Kanaka Mahalakshmi Temple	Sumitrapuram	Cheepurupalle
19	Sri.MannarRajagopalaswamy Temple	Vizianagaram (M)	Vizianagaram
20	SrimadhRamanarayanam	Sarika	Vizianagaram
21	Thatipudi Reservoir	Mushidipalle	Srungavarapukota
22	Vizianagaram Fort	Vizianagaram	Vizianagaram

Data Source: Tourism Department, Government of Andhra Pradesh.

A brief description of certain tourist places are given below:

1.6.3.1. Vizianagaram Fort: Vizianagaram Fort is located at a distance of about 2 km from the district headquarter Vizianagaram. The Vizianagaram Fort is a historical landmark. It's known for its impressive architecture and historical significance. The fort complex includes a palace, gardens, and other structures. It has a temple of Lord Hanuman on one side and Goddess Lakshmi on the other.

1.6.3.2. Thatipudi Reservoir: Thatipudi Reservoir is located at about 24 km from the district headquarter Vizianagaram. A picturesque reservoir surrounded by lush greenery and hills, offering a serene environment for picnics and relaxation. The Thatipudi dam is in the Gantyada mandal of Vizianagaram district. The Thatipudi reservoir is built across the Gosthani river.

1.6.3.3. Bobbili: Bobbili is located at about 60 km from the district headquarter Vizianagaram. It is known for its historical heritage, especially the Bobbili Fort. It's also famous for the annual Bobbili Utsavam, a cultural and historical festival.

1.6.3.4. Moti Mahal: Moti Mahal is located at about 2 km from the district headquarter Vizianagaram. The main door is decorated with two exquisite marble statues which speak of the good taste as well as the wealth of the occupants. The Moti Mahal is the main and most prominent building in the Vizianagaram fort. The link with its past is maintained through a display of artifacts in a museum on the ground floor of Moti Mahal.

1.6.3.5. Alakananda Palace: Alaknanda Palace is located at about 7.7 km from the district headquarter Vizianagaram. This opulent palace provided its occupants with all comforts of life in the lap of natural and man-made beauty. The area around the palace is well laid out with walkways and gardens. A runway, built in the grounds, enabled the royal visitors to alight straight from their aircraft into the palace. At present, the Alaknanda Palace is used as the headquarters of the 5th Battalion of the Andhra Pradesh Armed Reserve Police.

1.6.3.6. Raj Mahal: Raj Mahal is located at about 60 km from the district headquarter Vizianagaram. The Bobbili Rajas built several palaces to lavish hospitality on their guests. The Raj Mahal, also known as the Chikkavaram Guest House, is one such palace. It is situated in isolated splendour on the outskirts of modern-day town. Visitors to the palace must traverse a long driveway to reach the palace premises.

Places of Religious and Cultural importance given below.

1.6.3.7. Ramanarayanam: Ramanarayanam is located at about 4.8 km from the district headquarter Vizianagaram. Tucked away in the remote corner of the "CITY OF MUSIC", Vizianagaram. Ramanarayanam provides an awesome yet is a spiritual theme park with aesthetic Gate Way to those seeking solace in spiritual experience. The unique design and elevation of the Pranganam is bound to leave the tourist/Pilgrim spell bound with an experience, rich, cherishing and invigorating.

1.6.3.8. Pydithalli Temple: Pydithalli Temple is located at about 2.5 km from the district headquarter Vizianagaram. Pydithallamma is village goddess of Vizianagaram Town. Everyone who comes to Vizianagaram visits this temple. It has two temples Vanam Gudi and Chaduru Gudi. Vanam Gudi Situated opposite to Vizianagaram Railway Station and Chaduru Gudi where Sirimanu Utsav is performed which is at 3 Lantens Junction, Vizianagaram.

1.6.3.9. DwadasiJyothirlinga Temple: DwadasiJyothirlinga Temple is located at about 3 km from the district headquarter Vizianagaram. This temple is situated in Viziangaram town at SVN Nagar. It is a worth seeing temple with prototypes of DwadasaJyothirlingas all over India. Main Idol is Sphatika Linga opened everyday. It is a peaceful temple and just 4 kms away from Railway Station and Bus Stand.

1.6.3.10. Gnyana Saraswati Temple: Gnyana Saraswati Temple is located at about 4 km from the district headquarter Vizianagaram. This temple is situated in Viziangaram town at SVN Nagar. It is a worth seeing temple with Saraswati Ammavaru. In this temple Aksharabhyasams are performed daily for Children. Exclusive Saraswati temple in northeast Andhra.

1.6.3.11. Jagannath Temple: Jagannath Temple is located at about 1.8 km from the district headquarter Vizianagaram. The Temple is in Vizianagaram Town. The temple of Lord Jagannadha situated in the coastal town of Puri in Orissa is an important pilgrimage site for the Hindus. As per traditions, replica of the idol of Lord Jagannadha is immersed into the sea every twelve years.

1.6.3.12. Ramthirtam: The village is situated in Nellimarla mandal at a distance of 10 km to the Northeast of Vizianagaram. It is one of the holiest places in India, Ramtirtham, is a unique temple where three major faiths Jain, Buddhist and Hindu are represented. The complex is spread over three hills Bodi Konda, Gurubhakta Konda and Durga Konda containing Jain and Buddhist relics.

1.6.3.13. Govindapuram: It is situated in Puspatirega Mandal at 30 km from Vizianagaram. Amongst the modern temples in the district, the

'Geeta Bhavan' at Govindapuram deserves special mention. It is a beautifully built monument in the form of Chariot, which attracts many piligrims. It has a spiritual prayer cum meditation hall where the people come to gain spiritual solace. This village is nearer to Chintapalli sea shore, where light house was constructed by French.

1.6.3.14. Punyagiri: Punyagiri is located at about 35 km from the district headquarter Vizianagaram. Sri Dara-gangamma and Sivalayam is the ancient temple, which is situated on the hill known as "Punyagiri" in the vally of Eastern Ghats at a height of 1000 ft. above the sea level. The place is known for its mean waterfalls and valleys with beautiful surroundings of nature. On the right side of the way to hill, there is another waterfall known as "Chinaputtudara" which is said to be eminate from the idol and develops as natural spring.

1.6.3.15. Bobbili Venu Gopalaswamy Temple: Bobbili Venu Gopalaswamy Temple is located at about 61 km from the district headquarter Vizianagaram. The House of Bobbili was deeply religious. The temple of the family deity Venugopala Swamy – had been in existence since Bobbili was founded. It is located close to the royal residence and is the most revered temple in Bobblili. It is the only temple in the region where the Gopuram is higher than the main temple. The base of the Gopuram is made of solid stone while the six stories over it are made of stone and brick masonry. The base of the Gopuram itself is approximately 9 meters high.

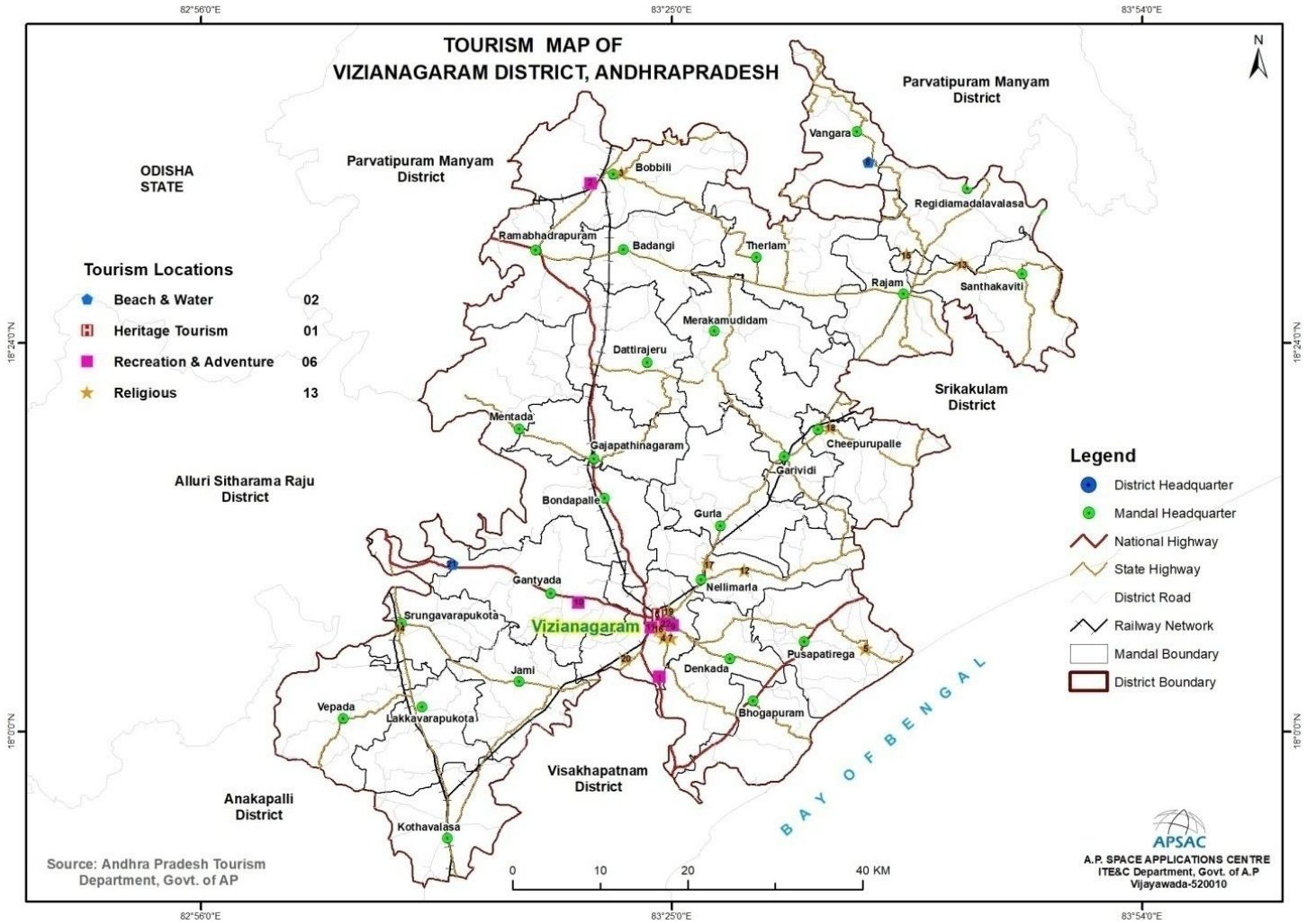


Figure-14: Tourism Map of Vizianagaram district, Andhra Pradesh

1.7 Drainage Pattern

1.7.1 Drainage

There are four rivers draining the district, viz. Nagavali, Gosthani, Champavathi and Kandivalasa. They originate in the Eastern Ghats and after flowing through the district, finally joining Bay of Bengal.

The Nagavali is the main river that flows towards south direction for 60 Km in east side border of the vizianagaram district and the catchment area is 1,136 Sq.km in the district. It is also known as Langulya river. The Nagavali river originates in the Eastern Ghats near Lakhbahal, located at an altitude of 1,300 metres in the Kalahandi district of the Indian state Odisha and joining to Bay of Bengal near Mofuzbander in Srikakulam district. The important tributaries are Suvarnamukhi river and Vegavathi river in the district. The Vegavathi river starts from Pachipenta hills of Pachipenta mandal, flows parallel to Suvarnamukhi before joining Nagavali river.

The Gostani River originates in the Ananthagiri forest area of Srungavarapukota near Borra caves. It flows towards south direction through Jami mandal before entering Visakhapatnam district and joining to Bay of Bengal near Bheemunipatnam in Visakhapatnam district.

The Champavathi River originates from Eastern Ghats, Ananthagiri hills, Aruku Valley in Alluri Sitharama Raju dsitrict, passes through Saluru mandal and Vizianagaram mandal. It finally joins Bay of Bengal near Konada village, Pusapatirega mandal of the district. Figure-15 Illustrates the drainage system and the surface water bodies.

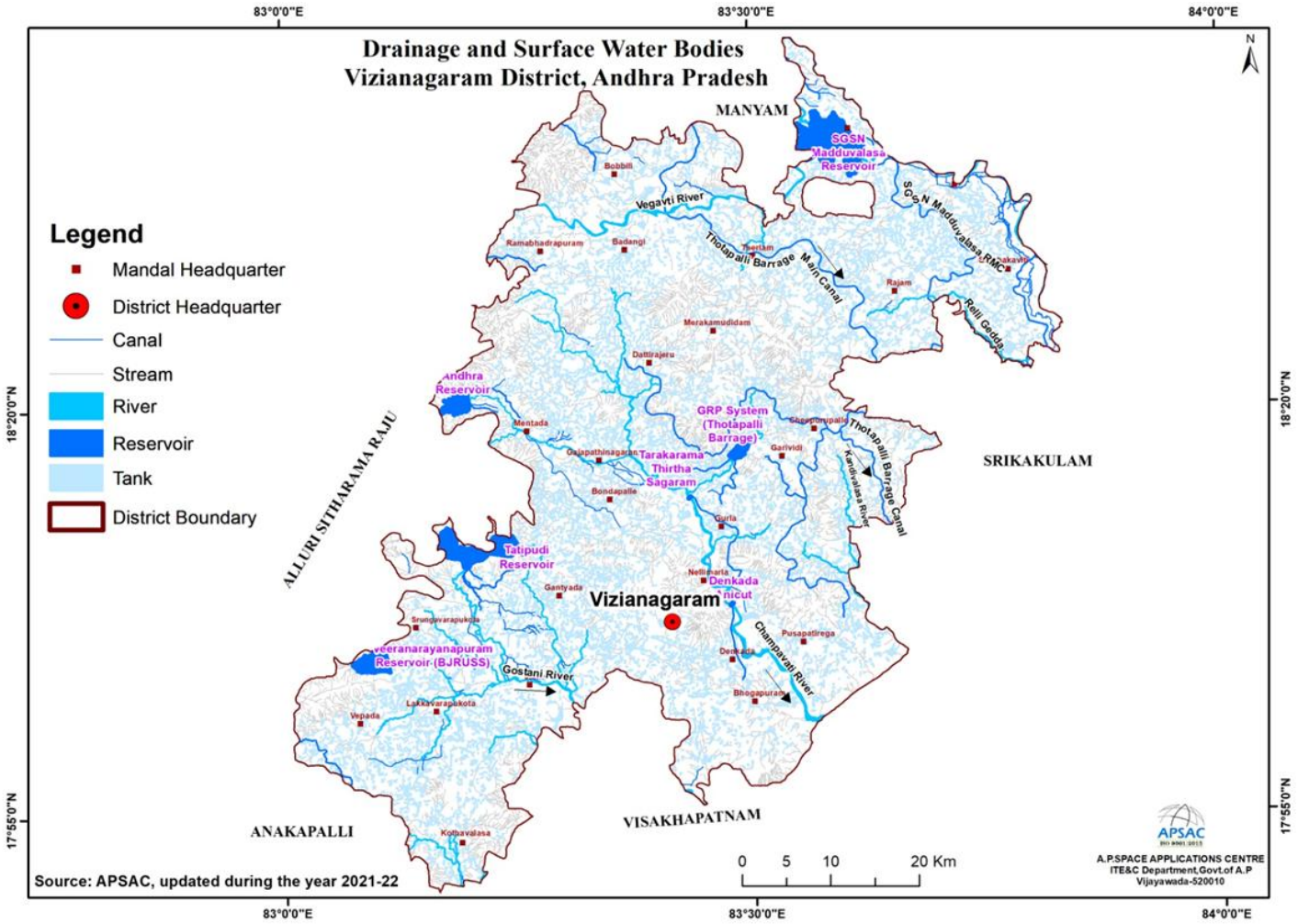


Figure - 15: Drainage Network and Surface Water Bodies of the Vizianagaram District

1.7.2 Geomorphology of the District:

Using IRS satellite data and GIS, a detailed geological, geomorphological, and structural map of the Vizianagaram District was generated according to Rajiv Gandhi National Drinking Water Mission (RGNDWM) guidelines on a 1:50,000 scale. The objective of this mapping is to identify the lithology, geomorphology, and structural characteristics of the area and to integrate this information to locate potential groundwater prospect zones and recommend suitable structures for groundwater recharge. Various hydrogeomorphic units are delineated, and suitable recharge structures are proposed in drinking water-affected villages under this project. The geomorphology map of the Vizianagaram district is shown in Figure-16.

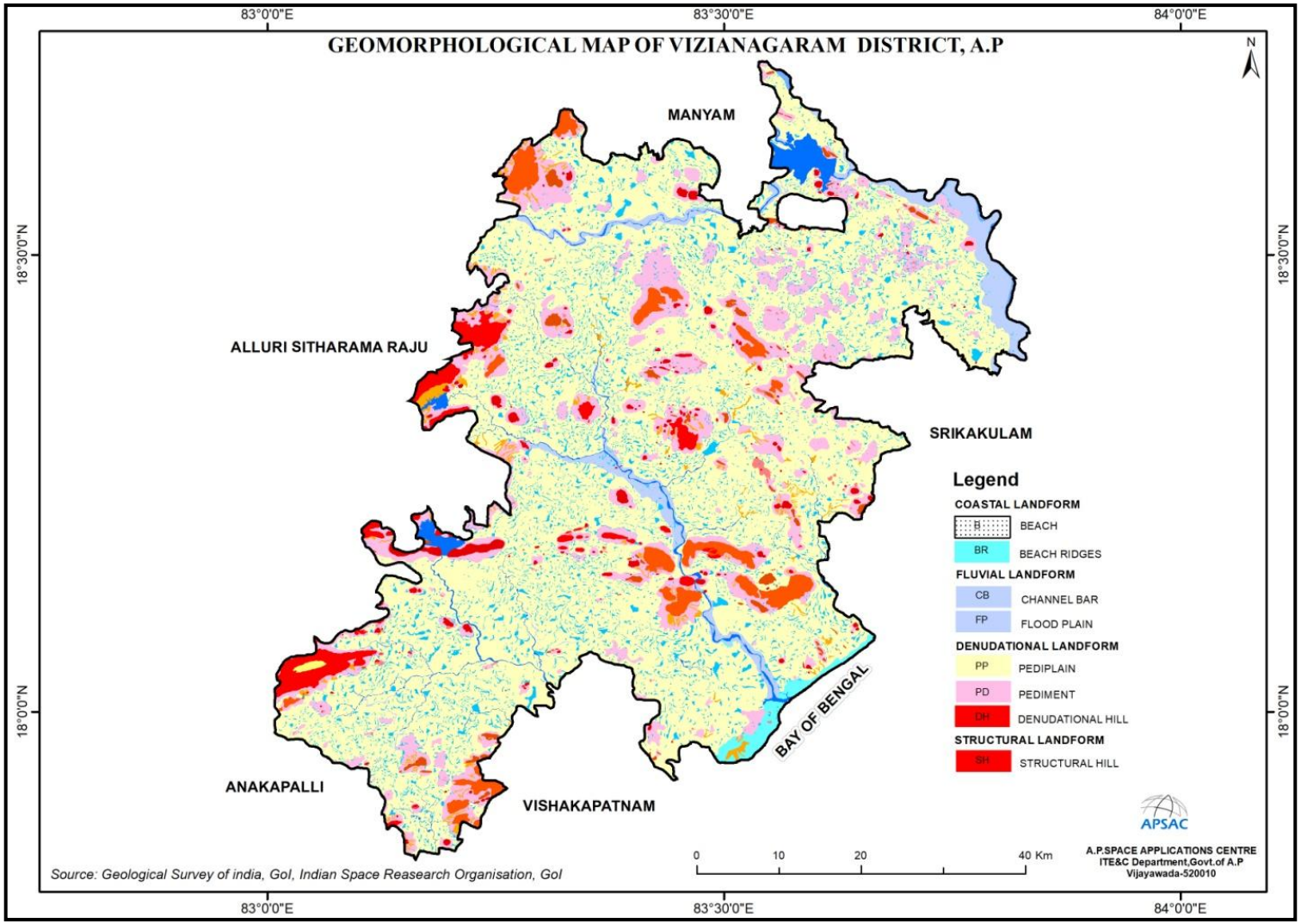


Figure 16: Geomorphology of Vizianagaram District, Andhra Pradesh

1.7.3 Landforms of Fluvial origin

The word "fluvial" is used in earth science to refer to processes and landforms produced by running water. As with other surficial processes, running water can either erode material from the earth's landscape or deposit layers of sediment. The resulting landforms can thus be classified as either erosional landforms or depositional landforms. The incredible power of running water in carving various erosional and depositional landforms is well known. Although the quantity of water in a stream may be small at any one time during the year, very large volumes of water move through the channel, making streams an important component in the hydrological cycle. The fluvial dissection of the landscape consists of valleys and their included channel ways organized into a system of connections known as a drainage network. Drainage networks display many types of quantitative regularity that are useful in analyzing both the fluvial systems and the terrains they dissect (NRSA, 2007).

1.7.3.1. Flood plain: The surface or strip of relatively smooth land adjacent to a river channel, constructed (or in the process of being constructed) by the present river in its existing regimen and covered with water when the river overflows its banks during times of high water. It is built of alluvium carried by the river during floods and deposited in the sluggish water beyond the influence of the swiftest current.

1.7.3.2. Delta: The low, nearly flat, alluvial tract of land deposited near the mouth of a river. Commonly forming a triangular or fan-shaped plain of considerable area, enclosed and crossed by many distributaries of the main river. It often extends beyond the general trend of the coast and results from the accumulation in a wider body of water (usually a sea) of sediment supplied by a river in such quantities that it is not removed by tides, waves, and currents.

1.7.4 Landforms of Coastal origins

Coasts are the loci of a unique assemblage of erosional and depositional processes. Various landforms of coastal areas are almost exclusively the result of ocean wave action. Wave action creates some of the world's most spectacular erosional landforms. Where wave energy is reduced, depositional landforms like beaches are created. The source of energy for coastal erosion and sediment transport is wave action. A wave possesses potential energy due to its position above the wave trough and kinetic

energy caused by the motion of the water within the wave. This wave energy is generated by the frictional effect of winds moving over the ocean surface. The higher the wind speed and the longer the fetch, or distance of open water across which the wind blows and waves travel, the larger the waves and the more energy they possess. Long open ocean waves, or swells, travel faster than short, locally generated sea waves. They also have longer wave periods, distinguishing them from the short sea waves upon reaching the coast. Long swells, which have traveled hundreds of kilometers, may have wave periods of up to 20 seconds. Smaller sea waves have wave periods of 5 to 8 seconds.

Where ocean depths are greater than the length of the waves, the wave motion does not extend to the ocean floor and remains unaffected by it. As the ocean depth falls below half the wavelength, the bottom increasingly affects the wave motion. As the depth of water decreases, the wave height increases rapidly and the wavelength decreases rapidly. Thus, the wave becomes more peaked as it approaches the shore, finally curling over as a breaker and breaking on the shore. As the wave breaks, its potential energy is converted into kinetic energy, providing a large amount of energy for the wave to work along the shoreline.

Transportation by waves and currents is necessary to move rock particles eroded from one part of a coastline to a place of deposition elsewhere. One of the most important transport mechanisms results from wave refraction. Since waves rarely break onto a shore at right angles, the upward movement of water onto the beach (swash) occurs at an oblique angle. However, the return of water (backwash) is at right angles to the beach, resulting in the net lateral movement of beach material. This movement is known as beach drift. The endless cycle of swash and backwash and resulting beach drift can be observed on all beaches. Frequently, backwash and rip currents cannot remove water from the shore zone as fast as it is piled up there by waves. As a result, there is a buildup of water that results in the lateral movement of water and sediment just offshore in a direction with the waves. The currents produced by the lateral movement of water are known as longshore currents. The movement of sediment is known as longshore drift, which is distinct from the beach drift described earlier, which operates on land at the beach. The combined movement of sediment via longshore drift and beach drift is known as littoral drift.

Tidal currents along coasts can also be effective in moving eroded material. While incoming and outgoing tides produce currents in opposite directions daily, the current in one direction is usually stronger than in the other, resulting in a net one-way transport of sediment. Longshore drift, longshore currents, and tidal currents in combination determine the net direction of sediment transport and areas of deposition. Using multi-temporal satellite data can reveal the dynamics of the coast (NRSA, 2007).

1.7.4.1. Beach: A gently sloping zone, typically with a concave profile, of unconsolidated material that extends landward from the low-water line to the place where there is a definite change in material or physiographic form (such as a cliff) or to the line of permanent vegetation (usually the effective limit of the highest storm waves).

1.7.4.2. Beach ridge: A low, essentially continuous mound of beach or beach and dune material (sand, gravel, shingle) heaped up by the action of waves and currents on the backshore of a beach, beyond the present limit of storm waves or the reach of ordinary tides, and occurring singly or as one of a series of approximately parallel deposits. The ridges are roughly parallel to the shoreline and represent successive positions of an advancing shoreline.

1.7.4.3. Tidal flat: An extensive, nearly horizontal, marshy, or barren tract of land that is alternately covered and uncovered by the rise and fall of the tide, consisting of unconsolidated sediment (mostly mud and sand). It may form the top surface of a deltaic deposit.

1.7.5 Landforms of Structural Origin

Landforms of structural origin are related to the structural aspects of an area. Most landforms in this category have a genesis related to the underlying structure. Structure plays an important role in reducing the resistance of rock, manifesting in different geomorphic forms. Some variations are minor, while others are on a mega scale. Mega-scale forms have a dramatic effect on the genesis of landforms, and mapping such forms indirectly indicates the structural setup of the area. Mega-scale structural features like faults and folds, depending on their type, play an important role in the genesis of structural landforms. The influence of geologic structures on the development and appearance of landscapes is prominent. This influence ranges from large features, which exert a

dominant influence on the form of an entire landscape, to small features, which affect individual landforms and the geomorphic processes operating on them. Structural control can involve active structures, whose forms are directly impressed on the modern landscape, or ancient structural features, whose influence on a modern landscape is due primarily to differential erosion (NRSA, 2007).

1.7.6.1. Structural Hills: Hills and valleys originated due to tectonic processes and are highly dissected by drainage lines. These can be further classified as highly, moderately, and low dissection, depending on the density of joints and drainage. Mostly, this will be interpreted from planimetric satellite data, and the classification is highly subjective.

1.7.6 Landforms of denudational origins

The landform of denudational origin is formed where the denudation process dominates over the other process. Most of the landform resulting due to this process is the combined effect of mechanical and chemical weathering. Denudation is the process of removal of material by erosion and weathering. This has direct influence on the relief of the area especially in the reduction of relief to the base level. The agents are mostly water, ice and wind. The major factors affecting denudation are geology, climate, tectonics and anthropogenic effects. All rocks and minerals at or near-surface are attacked by a physical and chemical process. The effect of this process is not the same everywhere because of rocks' varying resistance to change. As a result, weathering and erosion yield several landforms, which have typical shapes and forms. Weathering is an essential part of the rock cycle. The parent material or rock weathered material is disaggregated to form smaller fragments and some of the minerals are dissolved and removed by the agent of water. This removal of material is erosion and is accomplished by running water, wind, glacier etc. The weathering provides the raw material for the sedimentary rock and soil (NRSA, 2007).

1.7.6.1. Denudational Hill: It is a highly dissected hill that has obliterated the structures.

1.7.6.2. Inselberg: A prominent, isolated, steep-sided, usually smoothed and rounded, residual knob, hill or small mountain of circumdenudation rising abruptly and surrounded by an extensive and nearly level, lowland

erosion surface in a hot, dry region (as in the deserts of southern Africa or Arabia), generally bare and rocky although partly buried by the debris derived from and overlapping its slopes; it is characteristic of an arid or semiarid landscape in a late stage of the erosion cycle.

1.7.6.3. Pediment: A broad, flat or gently sloping, rock floored erosion surface or plain of low relief, typically developed by sub aerial agents (including running water) in an arid or semiarid region at the base of an abrupt and receding mountain front or plateau escarpment, and underlain by bedrock (occasionally by older alluvial deposits) that may be bare but more often partly mantled with and discontinuous veneer of alluvium derived from the upland masses and in transit across the surface.

1.7.6.4. Pediplain: An extensive, multi-concave, rock-cut erosion surface formed by the coalescence of two or more adjacent pediments and occasional desert domes, and representing the result (the "peneplain") of the mature stage of the erosion cycle. Based on the thickness of weathering they are further classified as shallow, moderate and deep pediplains.

