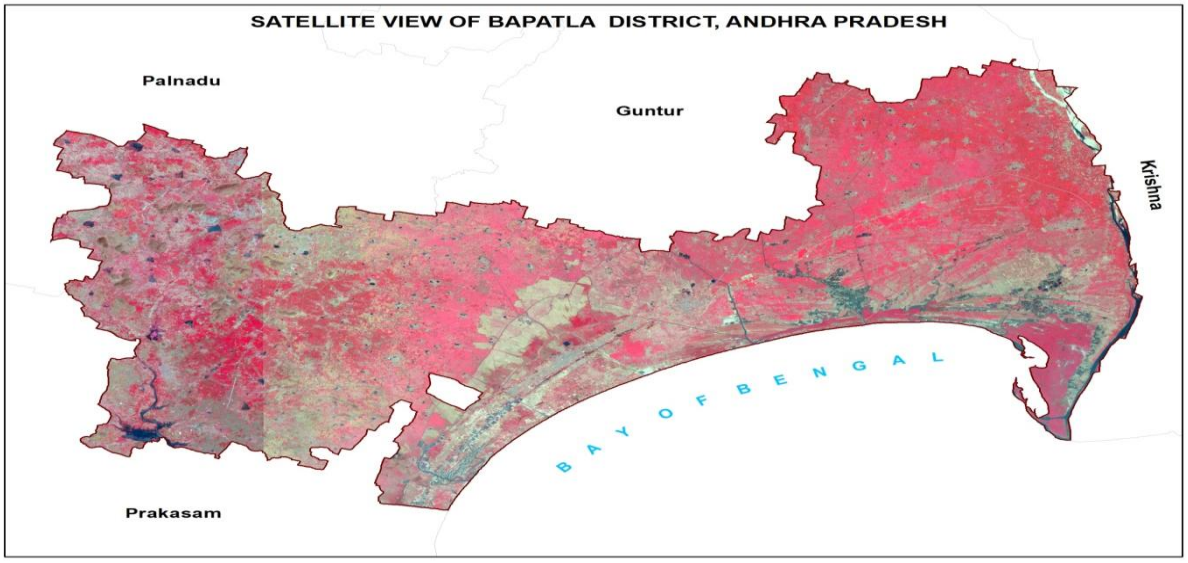
DISTRICT SURVEY REPORT
FOR
SAND AND OTHER MINOR MINERALS
BAPATLA DISTRICT

(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, & Enforcement & Monitoring Guidelines for Sand Mining 2020 of MOEF&CC, GoI



Prepared by

ANDHRA PRADESH SPACE APPLICATIONS CENTRE (APSAC)
ITE&C Department, Govt. of Andhra Pradesh

Submitted to

DEPARTMENT OF MINES AND GEOLOGY
Government of Andhra Pradesh

November 2023

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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 Bapatla 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

ACKNOWLEDGEMENTS

Our sincere gratitude to **Sri Gopal Krishna Dwivedi, IAS**, **Principal Secretary,** Department of Mines and Geology, Govt. of Andhra Pradesh for whole-hearted support.

Our sincere gratitude to **Sri Kona Sasidhar, IAS**, **Secretary to Government,** Information Technology, Electronics and Communications (ITE&C), Govt. of Andhra Pradesh and the **Chairman,** APSAC Governing Body, for his constant encouragement.

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.

We are very much thankful to **Dr.M.J.Ratnakanth Babu, Royalty Inspector (Head Office**), Mines and Geology for his support to complete the work successfully.

We are also thankful to the **District Mines and Geology Officer,** Bapatla 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
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	: Hactar
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
MoEF	: Ministry of Environment and Forests
MSL	: Mean Sea Level
NIRD	: National Institute of Rural Development
NH	: Natinal 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 and General Profile

1.1 Administrative Setup

Bapatla district is one of the coastal districts in the state of Andhra Pradesh established on 4thApril 2022. The administrative headquarter of the districts Bapatla. The district is formed from parts of erstwhile Prakasam and Guntur districts. The district headquarter is also a Municipality, mandal headquarters and revenue division headquarters. Geographically, Bapatla district is bounded to the north by the Guntur district, south by the Bay of Bengal, west by the parts of Palnadu and Prakasam districts, and east by the Krishna district. The total geographical area of the district is 3,829 Sq.km.

It is covered with 3 Revenue divisions namely Bapatla, Chirala and Repalle; 25 Revenue mandals and 282 Revenue villages. Bapatla mandal is having maximum number of villages (21) and Karlapalem and Vetapalem mandals having minimum number of villages each (5). Out of 25 mandals of the district, the maximum area (295 Sq.km) is occupied by Nizampatnam mandal and minimum area in Pittalavanipalem mandal (71 Sq.km).

The mandals covered in each Revenue division are shown in Table-1 and its spatial distribution is shown in the Figure-1. The satellite view of the district is shown in Figure-2.

Table 1 List of mandals covered in each Revenue division

Sl. No	Bapatla Division	Sl. No	Chirala Division	Sl. No	Repalle Division
1	Bapatla	**7**	Addanki	**17**	Amruthalur
2	Karlapalem	**8**	Ballikurava	**18**	Bhattiprolu
3	Martur	**9**	Chinaganjam	**19**	Cherukupalle
4	Parchur	**10**	Chirala	**20**	Kollur
5	Pittalavanipalem	**11**	Inkollu	**21**	Nagaram
6	Yeddanapudi	**12**	Janakavarampanguluru	**22**	Nizampatnam
		13	Karamchedu	**23**	Repalle
		14	Korisapadu	**24**	Tsundur
		15	Santhamaguluru	**25**	Vemuru
		16	Vetapalem		

Data Source: APSAC, Vijayawada.