1.7.7 Structural Features of Vizianagaram District

Vizianagaram District has consolidated formations, which include crystalline (Khondalites, Charnockites, and Granitic Gneisses) and metasediments (Dolomites, Shales, Phyllites, and Quartzites) from the Archaean and Precambrian periods, respectively. The Khondalite Group of rocks is seen as prominent hill ranges (strike ridges). The rocks of the Khondalite and Charnockite groups, along with the layered complex, show foliation trending dominantly North-South with NE-SW and NW-SE directions (GSI, 2000). The semi-consolidated formations are represented by Tertiary formations (Rajahmundry and Gollapalli sandstones), and unconsolidated formations comprise deltaic alluvial deposits from the Quaternary period (CGWB, 2013). The structural distribution map of the Vizianagaram district is shown in Figure-17.

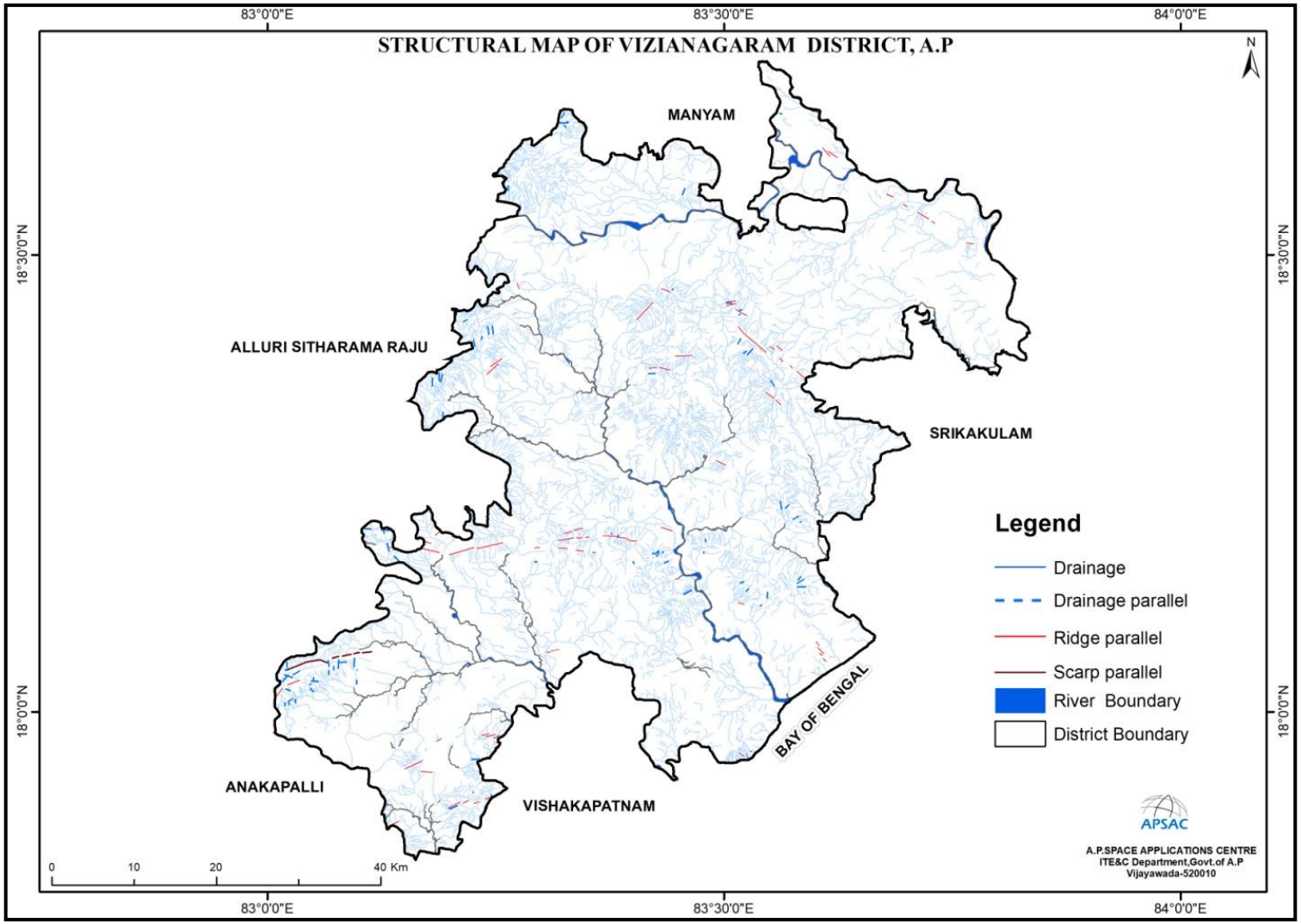


Figure-17 : Structural Map of Vizianagaram District, Andhra Pradesh

1.7.8 Ground Water Quality in Vizianagaram District

The groundwater quality laboratory analyzed physicochemical parameters like Total Dissolved Solids, Total Hardness, Chlorides, Nitrate, pH, Fluoride, Iron, Alkalinity, and Sulphate using standard techniques. Groundwater quality samples were collected for two seasons, i.e., post-monsoon and pre-monsoon, from December 2017 to June 2019 by the Rural Water Supply and Sanitation Department (RWS&S) and compared with the Bureau of Indian Standards, 2015 Groundwater Quality guidelines, in terms of desirable, permissible, and non-potable classes. Blue, yellow, and red colors indicate pre-monsoon quality, and +, -, symbols indicate post-monsoon quality for desirable, permissible, and non-potable classes, respectively.

From the analysis, it has been observed that groundwater is polluted in both pre-monsoon and post-monsoon periods, with about 20% of the area falling under the non-potable category due to high concentrations of Total Hardness, Total Dissolved Solids, and Alkalinity. Furthermore, about 70% of the area falls under the potable category, while the remaining 10% of the area is covered with hills and water bodies throughout the district. The occurrence and movement of groundwater in an area are governed by several factors such as topography, lithology, geological structure, depth of weathering, extent of fractures, drainage pattern, climatic conditions, and the interrelationship between these factors. The groundwater quality map of the Vizianagaram district is shown in Figure-18.

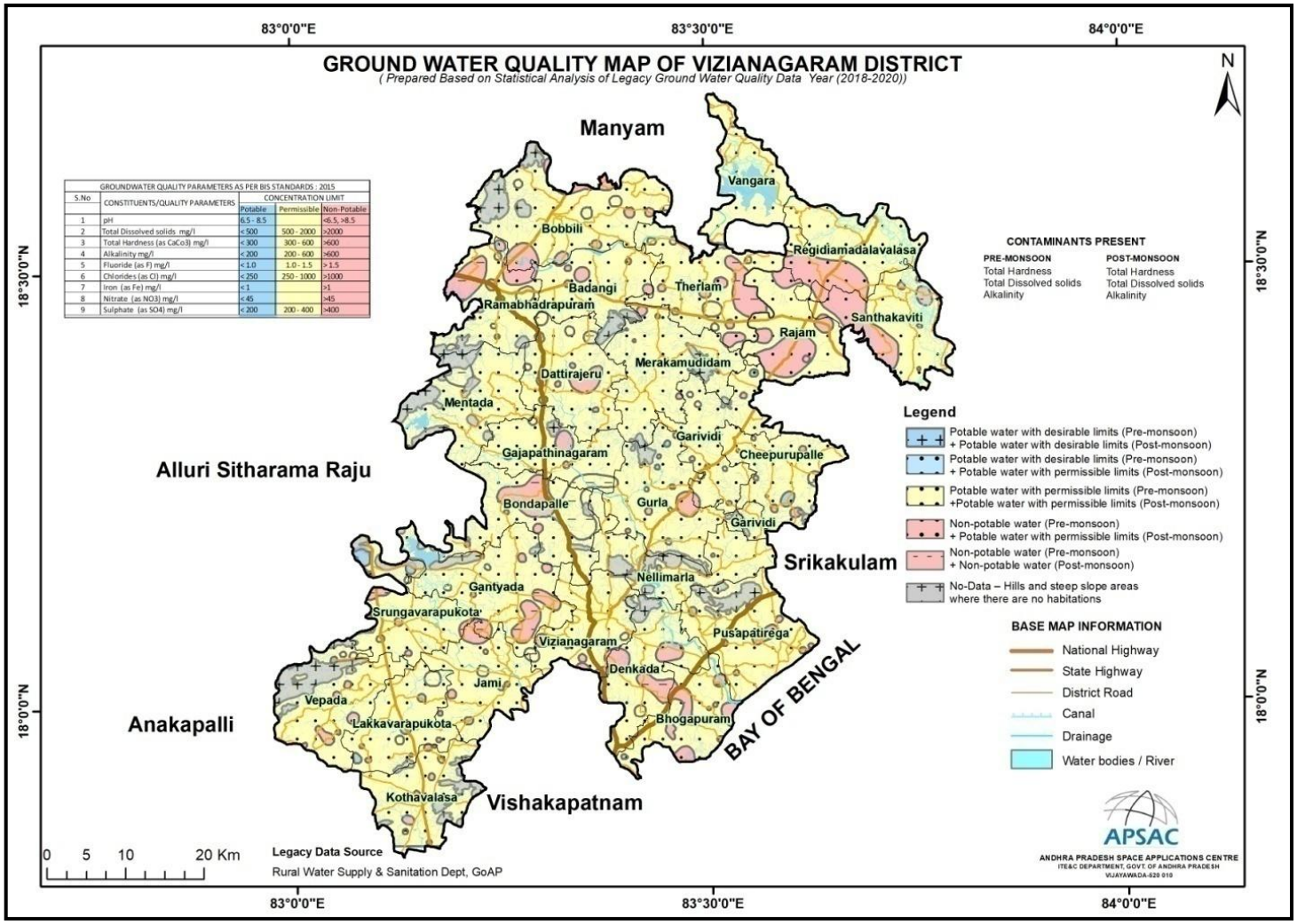


Figure-18: Ground Water Quality Map of Vizianagaram District

Chapter – II Minor Minerals

2.1 Overview of Mining Activity

The following leases exist in this Vizianagaram office jurisdiction. Mineral Regulatory, the important functioning of this office in these aspects are:-

i. Achievement of Targets of Mineral Revenue collections being fixed to this office annually
ii. Receiving and processing of the Mineral Concession Applications duly conducting the technical inspection, Survey and demarcation of the Mineral bearing applied areas
iii. Execution and Regulation of the operations of the Mining / Quarry leases in accordance with the Acts and Rules
iv. Issuing of dispatch permits duly collecting the Advance Royalty / Seig.fee from the lease holders on the minerals produced and intend to dispatch from their leased areas through online permit system
v. Controlling the illegal Mining / Quarrying and transportation by conducting the periodical inspections of the Mines and Quarries and also conducting the surprise vehicular checking and imposing the penalties
vi. Finalisation of Demand, Collection and Balance statements of the leases on annual basis

There are 25" Nos. Mining Leases are in force in the district, out of which "15" Nos. are Working and "10" Nos. are non-Working. Similarly, there are "160" Nos. Quarry Leases are in force in this District, out of which "141" Nos. are Working, and "19" Nos. are non-Working. Further, there are 30 No. of Quarry Leases (31 Minerals) in force. Out of which 24 are working and 6 are non-Working.

2.2 Geology of the District

Genaralized Litho-stratigraphic Succession of Andhra Pradesh

Geological Time (a)	(b)	Supergroup (c)	Group	Formation (d)
Holocene		-	-	Alluvium, river terraces, beach sands and soils
Pleistocene		-	-	Laterite and Gravel
Mio-Pilocene		-	-	Rajahmundry Fm.
Late Cretaceous Eocene		-	-	Deccan Trap with infra-and inter-trappeans

Lower Cretaceous to Upper Carboniferous	Gondwana	Upper Gondwana	Godavari Valley (Fluviatile) Chikiala Fm. Gangapur Fm.	Coastal Area (Fluvio-marine) Tirupati Fm. (Vejendla Fm) Raghavapuram Fm. (Vemavaram), Kandukuru, SriperambadurFms) Gollapalle Fm. (Satyavedu Fm.)
		Lower Gondwana	Kota Fm. Maleri Fm.	Kamthi Fm. Barren Measures, Barakar Fm. Talchir Fm.

		Cuddapah Basin	**Pakhal Basin**
Sullavai Sandstone			
Middle to Upper Proterzoic (980-500 m.y)	Kurnool	Nandyala Shale Koilakuntla Limestone Panyam Quarzite Owk Shale Narji Limestone Banaganapalli Quartzite	Putnur Limestone Penganga Group Takalapalle Arkose

			Srisailam Quartzite	**Alabaka Sandstone**
		Nallamalai	Cumbum Fm.	Lankavaram Shale Pattipalle Quartzite
			Mulug Group	Polavaram Fm. Jakaram Arkose
Middle Proterozoic (1600-1300 m.y.)	Cuddapah	Chitravathi	Bairankonda Quartzite Gandikota Quartzite	Pandikunta Shale
			Tadipatri Fm.	Gunjeda Dolomite
			Pulivendula Quartzite Mallampalli Group	
		Papaghni	Vempalle Fm. Gulcheru Quartzite	Bayyaram Quartzite Bolapalle Fm.
EPARCHAEAN INTERVAL				
Middle Proterozoic to Late Archean (2600-970 m.y)	Eastern Ghats		Charnockite Khondalites	Charnockite with megacrystic k-feldspar charnockite Two pyrozene granulite / amphibolite Calc-silicate / granulite, Garnet-sillimanite-quartz-graphite gneiss (biotite-k-feldspar (Khondalite) Quartzite (gernet, sillimanite)
Late Archaean (2700 m.y)	Dharwar	Ramagiri-Penakacherla, Kolar, Kadiri, Gadwal-Narayanpet, Jonnagiri, VeligalluPeddavuru Schist Belts &W.Part		Pyroclastic Rocks, local conglomerate / event conglomerate Metabasalt (Pillowed), Acid volcanics, minor andesite, dacite, rhyodacite, amphibolites, metaultramafics, minor quartzite, calcsilicates, phyllites, intrusives of basic rocks and granites, rare lamprophyres.

of Nellore Belt.

Middle Archaean (3100-2900 y.m)	Older Supracrustals (Sargur)	Eastern and Southern parts of Nellore.	High Grade schists include include garnet, staurolite, kyanite, sillimanite, cordierite (rarely sapphirine-kornuropine as in Karimnagar) Mica schists, calcilicate rocks, crystalline limestone (minor). BIF, fuchsite quartzite, hornblende granulite, amphibolite, migmatite streaky biotite gneiss.
Gneissic Complex			Banded Tonalite-Trondhjemite Gneiss

Geologically, the State of Andhra Pradesh forms a part of peninsular India and is one of the most ancient land masses. The geological formations of Andhra Pradesh range from the oldest to the recent.

The Sargur Supracrustals represent the oldest rocks in Southern India, primarily occurring as enclaves within migmatitic gneiss formations. These supracrustals are prominently exposed in the eastern and southern parts of the Nellore schist belt. The lithology of the Sargur region predominantly consists of garnet and staurolite schists, kyanite schists, banded iron formations (BIFs), quartzites, granulites, and amphibolites. Additionally, the gneissic complex includes banded tonalite trondhjhemite gneiss, which forms the basement rock of the study area, along with migmatitic gneiss and biotite granite gneiss. The tonalite trondhjemite gneiss (TTGs) are sodic, quartz-bearing granitic plutonic rocks, with plagioclase as the most common feldspar and K-feldspar ranging from subordinate to nearly absent.

Dharwarian rocks in Andhra Pradesh are exposed in the western part of the Nellore belt and various other areas such as Ananatapur, Ramagiri-Penakacherla, Kolar, Kadiri, Gadwal-Narayanpet, Jonnagiri, Veligallu-Peddavuru Schist Belts, and the western part of the Nellore Belt. The lithology primarily comprises metabasalt (pillowed), acid volcanics, minor andesite, dacite, rhyodacite, amphibolites, metaultramafics, minor quartzite, calcsilicates, phyllites, intrusives of basic rocks and granites, rare lamprophyres, as well as some pyroclastic rocks and local

conglomerates, which define a hiatus in stratigraphy within the study area.

Rocks ranging from middle Proterozoic to late Archaean are exposed in the Eastern Ghats mobile belt, characterized by extremely high-grade metamorphism falling under the granulite facies. These rocks primarily include khondalites and charnockites. Additionally, the metamorphic facies extend to granulite facies, with charnockite featuring megacrystic K-feldspar, two-pyroxene granulite/amphibolite, calc-silicate/granulite, and garnet-sillimanite-quartz-graphite gneiss (biotite-K-feldspar, quartzite (garnet, sillimanite). These rocks are extensively exposed across the state.

The Cuddapah Basin, a part of the Dharwar Craton, constitutes the second-largest Purana basin in Peninsular India, marking a profound unconformity known as the Eparchaen unconformity in early literature. The basin exposes rocks ranging from late Proterozoic to upper Proterozoic periods, divided into four groups: Nallamalai, Chitravathi, Papaghni, and Kurnool. These groups consist of various lithologies, including dolomite, limestones, shale, quartzites, arkosic sandstones, and rhythmic cycles of quartzite-shale-carbonates. Uraniferous limestone has also been reported from the Cuddapah Basin, with major exposures of Purana rock formations found in Prakasam, Kurnool, Cuddapah, Chittoor, and Nellore districts. Deccan traps are present in the East and West Godavari districts, with exposures near Rajahmundry. Tertiary formations occur in East and West Godavari and Visakhapatnam districts, while Quaternary sediments, primarily thick blankets of alluvium, are found in river valleys, deltas, and along the East coast.

Geologically, the district constitutes a part of the Eastern Ghats Mobile Belt of Archaean age, comprising rocks of the Khondalite Group, Charnockite Group, and Migmatite complex. Overlying the Archaean formations are sediments of Upper Gondwana, Cainozoic laterite, and Quaternary deposits. The lithological units of the Khondalite Group include Quartzite, Talcgranulite, Talcsilicate rock, crystalline limestone, scapolite, wollastonite, and garnetiferous quartzofeldspathic gneiss with sillimanite and graphite. Charnockite Group units consist of pyroxene granulite and Charnockite, while the Migmatite complex includes various gneiss formations such as porphyroblastic hypersthene-biotite gneiss and

cordierite-hypersthene gneiss, often intersected by thick pegmatite veins in the northwest.

Upper Gondwana sandstone, bearing plant fossils like Hausmania sp. and Cladophlebis sp., occurs near the coast in the southeast, overlain by extensive aluminous laterite capping. Quarternary formations, including brown, residual soil and fluvial and marine sediments, are found along river courses and the coast, respectively. Floodplain deposits of clay and silt are mainly located in the river valleys of Gostani, Champavati, Kandivalasa, Vegavati, Suvarnamukhi, and Nagavali, while coastal deposits of beach and dune sand form a narrow belt along the east coast between Konada and Duvapeta. Khondalite exhibits two distinct trends of foliation: in the west, it shows a northeast-southwest to east-northeast-west-southwest trend with dips ranging from 50' to 80' towards the southwest, while in the east, the general trend of foliation is N 30' W - S 30' E with varying dips from 40' to 70° easterly or southerly, sometimes showing reversals. The area has undergone polyphase deformation, with the Nagavali River marking a major NNW-SSE trending lineament, and the eastern area representing a faulted block. The geology map and detailed legend with a stratigraphic sequence of the Vizianagaram district are shown in Figure-19.

2.3 Minor Mineral Resources of Vizianagaram District:

The following minerals are available in Vizianagaram District (Figure-20).

2.3.1. Building Stone: Building stone, used for construction purposes, is available in various villages across several mandals. These villages include Kongavanipalem, Munjeru, Polipalle, and Ravada in Bhoghapuram Mandal; Mettavalasa in Bobbili Mandal; Garudabilli, Kondakindam, Maruvada, and Nelivada in Bondapalle Mandal; Boddavalasa and Chittigunkalam in Denkada Mandal; Gantyada, Jaggapuram, and Neelavathi in Gantyada Mandal; Devada in Garividi Mandal; Jami in Jami Mandal; and Ardhanapalem, Chintalapalem, Katakapalle, and Pedaraopalle in Kothavalasa Mandal. Additionally, minerals are available in Rega village in Lakkavarapukota Mandal; Piligummi in Mentada Mandal; Nellimarla in Nellimarla Mandal; Kumili in Pusapatirega Mandal; Chandapuram in Ramabhadrapuram Mandal; Alugubilli, Dharmavaram, Kothavooru, Kottam, Mallipudi, and Thimidi in Srungavarapukota Mandal; and Jakeru, Pedadungada, Ramaswamipeta, Sompuram, Vavilapadu, and Veeluparthi in Vepada Mandal.

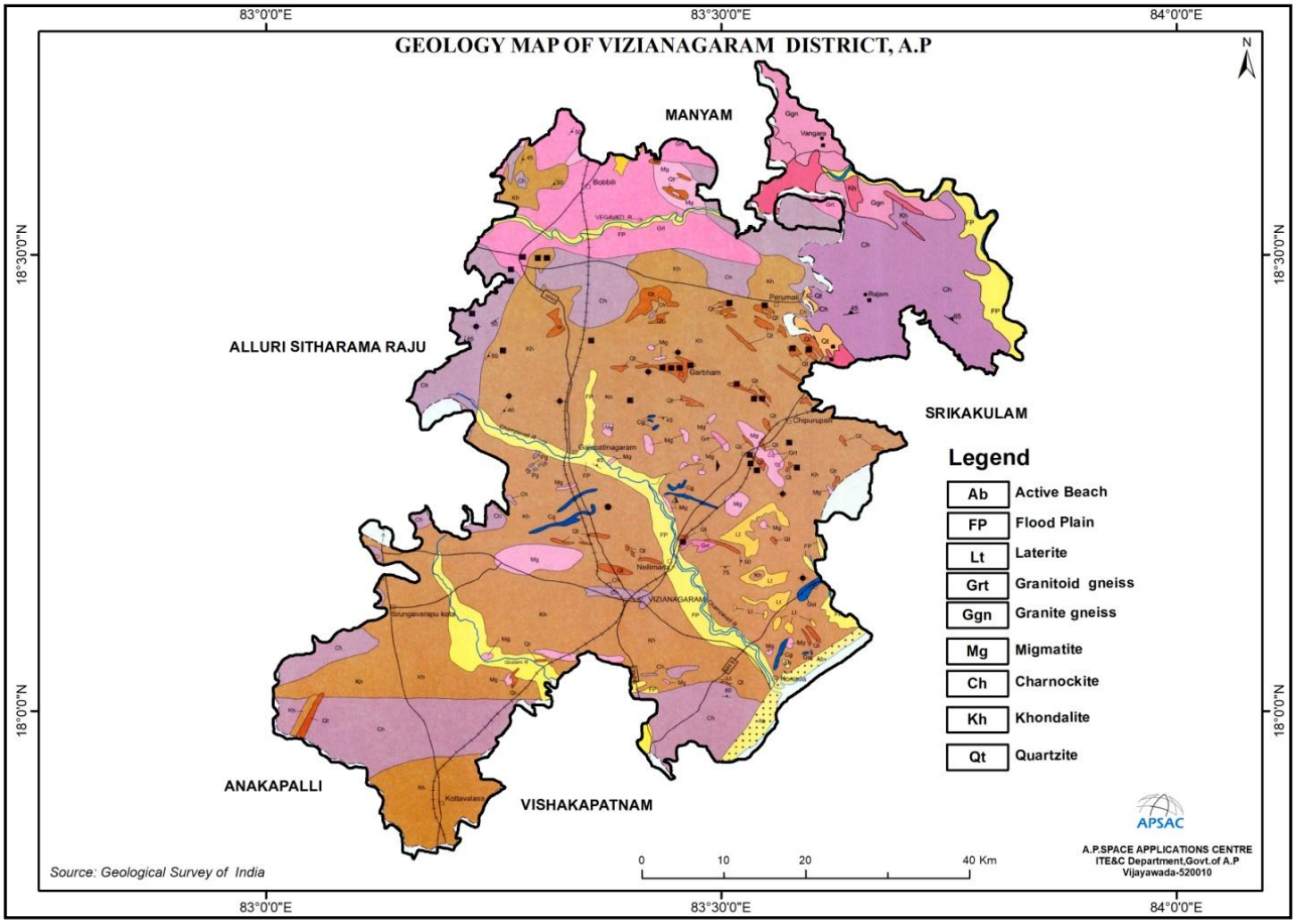
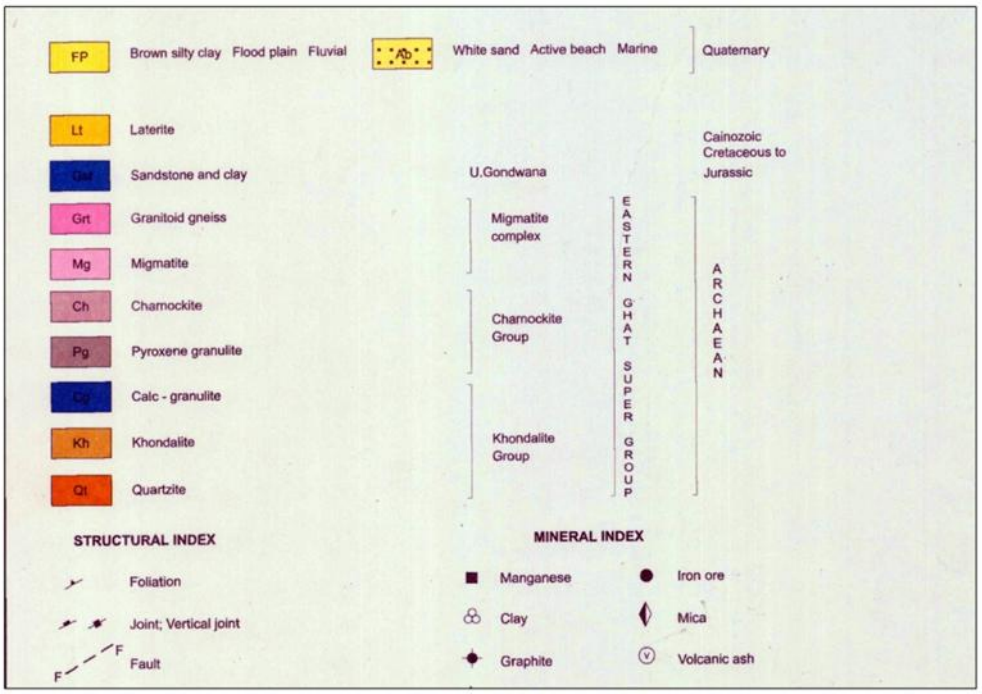


Figure 19: Geology of Vizianagaram District, Andhra Pradesh (Source: GSI, 2000)



Detailed Legend with Stratigraphic Sequence of Vizianagaram District

2.3.2. Road Metal: Road metal, used for construction purposes and railway ballast, is also available in various villages across different mandals. These include Kongavanipalem and Munjeru in Bhoghapuram Mandal; Mettavalasa in Bobbili Mandal; Garudabilli, Kondakindam, Maruvada, and Nelivada in Bondapalle Mandal; Boddavalasa and Chittigunkalam in Denkada Mandal; Gantyada, Jaggapuram, and Neelavathi in Gantyada Mandal; Jami in Jami Mandal; and Katakapalle and Pedaraopalle in Kothavalasa Mandal. Road metal is additionally found in Rega village in Lakkavarapukota Mandal; Piligummi in Mentada Mandal; Chandapuram in Ramabhadrapuram Mandal; Alugubilli, Dharmavaram, Kondamallipudi, Kothavooru, Kottam, Mallipudi, and Thimidi in Srungavarapukota Mandal; and Kondagangupudi, Pedadungada, Ramaswamipeta, Sompuram, Vavilapadu, and Veeluparthi in Vepada Mandal.

2.3.3. Gravel: Gravel is utilized in road construction for mixing with asphalt, as construction fill, and in the production of materials such as concrete blocks, bricks, and pipes. It is available in Munjeru village in Bhoghapuram Mandal, Nelivada village in Bondapalle Mandal, Jami village in Jami Mandal, Ardhanapalem, Chintalapalem, and Pedaraopalle villages in Kothavalasa Mandal, Nellimarla village in Nellimarla Mandal, Kumili

village in Pusapatirega Mandal, and Pedadungada, Ramaswamipeta, and Veeluparthi villages in Vepada Mandal.

2.3.4. Colour Granite: This type of granite is predominantly used for monuments and dimension stones for flooring and wall tiling. It is available in Konisa and Mutcherla villages in Gajapathinagaram Mandal, Chinabantupalle village in Merakamudidam Mandal, Madhupada village in Nellimarla Mandal, and Jagannadhavalasa and Neelayyavalasa villages in Vangara Mandal.