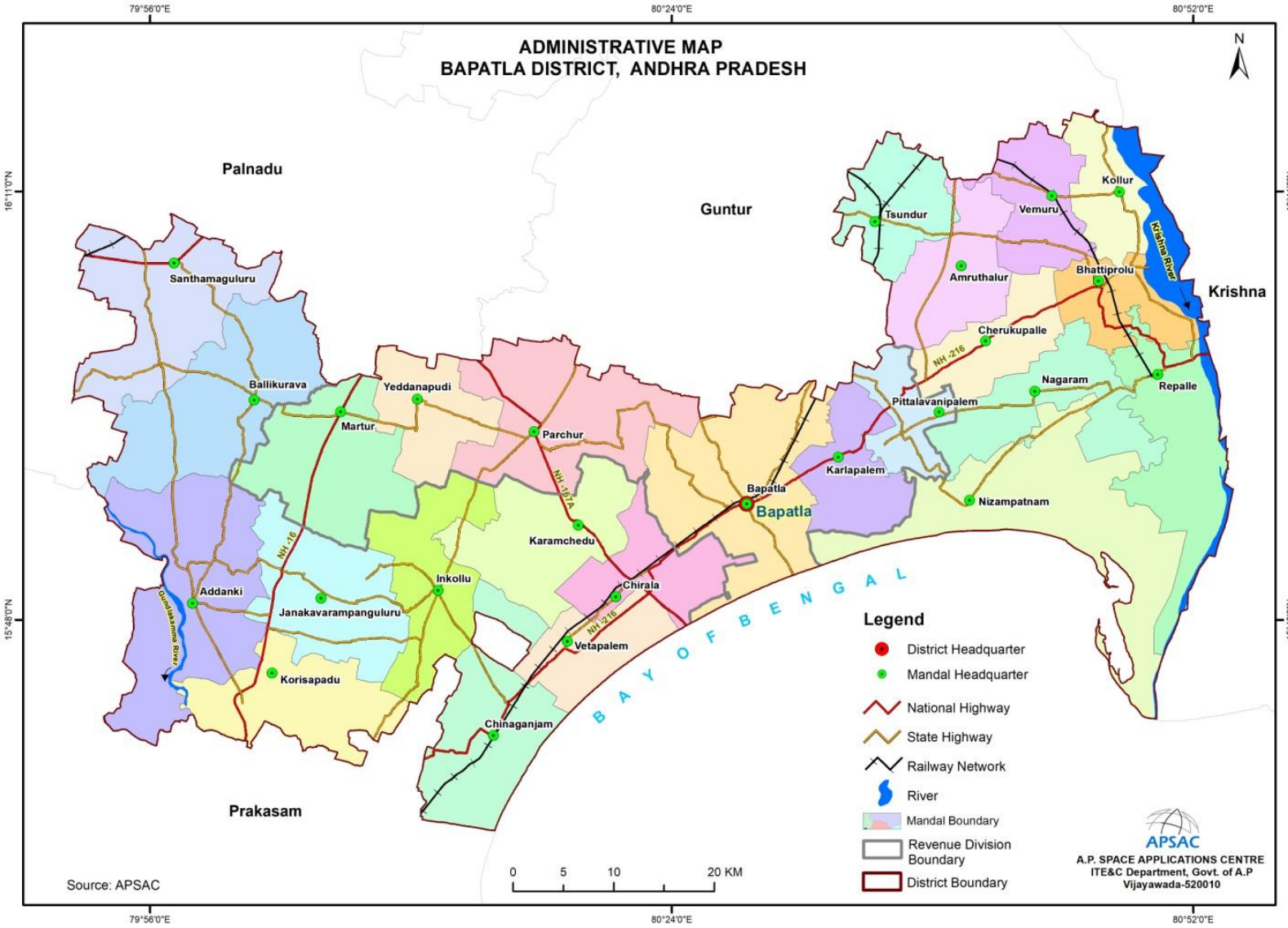


Figure-1: Administrative Map of Bapatla district, Andhra Pradesh

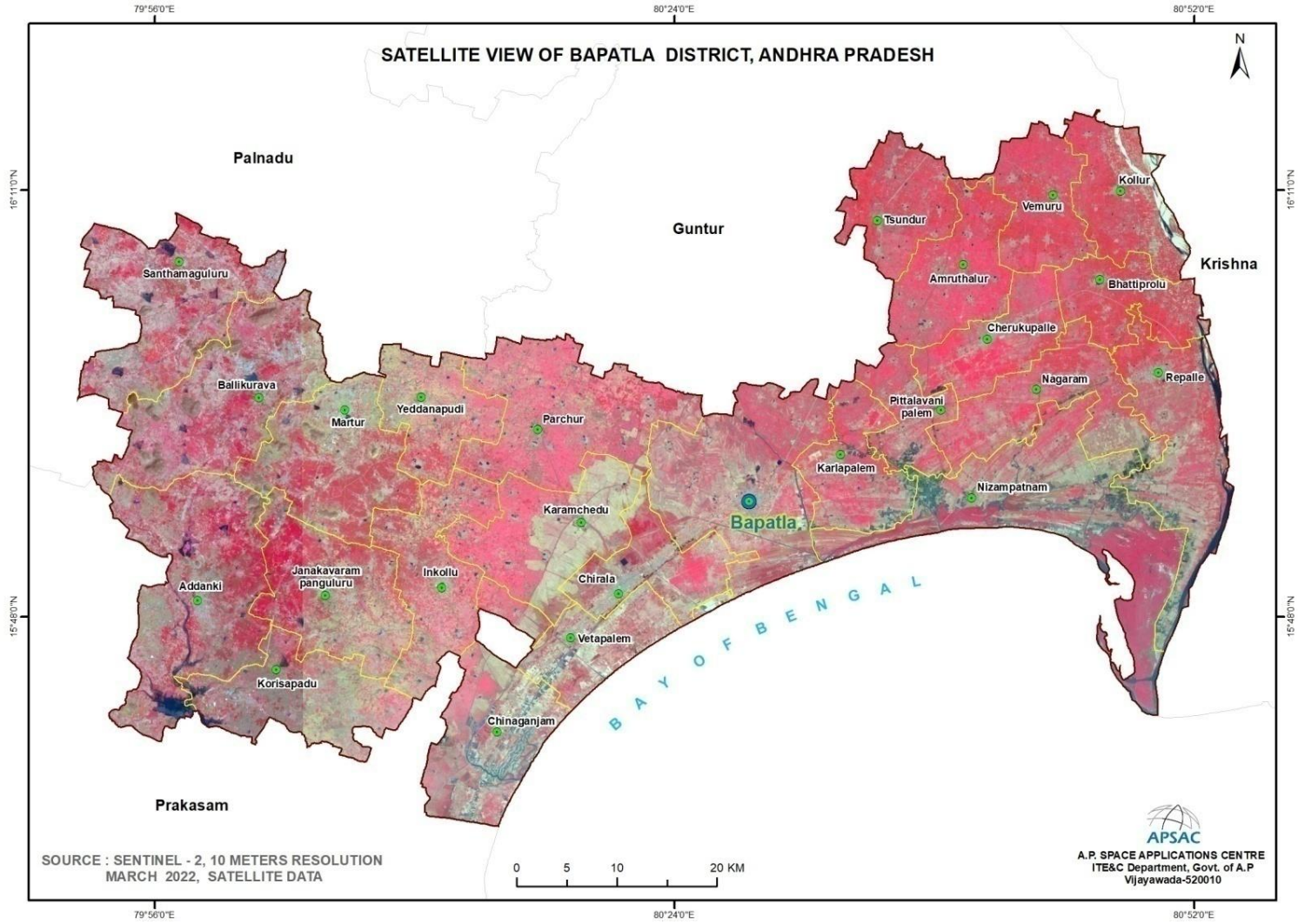


Figure-2: Satellite View of Bapatla District

1.2 Physiography

Physiographically, Bapatla District may divide into three parts. Western parts of the district composed of highlands, inselbergs, undulated hilly terrains and isolated hillocks; southeast and south west parts are covered under coastal regions composed of coastal landforms; North, North-North West, and North East parts are composed of pediment type landforms.