2.3.5. Silica Sand: Silica sand is used as a food additive and is available in Saripalle village in Nellimarla Mandal.

2.3.6. Quartzite: Quartz available in the Vizianagaram district is used in paint, ceramic tiles, and glass industries. It is found in Rajapulova village in Bhoghapuram Mandal, Korapa Kothavalasa, Marrivasala, Porali, and Sarayyavalsa villages in Dattirajeru Mandal, Bheemasingi village in Jami Mandal, and Ardhanapalem, Balighattam, Cheepuruvalasa, Kantakapalle, Relli, and Veerabhadrapuram villages in Kothavalasa Mandal. Additionally, these minerals are found in Gathada in Srirangara, Puthikavalasa, Rachagumadam, Ravivalasa, and Uttaravilli villages in Merakamudidam Mandal, Rompallevalasa village in Ramabhadrapuram Mandal, and Rangappavalasa village in Therlam Mandal.

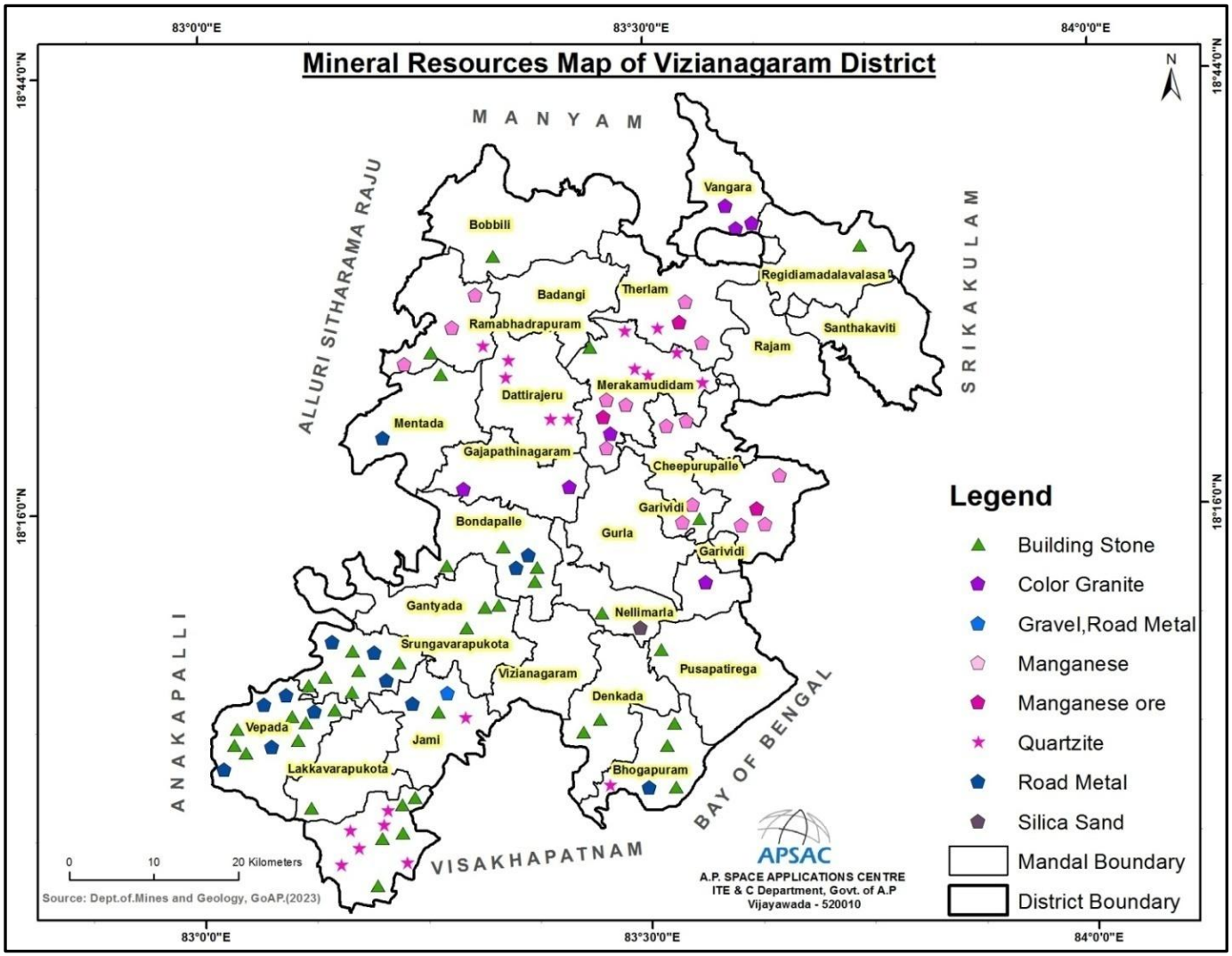


Figure-20: Mineral Resurce Map of Vizianagaram District

The Details List of statement showing the Leases wise for Major and Minor Minerals during the period described in Table-14:

Table 14 The list of statements showing leases for minor minerals to O/o ADM and G, Vizianagaram District

S. No.	LesseeID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
1	211170472	Sri N Rajesh	S/o. Ramana Murthy (Late), Door No. 1-175 a, Nallamaramma Colony, K.L.Puram, Vizianagaram Mandal & District.Phone No. 9441156682	738/Q3V/2017, dt.15.03.2017	BS & Gravel	267	Nelivada	Bondapalli	4	23/03/2017	22/03/2027	Non-working	No	-	Non Captive	18° 11' 45.43100"N	83° 22' 04.52616"E
2	211220545	Sri M. Narasimha Raju	S/o. Narasimha Raju (Late), D.No. 5-25A,Garbham Road, Garividi Mandal,	540/Q/DDMG-VZM/2020, Dt.02.05.2022	RM&BS	24/1	Devada	Garividi	2	14.06.2022	13.06.2032	Working	Yes	SEIAA/AP/VZM/MIN/9/3473/2021, Dt:03.02.2022	Non Captive	18° 15' 58.03" N	83° 32' 50.41" E
3	211220586	M/s Rock Sand Minerals Pvt. Ltd.	Mg.Dir: Sri P.Purnachand, Flat No. 203, Vijaya Enclave, Plot No. 32, Srinagar Colony, Hyderabad-500073.	3977/Q3V/2017, Dt.27.09.2022	Sand, Road Metal	334	Alamanda	Jami	10	10.10.2022	09.10.2037	Working	Yes	SEIAA/AP/VZN/MIN/11/2018/749, dt.22.06.2021	Non Captive	17-58-31.49000	83-14-05.14

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
4	21299 0112	Sri K. Subramanya Raju	1-8, Main Street, Gottapalem, Jami	1384/E1/2017, Dt.27.02.2019	Quartzite	330	Bheemasingi	Jami	11.53	25/02/1999	24/02/2039	Non-working	No	SIA/AP/MIN/65010/2021, Dt:18.01.2018	Non Captive	18° 01' 53.28647"N	83° 17' 04.29019"E
5	21204 0104	Sri D. Ramana Chitti	Jagga Rao, D.No.74/130-14, Prasanthinagar, Pendurthi	36944/R1-2/2000, Dt.23.11.2004	Quartzite	1/8	Relli	Kothavalasa	13.35	38272	45547	Working	Yes	SEIAA/AP/VZN/MIN/10/2016/233	Non Captive	17° 54' 16.86574"N	83° 13' 53.13741"E
6	21209 0123	M/s M.L.N.Minerals	Mg.Dir. Naga Sarala, Sujathanagara, Pendurthi	Memo No.11975/Ind. & Com. (M.III) Dept, Dt.28.11.2008	Quartzite	175	Cheepuruvalasa	Kothavalasa	10	28/11/2009	27/11/2029	Working	Yes	SEIAA/AP/VZM-13/2009-607	Non Captive	17° 53' 51.64262"N	83° 09' 45.68881"E
7	21203 0414	M/s Sri Sai Krupa Minerals	Smt. Y. Suguna, D.No.14-168/A, Simhadrinagar, RRV Puram, VSKP	56/Ind & Com (M.III), Dt.10.02.1993	Quartzite	239/1	Veerabhadra puram	Kothavalasa	8.09	37688	44965	Non-working	No	-	Non Captive	17° 56' 09.94152"N	83° 10' 14.30622"E
8	21209 0121	M/s M.L.N.Minerals	Mg.Dir. Naga Sarala, Sujathanagara, Pendurthi	G.O.Ms.No.327, Ind. & Com (M.III), Dt.01.12.2007	Quartzite	55	Ardhanapalem	Kothavalasa	8.09	28/11/2009	27/11/2029	Working	Yes	SEIAA/AP-VZM/14/2009	Non Captive	17° 55' 23.19340"N	83° 12' 35.31920"E

S. No.	LeseeID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
9	21298 0035	M/s G.R.R.Associates	D.No.50-40-3/1, Seethammadhara, VSKP	G.O.Ms.No .442, Ind & Com (M.III), Dt.14.12.1998	Quartzite	141	Balighattam	Kothavalasa	3.645	23/12/1998	21/12/2038	Non-working	No	SEIAA/AP/VZM/ 2012-6299, dt26.03.2013	Non Captive	17° 55' 34.78648"N	83° 11' 36.14055"E
10	21109 0347	M/s G V R Constructions (P) Ltd.,	D.No.106/A, VSKP	1621/Q3/2009, Dt..30.04.2009	RM&BS and Gravel	1	Pedaraopalle	Kothavalasa	3.086	28/05/2009	27/05/2024	Non-working	Yes	SIA/AP/MIN/ 25290/2018, dt.13-04-2018.	Non Captive	17° 58' 15.51"N	83° 14' 35.59"E
11	21123 0580	Sri G.Hemanth	D.No.9-6-474, 6-Tap Junction, VSKP	2344/Q/2013, Dt.04.01.2013	BS & Gravel	103	Chintalapalem	Kothavalasa	11	04.01.2023	03.01.2033	Working	Yes	SEIAA/AP/VZM/MIN/12/2018/792, dt.19.03.2022	Non Captive	17° 52' 52.73"N	83° 12' 35.52"E
12	21120 0509	M/S M.L.N.S.R Minerals	Mg.Dir. Naga Sarala, Sujathanagara, Pendurthi	Memo No.24633/ R1-1/2017, Dt.13.09.2017	Quartzite	245/ 1(P)	Kantakapalle	Kothavalasa	4.709	25/09/2020	24/09/2040	Non-working	Yes	SEIAA/AP/VZN/MIN/08/2019/1198-	Non Captive	17° 55' 23.19340"N	83° 12' 35.31920"E
13	21117 0479	D.Jayasri	Kantakapalli, Kothavalasa	884/Q3V/2017, Dt.25.03.2017	B.S& Gravel	103	Chintalapalem	Kothavalasa	10	22/06/2017	21/06/2027	Non-working	No	-	Non Captive	17° 53' 13.36"N	83° 12' 33.98"E
14	21117 0481	M.Satyanarayana	V.B.Puram Post, Nimmalavalasa, Kothavalasa	1043/Q3V/2017, Dt.30.03.2017	RM&BS and Gravel	180	Katakapalle	Kothavalasa	0.6	24/06/2007	23/06/2027	Non-working	No	-	Non Captive	17-57-08.17	83-13-35.03

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
15	2112005 03	M/S Sri Krishna Mines and Minerals	No. 16, PR Colony, Ring Road, Vzm	524/D2/2019, Dt:04.03.2020	Quartzite	50/1	Rachagumadam	Merakamudidam	4.99	16/04/2020	15/04/2040	Working	Yes	SEIAA/AP/VZN/MIN/07/2019/10571	Non Captive	18-26-06.34	83-13-22.16
16	2112305 90	M/s Sri Nidhitha Minewrals	No. 16, PR Colony, Ring Road, Vzm	1107/D2/2022, Dt:08.11.2022	Quartzite	1 & 34P	Puligumi	Merakamudidam	4.86	02.01.2023	01.01.2043	Working	Yes	SEIAA/AP/VZM/MIN/06/2022/4424, dt.04.08.2022	Non Captive	18-26-47.60000	83-28-47.08000
17	2112305 91	M/s Hari Om Minerals	No. 16, PR Colony, Ring Road, Vzm	1108/D2/2022, Dt:08.11.2022	Quartzite	1P	Puligumi	Merakamudidam	4.95	02.01.2023	01.01.2043	Working	Yes	SEIAA/AP/VZM/MIN/7/2022/4477, dt.26.08.2022	Non Captive	18-26-47.60000	83-28-47.08000
18	2120600 49	M/s Sri Venkateswara Mines and Minerals,	Balagudaba V, Parvathipuram M & Dist	2022/R1-1/2005, Dt:25.02.2006	Quartzite	43	Ravivalasa(near mudi	Merakamudidam	24.28	19/10/2006	18/10/2026	Non-working	Yes	SEIAA/AP/VZM-33-2010-90	Non Captive	18-26-25.89000	83-28-45.30000
19	2120901 24	Smt Ch. Jayasri	C.V.Subhash Patnaik, MIG, 307, Mithilapuri, VUDA Colony, Madhuravada, VSKP	G.O.Ms.No.188, Ind. & Com. (M.III), Dt.03.08.2009	Quartzite	46	Puthikavalasa	Merakamudidam	12.14	40129	47403	Non-working	Yes	SEIAA/AP/VZM-20/2009-2020	Non Captive	18-24-10.00	83-33-18.50
20	2112005 13	M/s Andhra Quartzite Pvt. Limited	#4-69-20/24, Flat No. - PH-2, Madhuri Palace Apartment, Lawson's Bay Colony, VSP - 17.	11924/D2/2018, Dt:23.07.2020	Quartzite	71	Gathadaat srirangara	Merakamudidam	5	14/08/2020	13/08/2040	Non-working	Yes	SEIAA/AP/VZN/MIN/08/2019/1056	Non Captive	18-23-27.27000	83-32-56.82000

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
21	21120 0514	M/s Coastal Minerals	4-69-20/24, Flat No. PH-2, Madhuri Palace Apartments, Lawson's Bay Colony, Vsp - 17.	11925/D2/ 2018, Dt:23.07.2020	Quartzite	71	Gathada	Merakamudidam	5	14/08/ 2020	13/08/ 2040	Non-working	Yes	SEIAA/AP/VZN/MIN/08/2019/11441	Non Captive	18-24-40.65000	83-31-16.95000
22	21118 0495	Sri S.A.MURALI	250/A, Tiruvananthapuram Road, Chennai, Tamilnadu	30957/R1-2/2017, Dt.29.06.2009	C.G.	186/P	Chinabantupalle	Merakamudidam	11.77	13/08/ 2018	50747	Non-working	Yes	SEIAA/AP/VZM/MIN/02/2018/510	Non Captive	18° 19' 27.50561" N	83° 27' 43.41242" E
23	21122 0596	Sri Manideep Badukonda	D.No. 32, Boddukundahoddi Street, Mopada, Denkada M, Vzm Dist	6694/D2/2021, Dt:22.09.2022	C.G.	182/2 p & 172/P	Thangubilli	Nellimarla	2.408	18.11.2022	17.11.2042	Working	Yes	SEIAA/AP/VZM/MIN/03/2022/4024, dt.29.03.2022	Non Captive	18-08-54.80000	84-31-21.51000
24	21110 0092	P. Venugopal Raju	H.No. 19-9/2-790,Rajeev Nagar, Vizianagaram.	280/Q/DDMG-VZM/2021, Dt.26.06.2023	RM&BS	328	Nellimarla	Nellimarla	2	01.04.2023	31.03.2033	Working	Yes	EC Obtained	Non Captive	18° 08' 31.58996"N	83° 27' 14.80791"E
25	21119 0499	D GOWTHAM REDDY	S/o Mutyala Naidu, Kumili Village, Pusapatirega Mandal, VZM	1451/Q3V/ 2018, Dt:27.02.2019	B.S & Gravel	1	Kumili	Pusapatirega	7	23/04/ 2019	22/04/ 2029	Working	Yes	SEIAA/AP/VZN/MIN/06/2018/63-1153	Non Captive	18° 84' 19.58996"N	83° 31' 19.56791"E
26	21122 0544	S. Govinda Rao	S/o. Jagga Rao (Late), Bhogapuram V & M, Vzm Dist - 535276.	1453/Q3V/ 2018, Dt:27.05.2022	BS & Gravel	1	Kumili	Pusapatirega	3	20.06.2022	19.06.2032	Working	Yes	SEIAA/AP/VZM/MIN/10/2020/2336, Dt.22.06.2022	Non Captive	18-08-04.19000	83-31-19.56000

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
27	21120 0511	Sri T.Mahesh Chandra	Plot No. 303, SG Enclave, Haromove, Agral Lake, Beside Cristan College, Bengalore- 506643. Karnataka	1627/D2/2019, Dt:09.10.2020	Quartzite	98(P)	Rompalli valasa	Ramabadrapuram	4.99	13/11/2020	51481	Working	Yes	SEIAA/AP/VZN/MIN/07/2019/10591	Non Captive	18-25-42.60000	83-18-48.21000
28	21121 0512	K.Krishna Prasad	S/o. Chinam Naidu, Mutcjeravalasa V, R.B.Puram M, Vzm Dist - 535579.	128/Q/DDMG-VZM/2020, Dt:18.01.2021	RM&BS and Gravel	141	Chandapuram	Ramabadrapuram	3.564	44229	47850	Working	Yes	SEIAA/AP/VZM/IN/OS/2020/1874-828	Non Captive	18-25-40.57000	83-15-45.45000
29	21122 0565	Sri B.Manoj Ram	D.No. 40-308/A, Poolbagh, Bobbili V& M, Vzm District	55/QL/DDMG-VZM/2022, Dt:21.06.2022	RM&BS	141	Chandapuram	Ramabadrapuram	1.26	02.09.2022	01.09.2032	Working	Yes	SEIAA/AP/VZM/MIN/03/2022/4104, dt.28.08.2022	Non Captive	18-25-45.39000	83-15-46.89000
30	11122 0372	Sri B.Prakash Rao	1-292, Main Street, Kondavalasa Village, Sarasanapalli Post, R.Amdalavalasa	3393/D1-1/2019, Dt.28.10.2022	Quartzite	14/1	Kondavalasa	Regadimdalavalasa	1.519	13.12.2022	12.12.2042	Working	Yes	SEIAA/AP/SKLM/MIN/05/2022/4293, dt.27.07.2022	Non Captive	18-34-19.83000	83-38-25.77000
31	11199 0042	M/s Sri Koduru Metals & Minerals	Managing Partner: Sri K.S.V.K.Siva Prasad, D.No. 3-746/2, NH16, Hukumpeta, Rajahmundry, Andhra Pradesh	743/Q/2023 Deemed to be renewal	C.G.	94,95, 96,126	Venkatapuram & Ambada	Regadimdalavalasa	4.61	02.10.1999	31.03.2023	Working	Yes	SEIAA/AP/EG/2015/2756, Dt.09.07.2015	Non Captive	18-32-17.03	83-40-39.36

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
32	11108 0034	M/s Pallava Granites	Appapuram Village, R.Amdalavalasa Mandal	27309/R1--1/2008, Dt.02.08.2008	C.G.	80/3	Appapuram	Regadia mdalavalasa	1.384	06.07.2008	05.07.2028	Working	Yes	SEIAA/AP/SKM-49/2013/2321, Dt.10.07.2013	Non Captive	18-32-44.68000	83-44-02.14000
33	11108 0035	M/s Priyamka Traders	Prop. P.Venkata Rao, 56/Ligh/APHB Colony, Near Collectorate, Srikakulam	34726/R1-1/2009, Dt.19.09.2009	C.G.	80/3	Appapuram	Regadia mdalavalasa	1.384	13.10.2009	05.07.2028	Working	Yes		Non Captive	18-32-44.68000	83-44-02.14000
34	21122 0527	M/s Aditya Aggrigates	Mg.Ptr: Sri YJM Prasad, D.No. 40-9/1-18A, Beside Vasavya Mahila Mandali, Vasavya Nagar, Vijayawada-520010.		Road Metal	1	Alugubilli	S.Kota	4	21.02.2022	20.02.2037	Working	Yes	SEIAA/AP/VZM/MIN/10/2020/2237/154-86 & 150.13115, Dt: 14.06.2021	Non Captive	18° 05' 41.93205"N	83° 12' 10.83043"E
35	21108 0367	M/s Varma Stone Crusher	Rajevepeta, PK Palli Post, S.Kota M, Vzm Dist 9849596979	1536/Q3V/2018, Dt.13.04.2022	Road Metal	365	Dharmavaram	S.Kota	3.72	39452	30/04/2028	Working	Yes	SEIAA/AP/VZM/MIN/09/2020/2161/154.06/149.06-86	Non Captive	18° 06' 12.73790"N	83° 11' 38.74076"E
36	21112 0075	M/s Veeranjaneya Mineral Products	8-83, Naiduthota, Vepagunta, VSKP-47	1407/Q/2023, Dt.11.08.2023	Road Metal	1	Kondamallipudi	S.Kota	2.5	18/01/2012	46389	Working	Yes	SEIAA/AP/VZM/MIN/3/2021/3021/164.92/161.89-716, Dt:14.09.2021	Non Captive	18° 05' 23.90130	83° 05' 58.3278"E

S. No.	LesseeID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
37	21110 0325	Sri L. Ashok Kumar	S/o. Simhadri (Late), R/o. House No. 1-13,Alamandal Village, Jami Mandal, Vzm District - 535240	2886/Q/2010, Dt.08.09.2010	Road Metal & BS	1	Alugubilli	S.Kota	2		31.03.2023	Working	Yes	SEIAA/AP/VZM/VIO/MIN//1/2023/4863, dt.03.03.2023	Non Captive	18° 05' 47.07482"N	83° 11' 50.524166" E
38	21112 0338	Sri M.Kasiviswanadham	Vizianagaram District – 535240.	4716/Q3/2006, Dt.04.08.2011	Road Metal	1	Alugubilli	S.Kota	1	41063	46851	Working	Yes	SEIAA/AP/VZM/MIN/7/2021/3326, dt.26.10.2021	Non Captive	18° 05' 46.870864"N	83° 12' 10.830436" E
39	21111 0048	Smt M.Ganga Bhavani	1-488, Allugubilli V, S.Kota M, Vzm Dist	2886/Q3/2010, Dt.08.09.2010	Road Metal	1	Alugubilli	S.Kota	2.46	18/04/2011	17/04/2021	Non-working	Yes	SEIAA/AP/MIN/VZM/VIO/10/2022/4662-1464, dt.19.09.2023	Non Captive	18° 05' 43.894439"N	83° 11' 54.152995" E
40	21203 0047	Sri Sai Mines and Minerals	Sri P.Vijaya Chandra Rao, Telaga Street, Gollapalli, Bobbili Mandal, Vzm Dist	G.O.Ms.No.52, Ind. & Com (M.III), Dt.27.02.2003	Quartzite	98	Rangappavalsa	Therlam	20.315	13/05/2003	45265	Non-working	No	-	Non Captive	18-26-47.1	83-30-37.3
41	11122 0374	M/s Triton Stone Exports, Mgp. Sro Posa Venkata Vara Kumar	P.Venkatavara Kmar, H.No.2-2-171/A/1, Flat No.304, Garuda Residency, Jayanagara Colony, KPHB, HYD	5428/D1-1/2021, Dt.22.09.2022	C.G.	132/1A/2	Jagannadhavalasa	Vangara	2	18.11.2022	17.11.2042	Working	Yes	SEIAA/AP/SKLM/MIN/12/2021/3786, dt.17.03.2022	Non Captive	18-34-04.45	83-37-18.41

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
42	11118 0296	Posa Consultancy Services Pvt. Ltd.	Mg.Dir. P.V. Varakumar, D.No.6-3-668/10/1, 2nd Floor, Durganagar Colony, Hyderanagar	16347/R1-3/2016, Dt30.01.2018	C.G.	177/1	Neelayyavalasa	Vangara	3.877	24.03.2018	23.03.2038	Non-working	Yes	DEIAA/APSKM-01/2017, dt.17.11.2017	Non Captive	18-34-09.98000	83-36-47.88000
43	11122 0360	M/s Hari Sai Granites	Prop. Desigachozhan, S/o Kannan, D.No.6/22, Murugan Street, Choolai, Chennai, Tamilnadu-600112	6196/D1-1/2018, Dt.06.01.2022	C.G.	177/1	Neelayyavalasa	Vangara	4.433	17.02.2022	16.02.2042	Working	Yes	SEIAA/AP/SKM/MIN/02/2019/833.481, Dt.16.10.2020	Non Captive	18-33-53.22000	83-36-58.53000
44	11109 0075	Monumental Monuments	Regd. Office No.B-254, 50th Street, Ashoknagar, Chennai, Tamilnadu.	1175/R1-1/2008, Dt.17.02.2009	C.G.	179	Jagannadhavalasa	Vangara	1	05.01.2009	04.01.2029	Non-working	No	-	Non Captive	-	-
45	11107 0094	M/s Bethan Granites	Regd. Office No.B-254, 50th Street, Ashoknagar, Chennai, Tamilnadu.	1450/R1-1/1/2007, Dt.07.06.2007	C.G.	177	Neelayyavalasa	Vangara	1.6	03.08.2007	02.08.2027	Non-working	No	-	Non Captive	18-34-18.60000	83-36-55.80000
46	21123 0617	Sri B. Naidu Babu	S/o. Suryanarayana Late, Door No. 16-3-29, Korada Veedhi, Vizianagaram Mandal & District.	781/Q/DDMG-VZM/2021, Dt.14.07.2023	RM	7	Pedadungada	Vepada	2.3	14.07.2023	13.07.2033	Working	Yes	SEIAA/AP/VZM/MIN/11/2021/3600, dt.01.05.2023	Non Captive	18-00-31.34235	83-01-27.78432

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
47	21118 0497	Smt. B. Sirisha	Plot No.75, CB Colony, R&B Guest House, Vizianagaram	1116/Q3V/ 2017, Dt.31.03.2017	RM	116	Gunkalam	Vizianagaram	5	14.09.2018	13.09.2028	Non-working	No	-	Non Captive	18° 10' 33.50742" N	83° 21' 21.39071" E
48	21109 0252	Sri K. NarasimhaRao	1-49-4,Visakhapatnam ,Visakhapatnam(U) ,Visakhapatnam	3902/Q3/2005 20 May 2009	RM&BST	71	Kongavanipalem	Bhogapuram	2.37	40032	45480	Working	Yes	SEIAA/AP/VZM/MIN/09/2020/2179/154.16/149.15-92	Non Captive	18° 00' 04.72206"N	83° 32' 59.86265"E
49	21117 0471	Smt L.S.T.B.V .Narasamamba	W/o. Nageswara Rao,Visakhapatnam - 530017.	3595/Q2/1996, Dt.14.03.2005	RM	99/10	Kongavanipalem	Bhogapuram	2	23/03/ 2017	22/03/ 2027	Non-working	No	No	Non Captive	18° 00' 13.44143"N	83° 32' 35.64311"E
50	21109 0287	Smt L.Naga Madhavi	MIG-19, Lawson's Bay Colony,	1597/Q3/2007 06 Nov 2008	RM&BST	99/10	Kongavanipalem	Bhogapuram	2	39965	31.03.2023	Working	Yes	SEIAA/AP/VZM/MIN/02/2021/2887/163.74&160.64-612, Dt:26.08.2021	Non Captive	18° 00' 08.68905"N	83° 32' 35.98077"E
51	21122 0564	Sri Venkateswara Constructions and Mining Company	Mg.Ptr:Sri S.V.S.S.S.R.K.Raju, D.No. 48-1-39, Kalyan Vihar Apartment, Sri Nagar, Visakhapatnam – 530016.	959/Q/DDMG-VZM/2021, Dt:25.07.2022	RM&BST	96&97	Kongavanipalem	Bhogapuram	4.11	18.08.2022	17.08.2032	Working	Yes	SEIAA/AP/VZM/MIN/3/2022/4030, dt.29.03.2022	Non Captive	18° 00' 15.27052" N	83° 32' 23.86821" E