1.2.1 Relief

As per the guidelines of All India Soil and Land Use Planning (AIS & LUP) soil survey manual, the slope distribution clearly shows that the district terrain is deltaic plains (Figure-3). The slope map shows that the majority of the district land is nearly level, followed by very gently sloping areas. They account for 71.13% and 26.05% of the district's total area, respectively. These sloping areas are found along the coastal and delta area of the district. The gently sloping areas (3-5%) are found along the streams and the western parts of the district, which accounts 1.58% of the district geographical area. The remaining slope categories account for 1.24% of the district's total area and are found along the scrub and forest areas. These are prevalent in the western parts of the district.

1.2.2 Climate & Rainfall

1.2.2.1. Climate:

Tropical climate conditions with extremely hot summer and cold winter prevail in the Bapatla District. April to June months are the hottest months with high temperature in May. The climate of the district is moderate and characterized by tropical rainy climate with aggressive summer. The period from December to middle of February is generally dry and cool winter season. The summer season is from March to May. The weather averages for the month of July, temperature averages around 40.8°c and at night it feels like 21.3°c in district head Bapatla. The maximum and minimum temperatures are overall the district 43.6° C to 47.0° C. and 19.6° C to 21.7° C. The Automatic Weather Stations (AWS) in the Bapatla District shown in Figure-3.

1.2.2.2. Rainfall:

The average annual rainfall of the district is 881.68 mm, of which 535.40 mm falls as South-West (June-September) monsoon and 262.30 mm as North-East (October-December) monsoon. The mean minimum and

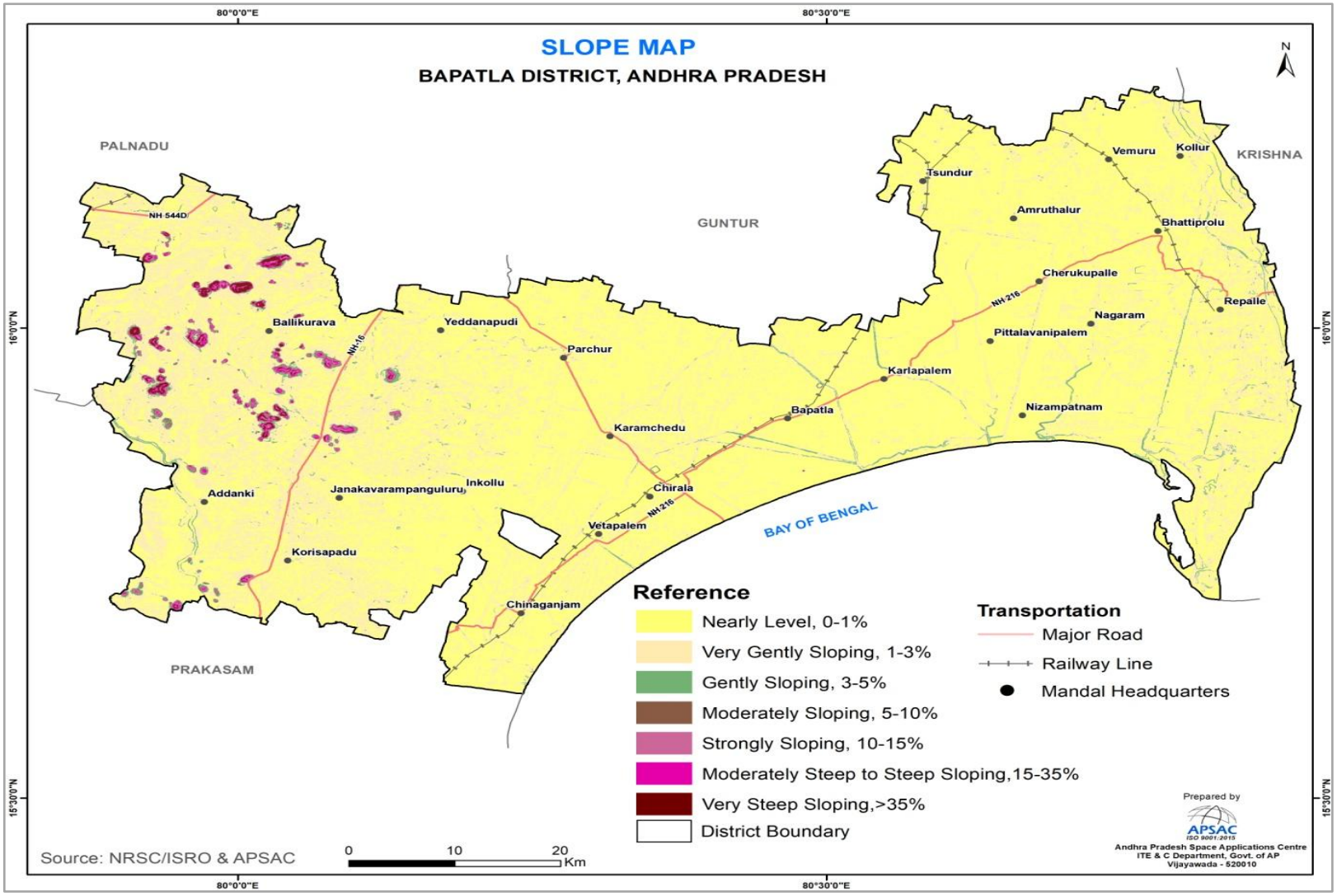


Figure-3: Slope Map of Bapatla District

maximum temperatures recorded in the district are 43.6° C to 47.0° 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-5 and details are 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	7.99
2	February	9.85
3	March	6.91
4	April	12.88
5	May	46.34
6	June	87.41
7	July	129.44
8	August	158.42
9	September	160.13
10	October	154.42
11	November	89.48
12	December	18.40
	Total	**881.68**

Data source: AWS & APSDPS, Vijayawada

1.2.3 Drainage

The district is bounded on the North by Guntur District, on the West by Palnadu/Narasaraopet and Prakasam Districts, on the South by Bay of Bengal, on the East by Krishna Western Delta. The Krishna River, Romperu and VogeruVagu are major rivers flows in the district. The Krishna River is west side border of the district, Krishna river enters into north east part of the district near Chilumuru village, Kolluru mandal and joining to Bay of Bengal near Gangadipalem village, Nizampatnam mandal in Bapatla district.

1.3 Population and Literacy

1.3.1. Population:

The total population of the district is 15,86,918; of which male and female are 7,88,804 and 7,98,114respectively as per the 2011 census of India. Among all the mandals, Chirala Mandal is having maximum population of 1,72,826; whereas Yeddanapudi Mandal is having minimum population of 28,373.

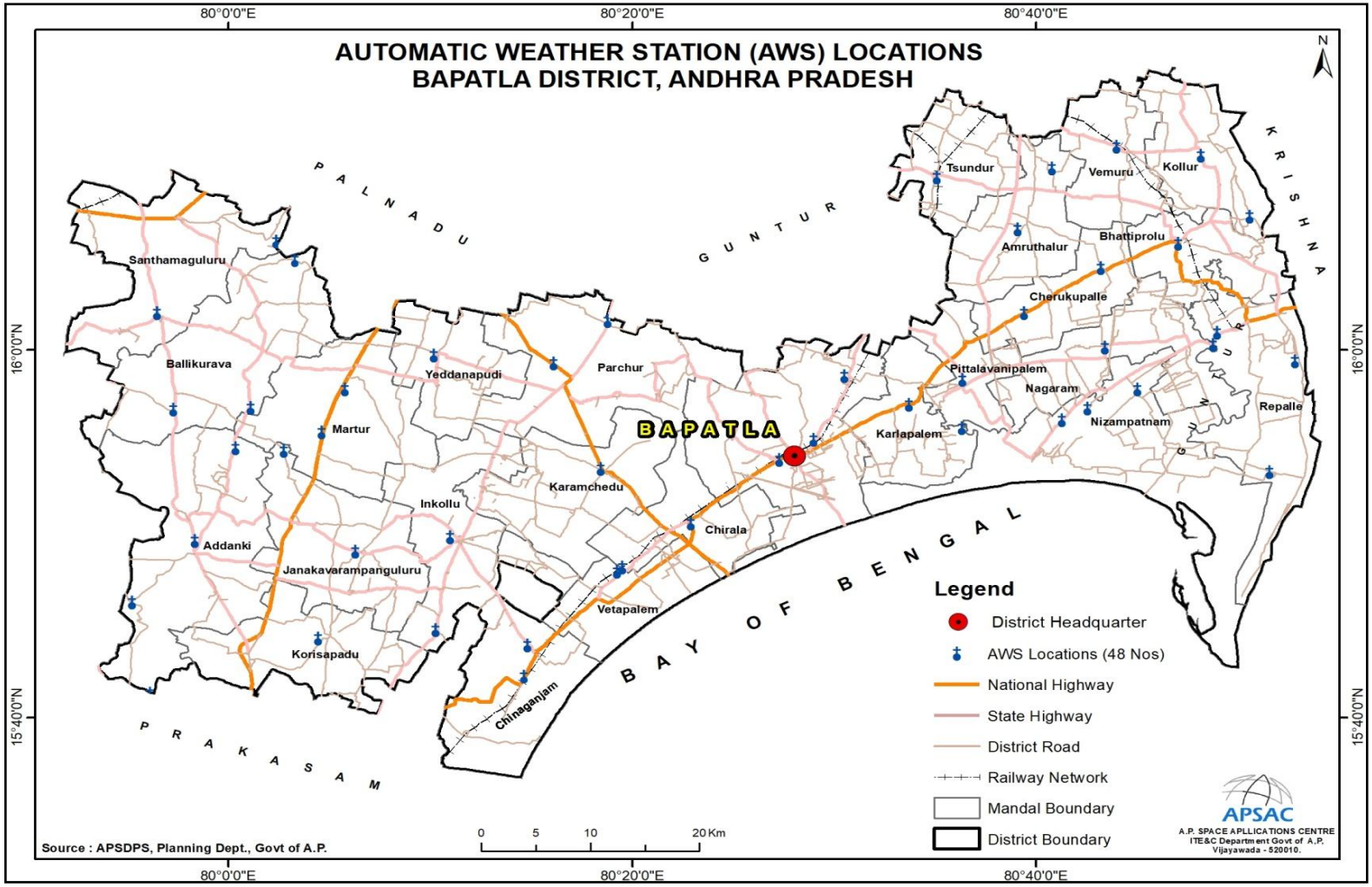


Figure-4: Locations of Automatic Weather Stations (AWS) in Bapatla District

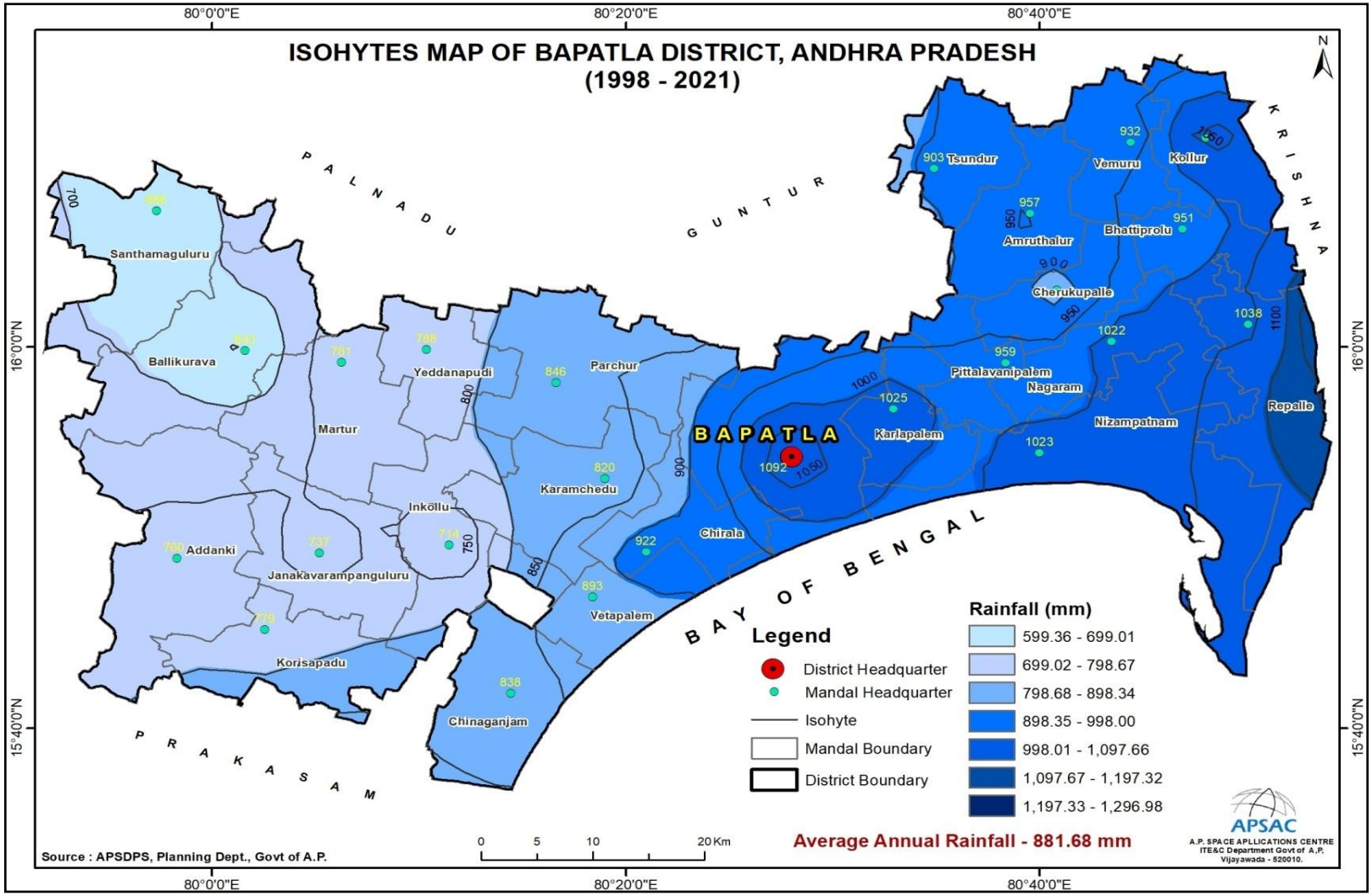


Figure-5: Rainfall distribution in Bapatla District

The total schedule caste (SC) population in the district is 3,58,655; of which, male and female are 1,77,695 and 1,80,960 respectively. The schedule tribe (ST) population is 78,838; of which male and female are 39,562 and 39,276 respectively.

The mandal wise population is shown in the Table-3. The mandal wise spatial distribution of total population is depicted in the Figure-6.

1.3.2. Literacy:

The total literacy in the district is 9, 66,122; of which male and female are 5,29,539 and 4,36,583 respectively. The total illiterates are 6,20,796; of which male and female are 2,59,265 and 3,61,531 respectively, as per the 2011 census of India. The mandal wise population is shown in the Table-4.

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

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 the proper understanding of the influence of the various human-induced land-use practices with regard to environmental change, it is essential to help simulate the land-use changes.

1.4.2 Spatial Distribution of Land Use / Land Cover

The major common LULC categories, including built-up (197.09 sq km), agriculture (3203.96 sq km), forest (123.24 sq km), wastelands (82.57 sq km), Wetlands (63.36 sq km), and water bodies (158.78 sq km), were identified and delineated using on-screen interpretation techniques. The study area has been divided into 38 LULC classes at the level III level. Agriculture land is the most prevalent, followed by built-up land. About 84% of the district's total land area is under agricultural land. The spatial distribution of land use / land cover map of Bapatla district is presented in Figure-7 and the area statistics are shown in Table-5.