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
52	21114 0604	Sri K.V.S.P. Raju	D.No. 7-74B,Bhogapuram V&M, Vizianagaram District	1849/Q2/04, Dt:19.07.2004	RM&BST	66/2	Ravada	Bhogapuram						No	Non Captive	17° 58' 45.70880"N	83° 27' 45.44245"E
53	21114 0393	M/s SriKanaka Mahalakshmi Stone Crushing Company	Bhogapuram Village and Mandal,	792/Q3/9920 Oct 2014	RM&BST	66/3	Ravada	Bhogapuram	1	41801	47355	Non-working	No	No	Non Captive	17° 58' 45.98069"N	83° 27' 47.81729"E
54	21208 0116	Smt L.S.Geetha	Vizianagaram.	G.O.Ms.No. 129, Dt:29.05.2007	Quartzite	46	Rajapulova	Bhogapuram	20.687	27/06/2008	26/06/2028	Working	Yes	SEIAA/AP/VZM-6/07-2536, DT:21.02.2008	Non Captive	17° 57' 04.88305"N	83° 25' 24.02913"E
55	21114 0388	Sri K. Narasimha Rao	D.No. 1-49-4, LIG-24, Sector - 1, MVP Colony, VSKP 9390530129	3902/Q3/2004, Dt:05.11.2011	RM&BST	282/47	Munjeru	Bhogapuram	0.3	18/11/2014	18/07/2024	Working	Yes	SEIAA/AP/VZM/MIN/10/2208/2020, dt.06.01.2022	Non Captive	18° 00' 15.02751"N	83° 32' 19.76992"E
56	21107 0266	Sri K. Sanjeeva Rao	,Vizianagaram ,Bhoghapuram,POLIPALLE	4668/Q3/2006 16 Mar 2007		43	Polipalli	Bhogapuram	0.5	18/05/2007	17/05/2027	Non-working	No	No	Non Captive	17° 58' 03.66583"N	83° 26' 38.11604"E
57	21114 0256	Smt L.V.N.Madhavi	W/o. L.V.N.V.Prasad, Lawsons bay Colony, Near Post Office, Visakhapatnam –	1702/Q2/1999, Dt:18.11.99	RM&BST	97	Kongavanipalem	Bhogapuram	1	41674	45295	Non-working	No	No	Non Captive	18° 00' 03.77300"N	83° 32' 42.17673"E

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			530017														
58	2112205 63	Sri K. Narasimha Rao	1-49-4, MVP Colony, Vskp.	468/Q3V/2018, Dt:03.01.2022	RM&BST	234	Munjeru	Bhogapuram	3.9	18.08.2022	17.08.2032	Working	Yes	SEIAA/AP/VZM/MIN/09/2020/2180, dt.14.06.2021	Non Captive	18° 00' 18.12281"N	83° 32' 17.90707"E
59	2112205 40	Sri R. Raghuram	H.No. 22, Bank Colony, Bheemunipatnam, Vskp- 531163 8106669035	940/Q/DDMG-VZM/2021, Dt:22.03.2022	RM&BST	99&100	Kongavanipalem	Bhogapuram	4.645	16.04.2022	15.04.2032	Working	Yes	SEIAA/AP/VZM/MIN/02/2021/2887/163.74&160.64-612, Dt:27.01.2022	Non Captive	18° 00' 04.01419"N	83° 32' 23.53708"E
60	2110801 42	Sri G.K.D.V.Rama Raju	50-39-07,Visakhapatnam ,Visakhapatnam(U) ,Visakhapatnam	0	RM&BST	97/14	Kongavanipalem	Bhogapuram	3.211	15/02/2008	46600	Working	Yes	SIA/AP/MIN/25502/2018, Dt:14.04.2018	Non Captive	18° 00' 00.19083"N	83° 32' 51.02431"E
61	2112205 48	Sri P. Ranga Rao	D.No. 2-37,Puvvalaveedhi, Bobbili - 535558 9177968427	1557/Q2/2008, Dt:20.04.2022	RM&BST	182	Mettavalasa	Bobbili	1	09.05.2022	08.05.2032	Working	Yes	SEIAA/AP/VZM/MIN/01/2021/2779, dt.26.08.2021	Non Captive	18° 31' 40.35"N	83° 19' 45.27"E
62	2112205 50	Sri S. Appa Rao	Mettavalasa V, Bobbili M, Vzm Dist - 535558. 9440336823	942/Q3/2018, Dt:20.04.2022	RM&BST	182	Mettavalasa	Bobbili	1	19.05.2022	18.05.2032	Working	Yes	SEIAA/AP/VZM/MIN/01/2021/2795, dt.26.08.2021	Non Captive	18° 31' 36.64"N	83° 19' 51.12"E

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63	21104 0010	Sri B. Sridhar	16-3-29,Vizianagaram ,Vizianagaram,VIZIANAGARAM BIT-I	2753/Q3/2003 23 Mar 2004		187/2	Garudabilli	Bondapalli	1	22/06/2004	31.03.2023	Non-working	No	-	Non Captive	18° 11' 59.25892"N	83° 20' 29.64561"E
64	21112 0021	M/s Satya Stone Crusher	16-3-29,Vizianagaram ,Vizianagaram,VIZIANAGARAM BIT-I	943/Q2/1996 21 Jan 2012	RM&BST	187/2	Garudabilli	Bondapalli	1	31/01/2012	17/10/2026	Working	Yes	SEIAA/AP/VZM/MIN/2/2021/2857, dt.07-09-2023	Non Captive	18° 12' 00.58193"N	83° 20' 34.20284"E
65	21104 0113	M/s Satya Granites (Lease transferred from Sri G.Ganapathi)	11-2-26,Vizianagaram ,Vizianagaram,VIZIANAGARAM BIT-II	847/Q3/2003 28 May 2004	RM&BST	187/2	Garudabilli	Bondapalli	1.5			Non-working	No	-	Non Captive	18° 12' 05.50551"N	83° 20' 40.80802"E
66	21123 0618	M/s Satya Stone Crusher	11-2-26,Vizianagaram ,Vizianagaram,VIZIANAGARAM BIT-II	905/Q/DDMG-VZM/2021, Dt:12.06.2023	RM&BST	187/2	Garudabilli	Bondapalli	3.576	11.07.2023	10.07.2033	Working	Yes	SEIAA/AP/VZM/MIN/11/2021/3656, dt.01.05.2023	Non Captive	18° 12' 01.51192"N	83° 20' 06.51091"E
67	21107 0009	M/s Satya Stone Crusher	8-18-120,Vizianagaram ,Vizianagaram,VIZIANAGARAM BIT-I	553/Q3/2007 07 Aug 2007	RM&BST	187/2	Garudabilli	Bondapalli	8	15/12/2007	31.03.2023	Working	Yes	SIA/AP/MIN/63649/2021, dt.02.06.2021.	Non Captive	18° 11' 57.72451"N	83° 20' 06.58172"E
68	21104 0012	Sri B. Sridhar	16-3-29,Vizianagaram ,Vizianagaram,VIZIANAGARAM BIT-I	2754/Q3/2003 23 Mar 2004	RM&BST	187/2	Garugubilli	Bondapalli	1	22/06/2004	31.03.2023	Non-working	No	-	Non Captive	18° 12' 18.44021"N	83° 20' 53.77712"E

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69	21107 0007	M/s Satya Granites	16-3-29,Vizianagaram ,Vizianagaram,VIZIANAGARAM BIT-I	556/Q3/2007 07 Aug 2007	RM&BST	187/3	Kondakindam	Bondapalli	2.5	30/10/2007	45016	Non-working	No	-	Non Captive	18° 11' 52.96901"N	83° 19' 54.89372"E
70	21113 0132	Sri M.Srinivasa Rao	8-18-120,Vizianagaram ,Vizianagaram,VIZIANAGARAM BIT-II	3828/Q3/2012 12 Aug 2013	RM&BST	67	Kondakindam	Bondapalli	5	41491	46939	Non-working	No	-	Non Captive	18° 11' 48.39856"N	83° 19' 37.51322"E
71	21113 0013	Sri B. Sridhar	16-3-29,Vizianagaram ,Vizianagaram,VIZIANAGARAM BIT-I	2993/Q2/2013 12 Aug 2013	RM&BST	67	Kondakindam	Bondapalli	1	41497	46939	Non-working	No	-	Non Captive	18° 11' 47.68261"N	83° 19' 35.51442"E
72	21100 0131	M/s Prakash Stone Crusher Indusrties	4-41,Vizianagaram ,Bondapalle Mandalm ,DEVUPALLE Village,	668/Q2/2000 00 24 Jun 2015	RM	9	Maruvada	Bondapalli	2	2/8/2000	31/07/2025	Non-working	No	-	Non Captive	18° 13' 36.98286"N	83° 16' 19.18039"E
73	21115 0407	Sri R. Sai Suresh	4-41,Vizianagaram ,Bondapalle,DEVUPALLE	1494/Q3/2013 01 Jun 2015	RM & Gravel	9	Maruvada	Bondapalli	1.64	5/6/2015	4/6/2025	Non-working	No	-	Non Captive	18° 13' 36.98286"N	83° 16' 19.18039"E
74	21112 0014	M/s Satya Stone Crusher, Prop: Sri B Sridhar	16-3-29, Korada Veedhi, VZM dist	944/Q2/1996, Dt:21.01.2012	RM&BST	187/2	Garugubilli	Bondapalli	2	31/01/2012	17/10/2026	Working	Yes	SEIAA/MIN/VZM/2/2021/2847, dt.07-09-2023	Non Captive	18°11'57.15"N	83°20'33.47"E

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75	21107 0008	M/s Satya Constructions, Mg. Ptr: Sri B. Adinarayana	16-3-29, Korada Veedhi, VZM dist	554/Q3/2007 07 Aug 2007	Road Metal	61	Kondakindam	Bondapalli	1.66	30/10/2007	31.03.2023	Non-working	No	-	Non Captive	18°12'01.51" N	83°20'06.51"E
76	21123 0616	Sri Botcha Naidu Babu	16-3-29, Korada Veedhi, VZM dist	821/Q/DDMG-VZM/2021, Dt:06.06.2023	RM & BS	187/2	Garudabilli	Bondapalli	1.97	14.07.2023	13.07.2033	Working	Yes	SEIAA/AP/VZM/MIN/11/2021/3599, dt.01.05.2023	Non Captive	18°12' 17.83"N	83°20'56.42"E
77	21123 0587	Sri B. Naidu Babu	16-3-29, Korada Veedhi, VZM dist	347/Q/DDMG-VZM/2021, Dt:06.01.2023	BS & Gravel	267	Nelivada	Bondapalli	4.93	27.01.2023	26.01.2033	Working	Yes	SEIAA/AP/VZM/MIN/8/2021/3403	Non Captive	18°11' 45.78329"N	83°22'15.08090"E
78	21122 0528	Sri B. Naidu Babu	16-3-29, Korada Veedhi, VZM dist	733/Q/DDMG-VZM/2021, Dt:11.03.2022	Road Metal	187/2	Garudabilli	Bondapalli	0.483	24.03.2022	23.03.2032	Working	Yes	SEIAA/AP/VZM/MIN/11/3643/2021/174.67/171.51	Non Captive	18° 12' 08.37039"N	83° 20' 32.07000"E
79	21123 0594	Sri B. Naidu Babu	16-3-29, Korada Veedhi, VZM dist	2876/Q/DDMG-VZM/2018, Dt:15.02.2023	Road Metal	187/2	Garudabilli	Bondapalli	1.5	06.03.2023	05.03.2033	Working	Yes	SEIAA/AP/MIN/VZM/8/2021/3436, dt.20.01.2023	Non Captive	18° 12' 17.83"N	83° 20' 56.42"E
80	21123 0613	Sri B. Naidu Babu	16-3-29, Korada Veedhi, VZM dist	688/Q/DDMG-VZM/2021, Dt:12.06.2023	RM & BS	187/2	Garudabilli	Bondapalli	1.974	14.07.2023	13.07.2033	Working	Yes	SEIAA/AP/VZM/MIN/11/2021/3596, dt.01.05.2023	Non Captive	18° 12' 10.37291"N	83° 20' 51.21190"E

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81	21123 0614	Sri B. Naidu Babu	16-3-29, Korada Veedhi, VZM dist	732/Q/DD MG-VZM/2021, Dt:14.07.2023	RM & BS	187/2	Garudabilli	Bondapalli	2.488	14.07.2023	13.07.2033	Working	Yes	SEIAA/AP/VZM/MIN/11/2021/3601, dt.01.05.2023	Non Captive	18° 12' 07.65725"N	83° 20' 42.36805"E
82	21123 0615	Sri B. Naidu Babu	16-3-29, Korada Veedhi, VZM dist	734/Q/DD MG-VZM/2021, Dt:06.06.2023	RM & BS	187/2	Garudabilli	Bondapalli	1.955	14.07.2023	13.07.2033	Working	Yes	SEIAA/AP/VZM/MIN/11/2021/3597, dt.01.05.2023	Non Captive	18° 12' 07.04651"N	83° 20' 35.69115"E
83	21123 0619	Sri B. Guru Naidu	16-3-29, Korada Veedhi, VZM dist	946/Q/DD MG-VZM/2021, Dt:06.06.2023	RM & BS	187/2	Garudabilli	Bondapalli	1.97	14.07.2023	13.07.2033	Working	Yes	SEIAA/AP/VZM/MIN/11/2021/3598, Dt.01.05.2023	Non Captive	18° 12' 01.45320"N	83° 20' 16.02934"E
84	21200 0058	Sri B. Ramesh	48-6-57/1, Ram Talkies Down, Srinagar, VSP.	6682/D2/2020, Dt:31.03.2023 Proposal sent to DMG	Quartzite	11	Marrivalasa	Dattirajeru	40.06	36689	31.03.2023	Working	Yes	SEIAA/AP/VZM/MIN/VIO/11/2018, dt:26.08.2022	Non Captive	18° 25' 19.64402"N	83° 19' 55.21218"E
85	21212 0231	Sri.G.Tirupathi Rao.	S/o. Thami Naidu, Busayyavalasa V, Ramabhadrapuram M, Vzm Dist	G.O.Ms.no. 86, Dt:23.05.2012	Quartzite	1	Korapakothavalasa	Dattirajeru	29.14	16/05/2012	15/05/2032	Non-working	No	-	Non Captive	18° 25' 48.25414"N	83° 19' 17.11717"E
86	21118 0487	R HANUMANTHA RAO	Plot No. 80, Sri Sai Sivayam Apartment, Near G.Yendada, Gitam Post Office, VSP.	9718/R1-2/2009, Dt:19.01.2007	Quartzite	1	Sarayyavalsa	Dattirajeru	21.85	27/04/2018	26/04/2038	Working	Yes	SEIAA/AP/VZM-82/2014	Non Captive	18° 21' 57.62982"N	83° 25' 29.15691"E

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87	21207 0057	Smt. R.Suneetha,	Plot No. 80, Sri Sai Sivayam Apartment, Near G.Yendada, Gitam Post Office, VSP.	991/M/2007, Dt:05.03.2007	Quartzite	1	Sarayyavalsa	Dattiraj eru	28	39205	46480	Non-working	Yes	SEIAA/AP/VIZ-54/2013-1705	Non Captive	18° 22' 03.21992"N	83° 25' 21.57301"E
88	21203 0061	M/s R.G Mines and Minerals	50-116-20/1, MIG-112, Seethammadhara, Visakhapatnam	G.O.Ms.no. 104 Ind & Comm (M.III) Dept, Dt:07.03.2023	Quartzite	37	Porali	Dattiraj eru	24.28	26/05/2003	25/05/2023	Working	Yes	SEIAA/AP/VZM-44/2012-4745, dt:09.01.2013	Non Captive	18° 22' 19.73890"N	83° 24' 45.92793"E
89	21122 0597	M/s R.G. Minerals	50-116-20/1, MIG-112, Seethammadhara, Visakhapatnam	6978/D2/2020, Dt:27.02.2023	Quartzite	37	Porali	Dattiraj eru	16.17	09.03.2023	08.03.2043	Working	Yes	SEIAA/AP/VZM/MIN/03/2021/2957, dt.27.07.2022	Non Captive	18° 22' 26.56271"N	83° 25' 13.85650"E
90	21114 0203	Sri M. Appala Naidu	Appala Narasayya (Late), Pollipalle V, Bhogapuram M, Vzm Dist	5757/Q/2003, Dt:13.03.2014	RM&BS and Gravel	102	Boddavalasa	Denkada	2	25/03/2014	24/03/2029	Working	Yes	SEIAA/AP/VZM/MIN/11/2021/3674, dt:15.03.2022	Non Captive	18° 02' 05.71022"N	83° 25' 15.69824"E
91	21122 0560	Sri P.S.R.V. Sagar Naidu	S/o. Appala Narayana, H.No. 5-135, Akula Peta, Denkada	347/DDMG-VZM/2021, Dt:06.07.2022	RM&BS	25	Chittigunkalam	Denkada	1.5	01.08.2022	31.07.2032	Working	Yes	SEIAA/AP/VZM/MIN/6/2021/3212, dt.25.03.2022	Non Captive	18° 02' 07.69745"N	83° 25' 18.13117"E
92	21111 0129	Sri P.Adi Babu	16-3-29, Korada Veedhi, VZM dist	881/Q/DDMG-VZM/21, Dt:04.08.2022	RM&BS and Gravel	102	Boddavalasa	Denkada	1	31/05/2011	31.03.2023	Non-working	No	-	Non Captive	18° 02' 08.12542"N	83° 25' 09.20462"E

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93	21115 0404	Sri A.Suryanaraya ana	45-1-1-1/2, Akkayapalem, VSP.	9215/D2/2021, Dt:12.01.2021	C.G.	272	Mutcherla	Gajapathinagaram	5	42281	49556	Working	Yes	SEIAA/AP/VZN-85/2014-1985	Non Captive	18° 16' 56.99032"N	83° 25' 14.23871"E
94	21109 0267	Smt N.K.Chinnammal	3/151-HF, Anna Nagar, Mettur Dam, Thanapuram patnam, RS-1, Sailam, Tamil Nadu	2695/R1-1/2005, Dt:30.09.2009	C.G.	190/6, 7,12	Konisa	Gajapathinagaram	2.91	40158	47433	Non-working	No	-	Non Captive	18° 17' 43.25"N	83° 17' 10.01"E
95		Smt. S. Vijaya Lakshmi	1/208, Perugopanapalli, Bargur Taluq, Krishna Nagar Dist	8438/D2/2008, Dt:01.09.2022	C.G.	243P	Vemali	Gajapathinagaram	4.3	19.09.2022	18.09.2042	Non-working	Yes	SEIAA/AP/VZM/MIN/00/2021	Non Captive	18° 18' 43.45685"N	83° 25' 41.96873"E
96	21110 0171	Sri Y. Rajesh	1-175A, Nallammaramma Colony, K.L.Puram 9441156682	2289/Q/DDMG-VZM/2020, Dt:11.11.2021	RM&BS and Gravel	1	Jaggapuram	Gantyada	1	19/08/2010	18/08/2030	Working	Yes	SEIAA/AP/VZM/MIN/02/2021/2902/163.104&160.87624	Non Captive	18° 10' 21.13567" N	83° 19' 39.25615" E
97	21110 0178	Sri S. Ramu Naidu	D.No. 3-169, Bodara Road, Narava V, Gantyada M, Vzm Dist	2288/Q/DDMG-VZM/2020, Dt:11.11.2021	RM&BS and Gravel	1	Jaggapuram	Gantyada	1	18/06/2010	17/06/2030	Working	Yes	SEIAA/AP/VZM/MIN/02/2021/2899/163.03&160.86623	Non Captive	18° 10' 27.83184" N	83° 19' 43.12331" E
98	21110 0184	Sri S.Ramu Naidu	D.No. 3-169, Bodara Road, Narava V, Gantyada M, Vzm Dist	2176/Q/DDMG-VZM/2020, Dt:11.11.2021	RM&BS and Gravel	1	Jaggapuram	Gantyada	2	25/06/2010	24/06/2030	Working	Yes	SEIAA/AP/VZM/MIN/02/2021/295/163.98&160.82620	Non Captive	18° 10' 26.53503" N	83° 19' 40.52585" E

S. No.	LesseeID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
99	211100173	Sri S. Ramu Naidu	D.No. 3-169, Bodara Road, Narava V, Gantyada M, Vzm Dist	2290/Q/DDMG-VZM/2020, Dt:11.11.2022	RM&BS and Gravel	44	Gantyada	Gantyada	1	40485	30/05/2030	Working	Yes	SEIAA/AP/VZM/MIN/02/2021/2894/163.97&160.81619	Non Captive	18° 09' 51.58729" N	83° 17' 41.71925" E
100	211100174	Sri Y. Rajesh	1-175A, Nallammaramma Colony, K.L.Puram 9441156682	2291/Q/DDMG-VZM/2020, Dt:11.11.2021	RM&BS and Gravel	1	Jaggapuram	Gantyada	1	19/08/2010	18/08/2030	Working	Yes	SEIAA/AP/VZM/MIN/02/2021/2928/163.121&160.100629	Non Captive	18° 10' 21.13567" N	83° 19' 39.25615" E
101	211210522	R Satyanarayana	D.No. 3-15, Koralam V, Gantyada M, Vzm Dist	948/Q/DDMG-VZM/21, Dt:19.02.2021	RM&BS and Gravel	1	Neelavathi	Gantyada	1.5	27/03/2021	26/03/2031	Working	Yes	SEIAA/AP/VZM/MIN/08/2020/20618	Non Captive	18° 10' 19.55746" N	83° 18' 06.81853" E
102	211070421	Sri S. Venkata Kumar Swamy	S/o. S.V.K.Subudhi, D.No. 2-54, Near Balikala Unnatha Patasala, Cheeepurapalli Village and Mandal, Vizianagaram District	#N/A	RM&BS and Gravel	24/1P	Devada	Garividi	1.3	22/12/2007	31.03.2023	Non-working	Yes	SIA/AP/MIN/20584/2018, Dt.06-08-2018.	Non Captive	18° 15' 45.74192" N	83° 33' 03.05041" E
103	211120055	Sri K. Murali	8-12-70A,Vizianagaram ,Vizianagaram,VIZIANAGARAM BIT-I	134/Q/2012 18 Jan 2012	Gravel & RM	464	Jami	Jami	1.4	23/01/2012	22/01/2027	Non-working	No	-	Non Captive	18°03'10.99835"N	83°14'46.15174"E

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
104	21105 0059	Sri K. Murali	8-12-70A, Vizianagaram, Vizianagaram Agaram Bit- 1.	697/Q/DDMG-VZM/2021, Dt:13.06.2022	Road Metal	464	Jami	Jami	2.5	19/11/2005	20/11/2035	Non-working	No	-	Non Captive	18°03'09.45735"N	83°14'46.69351"E
105	21122 0539	Sri K. Murali	8-12-70A, Vizianagaram, Vizianagaram Agaram Bit- 1.	110/Q3V/2019, Dt:02.05.2022	RM&BS	394	Jami	Jami	1.084	27.05.2022	26.05.2037	Working	Yes	SEIAA/AP/VZM/MIN/9/3489/2021, Dt:05.03.2022	Non Captive	18° 02' 55.83"N	83° 14' 12.05"E
106	21114 0313	Sri N. Pedda Veeraiah	S/o. N.Nadipi Veeraiah, Main Road, Allu Veedhi, Jami Village and Mandal, Vizianagaram District – 535250.	6775/Q3/2002, Dt:09.07.2013	RM&BS and Gravel	394	Jami	Jami	2	27/06/2014	45108	Non-working	No	-	Non Captive	18° 02' 58.85122"N	83° 14' 10.48870"E
107	21114 0187	Sri N. Pedda Veeraiah	Allu Veedhi, Main Road, Jami, VZM.	3596/Q3/2021, Dt:28.08.2023	RM&BS and Gravel	394	Jami	Jami	1	41646	31/12/2024	Non-working	No	-	Non Captive	18° 03' 00.75213"N	83° 14' 17.16775"E
108	21107 0053	Sri K. Murali	8-12-70A, Vizianagaram, Vizianagaram Agaram Bit- 1.	832/Q1/2007, Dt:19.12.2007	Road Metal	394	Jami	Jami	1	19/12/2007	31.03.2023	Non-working	No	-	Non Captive	18° 03' 02.46"N	83° 14' 19.74"E

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
109	21112 0167	M/s Sakthidhar Nirmans	3,Vizianagaram ,Kothavalasa,KOTHAVALASA	3439/Q3/2007 23 Feb 2012	Quartzite	1/8	Relli	Kothavalasa	6.48	37176	31.03.2023	Non-working	No	-	Non Captive	17°58' 20.59839" N	83° 14' 44.21112" E
110	21117 0477	M/s ICON Readymix Concrete Pvt. Ltd.	3,Vizianagaram ,Kothavalasa,KOTHAVALASA	4809/Q/DDMG-VZM/2022, Dt:27.12.2022	RM&BS and Gravel	1	Pedarao palle	Kothavalasa	5.5	21/05/2012	31.03.2023	Non-working	Yes	SIA/AP/MIN/24282/2018, dt.11-04-2018.	Non Captive	17° 58' 25.36786" N	83° 14' 55.32888" E
111	21108 0348	Dr.G.Sudrashana Rao	,Krishna ,Pamidimukkala,VEERANKI	3582/Q3/2006 12 Aug 2008	RM&BS and Gravel	1	Pedarao palle	Kothavalasa	2.5	28/04/2017	27/04/2027	Non-working	No	SEIAA/AP/VZM/MIN/10/2021/3546, Dt.30.04.2022	Non Captive	17°58' 17.98180" N	83° 14' 21.22040" E
112	21107 0470	Sri R.V.V.Satyanarayana Raju	3,Vizianagaram ,Kothavalasa,KOTHAVALASA	2837/Q3/2015 13 Nov 2015	RM&BS and Gravel	1	Pedarao palle	Kothavalasa	5.5	39422	46697	Non-working	No	-	Non Captive	17° 58' 21.29370" N	83° 14' 36.52380" E
113	21201 0151	M/s Rocky Minerals	Plot No. 3, Teegala Narasinga Rao Layout, Kothavalasa, Vzm District	487/D2/2021, Dt:10.06.2022	Quartzite	1/8	Relli	Kothavalasa	6.48	37176	31.03.2023	Working	No	-	Non Captive	17°54'30.11701"N	83° 14' 17.41890"E
114	21122 0555	M/s ICON Readymix Concrete Pvt. Ltd.	3,Vizianagaram ,Kothavalasa,KOTHAVALASA	Procd No. 4808/Q/DDMG-VZM/2022, Dt:27.12.2022	RM&BS and Gravel	1	Pedarao palle	Kothavalasa	1.816	02.07.2022	01.07.2037	Working	Yes	SEIAA/AP/VZM/MIN/11/2020/2432, Dt.13.07.2021	Non Captive	17° 58' 22.40247"N	83° 14' 53.45768"E

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
115	21122 0556	M/s ICON Readymix Concrete Pvt. Ltd.	3,Vizianagaram ,Kothavalasa,KOTHAVALASA	Procd No. 4810/Q/DDMG-VZM/2022, Dt:27.12.2022	RM&BS and Gravel	1	Pedaraopalle	Kothavalasa	1.285	02.07.2022	01.07.2037	Working	Yes	SEIAA/AP/VZM/MIN/6/2021/3256, Dt.27.09.2021	Non Captive	17° 58' 28.70"N	83° 14' 45.66"E
116	21110 0163	Smt P. Syamala	2-137,Visakhapatnam ,Visakhapatnam(U) ,Visakhapatnam	6090/Q3/2009 27 Jul 2010	RM&BS and Gravel	111	Rega	L.Kota	1	40457	47597	Non-working	No	-	Non Captive	17° 56' 50.62"N	83° 07' 7.70110"E
117	21110 0165	Smt P. Syamala	2-137,Visakhapatnam ,Visakhapatnam(U) ,Visakhapatnam	6092/Q3/2009 27 Jul 2010	RM&BS and Gravel	111	Rega	L.Kota	1.15	40457	47597	Non-working	No	-	Non Captive	17° 56' 46.58"N	83° 07' 10.29"E
118	21205 0235	M/s Srinivasa Mines and Minerals	Flat No. 7, Bharat Villa, Opp:Timpany School, CBM Compound, Vsp.	3624/D2/2020, Dt:24.07.2020	Quartzite	467	Uttaravilli	Merakamudidam	26.91	14/06/2005	13/06/2025	Working	Yes	SEIAA/AP/VZM/VIO/MIN/4/2021/31481011, Dt:03.02.2022	Non Captive	18° 26'56.38472" N	83°30'17.04904"E
119	21121 0517	Sri M.V.N Seetharama Raju	D.No. 304, Swarna Rama Towers, Rayalam, Bheemavaram, West Godavari District .	9178/D2/2018, Dt:12.12.2020	Quartzite	50/1(P)	Rachagumadam	Merakamudidam	4.99	44501	51775	Non-working	Yes	SEIAA/AP/VZN/MIN/10/2019/1268-154	Non Captive	18° 26 06'71991" N	83° 31' 2202022" E

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
120	21118 0496	SRINI SANDHYA GRANITES	SatyaSiva Raja, 132A, Mallilai Subbaraja Street, Rajaplalayam,	30958/R1-2/2017, Dt:08.08.2018	C.G.	144/P	Chinabantupalle	Merakamudidam	4.57	29/09/2018	28/09/2038	Working	Yes	1122/DEIAA/AP/VZM/2017-5	Non Captive	18° 19' 39.35471" N	83° 27' 43.96812" E
121	21122 0562	M/s Rajyog Minerals Pvt. Ltd.	B-16/01, Pushan Marg, DLF Phase - I, Gurgeon - 122002, Hariyana State	1786/D2/2022, Dt:28.07.2022	C.G.	34	Madhupada	Nellimarla	3	18.08.2022	17.08.2042	Working	Yes	SEIAA/AP/VZM/MIN/04/2022/4212, dt.22.06.2022	Non Captive	18° 11' 29.07169"N	83° 3424.35811 "E
122	21107 0170	Sri B. Ananda Rao	52,Vizianagaram ,Vizianagaram,VIZIANAGARAM BIT-II	1247/Q3/2007 23 Jun 2007	B.S & Gravel	328	Nellimarla	Nellimarla	2	17/07/2007	31.03.2023	Non-working	No	-	Non Captive	18° 08' 30.54383"N	83° 27' 12.54749"E
123	21114 0384	M/s S.V.S.Mookambika Constructions(P)Ltd.,	15-16,Vizianagaram ,Vizianagaram,VIZIANAGARAM BIT-I	1051/Q3/2006 11 Nov 2014	RM&BS and Gravel	365	Dharmavaram	S.Kota	2.82	19/12/2014	27/08/2027	Working	Yes	(TOR) SEIAA/AP/VZM/VIO/MIN/1/2023/4854-1536, dt.15-03-2023	Non Captive	18° 06' 02.76011"N	83° 11' 36.23992"E
124	21114 0386	M/s S.V.S.Mookambika Constructions(P)Ltd.,	15-16,Vizianagaram ,Vizianagaram,VIZIANAGARAM BIT-I	690/Q3/2013 11 Nov 2014	RM&BS and Gravel	365	Dharmavaram	S.Kota	2.36	19/12/2014	21/05/2023	Working	Yes	(TOR) SEIAA/AP/MIN/VIO/VZM/8/2022, DT.11-11-2022	Non Captive	18° 05' 56.62481"N	83° 11' 34.96512"E
125	21112 0074	M/s Veeranjaneya Mineral Products	8-83, Naiduthota, Vepagunta, VSKP-47	1407/Q/2023, Dt:10.05.2022	Road Metal	1	Kondamallipudi	S.Kota	2.5	18/01/2012	31.03.2023	Working	Yes	SEIAA/AP/VZM/MIN/11/2021/3678, dt.17.08.2022	Non Captive	18° 05' 23.46840"N	83° 06' 01.42335"E

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126	2111202 93	Smt A. Kamala	12-96,Vizianagaram ,Srungavarapukota, SRUNGAVARAPUKOTA	3322/Q3/2009 19 Jan 2012	RM&BS and Gravel	1	Mallipudi	S.Kota	8.9	28/01/2012	18/09/2024	Working	Yes	SEIAA/AP/MIN/VSP/VIO/7/2021/3236, dt.09.03.2023	Non Captive	18° 05' 16.52655"N	83° 06' 20.47896"E
127	2110803 39	Sri. M. Kasiviswaradham	R/o. House No. 1-13,	1192/Q3/2006 13 May 2008	Road Metal	1	Alugubilli	S.Kota	1	41063	46851	Working	Yes	SEIAA/AP/VZM/MIN/7/2021/3326, dt.26.10.2021	Non Captive	18° 05' 46.882695"N	83° 11' 58.041058"E
128	2110803 27	Sri L. Ashok Kumar	Alamandal Village, Jami Mandal,	5076/Q3/2006 11 Jan 2008	RM&BS and Gravel	1	Alugubilli	S.Kota	2	29/01/2008	24/05/2027	Working	Yes	SEIAA/AP/VZM/MIN/12/2021/3763, dt.15.03.2022	Non Captive	18° 05' 43.062323"N	83° 11' 47.945944"E
129	2110400 46	Smt M. Ganga Bhavani	Vizianagaram District – 535240.	4776/Q/2014, Dt:10.06.2015	Road Metal	1	Alugubilli	S.Kota	1	18/06/2004	17/06/2029	Non-working	No	SIA/AP/MIN/407427/2022, dt.22.11.2022	Non Captive	18° 05' 49.44978"N	83° 11' 54.71908"E
130	2111300 56	Sri K. Murali	8-12-70/A, Balaji Nagar, Vzm Dist.	691/Q3/2013, Dt:06.13.2013	Road Metal	365	Dharmavaram	S.Kota	2.33	21/05/2013	20/05/2028	Non-working	No	No	Non Captive	18° 05' 58.06784"N	83° 11' 35.10265"E
131	2111402 74	M/s Aditya Aggregates	Mg.Ptr: Sri YJM Prasad, D.No. 40-9/1-18A, Beside Vasavya Mahila Mandali, Vasavya Nagar, Vijayawada-	LoI Issued	RM&BS and Gravel	365	Dharmavaram	S.Kota	1.66	19/08/2014	17/03/2023	Non-working	No	No	Non Captive	-	-

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
			520010.														
132	2110700207	Sri R.Sankar Rao	D.No. 40-9/1-18A, Beside Vasavya Mahila Mandali,	#N/A	RM&BS and Gravel	7	Kothavooru	S.Kota	1	18/04/2007	23/05/2021	Non-working	No	No	Non Captive	18° 05' 24.20461"N	83° 07' 30.752"E
133	2111203328	M/s SANCO Projects	Vasavya Nagar, Vijayawada-520010.	1665/Q/DDMG-VZM/2021, Dt:05.11.2022	RM&BS and Gravel	464	Kottam	S.Kota	2	41191	46365	Non-working	Yes	SIA/AP/MIN/281190/2022, dt:01.07.2022	Non Captive	18° 05' 13.54344"N	83° 13' 21.28110"E
134	2111500415	M/s Sri Sai Krishna Stone Crusher	Mg.Ptr: A.Srimanarayana, D.No. 10-87, Housing Board Colony, PM Palem, VSP.	1945/Q2/1999, Dt:25.11.2024 of the DDM&G, VSP	RM&BS and Gravel	464	Kottam	S.Kota	2	19/02/2015	27/09/2029	Non-working	Yes	SIA/AP/MIN/25060/2018, Dt:13.04.2018	Non Captive	18° 05' 16.58405"N	83° 13' 27.41338"E
135	2111500424	M/s Lorven Associates LLP Designated Ptr: D.Tulasi Ramana	S/o. Venkateswarlu, Thummapalem, Nellore	1952/Q/DDMG-VZM/2022, Dt:01.11.2022	RM&BS and Gravel	464	Kottam	S.Kota	4.98	23/09/2015	22/09/2030	Non-working	Yes	SEIAA/AP/MIN/VIO/VZM/9/2022/4602/221.08, dt.24.08.2023	Non Captive	18° 05' 22.3920"N	83° 13' 23.1113"E
136	2111500425	M/s Lorven Associates LLP Designated Ptr: D.Tulasi Ramana	S/o. Venkateswarlu, Thummapalem, Nellore	1953/Q/DDMG-VZM/2022, Dt:01.11.2022	RM&BS and Gravel	464	Kottam	S.Kota	4	24/06/2015	23/06/2030	Non-working	Yes	SEIAA/AP/MIN/VIO/VZM/9/2022/4601/221.09, dt.24.08.2023	Non Captive	18° 05' 13.3800"N	83° 13' 21.3198"E

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137	2111300044	Smt D. Krishnaveni	W/o. Srinivasa Babu, Near R.C.M. School, Vzm Dist	691/Q3/2013, Dt:06.03.13 of the DDM&G, VSKP	Road Metal	365	Dharmavaram	S.Kota	3.33	41432	46880	Working	Yes	SEIAA/AP/VZM/VIO/MIN/2/2021/2846, DT:25.07.2023	Non Captive	18° 05' 57.99480"N	83° 11' 35.07347"E
138	2111200126	Sri B.Adinarayana	16-3-29,Vizianagaram ,Vizianagaram,VIZIANAGARAM BIT-II	3759/Q3/2010 09 Feb 2012	RM	1	Pedakrishnarajapuram	Vepada	2.33	8/5/2012	8/1/2031	Non-working	No	-	Non Captive	18° 05' 16.95452"N	83° 06' 13.46531"E
139	2112300589	Smt V. Kalyani	W/o. V.Divakar, D.No. 6-89/9, V.A.N.Sundar Nagar, Pendurthi, Visakhapatnam - 531173.	698/QL/DDMG-VZM/2021 Dt:27.12.2022	RM	1	Pedakrishnarajapuram	Vepada	3	14.02.2023	13.02.2033	Working	Yes	SEIAA/AP/VZM/MIN/12/2021/3713, dt.29.11.2022	Non Captive	18° 05' 16.85641"N	83° 06' 16.65462"E
140	2110800304	M/s Pragati Aqua & Mineral Products (P) Ltd Mg.Dir:Smt G.Rekha Rani	W/o. G.V.S.Prasad, D.No. 1-38/9, FF1, Sri Lakshmi Gardens, Visakhapatnam.	1508/Q/2023 Dt:01.06.2023	RM	7	Pedadungada	Vepada	5	21/06/2008	4/8/2027	Working	Yes	SEIAA/AP/MIN/VZM/12/2020/2737, Dt:16.12.2022	Non Captive	18° 00' 44.58726"N	83° 01' 20.22710"E
141	2111000300	M/s Mahaveer Aggregates LLP,	Part R Sunil Kumar Jain, D.No. 10-28-2, Flat No. 407, Facor Layout, M.V.V & M.Ks Royal Garden, Ramnagar, Visakhapatnam –	752/Q/2023, Dt: .07.2023	RM	7	Pedadungada	Vepada	4.840	01.04.2023	31.03.2033	Working	Yes	SEIAA/AP/CTR/MIN/12/2021/3761, dt.25.06.2022	Non Captive	18° 00' 51.17612"N	83° 01' 10.54196"E

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			530002.														
142	2111400315	M/s Sai Parameswari Stone Crusher	D.No. 10-28-2, Flat No. 407,	2505/Q3/2010 07 Mar 2014	RM	1	Jakeru	Vepada	2	16/04/2014	25/09/2030	Working	Yes	SEIAA/AP/VZM/MIN/1/2021/2828/179.19/177.11, dt:23.03.2022	Non Captive	18° 02' 56.56644"N	83° 06' 20.16585"E
143	2111400428	M/s Divya Anjaneya Stone Crusher	Facor Layout, M.V.V & M.Ks Royal Garden,	1463/Q3/2007 14 Jun 2013	RM	7	Pedadungada	Vepada	2.5	27/01/2014	26/01/2024	Non-working	No	--	Non Captive	18° 0' 26.43486"N	83° 1' 24.17296"E
144	2111400356	M/s Vajrakaya Crushers Pvt Ltd, Mg.Ptr:Sri Sreecharan (Transferred from Sri P.Raghu)	Ramnagar, Visakhapatnam – 530002.	692/QL/DDMG-VZM/2022 Dt:18.07.2022	RM	7	Pedadungada	Vepada	7.6	21/10/2014	20/10/2024	Non-working	No	-	Non Captive	18° 00' 36.58711"N	83° 01' 10.70449"E
145	2111400297	Sri G.Chandra Sekhar Varma	,Vizianagaram ,Lakkavarapukota,LAKKAVARAPUKOTA	1463/Q3/2007 14 Jun 2013	RM	7	Pedadungada	Vepada	1.8	27/01/2014	26/01/2024	Non-working	No	-	Non Captive	18° 00' 43.26786" N	83° 01' 09.27600" E

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
146	21114 0427	Sri A.Koteswara Rao	S/o Satyanarayana, Door No.2-171 Kothapalem Gopalapatnam Visakhapatnam	1463/Q3/2007 14 Jun 2013	RM	7	Pedadungada	Vepada	2.3	27/01/2014	26/01/2024	Non-working	No		Non Captive	18° 00'30.52800" N	83° 01' 12.98450" E
147	21118 0488	Sri.Lakshminarasimha Chirangeevi Minerals, Prop: Sri B.Oma Siva	D.No.11-93/1, Main Road, Gopalapatnam, Vsp - 530027.	738/Q3/2018 Dt:29.06.2018	RM	6	Veelupar thi	Vepada	6.445	2/7/2018	1/7/2033	Working	Yes	SEIAA/AP/VZM/MIN/05/2018/569	Non Captive	18° 10' 16.57985"N	83° 02' 21.16170"E
148	21115 0395	M/s Sri Ganesh Sai Granites & Minerals	49-54-4/67,Visakhapatnam ,Visakhapatnam(U) ,Visakhapatnam	2140/Q3/2009 18 Apr 2015	RM	6	Veelupar thi	Vepada	11	4/5/2015	20/05/2033	Non-working	No	-	Non Captive	18° 01' 14.30421"N	83° 02' 31.91418"E
149	21109 0172	M/s Veeranjaney a Mineral Products, A.G.Murali	S/o. Viswanadha Rao, D.No. 8-86, Vepugunta Post, Naiduthota, Pendurthi Mandal, VSP.	2113/Q3/2016, Dt:23.06.2016	RM	1	S.Kota Seetara mpuram	Vepada	1.2	3/2/2009	2/2/2034	Non-working	No	-	Non Captive	18° 05' 25.09901"N	83° 05' 54.24383"E
150	21112 0076	M/s Veeranjaney a Mineral Products	S/o. Viswanadha Rao, D.No. 8-86, Vepugunta Post, Naiduthota, Pendurthi Mandal, VSP.	Renewal LoI	RM	1	S.Kota Seetara mpuram	Vepada	1.2	27/03/2012	2/2/2034	Non-working	No	-	Non Captive	18° 05' 16.45340"N	83° 05' 54.67833"E
151	21112 0077	M/s Veeranjaney a Mineral Products	S/o. Viswanadha Rao, D.No. 8-86, Vepugunta Post, Naiduthota, Pendurthi Mandal,	Renewal Application filed	RM	1	S.Kota Seetara mpuram	Vepada	1.2	27/03/2012	2/2/2034	Non-working	No	-	Non Captive	18° 05' 16.49379"N	83° 05' 53.47380"E

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
			VSP.														
152	2111200078	M/s Veeranjaneya Mineral Products	S/o. Viswanadha Rao, D.No. 8-86, Vepugunta Post, Naiduthota, Pendurthi Mandal, VSP.	3942/Q1/2006, Dt:27.03.2012	RM	1	S.Kota Seetarampuram	Vepada	1.2	27/03/2012	2/2/2034	Non-working	No	-	Non Captive	18° 05' 16.59501"N	83° 05' 58.25363"E
153	2111200079	M/s Veeranjaneya Mineral Products	S/o. Viswanadha Rao, D.No. 8-86, Vepugunta Post, Naiduthota, Pendurthi Mandal, VSP.	Renewal Application filed	RM	1	S.Kota Seetarampuram	Vepada	1.2	27/03/2012	2/2/2034	Non-working	No	-	Non Captive	18° 05' 16.33735"N	83° 05' 57.10591"E
154	2110900082	M/s Veeranjaneya Mineral Products	S/o. Viswanadha Rao, D.No. 8-86, Vepugunta Post, Naiduthota, Pendurthi Mandal, VSP.	1413/Q3/2004, Dt:31.01.2009	RM	1	S.Kota Seetarampuram	Vepada	1.2	3/2/2009	2/2/2024	Non-working	No	-	Non Captive	18° 05' 16.37952"N	83° 05' 55.88790"E
155	2112200575	Sri A. Koteswara Rao	S/o. Satyanarayana, D.No. 2-171,Kothapalem, Gopalapatnam, VSP	346/Q/DDMG-VZM/2019, Dt:30.11.2022	RM	7	Pedadungada	Vepada	2	09.12.2022	08.12.2032	Working	Yes	SEIAA/AP/MIN/VZM/11/2020/2342, dt.11.11.2022	Non Captive	18°0'26.74"N	83°1'19.23" E

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
156	21121 0523	Sri E.V. Nagabushan Rao	S/o. Satyanarayana, Nallaballi V, Vepada M, Vzm Dist	467/Q/DDMG-VZM/2019, Dt:03.01.2020	RM	45	Pedadungada	Vepada	13.5	11/24/2021	11/23/2031	Working	Yes	SEIAA//AP/VZM/MIN/06/2020/1922	Non Captive	18° 00' 44.73619"N	83° 01' 29.57946"E
157	21120 0506	M/s Chirla Rama Reddy & Co, Mg.Ptr:Smt Ch. Santoshi Pavani	W/o. Ch Satish Reddy, D.No. 2-295, Sri Nagar Colony, Anaparthi, East Godavari District	497/Q/DDMG-VZM/2019, Dt:11.11.2023	RM	45	Pedadungada	Vepada	4	1/9/2020	31/08/2030	Working	Yes	SEIAA/AP/VZN/MIN/09/2019/12341	Non Captive	18° 00' 40.38196"N	83° 01' 34.57226"E
158	21118 0489	G Sridevi	W/o Naresh Babu (Late), D.No. 50-1-54/23, ASR Nagar, Seethammadhara, Vsp -13	3167/Q3V/2018, Dt:29.06.2019	RM	7	Sompuram	Vepada	2	10/7/2018	9/7/2028	Working	Yes	1122/DEIAA/AP/VZM/2017-2	Non Captive	18° 03' 16.95982"N	83° 07' 31.58171"E
159	21122 0558	M/s Chiranjeevi Black Stone Crusher, Prop:Sri B.Sivaji	11-93/1, Main Road, Gopalapatnam, VSP-27.	357/Q/DD-VZM/2019, Dt:27.04.2022	RM	20	Ramaswamipeta	Vepada	3.984	29.04.2022	28.04.2037	Working	Yes	SEIAA/AP/VZM/MIN/7/3296/2021/167.07/164.04-915, Dt.18.10.2021	Non Captive	18° 03' 24.32218"N	83° 07' 16.2467"E
160	21122 0571	M/s R.G. Minerals, Mg.Ptr:Sri S.Raja Gopala Rao	Flat No. 102, Anantha Padmanabha Towers, Pulaganipalem Road, Pendurthi, VSP.	261/DDMG-VZM/2019, Dt:22.06.2023	RM	7	Pedadungada	Vepada	4	18.11.2022	17.11.2037	Working	Yes	SEIAA/AP/VZM/MIN/10/2020/2227, dt.07.10.2022	Non Captive	18° 00' 36.59123"N	83° 01' 29.97983"E

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
161	21114 0378	M/s High Yield Estates Pvt. Ltd.	Mg.Ptr: Sri S.Appala Naidu, D.No. 1-139, LIC Colony, Pendurthi, Visakhapatnam – 531173.	LOI issued 2283/Q/DMGO-VZM/2023, Dt:01.11.2023	RM	7	Pedadungada	Vepada	2.5	27/01/2014	26/01/2024	Non-working	No	-	Non Captive	18° 00' 50.04183"N	83° 01' 05.35811"E
162	21123 0602	M/s R.G. Minerals	D.No. 50-116-20/1, MIG- 112, NE Layout, Near Cancer Hospital, Seethammadhara, VSP- 13.	1679/DDMG-VZM/2018, Dt:20.02.2023	RM	45	Pedadungada	Vepada	4.5	20.03.2023	19.03.2038	Working	Yes	SEIAA/AP/VZM/MIN/09/2020/2185, dt.11.11.2022	Non Captive	18° 01' 01.00"N	83° 01' 32.50"E
163	21113 0480	Ms Sri Devi Industries	W/o. Naresh Babu (Late), 50-01-54/23, A.S.R.Nagar, Near Sai Baba Temple, Seethammadhara, P&T Colony, Visakhapatnam – 530013.	Renewal	RM	20	Ramaswamipeta	Vepada	3	28/01/2013	23/11/2022	Working	Yes	SIA/AP/MIN/21124/2017, Dt:23.11.2017	Non Captive	18° 03' 25.52099"N	83° 07' 08.44462"E
164	21113 0160	M/s Padmavathi Stone Crusher, Prop: Sri G.Sriramullu Naidu	S/o. Appala Naidu (Late), Patthuru Village, L.Kota Seetharamapuram Post, Vepada M, Vzm Dist.	4044/Q3/1996, Dt:20.04.2013 of DDM&G,VSP	RM	20	Ramaswamipeta	Vepada	2	12/7/2013	19/08/2027	Non-working	Yes	SEIAA/AP/MIN/VZM/VIO/5/2023/507, dt:18.08.2023	Non Captive	18° 03' 26.48"N	83° 07' 11.59"E

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
165	211150408	M/s Parameswari Stone Crusher	Prop: Sri Alla Uday Kumar, S/o. A.Satyanarayana, D.No. 4-52/3, Near Rathi Cheruvu, Pendurthi, Visakhapatnam District.		RM	7	Sompuram	Vepada	0.5	30/05/2015	29/05/2030	Non-working	Yes	SIA/AP/MIN/68888/2021, dt. 30.10.2021	Non Captive	-	-
166	211170475	Sri K.Ramana Murthy	S/o. Suryanarayana, Paturu V, Vepada M, Vzm District.	941/Q3V/2017 27.03.2017 of DDM&G,VSP	RM	7	Sompuram	Vepada	1.41	4/4/2017	3/4/2027	Non-working	Yes	SEIAA/AP/MIN/VZM/VIO/12/2021/3818-1158	Non Captive	18° 03' 10.91"N	83° 07' 15.25"E
167	211080451	M/s Sri Sai Stone Crusher	S/o Satyanarayana Murthy Vedurumudi Village Kapileswarapuram Mandal E.G.district.	3771/Q3/2007 31 Jan 2008	RM	1	Kondagangupudi	Vepada	5	19/02/2008	9/11/2027	Non-working	No		Non Captive	-	-
168	211080080	M/s Veeranjaneya Blue Stone Crusher	8-83,Visakhapatnam ,Pendurthi,Vepagunta	2611/Q3/2007 19 Apr 2008	RM	20	Ramaswamipeta	Vepada	0.5	8/5/2008	17/07/2027	Non-working	No		Non Captive	-	-
169	211130308	Sri G.Jagannadham Naidu	S/o. Suryanarayana, Vavilapadu V, Vepada M, Vzm District.	864/Q3/2008, Dt:13.08.2013 of DDM&G,VSP	RM	58	Vavilapadu	Vepada	3.5	08.11.2013	07.11.2023	Non-working	Yes	SEIAA/AP/MIN/VZM/VIO/9/2022/4615, Dt:15.11.2022	Non Captive	18° 03' 10.91"N	83° 07' 15.25"E

S. No.	Lessee ID	LESSEE NAME	Address	Grant Order	Mineral	Sy No	Village	Mandal	Extent in Ha	Date of Commencement of Mining Operation	Date	Status (Working /Non Working/ Temp. Working for Dispatch etc)	Obtained Environment Clerachen (Yes/No)	Environemental No	Captive /Non-Captive	LAT DMS	LONG DMS
170		M/s V. V. Metals, Mg.Ptr:Sri M.Kasi Viswanadham	D.No. 8-4-25, Plot No. 2, Doctors Colony, Pedawaltair, VSP-17.	739/Q/DD MG-VZM/2020, Dt:17.06.2023	RM	45	Pedadungada	Vepada	5.534			Working	Yes	EC Obtasined	Non Captive	18° 00' 48.64926"N	83° 02' 07.71893"E
171		Y.Venkatarama na	S/o. Yerri Babu, d.No. 1.25, Kallamupudi V, L.Kota M, Vzm Dist	2271/Q/DD MG-VZM/2020, Dt:27.07.2023	RM	7	Pedadungada	Vepada	1.8	19-10-2023	18-10-2033	Working	Yes	EC Obtasined	Non Captive	18° 00’ 30.18495”N	83° 01’ 13.04704”E

Data Source: Assistant Director of Mines and Geology, Vizianagaram District, Andhra Pradesh

The Details of statement showing the letter of intent (LoI) in the district is showing in Table-15:

Table 15: The letter of intent (LoI) in the district

Sl. No.	Name of the Mineral	Name of the Lessee	Address & Contact No. of Letter of Intent holder	Letter of Intent Grant order No. & Date	Area of mining lease to be allotted				validity of LoI	Use (captive / Non-captive)	Location of the Mining Lease	
					Sy.No.	Village	Mandal	Extent			Latitude	Longitude
1	Quartzite	M/s. Srinivasa Mines & Minerals	Prop: Sri Ch.Srinivasa Rao, Flat No.SF-1, D.O.10-51-6/A/4, Kanakagiri Apartment, Opp: MVV Royal Palace, Kailasametta, Waltari Upland, Ramnagar, Visakhpatnam Cell No.8886598888	2100/R1-2/2019 dt.24.06.2019	352,204,51,1	Chinnachamalapalli	Dattirajeru	8.908	1 year	non captive	18° 22'48.224196"N 18° 22'38.2242"N	83 18'37.189955" E 83 18' 34.902022" E
2	Quartzite & Gravel	M/s. Rocky Minerals	Mgp: Sri D.Bhima Raju Plot No.3, Thigalanageswara Rao Layout, Kothavalasa Vg, & M, Vizianagaram Dsit., Cell No.9849977177	1840/R1-2/2019 dt.28.06.2019	1/8(P)	Relli	Kothavalasa	7.025	1 year	non captive	17° 54'30.90446"N 17° 54'17.10296"N	83 14'21.41895"E 83 13'52.70567"E
3	Quartzite	M/s. Srinivasa Mines & Minerals	Prop: Sri Ch.Srinivasa Rao, Flat No.7, Bharat Villa, Opp: Timpany School, CBM Compound, Visakhapatnam Cell No.8886598888	2099/R1-2/2019 dt.28.06.2019	33(P)	Nimmalapalem	Kothavalasa	4.939	1 year	non captive	17° 56'5.289499"N 17° 56'1.472239"N	83 10'32.567992" E 83 10'32.806582" E
4	Quartzite	M/s. Thanu Sree Mines & Minerals	Partner: Sri Satti Venkata Reddy, D.No.8-56, Turupeta, Ramavaram, Anaparthi Mandal, E.G.Dist., Cell No.9502374777	1528/R1-2/2019 dt.05.07.2019	11(P)	Marrivalasa		24.631	1 year	non captive	18° 25'38.50138"N 18° 34'21.76684"N	83 18'50.41454"E 83 20'44.66904"E
5	Quartzite	M/s. Rohati Mines & Minerals	Prop: Sri A.Bala Murali Krishna, D.No.9-6-47/1(1), GF-1, Sri Raja Rajeswari Enclave, Sivajipalem, Visakhapatnam Dist., Cell No.9333301048	2536/R1-2/2019 dt.05.07.2019	1(P)	Chinnamedapalli	Mentada	11.835	1 year	non captive	18° 25'21.08595"N 18° 25'15.44461"N	83 18'28.64364"E 83 18'24.18893"E