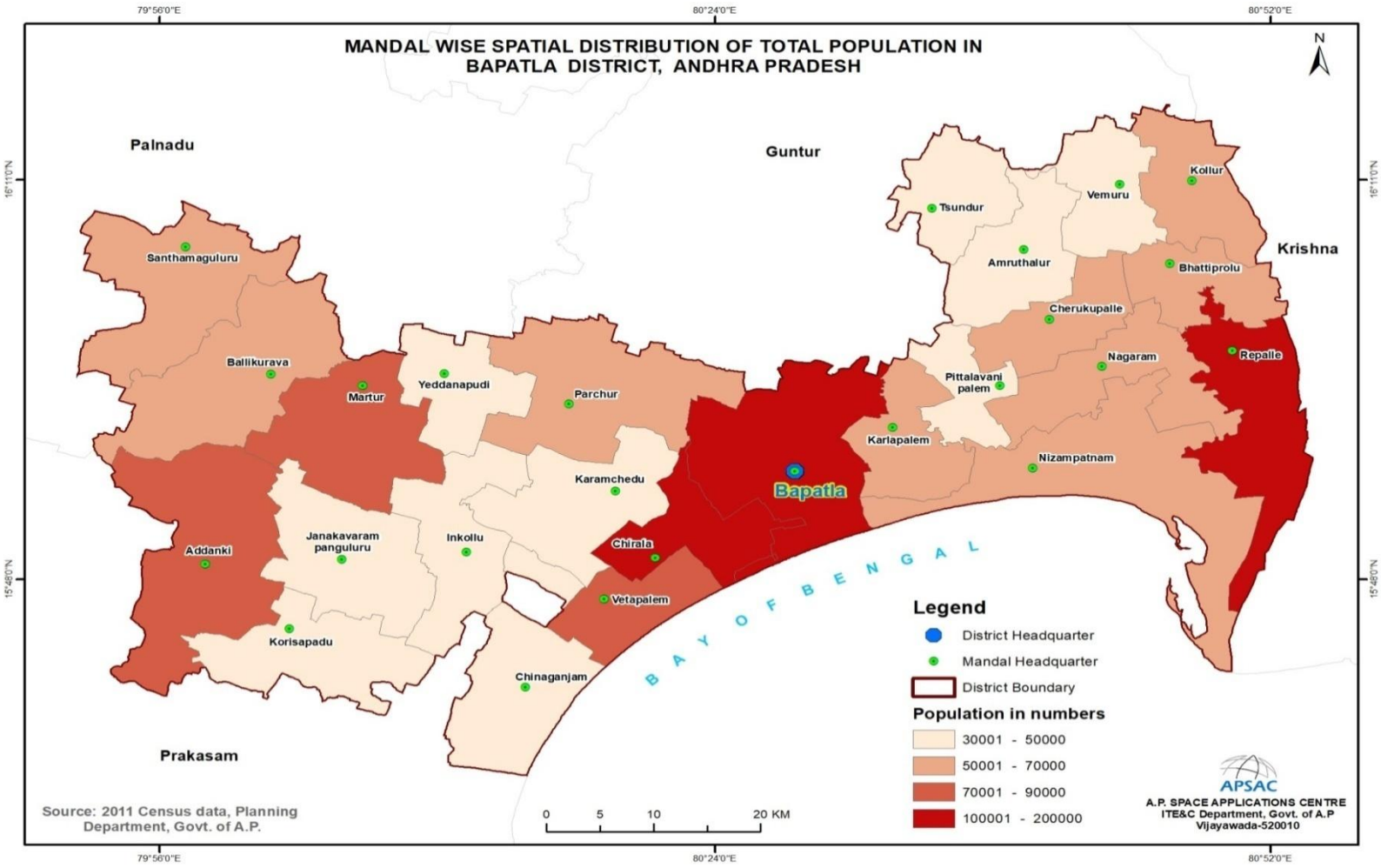


Figure-6: Mandal wise Spatial Distribution of Population in Bapatla district, Andhra Pradesh

Table 3 Population Statistics Summary of 2011 Census

S.No	Mandal Name	Total House Holds	Total Popu-lation	Total Male Popu-lation	Total Female Popu-lation	Total SC Popu-lation	Male SC Population	Female SC Population	Total ST Population	Male ST Population	Female ST Population
1	Addanki	23389	89769	44874	44895	22312	11048	11264	4127	2053	2074
2	Amruthalur	13207	44713	22123	22590	20576	10261	10315	1948	997	951
3	Ballikurava	13661	53269	26942	26327	14258	7255	7003	3331	1703	1628
4	Bapatla	38605	143825	70847	72978	28807	13829	14978	8492	4186	4306
5	Bhattiprolu	15372	50252	25134	25118	14461	7291	7170	2299	1169	1130
6	Cherukupalle	17586	60385	29852	30533	6632	3244	3388	2772	1369	1403
7	Chinaganjam	11718	42468	21249	21219	6857	3414	3443	2397	1194	1203
8	Chirala	46878	172826	85735	87091	26260	12885	13375	9206	4529	4677
9	Inkollu	13812	49546	24905	24641	13507	6810	6697	1866	955	911
10	Janakavarampanguluru	12583	45186	22486	22700	12504	6322	6182	1839	961	878
11	Karamchedu	11322	38916	19422	19494	9458	4829	4629	1558	794	764
12	Karlapalem	14361	50320	25232	25088	8499	4271	4228	3309	1707	1602
13	Kollur	16310	55323	27709	27614	19968	9997	9971	2297	1131	1166
14	Korisapadu	13278	48273	23958	24315	16379	8219	8160	1466	727	739
15	Martur	19317	73862	37083	36779	18278	9187	9091	4123	2057	2066
16	Nagaram	15333	50262	24989	25273	11339	5694	5645	1422	729	693
17	Nizampatnam	17086	59973	30533	29440	5910	3114	2796	2072	1078	994
18	Parchur	15531	54668	26622	28046	14000	6612	7388	3691	1877	1814
19	Pittalavanipalem	10992	38609	19175	19434	6450	3137	3313	1900	959	941
20	Repalle	30556	111989	54459	57530	22243	10361	11882	5419	2696	2723
21	Santhamaguluru	15344	59528	30355	29173	11990	6174	5816	2975	1555	1420
22	Tsundur	13873	45778	22599	23179	15379	7733	7646	2190	1112	1078
23	Vemuru	12858	43586	21752	21834	15664	7835	7829	2008	1001	1007
24	Vetapalem	21247	75219	37352	37867	7644	3820	3824	5514	2733	2781
25	Yeddanapudi	8138	28373	13417	14956	9280	4353	4927	617	290	327
	Grand Total	**442357**	**1586918**	**788804**	**798114**	**358655**	**177695**	**180960**	**78838**	**39562**	**39276**

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

Table 4 Literacy statistics summary of 2011 Census

S.No	Mandal Name	Total Literacy	Male Literacy	Female Literacy	Total Illiterates	Male Illiterates	Female Illiterates
1	Addanki	50753	28923	21830	39016	15951	23065
2	Amruthalur	29801	15740	14061	14912	6383	8529
3	Ballikurava	26682	15755	10927	26587	11187	15400
4	Bapatla	93653	49893	43760	50172	20954	29218
5	Bhattiprolu	32436	17343	15093	17816	7791	10025
6	Cherukupalle	36795	19835	16960	23590	10017	13573
7	Chinaganjam	23217	13405	9812	19251	7844	11407
8	Chirala	112911	61347	51564	59915	24388	35527
9	Inkollu	31588	17930	13658	17958	6975	10983
10	Janakavarampanguluru	25395	14432	10963	19791	8054	11737
11	Karamchedu	24154	13521	10633	14762	5901	8861
12	Karlapalem	27692	15389	12303	22628	9843	12785
13	Kollur	34967	18325	16642	20356	9384	10972
14	Korisapadu	29199	16475	12724	19074	7483	11591
15	Martur	40358	23338	17020	33504	13745	19759
16	Nagaram	29635	16127	13508	20627	8862	11765
17	Nizampatnam	33970	19361	14609	26003	11172	14831
18	Parchur	33741	18580	15161	20927	8042	12885
19	Pittalavanipalem	23711	12678	11033	14898	6497	8401
20	Repalle	74830	38290	36540	37159	16169	20990
21	Santhamaguluru	28421	17104	11317	31107	13251	17856
22	Tsundur	28384	15099	13285	17394	7500	9894
23	Vemuru	28079	14835	13244	15507	6917	8590
24	Vetapalem	48823	26831	21992	26396	10521	15875
25	Yeddanapudi	16927	8983	7944	11446	4434	7012
	Grand Total	**966122**	**529539**	**436583**	**620796**	**259265**	**361531**