6	Quartzite	M/s. A.R.Apex Agro & Mines (P) Ltd.,	Partner: Sri N.Ramesh, D.NO.6-10-7, Chinawaltair, Visakhapatnam-17 Cell No.8500636127	2537/R1-2/2019 dt.05.07.2019	19(P)	Pedachamalapalli	Mentada	9.546	1 year	non captive	18° 22'45.55921"N 18° 22'33.40203"N	83 18'16.17742"E 83 18'19.26896"E
7	Quartzite	M/s. Radha Krishna Minerals	Mgpt: Sri Deepak Gupta D.No.MIG-13, Chiranjiv Das nagar, Raigarh Mandal & Dist., Chattisghad - 496 001, Cell No.9893126680	1678/D2/2019 dt.04.03.2020	364	Arikathota	Ramabhadrapuram	12.824	1 year	non captive	18° 25' 57.50175" N 18° 34' 21.76684" N	83 19' 07.86774" E 83 20' 44.66904" E
8	Colour Granite	M/s. Satya Deva Mines & Minerals	Partner: Sri K.Srinivas,D.No.7-197, R.S.No.299 & 300, G.N.T.Road, Near Mary Matha Temple, Gowripatnam Vg, Devarapalli M, West Godavari Dist., Cell No.8985095555	4531/D2/201927.02.2020	121	Buduruwada	Parvathipuram	4.889	1 year	non captive	18° 45'18.55"N18° 45'15.14"N	83 14'59.93"E83 14'02.30"E
9	Colour Granite	M/s. Chamundi Natural Stones	Prop: Sri R.Veeramani, D.No.194, Peters Road, Indira Garden, Rayapeta, Chennai - 14. Cell No.8248502215	758/D2/2020 dt.23.01.2021	398	Nidagallu	Seethanagaram	4.300	1 year	non captive	18° 41'13.14426"N 18° 41'21.76684"N	83 24'14.04092"E 83 24'44.66904"E
10	Colour Granite	Smt. K.Sridevi	W/o. Sri Kolla Naga Babu, B.Mandagunta Vg, Paruchuru Mandal, Prakasam Dist., Cell No.9866562255	11772/D2/2018 dt.07.02.2019	323/P	Laxminarayanapuam	Parvathipuram	4.941	6 months	non captive	18° 47'40.18"N 18° 47'35.54"N	83 23'4.89"E 83 23'11.89"E
11	Colour Granite	Sri Ch.Srinivasa Rao	Flat No.SF-1, D.No.10-51-6/A/4, Kanakagiri Aparmtent, Opp: MVV Royal Palace, Kailasametta, Waltair Upland, Ramnagar, Visakhapatnam Cell No.8886598888	11771/D2/2018 dt.07.02.2019	323	Laxminarayanapuam	Parvathipuram	2.964	6 months	non captive	18° 47' 40.18" N 18° 47' 35.54" N	83 23' 4.89" E 83 23' 11.89" E
12	Quartzite	Sri Mudunuri Rama Raju	48-1-39, Kalyan Vihar Apartment, Sri Nagar, Visakhapatnam-16 Cell No.9989555688	11929/D2/2018 dt.11.01.2019	127	Bheemavaram	Merakamudidam	15.000	6 months	non captive	18° 24'8.17"N 18° 24'12.66"N	83 32'8.28"E 83 32'12.43."E
13	Quartzite	M/s. Sneha Analytics &	Mgp: Sri V.Sridhar Babu, Lalitha Nagar, Near Sakshi	9247/D2/2018	245	Uttaravalli	Merakamudida	20.000	6 months	non captive	18° 26' 14.66" N 18° 26' 31.23" N	83 29' 16.91" E 83 29' 10.47" E

		Scientifics	Office, Akkayyapalem, Visakhapatnam Dist., Cell No.9963338723	dt.08.01.2019			m					
14	Colour Granite	M/s. Tandra Minerals	Mgpt: T.Ramana Rao Plot No.585/A/1, Road No.32, Jublee Hills, Hyderabad - 45 Cell No.9849245679	6248/D2/2018 dt.29.06.2018	293/2	Sibiliped avalasa	Makkuva	9.132	6 months	non captive	18°40' 21.31" N 18° 40' 22.73" N	83 11' 53.47" E 83 11' 55.09" E
15	Colour Granite	M/s. Tandra Exports	Mgpt: T.Ramana Rao Plot No.585/A/1, Road No.32, Jublee Hills, Hyderabad - 45 Cell No.9849245679	6247/D2/2018 dt.29.06.2018	293/3	Sibiliped avalasa	Makkuva	9.951	6 months	non captive	18° 40' 22.73" N 18° 40' 32.51" N	83 11' 55.09" E 83 11' 06.20" E
16	Quartzite	Sri Mudunuri Rama Raju	48-1-39, Kalyan Vihar Apartment, Sri Nagar, Visakhapatnam-16 Cell No.9989555688	11934/D2/2018 dt.06.02.2019	1(P)	Kondalaveru	Merakamudidam	9.000	6 months	non captive	18° 24'5.43"N 18° 24'8.17"N	83 32'6.09"E 83 32'8.28"E
17	Quartzite	Sri Mudunuri Pradeep Varma	48-1-39, Kalyan Vihar Apartment, Sri Nagar, Visakhapatnam-16Cell No.9989555688	11932/D2/2018dt.08.03.2019	1	Garugubilli	Merakamudidam	8.000	6 months	non captive	18° 23'49.25"N18° 23'53.60"N	83 32'33.20"E83 32'35.31"E
18	Quartzite	Sri Mudunuri Pradeep Varma	48-1-39, Kalyan Vihar Apartment, Sri Nagar, Visakhapatnam-16 Cell No.9989555688	11933/D2/2018 dt.08.03.2019	152(P)	Satamvalasa	Merakamudidam	3.000	6 months	non captive	18° 23'59.24"N 18° 24'10.22"N	83 32'16.83"E 83 32'10.22"E
19	Quartzite	M/s. Andhra Quartzite Pvt. Ltd.,	4-69-20/24, Flalt No.PH-2, Madhuri Palace Apartments, Lawsons Bay Colony, Visakhapatnam - 17. Cell No.9246663033	11931/D2/2018 dt.08.03.2019	1P	Garugubilli	Merakamudidam	24.000	6 months	non captive	18° 23'27.11"N 18° 23'31.87"N	83 32'56.65"E 83 32'59.89"E
20	Quartzite	Sri Rudra Raju Satyanarayana Raju	4-646, New Colony, Puritipenta, Gajapathinagaram, Vizianagaram Dist., Cell No. 9246663033	11930/D2/2018 dt.11.01.2019	127	Bheemavaram	Merakamudidam	8.000	6 months	non captive	18° 24'26.20"N 18° 24'29.96"N	83 31'47.12"E 83 31'50.17"E
21	Quartzite	M/s Coastal Minerals	4-69-20/24, Flat No.PH-2, Madhuripalace Apartments, Lawsons Bay colony, Visakhapatnam -17 Cell No.9989555633	11935/D2/2018 dt.07.02.2019	1(P)	Kondalaveru	Merakamudidam	8.000	6 monts	non captive	18°24'32.77"N 18° 24'38.40"N	83 31'29.50"E 83 31'31.90"E
22	Quartzite	Sri Rudra Raju Satyanarayana	4-646, New Colony, Puritipenta,	11936/D2/2018	1(P)	Kondalaveru	Merakamudida	7.000	6 months	non captive	18° 24'23.40"N 18° 24'26.20"N	83 31'44.86"E 83 31'47.12"E

		Raju	Gajapathinagaram, Vizianagaram Dist., Cell No. 9246663033	dt.07.02.2019			m					
23	Quartzite	M/s Coastal Minerals	4-69-20/24, Flat No.PH-2, Madhuripalace Apartments, Lawsons Bay colony, Visakhapatnam -17 Cell No.9989555633	11928/D2/2018 dt.11.01.2019	127	Bheemavaram	Merakamudidam	10.000	6 months	non captive	18° 24'38.40"N 18° 24'41.92"N	83 31'31.87"E 83 31'36.14"E
24	Quartzite	Sri Rudra Raju Vijaya Raju	48-1-39, Kalyan Vihar Apartment, Sri Nagar, Visakhapatnam-16 Cell No.9989555688	11927/D2/2018 dt.11.01.2019	127	Bheemavaram	Merakamudidam	8.000	6 months	non captive	18° 24'48.94"N 18° 24'53.37"N	83 31'19.22"E 83 31'23.57"E
25	Quartzite	Sri S.Samba Murthy	D.No.14-1-48, Pedakomatipeta, Salur, Vizianagaram Dist., Cell No.9490026891	5750/D2/2021 dt.11.03.2022	179	Dangabadra	Jiyyammavalasa	14.456	1 year	non captive	18° 46'9.52258" 18° 34'21.73001"	83 37'35.23881" 83 20'44.70032"
26	Colour Granite	M/s. Sri Venkata Sai Granties	Mgp: P.Amruthavalli, D.No.4-1895/A, C-Block, Durga Nagar Colony, Chittoor - 517 002 Cell No.9629930107	4508/D2/2019 16.09.2021	108	Pedabondepalli	Parvathipuram	4.610	1 year	non captive	18° 44'24.69123"N 18° 44'24.65917"N	83 23'04.76557"E 83 23'04.29620"E
27	Quartz & Quartzite	M/s. Crystline Industries	Mgpt: Sri K.Mukunda Rao, 8-52-9/2, Old CBI Road, China Waltari,Visakhapatnam,Cell No.7036216888	861/D2/2018dt.18.05.2018	19/2(P)	Mathuru	Pachipenta	14.240	6 months	non captive	18° 28'03.5185"N18° 27'58.0284"N	83 09'14.5791"E83 09'14.7186"E
28	Colour Granite (other variety)	Sri K.Kumar M/s. Shivasakthi Builders	Partner: Sri K.Kumar, No.15/1, New NO.48, 3rd Floor, Kanakapura Main Road, Yadiyur Circle, Basavanagudi, Bengaluru - 560 004, Cell No.9448732946	25998/D2/2017 dt.21.03.2018	243	Pedapadam	Saluru	4.980	6 months	non captive	18° 34'45.78"N 18° 34'43.93"N	83 13'16.53"E 83 13'27.37"E
29	Quartzite	M/s. Subhash Minerals	Mgpt: Sri Y.Venkateswara Rao, 54-16-18, K.R.M.Colony, Yechuri Fort, F-3, Seethammadhara, Near Alluri Seetaramaraju Statue, Visakhapatnam Urban, Visakhapatnam Dist.,	9248/D2/2018 dt.08.01.2019	245	Uttaravalli	Merakamudidam	20.000	6 months	non captive	18° 26'14.66"N 18° 26'31.23"N	83 29'16.91"E 83 29'10.47"E

			Cell No.9704559718									
30	Quartzite	M/s M.R.Minerals	Mgpt: P.Satyam D.No.31-30-6, Narayana Street, Allipuram, Waltair RS, Visakhapatnam Cell No.9849777098	6942/D2/2018 dt.18.09.2018	175	Cheepuruvalasa	Kothavalasa	8.000	1 year	non captive	17° 53'43.41"N 17° 53'41.04"N	83 9'36.00"N 83 9'45.38"N
31	Colour Granite	Sri R.Mohan Naidu	Partner: M/s. Deeshmitha Granites, Kothavenkatapuram VG, Thambuganipalli Post, Bangaupalem Mandal, Chittoor Cell No.9000023103	26000/R1-2/2017 dt.23.03.208	243	Pedapadam	Salur	4.980	6 months	non captive	18° 34'40.90"N 18° 34'39.06"N	83 13'.15.75"E 83 13'26.59"E

Data Source: Assistant Director of Mines and Geology, Vizianagaram District, Andhra Pradesh

2.4 Details of Royalty in last 3 years

The royalty of last three years in the Vizainagaram district detailed list is given in Table-16.

Table 16 Details of Royalty in last 3 years

Royalty for 2022-23

S. No.	Mineral	Royalty (in Rs. Lakhs)	Consideration Amt. (in Rs. Lakhs)	DMF (In Rs. Lakhs)	MERIT (in Rs. Lakhs)
1	Building Stone	1.327	1.327	0.398	0.027
2	Color Granite-Leptinites	853.194	426.57	106.269	17.003
3	Colour Granite (Others)	1.158	0.579	0.145	0.023
4	Gravel	438.084	438.084	131.425	8.762
5	Quartzite	662.126	662.126	198.638	13.243
6	River Sand	0.75	0.75	0.225	0.015
7	Road Metal	411.527	411.527	123.458	8.231
8	Road Metal	394.429	394.429	118.329	7.889
TOTAL		**2763**	**2335**	**679**	**55**

Royalty for 2021-22

S. No.	Mineral	Royalty (in Rs. Lakhs)	Consideration Amt. (in Rs. Lakhs)	DMF (In Rs. Lakhs)	MERIT (in Rs. Lakhs)
1	Building Stone	7.986	3.993	2.396	0.16

S. No.	Mineral	Royalty (in Rs. Lakhs)	Consideration Amt. (in Rs. Lakhs)	DMF (In Rs. Lakhs)	MERIT (in Rs. Lakhs)
2	Color Granite-Leptinites	503.854	125.96	62.927	10.068
3	Gravel	80.971	40.485	24.291	1.619
4	Ordinary Earth	9.9	4.95	2.97	0.198
5	Quartzite	679.995	339.997	203.999	13.6
6	River Sand	1.613	0.856	0.484	0
7	Road Metal	342.389	171.195	102.717	6.848
8	Road Metal	82.542	41.271	24.741	1.649
TOTAL		**1709**	**729**	**425**	**34**

Royalty for 2020-21

S. No.	Mineral	Royalty (in Rs. Lakhs)	DMF (In Rs. Lakhs)	MERIT (in Rs. Lakhs)
1	Building Stone	0.94	0.282	0.019
2	Color Granite-Leptinites	438.755	54.844	8.775
3	Gravel	161.144	48.343	3.223
4	Quartzite	610.971	183.291	12.219
5	Road Metal	572.879	171.864	11.458
6	Road Metal	65.28	19.584	1.306
TOTAL		**1850**	**478**	**31**

Data Source: Assistant Director of Mines and Geology, Vizianagaram District, Andhra Pradesh

2.5 Details of Production in last 3 years

The details of the production in last three years in the Vizianagram district are given in Table-17.

Table 17 Details of Production in last 3 years

Production for 2022-23

S. No.	Mineral	Unit	Production (in MT)
1	Building Stone	Cubic Meter	1411
2	Color Granite-Leptinites	Cubic Meter	30389.847
3	Colour Granite (Others)	Cubic Meter	45.772
4	Gravel	Cubic Meter	964727.285
5	Quartzite	MT	735051.41
6	River Sand	MT	0
7	Road Metal	Cubic Meter	452232.5
8	Road Metal	MT	657380.08

Production for 2021-22

S. No.	Mineral	Unit	Production (in MT)
1	Building Stone	Cubic Meter	8512
2	Color Granite-Leptinites	Cubic Meter	18235.055
3	Gravel	Cubic Meter	179621
4	Ordinary Earth	Cubic Meter	21999
5	Quartzite	MT	753006.55
6	River Sand	MT	2125.5

S. No.	Mineral	Unit	Production (in MT)
7	Road Metal	Cubic Meter	380340
8	Road Metal	MT	137020

Production for 2020-21

S. No.	Mineral	Unit	Production (in MT)
1	Building Stone	Cubic Meter	1044
2	Color Granite-Leptinites	Cubic Meter	15240.124
3	Gravel	Cubic Meter	357276
4	Quartzite	MT	678852
5	Road Metal	Cubic Meter	635438
6	Road Metal	MT	108790

Data Source: District Mines and Geology Officer, Vizianagram District, Andhra Pradesh

2.6 Impact on environment

The extraction and utilization of minor minerals have become integral to our modern way of life, fueling infrastructure development, construction, and various industries. However, the impact of these activities on the environment cannot be underestimated. Minor minerals, which include granite, road metal, gravel, clay, and more, play a significant role in shaping the natural landscape and ecosystems. The various environmental consequences associated with the extraction and use of minor minerals are:

i. **Habitat Destruction:** The mining of minor minerals often entails the removal of topsoil and vegetation, leading to habitat destruction. This can disrupt ecosystems, displace wildlife, and

threaten the survival of numerous species. Loss of biodiversity is a significant concern in regions with extensive mining operations.

ii. **Land Degradation:** Mining activities can lead to land degradation, including soil erosion and compaction. This not only reduces the land's fertility but also affects its ability to support agriculture and vegetation growth. Moreover, land degradation can contribute to increased vulnerability to natural disasters like floods.

iii. **Water Pollution:** Mining operations can contaminate nearby water bodies through the discharge of sediments, chemicals, and heavy metals. This pollution can have detrimental effects on aquatic life, disrupt local hydrology, and compromise the quality of water available for human consumption.

iv. **Air Quality:** Dust emissions from mining sites can deteriorate air quality in surrounding areas. The fine particles and pollutants released during excavation and transportation of minor minerals can pose health risks to both workers and nearby communities.

v. **Regulatory Challenges:** Enforcing regulations and monitoring mining activities in remote or unregulated areas can be challenging, allowing illegal and unsustainable practices to persist.

The extraction and utilization of minor minerals are essential for economic development, but they come at a cost to the environment. Recognizing the environmental impacts of these activities is crucial for sustainable resource management.

2.7 Remedial Measures

The provisions of Rule 12 (1) and Rule 12 (5) and of Andhra Pradesh Minor Mineral Concession Rules, 1966 allows the State Government to issue the Letters of Intent with the stipulated conditions to submit Approved Mining Plan (AMP), Environment Clearance (EC) and Consent for Establishment (CFE) for grant of lease.

Mine Plan stipulate the maximum permissible annual production of the mineral from the designated lease area and also includes

estimated quantum of solid waste generation and its method of disposal, etc. Based on the Approved Mine Plan projections, Environment Management Plan shall be prepared and SEIAA makes the decision to grant the EC based on the EMP.

Leaseholders commit to all the remedial measures in the Mining Plan and the State Environment Impact Assessment Authority (SEIAA) ensures the remedial measures are being adhered to during the tenure of the Environmental Clearance.

Leaseholders in the district have adopted various remedial measures to mitigate the impact of mining on the environment. These measures aim to reduce the environmental footprint of mining operations and address the associated challenges. Some common practices include:

i. **Environmental Impact Assessments (EIAs):** Leaseholders conduct comprehensive EIAs to evaluate the potential environmental consequences of mining projects. They shall use this information to develop mitigation strategies.

ii. **Reclamation and Rehabilitation:** Leaseholders work to restore mined areas by re-contouring landscapes, replanting native vegetation, and stabilizing soils to promote ecosystem recovery.

iii. **Water Management:** Proper management of water resources is crucial. Leaseholders use techniques like sedimentation ponds, water recycling, and water treatment facilities to minimize water pollution and ensure responsible water use.

The following preventive measures are being followed for minimizing adverse effects on water regime:

- Small Gully checks, gully check dams, silt settling tanks, silt traps, etc. shall be constructed.
- Along all discharge points leaving the mining lease, into the surrounding area, suitable number of filter walls of sufficient lengths shall be erected across the flow, at

intervals, all along the length to prevent suspended solids entering the surrounding streams/ drains/ water courses, to confine the discharge water quality to the permissible limits.

- Regular monitoring may be carried out and further remedial steps as may be necessary may be taken.

iv. **Waste Management:** Effective management of mining waste, such as tailings and slag, involves containment in secure facilities to prevent soil and water contamination. Advances in waste disposal technologies are also being explored.

Steps being followed for effective waste management:

- Implementation of practices to minimize waste generation at the source. This involves optimizing extraction techniques, reducing overburden removal, and improving resource utilization.
- Encouraging recycling and reuse of waste materials wherever possible within the mining operation.
- Selection of an appropriate disposal methods based on waste characteristics and environmental considerations. Common methods include landfilling, controlled dumping, and backfilling.
- Treatment of contaminated water and effluents using appropriate technologies before discharge.

v. **Afforestation:** Leaseholders carry out a year-wise afforestation plan for the initial years with detailed costing of each plant, its maintenance per piece, etc.

While these measures represent positive steps toward mitigating environmental impact, it's important to note that the effectiveness of these practices can vary widely depending on factors such as the location, scale, and specific mineral being mined. Continuous improvement and adaptation are essential in the mining industry's ongoing efforts

2.8 Reclamation Measures

As per Rule 7A (ii) of Andhra Pradesh Minor Mineral Concession Rules, 1966, Mine Closure Plan shall be submitted by the leaseholder before 6 months of expiry of the lease in the proforma as prescribed by the Director. The Deputy Director concerned shall approve the mine closure plan and ensure compliance of conditions of the approved mine closure plan before expiry of the lease period.

Financial assurance of Rs.50,000/-(Rupees Fifty Thousand) for the quarry lease granted below five(5) hectares and Rs.10,000/- (Rupees Ten Thousand) per Hectare or part thereof for the quarry lease granted five (5) hectares and above, shall be submitted in the form of deposit. If the leaseholder does not reclamate the area as mentioned in the Mine Closure Plan, the deposit shall be forfeited, and the Department of Mines & Geology ensure the proper implementation of the Mine Closure Plan.

2.9 Risk Assessment & Disaster Management Plan

Leaseholders conduct comprehensive risk assessment, prepare a model disaster management plan and submit in the Mining Plan.

The leaseholders maintain and arrange following resources at the mine site:

a) Firefighting equipment

b) Ambulance services with location

c) List of volunteer organizations

d) List of Civil, Police and other authorities to be informed in case of an accident

e) Last of mobile crane operators (Government, Public Sector, and Private Sector).

f) List of mines, contacts, facility available nearby

g) List of first aiders and contacts.

h) List of Officers of DGMS to be informed in case of serious accidents Concerned DGMS officers concerned is displayed at the mine head.

The leaseholders shall monitor the total execution of the disaster management plan. The resources of all departments including men and material are being promptly made available. They are also conducting

regular mock rehearsals with their staff to update the risk register and accordingly, disaster management plan

Mineral Regulatory:

The important functioning of District Mines and geology Officer, Vizianagaram are:-

1. Achievement of Targets of Mineral Revenue collections being fixed to this office annually
2. Receiving and processing of the Mineral Concession Applications duly conducting the Technical inspection, Survey and demarcation of the Mineral bearing applied areas
3. Execution and Regulation of the operations of the Mining / Quarry leases in accordance with the Acts and Rules
4. Issuing of dispatch permits duly collecting the Advance Royalty / Seig.fee from the lease holders on the minerals produced and intend to dispatch from their leased areas through online permit system
5. Controlling the illegal Mining / Quarrying and transportation by conducting the periodical inspections of the Mines and Quarries and also conducting the surprise vehicular checking and imposing the penalties
6. Finalisation of Demand, Collection and Balance statements of the leases on annual basis

2.10 Plantation & Green Belt Development

Leaseholders are complying with the plantation and green belt development programmes as committed in their Mining Plans.

CHAPTER III: SAND

3.1 Sand Mineral Resources of the Vizianagaram District

3.1.1 General Sand Mineral Details Vizianagaram District

(Prepared as per Sustainable Sand Mining Management Guidelines 2016 & 2020) (Data Source: Assistant Director of Mines and Geology, Vizianagaram District, Andhra Pradesh.

In Vizianagaram district, there are four rivers that drain the area: Nagavali, Gosthani, Champavathi, and Kandivalasa, collectively covering a total of 285 kilometers. These rivers are significant sources of sand deposits in the region. They are primarily seasonal, flowing mostly during the rainy season. Currently, there are 165 existing check dams and reservoirs constructed across these rivers. A detailed list of sand production in the district over the past three years is provided in Table-18.

Table 18 Details of Production of Sand in Last three years in the District

Year	Production (In MTs)	Revenue Generated (In Rs)
2020-21	--	--
2021-22	34559	30,41,192
2022-23	10718	9,43,184

Data Source: District Mines and Geology Officer, Vizianagaram District

3.1.2 River Basins in Vizianagaram District

Vizianagaram district is covered all minor rivers are directly joined to the Bay of Bengal. The Champavathi, Minor drainages between Gosthani and Champavathi, Gosthani,Kandivalasagedda, Madhuravada minor drainages, Nagavali, Naravagedda, Peddagedda and Saradha are the minor basins covered in the district. These 09 minor-basins are further divided into 92 sub-basins subsequently divided into 426 cascades. The catchment area of each basin is delineated using the boundaries from master plan records and updated by super imposing on Survey of India topo-sheet (1:50K). The sub basins are suitably subdivided into cascades based on local drainage conditions. The Hydrological units of Vizianagaram District is

shown in Table-19 and Figure-21, Drainage system with description of main rivers is shown in Table-20, Salient features and altitudes origin of rivers is shown in Table-21 and rivers lengths of Vizianagaram District is shown in Table-22.

Table 19 Hydrological units of Vizianagaram District

S.No	Major Basin	Minor Basin	Catchment Area (Sq.km)	No of. Sub Basins	No of. Cascades	No of. Tanks
1	Champavathi	Champavathi	1,368.39	20	124	3,655
2	Minor drainages between Gosthani& Champavathi	Minor drainages between Gosthani& Champavathi	20.73	1	4	19
3	Gosthani	Gosthani	910.39	10	91	2,551
4	Kandivalasagedda	Kandivalasagedda	233.34	17	38	558
5	Mathuravadaminior drainage	Mathuravadaminior drainage	10.95	1	2	14
6	Nagavali	Nagavali	1,136.30	29	129	2,978
7	Narvagedda	Narvagedda	90.02	7	20	219
8	Peddagedda	Peddagedda	70.95	4	10	187
9	Saradha	Saradha	29.88	3	8	50
		Total	**3,870.95**	**92**	**426**	**10,231**

Data source: APSAC, Vijayawada

Table 20 Drainage System with Description of main rivers

S.No	Name of the River	Area Drained (Sq.Km)	% of Area Drained in the District
1	Champavathi	1390.36	35.35
2	Nagavali	1137.52	29.35
3	Gosthani	912.33	23.53
4	Kandivalasagedda	233.76	6.03
5	Narvagedda	90.98	2.33
6	Peddagedda	71.03	1.83
7	Sarada	30.74	0.77
8	Minor drainages between Gosthani& Champavathi	20.73	0.53
9	Madhuravada Minor Drainages	9.78	0.28

Data source: APSAC, Vijayawada

Table 21 Salient Features of Important Rivers in Vizianagaram District

S.No	Name of the River	Place of Origin	Altitude at Origin (m)
1	Champavathi	Eastern Ghats, Ananthagiri hills, Aruku Valley in Alluri Sitharama Raju dsitrict	1,291
2	Nagavali	Thuamul Rampur block, Kalahandi District of Odisha state	1,300
3	Gosthani	Eastern Ghats, Ananthagiri hills, Borra Caves of Alluri Sitharama Raju dsitrict	1,278
4	Kandivalasagedda	Dibba Konda, Garividi mandal in Vizianagaram district	333
5	Vegavti River	Eastern Ghats, Taduru RF, Pachipenta in Manyam dsitrict	1,291

Data source: APSAC, Vijayawada

Table 22 River Lengths in Vizianagaram District

S.No	Name of the Major Basin	Name of the Minor Basin	Name of the River	River Length in Km
1	Champavathi	Champavathi	Champavati River	84.01
2			Chitta Gedda	5.11
3			Eduvampula Gedda	21.53
4			Erra Gedda	4.95
5			Gadi Gedda	17.83
6			Potulu Gedda	30.39
7	Gosthani	Gosthani	Argivani Gedda	58.43
8			Gostani River	0.69
9			Gosthani	9.87
10			Takapuni Gedda Nala	26.06
11	Nagavali	Nagavali	Mugudari Gedda	12.05
12	Narvagedda	Narvagedda	Mehadri Gedda	7.63
			Total	**278.55**

Data source: APSAC, Vijayawada

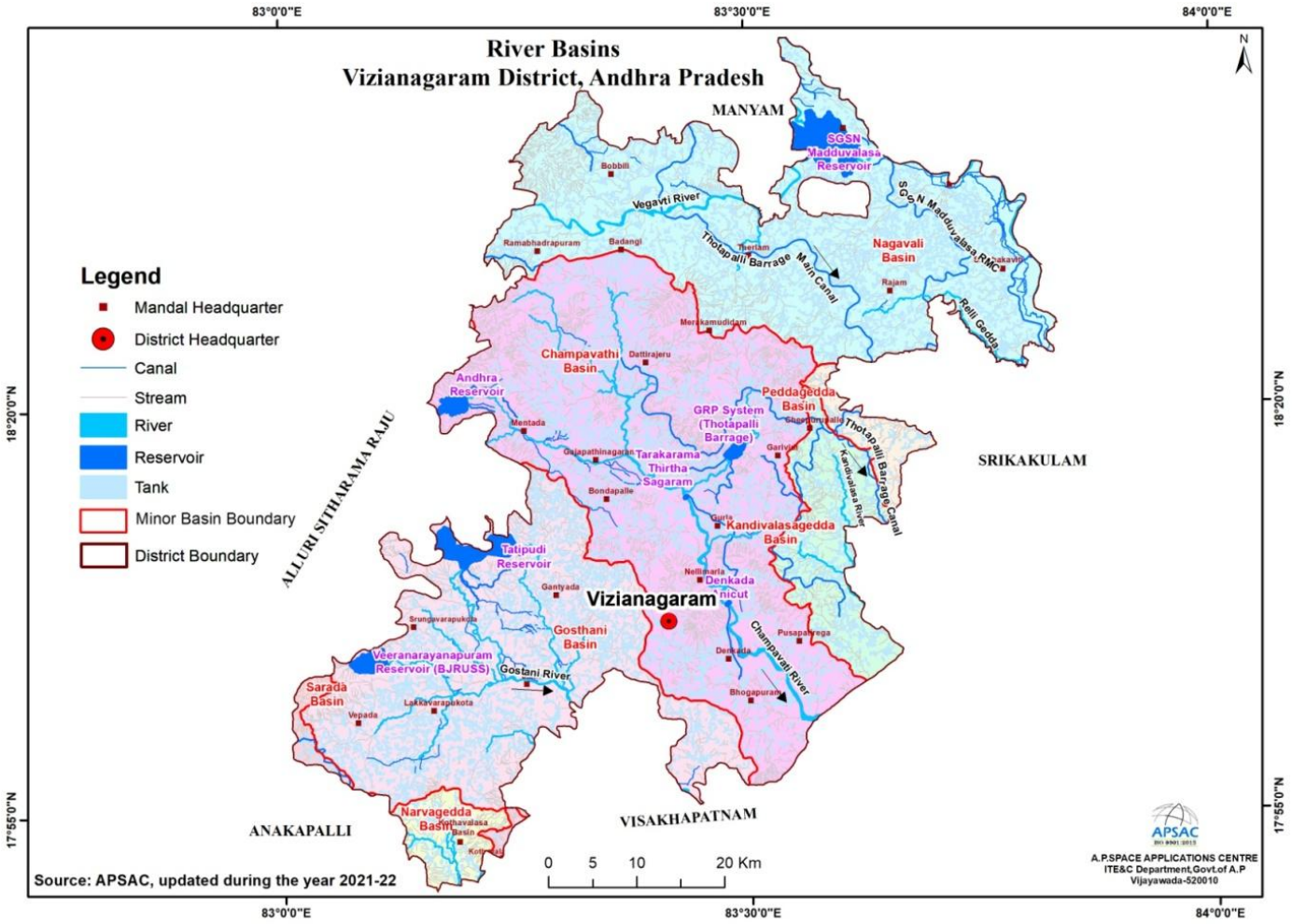

Figure-21: Major and MinorRiver basin boundaries

3.1.3 Process of Deposition of Sediments in the Rivers of the District

Sediment transport is a natural process, and many have argued that the point of rivers is to move sediment downstream. However, with land use changes, e.g., deforestation and construction; agricultural practices; and development activities, accelerated erosion rates is ubiquitous. Sediment in the water column reduces transparency and can be deposited downstream and exacerbate flooding. Three principal sources of sediment are the following:

Sediment transport is the movement of organic and inorganic particles by water. In general, the greater the flow, the more sediment that will be conveyed. Water flow can be strong enough to suspend particles in the water column as they move downstream, or simply push them along the bottom of a waterway. Transported sediment may include mineral matter, chemicals and pollutants, and organic material. Another name for sediment transport is sediment load. The total load includes all particles moving as bedload, suspended load, and wash load.

3.1.3.1. Bedload

As the name suggests, this element of sediment movement consists of loose, granular particles at the sediment-water interface (such as a stream bed or tidal flat). Air or water that moves across the bed will being to move grains if the flow velocity is great enough to overcome the force of gravity and any resistance at grain contacts. This is the **threshold velocity** (Figure-22).

The bedload contains two main components:

- the **traction load**, or traction carpet, and
- the **saltation loads**.

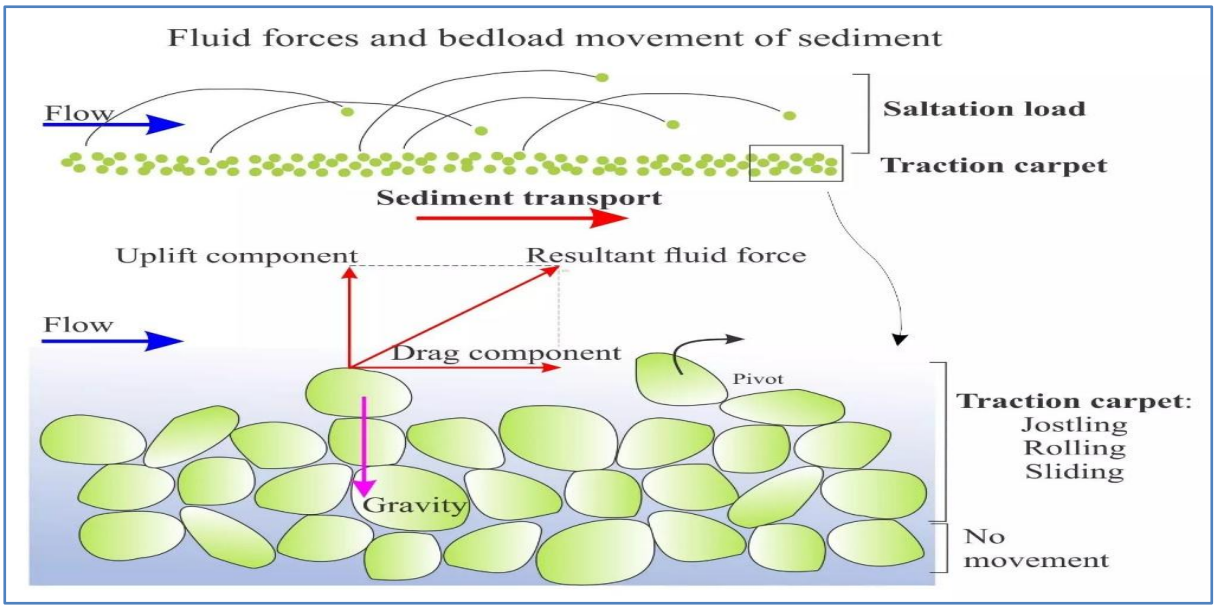

Figure-22: Bedload Movement of Sediment

The various components of force involved in initiation of grain movement are shown above. Here, fluid flowing over a sediment bed produces shear stresses that can be resolved into a component of drag (parallel to the bed) and a lift component normal to the bed. At the threshold velocity when the resultant fluid force on grains is greater than gravity, grains begin to roll, slide and jostle along the bed like a moving carpet – the **traction carpet**.

3.1.3.2. Suspended Load Most natural flows in rivers, shallow marine settings and air are turbulent. Even at low-flow velocities, the speed and trajectories of flow can vary considerably – witness the eddies and boils in seemingly tranquil streams. Very fine particulate sediment (particularly clays) can be kept in suspension for long periods by turbulence; the stresses generated by turbulent flow balance or overcome the gravitational force acting on the particles.

If turbulence decreases significantly, for example when a river empties into a lake, then most particles will gradually settle to the sediment bed. The rate at which a particle settles out of suspension is called the **settling velocity**, where the force of gravity (downwards) exceeds the combined effects of upward-directed **buoyancy forces** acting on a grain and the drag on a particle caused by **fluid (viscous) resistance**. Thus, the rate of settling depends on the size, shape and density of particles, and the viscosity of the fluid. In general, settling through air is much more rapid than through water (Figure-23).

Both bedload and suspension load are important processes in the generation of sedimentary structures. In particular, bedload transport of loose sand is the critical process for growth of bedforms and their internal cross-stratification (crossbedding). The description of **bedforms** (crossbeds) and the flow conditions (**flow regime**) under which they form have been described in other posts.

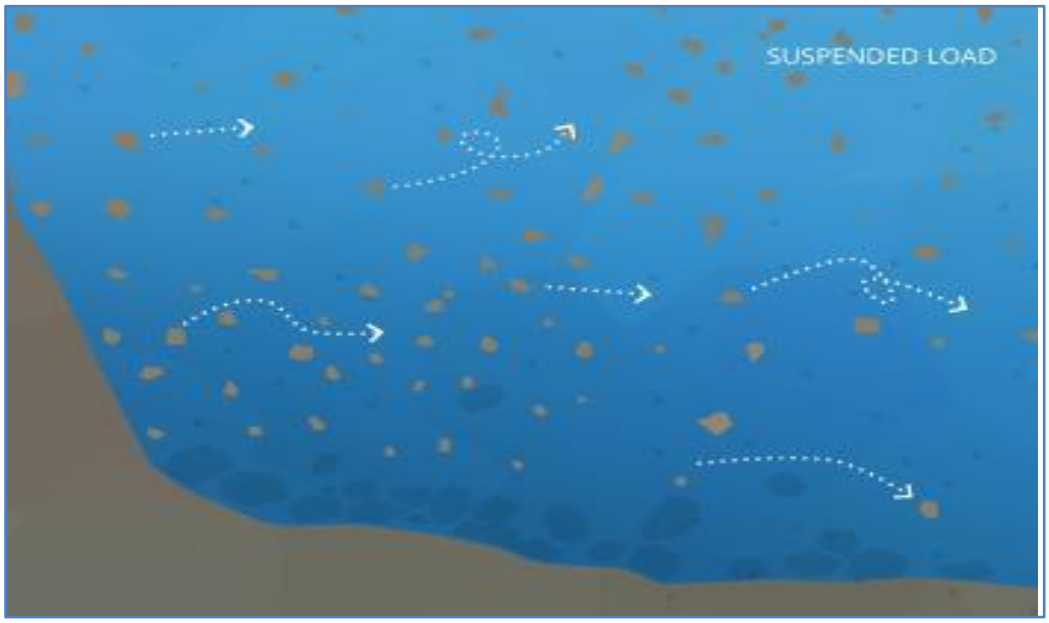

Figure-23: Sediment Load

3.1.3.3. Wash Load

The wash load is the portion of sediment that will remain suspended even when there is no water flow. The wash load is a subset of the suspended load. This load is comprised of the finest suspended sediment (typically less than 0.00195 mm in diameter). The wash load is differentiated from the suspended load because it will not settle to the bottom of a waterway during a low or no flow period. Instead, these particles remain in permanent suspension as they are small enough to bounce off water molecules and stay afloat. However, during flow periods, the wash load and suspended load are indistinguishable. Turbidity in lakes and slow-moving rivers is typically due the wash load 8. When the flow rate increases (increasing the suspended load and overall sediment transport), turbidity also increases. While turbidity cannot be used to estimate sediment transport, it can approximate suspended sediment concentrations at a specific location (Figure-24).

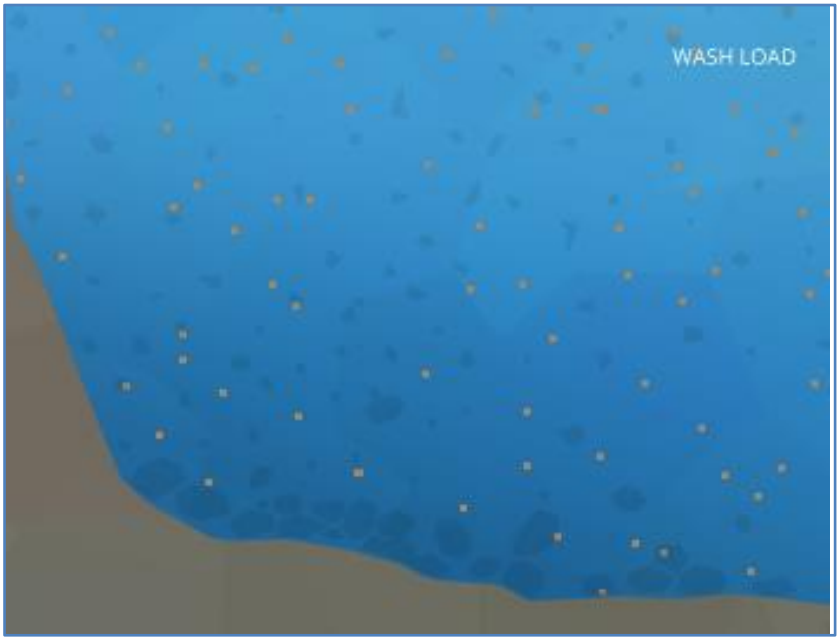

Figure-24: Wash Load

3.1.3.4. Settleable Solids

The suspended particles that fall to the bottom of a water body are called settleable solids. As they are found in riverbeds and streambeds, these settled solids are also known as bedded sediment. The size of settleable solids will vary by water system – in high flow areas, larger, gravel-sized sediment will settle out first. Finer particles, including silt and clay, can be carried all the way out to an estuary or delta (Figure-25).

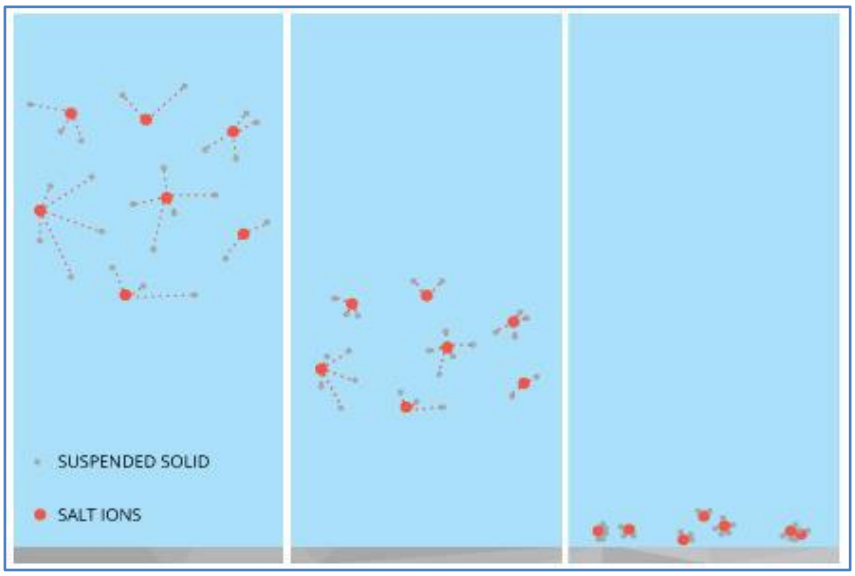

Figure-25: Settleable Solids

3.1.3.5. Sediment Deposition

Sediment is necessary to the development of aquatic ecosystems through nutrient replenishment and the creation of benthic habitat and spawning areas. These benefits occur due to sediment deposition – when suspended particles settle down to the bottom of a body of water. This settling often occurs when water flow slows down or stops and heavy particles can no longer be supported by the bed turbulence. Sediment deposition can be found anywhere in a water system, from high mountain streams, to rivers, lakes, deltas and floodplains. However, it should be noted that while sediment is important for aquatic habitat growth, it can cause environmental issues if the deposition rates are too high, or too low. Sediment transportation and Deposition depends upon various factors like Slope of the Area, Annual Rainfall, Lithology, flow intensity of River, Geomorphology, Soil, Geology and Land use.

In sediment transport a distinction is generally made between fine and coarse sediment, because the transport mechanisms differ. Coarse sediment (grain size >63 μm) tends to be characterised by particles that remain separate and are chemically inert; fine sediments (<63 μm) on the other hand tend to come together as flocculated populations (flocs) and have the tendency to attract organic material and contaminants to their surface. A great deal has been researched and written about the break up and flocculation of these primary particles under turbulence and subsequent settling (e.g., Uncles et al., 2010). These differences imply important variations in the rate of transport and settling characteristics for the same flow conditions for different sediments. The nature of the physical environment also has an important bearing on this, in that fine sediment tend to be found in sheltered environments (shallow, enclosed estuarine systems), while beaches on open coasts are characterised by coarser materials. This reflects the energy of the water in which the particles become suspended and their subsequent fate.

Rates of transport of material are generally expressed in terms of a flux, as kg/s for example, where this figure is generally obtained by considering the product of the flow rate (in m^3/s) and the concentration of material in suspension (kg/m^3). This does not necessarily imply a requirement for the material to be suspended; it is equally possible to express a bed load using the same units, for example, but it does imply that to obtain an estimate of the sediment flux it is necessary to know both the concentration and the flow rate over a given cross section. Both these quantities can be measured and there are a variety of techniques

available to do this, using insitu collection or sampling, in situ optical or acoustic methods, or remote sensing from aircraft or satellites (Uncles and Mitchell, 2017) (Figure-26).

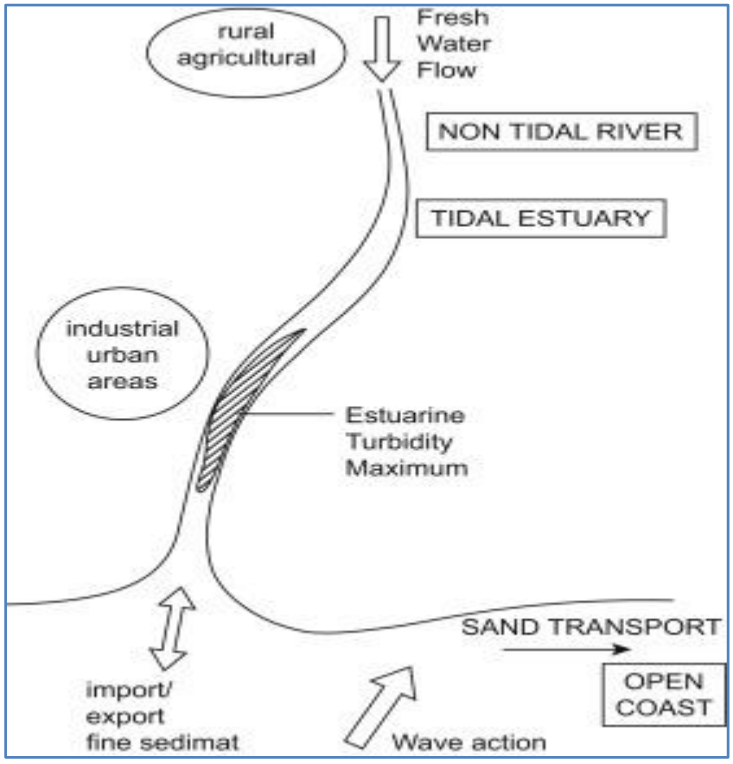

Figure-26: Sediment Deposition Process

Process of Deposition of Sediments in the Rivers of the District Sand is deposited because of the following reasons: (a) Floods: The surface or strip of relatively smooth land adjacent to a river channel constructed (or in the process of being constructed) by the present river in its existing regimen and covered with water when the river overflows its banks at times of high water. It is built of alluvium carried by the river during floods and deposited in the sluggish water beyond the influence of the swiftest current (b) Valley fill: The unconsolidated sediment deposited by any agent so as to fill or partly fill a valley.

3.1.4 Replenishment Study

A replenishment study for riverbed sand is required in order to nullify the adverse impacts arising due to excessive sand extraction. Mining within or near the riverbed has a direct impact on the stream's physical characteristics, such as channel geometry, bed elevation, substratum

composition and stability, in-stream roughness of the bed, flow velocity, discharge capacity, sediment transport capacity etc. For sustainable river sand mining, it is necessary that the mine pits formed as a result of sand excavation are refilled with sand by the natural process of replenishment in a reasonable period so that the area is again available for mining. The rate of gross erosion is dependent upon many physical factors like climatic conditions, the nature of the soil, the slope of the area, topography and land use. The effect of any of these variables may vary greatly from one geographic location to another, and the relative importance of controlling factors often varies within a given land resource area (Dendy, 1976).

There is no denial of the fact that bed load changes from hour to hour, day to day, and year to year; estimating annual bed load rates is a dynamic process involving careful examination. Therefore, proper care has been taken before applying the empirical model to calculate the sediment yield from the watershed. However, as far as Kerala is concerned, the topography, geomorphology and soil are different from a typical plateau region. Hence, due weight age is given to actual field studies, and replenishment occurred on the stretches under consideration in the river. As a matter of fact, the modelling activity and replenishment studies are viewed from an angle of an add-on to the physical verification and rate of replenishment.

The estimation of sand replenishment is based on empirical and analytical approaches. There are many sediment transport equations as well as models which are suitable for use inthe prediction of the replenishment rate of rivers/watersheds. The sedimentation models include SWAT, HEC-HMS etc. These models are developed based on the fundamental hydrological and sedimentological processes. They may provide detailed temporal and spatial simulation but usually require extensive data input. Hourly/daily input values of meteorological and radiation variables are required for continuous simulations. Some of the empirical equations for estimating sediment transport are as follows.

Annual Replenishment Rate for sand for Major Sand Resource Area is determined using empirical mathematical expression Dendy Bolton Equation and reproduced below:

- Einstein (1950)
- Laursen (1958)

- Bagnold (1966)
- Engelund-Hansen equation (1967)
- Yang equations (1973)
- Dendy- Bolton equation (1976)
- Modified Universal Soil Loss Equation (MUSLE) developed by Williams and Berndt (1977)
- Van Rijn (1984)
- Zanke (1987)

To estimate the transport capacity or the sediment load being conveyed by a water stream, one of the many transport equations that are available in the literature is frequently used. Einstein (1950) introduced statistical methods to represent the turbulent behaviour of the flow. Bagnold (1966) introduced an energy concept and related the sediment transportrate to work done by the fluid. Engelund and Hansen (1967) presented a simple and reliable formula for the total load transport in rivers. The Yang equation makes use of the total bed hydraulic radius, and studies show that it is good for estimating the sediment transport in the channel for the condition of dunes on the bed. MUSLE includes only one type of sediment yield (sheet and rill Erosion). Van Rijn (1984) solved the equations of motions of an individual bed-load particle and computed the saltation characteristics and the particle velocity as a function of the flow conditions and the particle diameter for plane bed conditions. The equations of Zanke and Van Rijn seem to be only moderately satisfactory in estimating the sediment transport in the channel for the condition of dunes on the bed. However, it appears that no single equation could provide reliable estimates of a total load of sediment transport for all of the bed forms that could occur sequentially or randomly in alluvial channels or natural water courses. The comparison of the equations for estimating sediment rate is given below Table 23:–

Table 23: Types of Sediment Transport Equation

Sl.No.	Sediment Transport Equation	Remarks
1	Einstein (1950)	Bed load function was determined for many but not all types of stream channels
2	Laursen (1958)	Laursen equation outperforms other transport equations in the silt

Sl.No.	Sediment Transport Equation	Remarks
		range
3	Bagnold (1966)	Bagnold related the sediment transport rate to work done by the fluid
4	Engelund-Hansen equation (1967)	The original Engelund-Hansen relation (OEH) is based on a single characteristic grain size, which limits its applicability in sand-bed rivers with a wide GSD
5	Yang equations (1973)	It makes use of a total bed hydraulic radius
6	Dendy- Bolton equation (1976)	It uses both drainage area and means annual runoff for estimation of sediment yield. It calculates all types of sediment yield like sheet and rill erosion, gully erosion, channel bed and bank erosion and mass movement
7	Modified Universal Soil Loss Equation (MUSLE) developed by Williams and Berndt (1977)	MUSLE includes only one type of sediment yield (sheet and rill Erosion)
8	Van Rijn (1984)	Calculated equations of motions of an individual bed-load particle for plane bed conditions
9	Zanke (1987)	Zanke was found to be moderately satisfactory for the condition of the dunes on the bed.

In this study, the rate of gross silt production in the watershed and the ability of the stream system to transport the eroded material in a river have been carried out by the Dendy-Bolton equation. Dendy-Bolton formula is often used to calculate the sedimentation yield as it uses both drainage area and mean annual runoff as key parameters to give a yield value. Also, Dendy-Bolton equation calculates all types of sediment yield

like sheet and rill erosion, gully erosion, channel bed and bank erosion and mass movement.

Annual Replenishment Rate for sand for Major Sand Resource Area is determined using empirical mathematical expression Dendy Bolton Equation and reproduced below:

For Average Annual Run-off less than 2"

$S = 1280 \times Q0.46 [1.43 - 0.26 \log(A)]$-------- FORMULA (A)

For Average Annual Run-off more than 2"

$S = 1965 \times (e^{-0.055 \times Q}) [1.43 - 0.26 \log(A)]$-------- FORMULA (B)

Q = Mean Annual Run-off in mm

A = Net drainage Area in Sq. km

S = Sediment yield (tons/Sq. km/yr)

The sedimentation yield for Nagavali River in Vizianagaram District is arrived based on the above Dendy Bolton Equation or Formula (A). The Sedimentation yield for the River in the District is shown in Table-24.

Table 24 Sedimentation yield for the rivers in Vizianagaram District

Name of the River	Area Drained (sq. km)	Mean Annual Run-off (in mm)	Rate of Annual Deposition in the River (tons / sq. km /year)	Annual Deposition (tons)
Nagavali	1137	4.46	149.7	1,70,203

Data Source: District Mines and Geology Officer, Vizianagaram District, Andhra Pradesh

***Note**: The sedimentation yield was calculated manually by APSAC and the value is **1,87,350 Tons/ year.** The details are provided as an Annexure at page number 145.

In this report, the sediment yield was calculated using the standard records of Department of Water Resources. To ensure systematic and scientific studies, Department of Mines & Geology is in the process of

selection of NABET Accredited agency for conducting detailed & regular replenishment studies for potential sand bearing areas.

3.1.5 Details of Sand Mining Leases:

The rivers Champavathi, Nagavali and Vegavathi are the main source of sand in the district through following mandals

Name of the river	List of Mandals
Champavathi	Nellimerla
	Mentada
	BondapalliGajapathinagaram
	Gurla
	Denkada
	Bhogapuram
	Pusapatirega
Nagavalli	RegadiAmdalavalasa
	Santhakaviti
Vegavathi	Ramabhadarapuram
	BadangiVangara
	Therlam

Data Source: District Mines and Geology Officer, Vizianagaram District, Andhra Pradesh

Proposed potential Sand Mining Leases in Vizianagaram district shown in Table-25.

Table 25 The detail of Potential Sand Mining Leases

Reach Name	Quantity (in MTs)	Remarks
Tamaram (Nagavali)	32393	A 18° 28' 24.63", 83° 48' 58.88" B 18° 28' 26.21", 83° 49' 2.11" C 18° 28' 17.91", 83° 49' 7.04" D 18° 28' 16.21", 83° 49' 3.61"
K. Venkatapuram (Nagavali)	48485	A 18° 32' 52.20", 83° 47' 51.00" B 18° 32' 53.40", 83° 48' 03.90" C 18° 32' 47.50", 83° 48' 02.70" D 18° 32' 49.70", 83° 47' 50.30"
Kusumuru (Lower order stream)	11360	A 18° 32' 14.38", 83° 30' 41.88" B 18° 32' 12.51", 83° 30.40.51" C 18° 32' 14.24", 83° 30' 36.31" D 18° 32'16.99", 83° 30' 37.49"

Data Source: District Mines and Geology Officer, Vizianagaram District, Andhra Pradesh

Probable Sand Mining reaches in Vizianagaram district shown in Table-26. Name of the sand bearing index are given from North to South direction. The Probable Sand bearing areas were identified through field survey with the help of hand held GPS (Global Positional System) and the help of existing literature.

Table 26: Probable Sand Mining reaches in Vizianagaram district

S.No	Name of the River	Sand Bearing Area	Central Coordinates		Area in Ha.
			Longitude	Latitude	
1	Vegavti River	A	83° 17' 32.985" E	18° 31' 47.672" N	0.94
2	Vegavti River	B	83° 18' 46.011" E	18° 31' 6.383" N	0.81
3	Vegavti River	C	83° 19' 55.499" E	18° 30' 43.371" N	1.18
4	Vegavti River	D	83° 27' 19.716" E	18° 32' 12.509" N	1.25
5	Vegavti River	E	83° 27' 42.838" E	18° 32' 47.057" N	2.19
6	Vegavti River	F	83° 28' 39.003" E	18° 32' 51.627" N	2.51
7	Vegavti River	G	83° 44' 35.948" E	18° 34' 50.037" N	5.48
8	Vegavti River	H	83° 46' 51.207" E	18° 32' 37.597" N	3.69
9	Vegavti River	I	83° 47' 16.524" E	18° 30' 57.135" N	5.87
10	Vegavti River	J	83° 48' 41.849" E	18° 26' 46.797" N	3.98
11	Vegavti River	K	83° 49' 49.893" E	18° 25' 18.241" N	1.59

Data Source: District Mines and Geology Officer, Vizianagaram District, Andhra Pradesh

3.1.6 Details of De-Siltation Location: (Lakes/Ponds/Dams etc.)

The details of potential of de-siltation locations in Vizianagaram District are shown in Table-27.

Table 27 List of Potential De-Siltation Location: (Lakes/Ponds/Dams etc.) (Existing and proposed)

De-siltation Point	Quantity (in MTs)	Remarks
NIL		

Data Source: District Mines and Geology Officer, Vizianagaram District, Andhra Pradesh

3.1.7 Details of Patta Lands in the District:

The details of Patta Lands in the Vizianagaram district are shown in

Table-28.