Data Source: 2011 Census data, Planning Department & DES

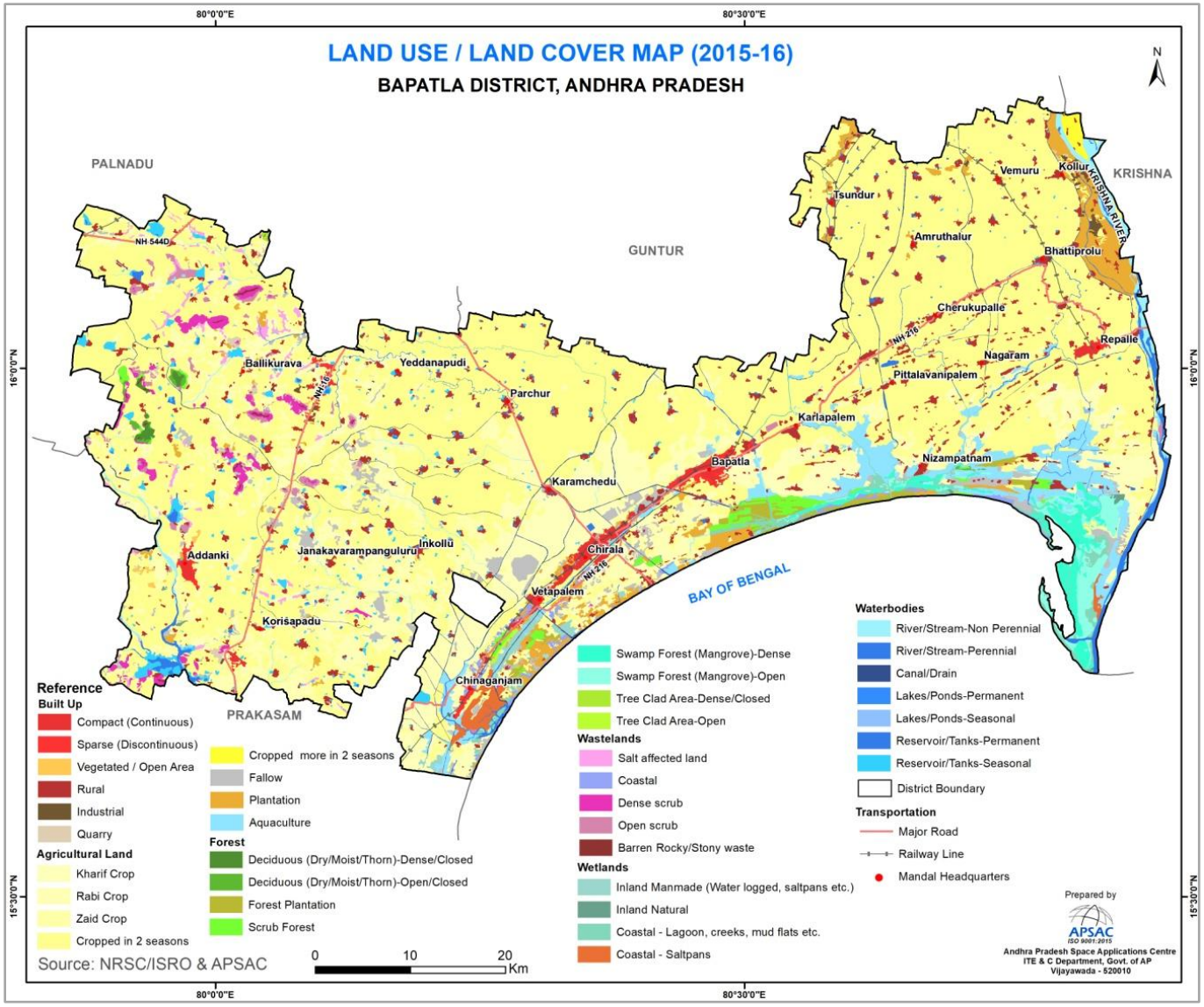


Figure-7: Land use / land cover map of Bapatla District 2015-16

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		**197.09**	**5.15**
1	Compact (Continuous)	33.12	0.86
2	Sparse (Discontinuous)	12.79	0.33
3	Vegetated / Open Area	2.46	0.06
4	Rural	133.88	3.50
5	Industrial	7.77	0.20
6	Quarry	7.07	0.18
Agricultural Land		**3203.96**	**83.68**
7	Kharif Crop	490.29	12.80
8	Rabi Crop	238.30	6.22
9	Zaid Crop	4.76	0.12
10	Cropped in 2 seasons	2173.11	56.75
11	Cropped more in 2 seasons	6.75	0.18
12	Fallow	84.04	2.19
13	Plantation	91.62	2.39
14	Aquaculture	115.07	3.01
Forest		**123.24**	**3.22**
15	Deciduous (Dry/Moist/Thorn)-Dense/Closed	3.87	0.10
16	Deciduous (Dry/Moist/Thorn)-Open/Closed	3.38	0.09
17	Forest Plantation	18.97	0.50
18	Scrub Forest	22.49	0.59
19	Swamp Forest (Mangrove)-Dense	37.70	0.98
20	Swamp Forest (Mangrove)-Open	34.72	0.91
21	Tree Clad Area-Dense/Closed	0.64	0.02
22	Tree Clad Area-Open	1.47	0.04
Wastelands		**82.57**	**2.16**
23	Salt affected land	15.88	0.41
24	Dense scrub	27.42	0.72
25	Open scrub	18.92	0.49
26	Coastal sand	17.68	0.46
27	Barren Rocky/Stony waste	2.68	0.07
Wetlands		**63.36**	**1.65**
28	Inland Natural	1.74	0.05
29	Inland Manmade (Water logged, saltpans etc.)	12.41	0.32
30	Coastal - Lagoon, creeks, mud flats etc.	33.47	0.87

S. No	LULC categories	Area in sq. km	% to total
31	Coastal - Saltpans	15.74	0.41
Water bodies		**158.78**	**4.15**
32	River/Stream-Perennial	37.37	0.98
33	River/Stream-Non Perennial	33.26	0.87
34	Canal/Drain	28.70	0.75
35	Lakes/Ponds-Permanent	0.10	0.00
36	Lakes/Ponds-Seasonal	0.83	0.02
37	Reservoir/Tanks-Permanent	19.34	0.51
38	Reservoir/Tanks-Seasonal	39.17	1.02
Total		**3829**	**100**

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

1.4.2.1. Built-up

These are the areas where people live, and they are supported by infrastructure such as buildings, roads, and other modes of transportation, as well as utilities linked to water, vegetation, and open spaces. It consists of built-up (Compact and Sparse), Vegetated / Open Area, Rural, Industrial, and Mining/Quarry. It occupies an area of 197.09 sq. km, which is about 5.15% of the total geographical area of the district. The built-up category includes district headquarters, some mandal headquarters, industrial areas, and rural settlement areas based on size and population. Many vacant lands with layouts and fencing are being developed for real estate development on the outskirts of the Bapatla, Chirala, Repalle and Addanki towns.