Table 28 Details of Patta Lands.

Owner	Sy. No.	Area (Ha)	District	Tehsil	Village	Total Reserve (MT)	Total Mineral to be mined (MT)	Existing/ Proposed
NIL								

Data Source: District Mines and Geology Officer, Vizianagaram District, Andhra Pradesh

3.1.8 Details of M-Sand Plants in the District:

The details of Manufacturing Sand in Vizianagaram district are shown in Table-29.

Table 29 Shown Details of Details of M-Sand Plants

Plant Name	Owner	District	Tehsil	Village	Geo-location	Quantity Tonnes/Annum
NIL There are no existing M - Sand units under this Vizianagaram office jurisdiction						

Data Source: District Mines and Geology Officer, Vizianagaram District, Andhra Pradesh

3.1.9 Details of Cluster of Sand Mining Leases

The area of Cluster of Mining Leases in Vizianagaram jurisdiction is shown in Table-30.

Table 30 Details Cluster of Mining Leases in Vizianagaram District

Sl.No	Name of the Cluster	Location (Latitude and Longitude)	Extent (in Ha)	Total No. of Mining Leases in the Cluster	No.of Leases working	Extent of the working leases (in Ha)
NIL						

Data Source: District Mines and Geology Officer, Vizianagaram District, Andhra Pradesh

3.1.10 Details of Contiguous Clusters

The area of Contiguous Cluster of Sand Reaches in Vizianagaram jurisdiction is shown in Table-31.

Table 31 Details of Contiguous Cluster of Sand Reaches in Vizianagaram District

Sl.No	Name of the Cluster	Location (Latitude and Longitude)	Extent (in Ha)	Total No. of Mining Leases in the Cluster	No. of Leases working	Extent of the working leases (in Ha)
NIL						

Data Source: District Mines and Geology Officer, Vizianagaram District, Andhra Pradesh

3.1.11 Sand Reaches Details in Vizianagaram District

The Nagavali River is the primary river flowing in a southward direction along the eastern border of Vizianagaram district. Originating in the Eastern Ghats near Lakhbahal, it is joined by important tributaries such as the Suvarnamukhi River and Vegavathi River within the district. The Vegavathi River originates from the Pachipenta hills of Pachipenta mandal and flows parallel to the Suvarnamukhi before converging with the Nagavali River.

The Gostani River originates in the Ananthagiri forest area of Srungavarapukota near Borra caves. Meanwhile, the Champavathi River originates from the Ananthagiri hills of the Eastern Ghats in Aruku Valley, Alluri Sitharama Raju district. It then passes through Saluru mandal and Vizianagaram mandal.

The Department of Mines and Geology has already identified sand reaches in Kadapa district, and numerous sand reach points have been identified near the Nagavali, Champavathi, and Gostani Rivers. The locations of these sand reach points are illustrated in Figure-27, Figure-28, Figure-29, Figure-30, and Figure-31.

Probable sand-bearing areas were identified through field surveys conducted with the assistance of handheld GPS devices and existing literature. The probable sand-bearing areas in Vizianagaram District are depicted in Figure-32.

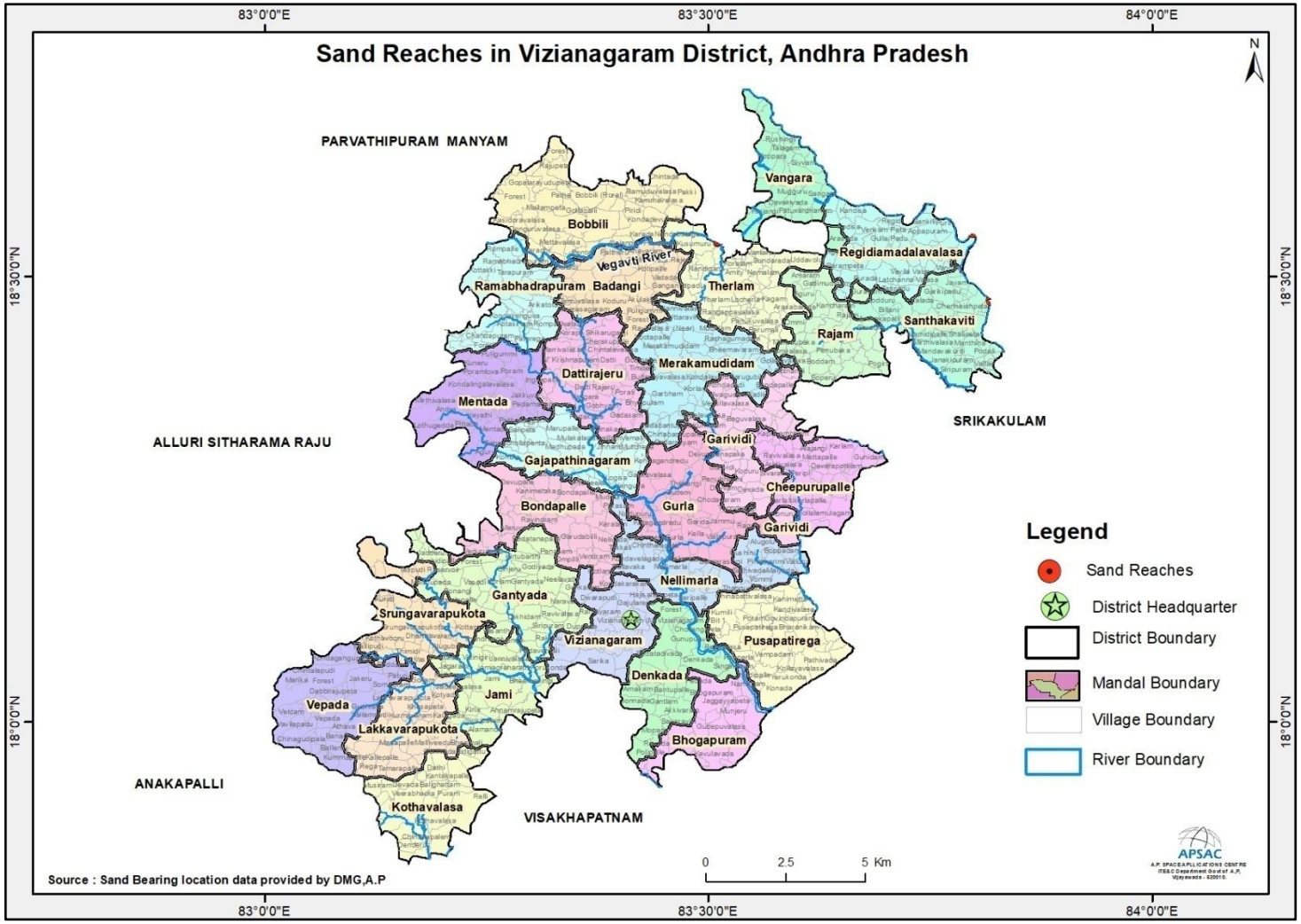

Figure-27: Location map of Sand Reaches map in Vizianagaram District

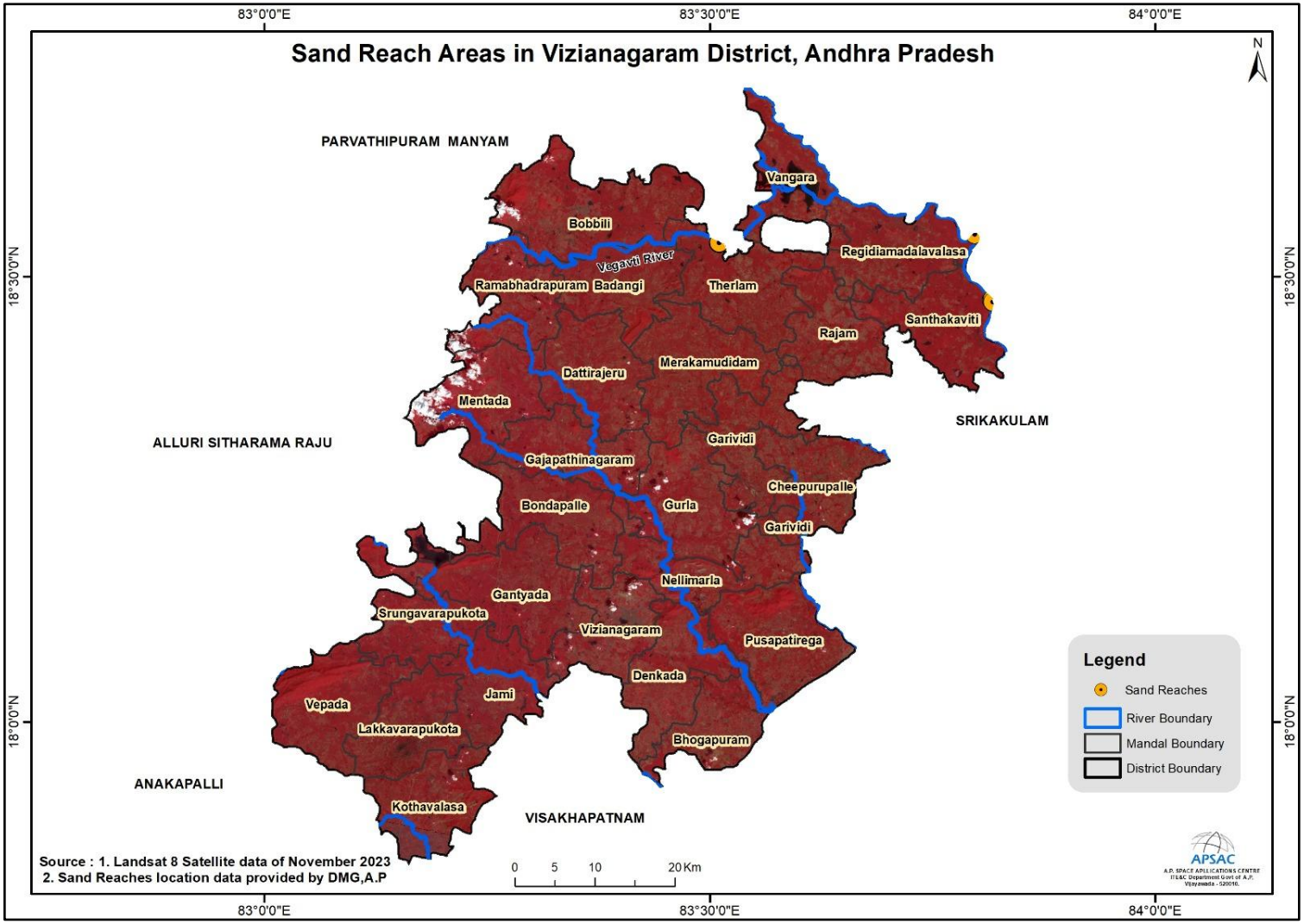

Figure-28: Satellite View of Sand Reaches Map in Vizianagaram District.

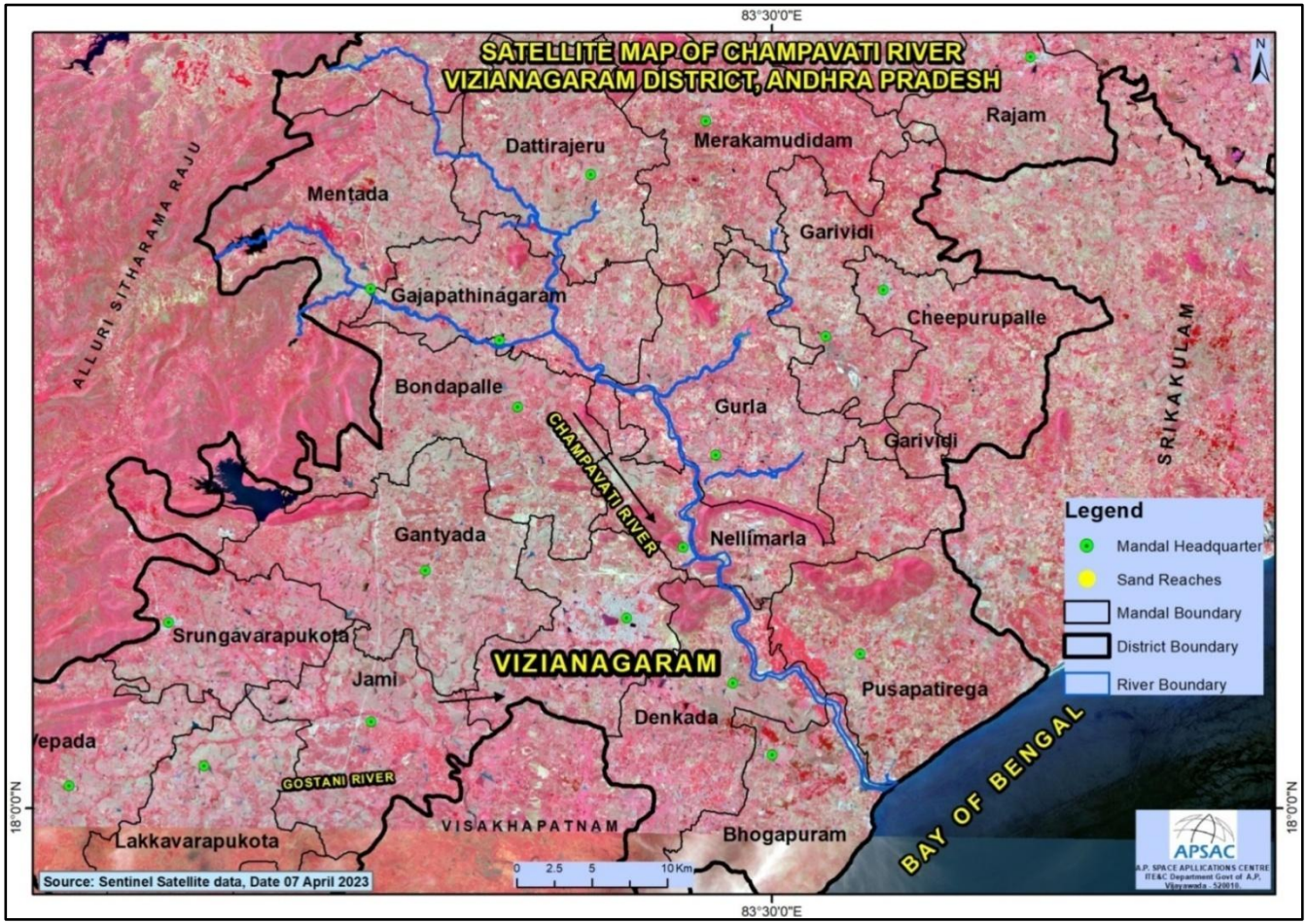

Figure-29: Sand Reaches map of Champavati River in Vizianagaram District

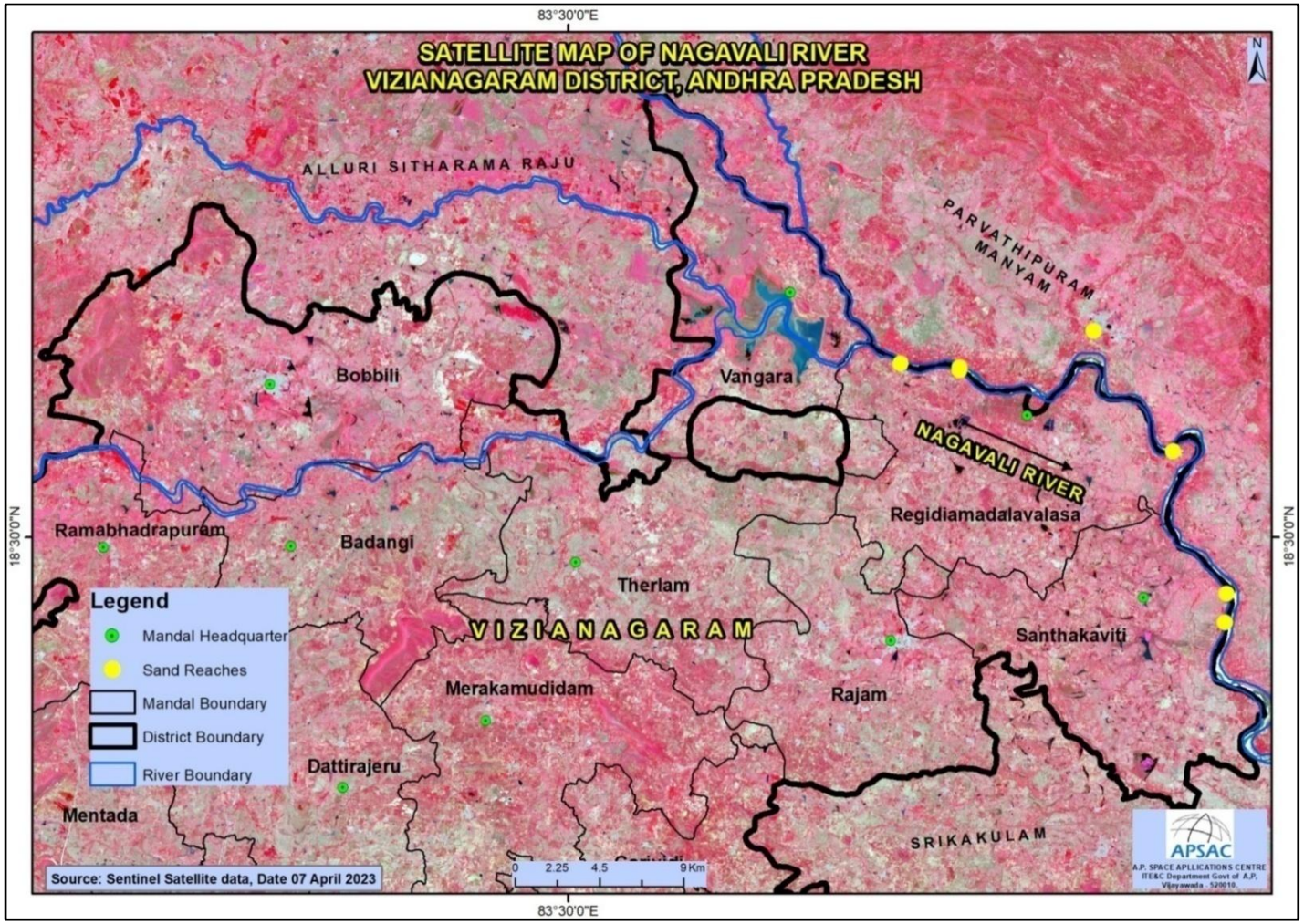

Figure-30: Sand Reaches map of Nagavali River in Vizianagaram District

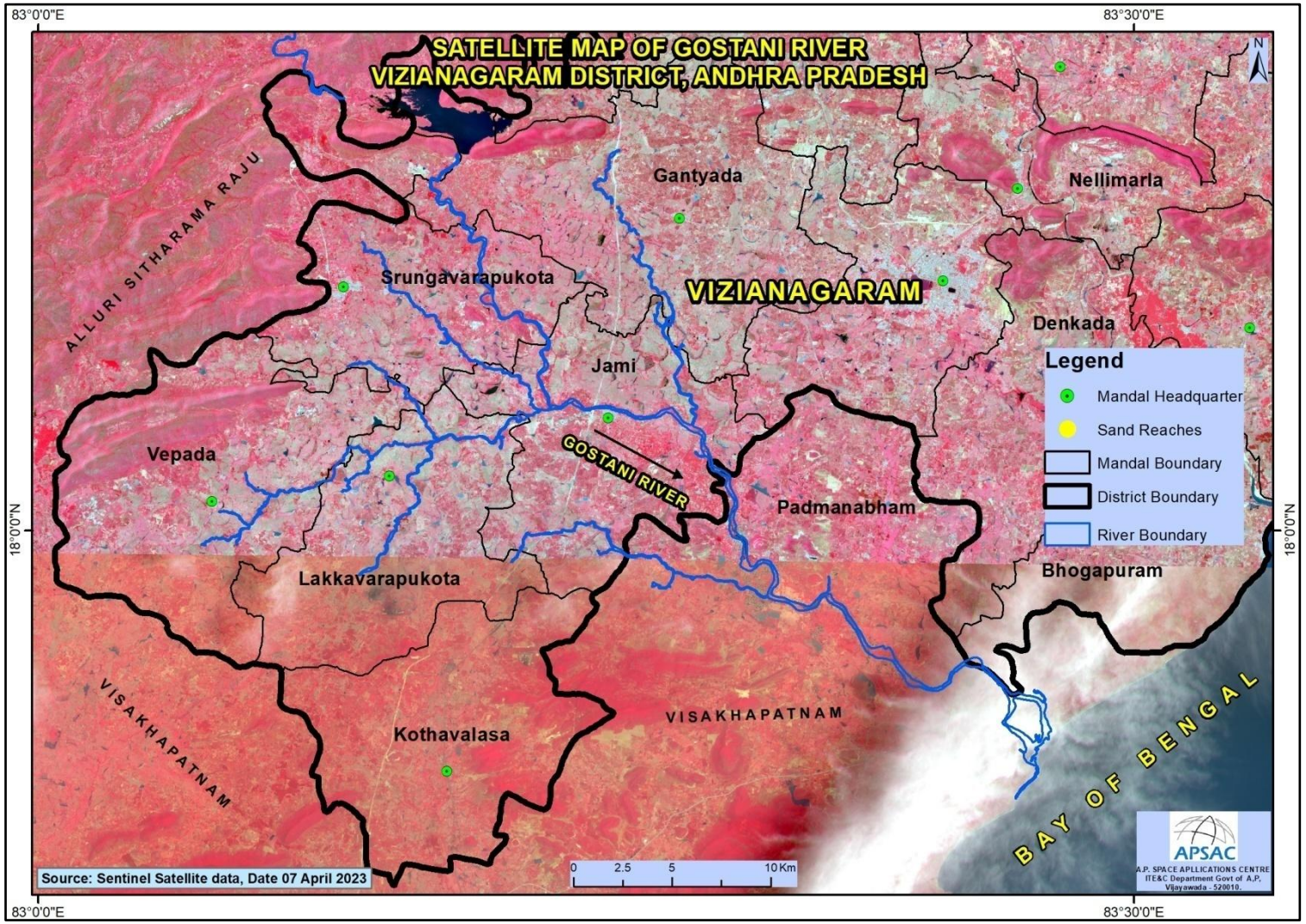

Figure-31: Sand Reaches map of Gostani River in Vizianagaram District

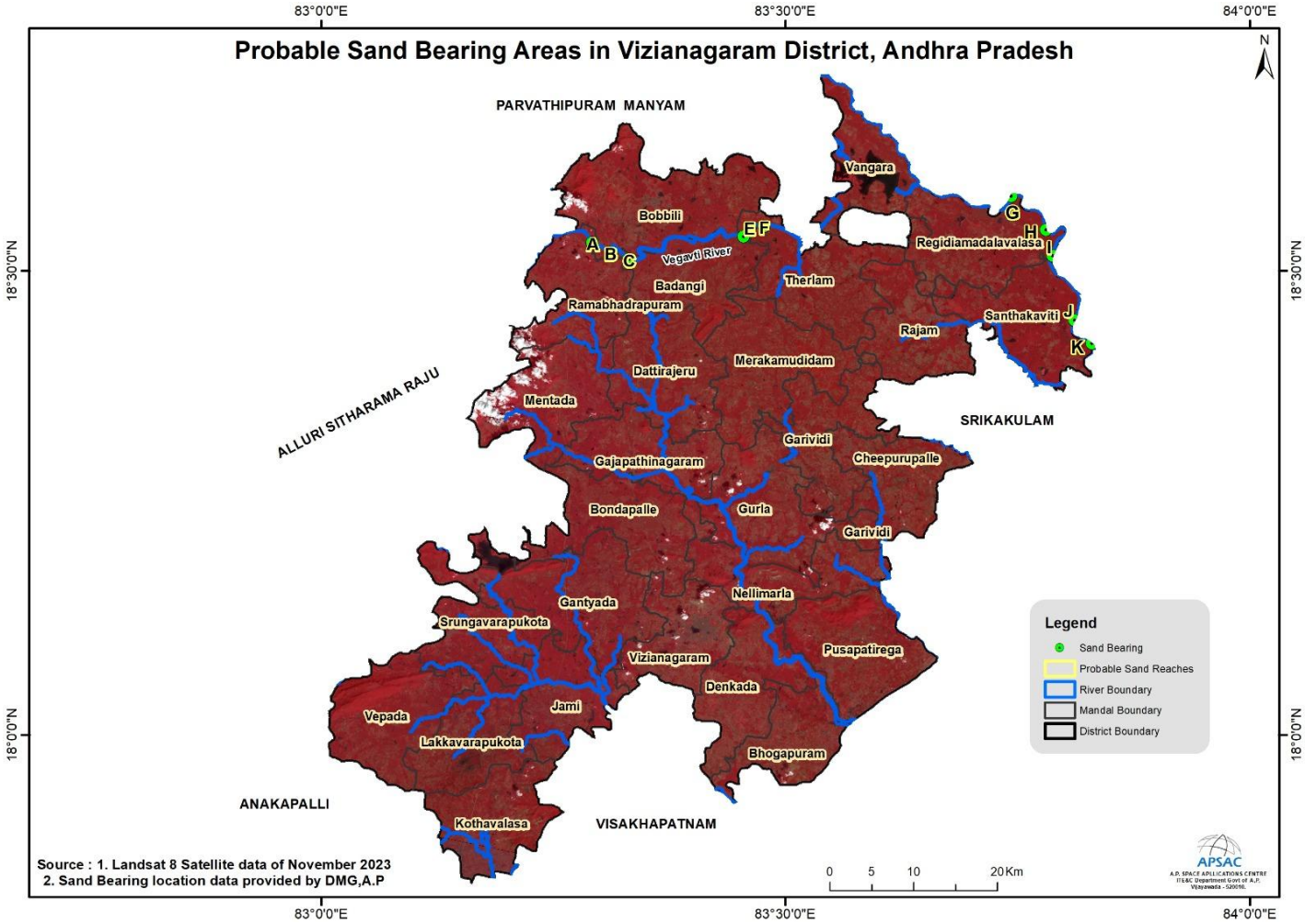

Figure-32 Probable Sand bearing areas in Vizianagaram District

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ANNEXURE

As the average annual run-off is less than 2" in the Vizianagaram District, the sedimentation yield in Nagavali River in Vizianagaram District was manually arrived by the APSAC based on the Dendy Bolton Equation or Formula and is given below.

$$S = 1280 \times Q^{0.46} [1.43 - 0.26 \log (A)]$$

Q = Mean Annual Run-off in mm
A = Net drainage Area in Sq. km
S = Sediment yield (tons/Sq. km/yr)

Sedimentation yield for the Nagavali River in Vizianagaram District

Name of the River	Area Drained (sq. km)	Mean Annual Run-off (in mm)
Nagavali	1137	4.46

Data Source: District Mines and Geology Officer, Vizianagaram District, Andhra Pradesh and APSAC, Vijayawada

The given drained area value converted from Sq.Km to Sq.mile and the mean annual run-off converted from mm to inches for the calculations.

$$S = 1280 \times Q^{0.46} [1.43 - 0.26 \log (A)]$$ **Tons/sq.mile/year**

Drainage Area (A) = 1137 sq. Km (1 Sq.km = 0.386 Sq.mile)
= 1137 x 0.386
A = 438.882 Sq.mile ----------(1)

Mean Annual Run-off (Q) = 4.46 mm (1 mm = 0.0393 inches)
= 4.46 x 0.0393
Q = 0.175278 inches ----------(2)

$$S = 1280 \times Q^{0.46} [1.43 - 0.26 \log (A)]$$ **Tons/sq.mile/year**

$S = 1280 \times (0.175278^{0.46}) [1.43 - 0.26 \log (438.882)]$

Log 43 of 8 = 0.6415
0.8 = 8
As per base, the value = 2.0000
(+)
Log 438.882 =2.6423 ----------(3)

$= 1280 \times (0.175278^{0.46}) [1.43 - 0.26 \times 2.6423]$
$= 1280 \times (0.175278^{0.46}) [1.43 - 0.68701]$
$= 1280 \times (0.175278^{0.46}) [0.74299]$
$= 1280 \times 0.448864 \times 0.629876$
$= 426.881$
S = 426.881 **Tons/sq.mile/year** ----------(4)

For total district Sedimentation Yield =
Per Sq.mile Sedimentation Yield (4) x Total Drainage Area (1)

426.881 x 438.882 = 1,87,350

As the Sedimentation yield calculated manually,
The sedimentation in the total River in the Vizianagaram District = **1,87,350 Tons/ year**

END