1.4.2.2. Built-up - Compact (Continuous)

Most of the land is covered by buildings, roads, and artificially surfaced area and cover almost all the ground. The built-up-compact class is assigned where the impermeable surfaces such as the transportation network and urban structures take up more than 80% of the surface area. This category occupied 33.12 sq. km, which are found in Bapatla and Chirala towns.

1.4.2.3. Built-up - Sparse (Discontinuous)

The majority of the land is covered by structures such as buildings, roads, and artificially surfaced areas that are associated with vegetated areas and bare soil, occupying discontinuous but significant surfaces. Between 30 to 80 % of the total surface should be impermeable. This category delineates scattered blocks of residential flats, hamlets, and small villages. It covers an

area of 12.79 sq. km and is located in peri-urban areas of Bapatla and Chirala.

1.4.2.4. Vegetated / Open Area

These are vegetated areas within an urban agglomeration (areas located within or adjacent to urban areas). The vegetation cover of trees, shrubs, and herbs has been delineated and covers the surface area. Open areas used as Parks, sport and leisure facilities, camping grounds, sports grounds, leisure parks, golf courses, race courses, including formal parks etc are considered in this category. This category covers an area of 2.46 sq. km and is found in and around the towns of Bapatla and Chirala.

1.4.2.5. Built-up – Rural

These are lands used for human settlement of a size comparable to urban settlements, in which more than 80% of the people are engaged in primary agricultural activity and are associated with non-commercial and allied classes, and are classified as built-up (rural). The rural built-up area is the most prevalent of the built-up categories and is spread throughout the district. It contributed an area of 133.88 sq. km (3.50%) of the district total geographical area.

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 7.77 sq. km, which is observed in and around towns.

1.4.2.7. Quarry

These are manifestations of surface mining operations, which involve small-scale land surface excavation for quarries of granite, sand, and other minerals. They are primarily distinguished by their proximity to cities. It covers 7.07 sq. km and accounts for 0.18% of the district's total area.

1.4.2.8. Agricultural Land

Agriculture land 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 plantation, and aquaculture. The district's economy is primarily based on agriculture, which was found to account for

3203.96 sq. km (83.68%) of its total area during the period. It is also found that the double-cropped area accounts for about 56.75% of the district total. Major food crops grown are Paddy, Jowar, Bajra, Black gram, Bengalgram, Redgram, and sugarcane, cotton, tobacco, chillies, turmeric, castor, groundnut, and lemon, banana, sapota, coconut and vegetables.

1.4.2.9. Kharif Crop

The agricultural area cultivated between June/July to September/October coinciding with South-West monsoon season is considered 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 cropland is the second-largest agricultural category, covering 490.29 sq. km (12.80%). During the Kharif season, a variety of crops including paddy, sugarcane, jowar, maize, redgram, cotton, castor, groundnut, and others are widely grown in the district.

1.4.2.10. 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, rain-fed areas with residual soil moisture, particularly in areas with black soil and high rainfall during the Kharif season, also have areas that are planted with Rabi crops. During the Rabi season, primarily irrigated crops like rice, sugarcane, and chillies are grown using canals, tanks, and groundwater resources. In the years 2015–16, Rabi cropland covered 238.30 sq. km (6.22%) of the total area.

1.4.2.11. Zaid Crop

These are the cropped areas that are mostly associated with irrigated areas with fertile soils and are confined to plains and delta areas during the summer (April-May). Summer crops grown from April to June were mapped under Zaid cropland and occupied an area of 4.76 sq. km during the study period.

1.4.2.12. Cropped in two seasons

These are the cropping areas that are commonly associated with irrigated areas during the two cropping seasons. Three combinations are possible in this category viz., - Kharif + Rabi, Kharif + Zaid, and Rabi + Zaid. Cropped areas in any two seasons are mapped under cropped in the two seasons category, occupying an area of 2173.11 sq. km (56.75%). These can be

found throughout the district, with reliable irrigation provided by canals, tanks, and groundwater.

1.4.2.13. 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), areas under multiple cropping. Long-duration crops like sugarcane, cotton, banana, and tobacco are considered under this category.This category accounts for 6.75 sq. km (0.18%) of the district's total geographical area.

1.4.2.14. Fallow land

Fallow land is agricultural land that is used for cultivation but is temporarily allowed to rest or be un-cropped for one or more seasons, but not less than a year and not more than five years. The fallow land covers an area of 84.04 sq. km and is devoid of crops during both cropping seasons for various reasons.

1.4.2.15. Agricultural Plantation

These are the areas where agricultural tree crops have been planted using agricultural management techniques. These also include the 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 can be distinguished from cropland, especially using data collected during the Rabi/Zaid season. Plantations appear in varying sizes with regular and sharp edges, indicating the presence of a fence around them. Plantations such as banana, cashew, eucalyptus, teak, and others are grown throughout the district. The plantations category accounts for 91.62 sq. km (2.39%) of the district's total geographical area.

1.4.2.16. Aquaculture

These are the locations used for the commercial breeding and rearing of fish and shrimp. Aquaculture ponds are located mostly along coast or in lakes, river and estuaries. This also includes breeding and rearing of fresh water or marine fish in captivity. A total of 115.07 sq. km is occupied by the category of aquaculture.

1.4.2.17. Forest

The term forest is used to refer to land with a tree canopy cover of more than 30 percent and an area of more than 0.5 ha. Forest is determined both by the presence of trees and the absence of other predominant land uses within the notified forest boundaries. The trees should be able to reach a minimum height of 5 m within the notified forest boundaries. The forest area occupied an area of 123.24 sq. km (3.22%) and found along the coast and western parts of the district where several forest species grow. The important species are teak, nalla maddi, rosewood, devadari, etc.

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

This category is predominantly composed of species, which shed their leaves once in 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 areas where the canopy cover/density is more than 40 % and contributed 3.87 sq. km in the district.

1.4.2.19. 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% - 40%. In addition to timber, these forests also contain a large variety of fauna like tigers, leopards, wolves, bears etc. An area of 3.38 sq. km (0.09%) is attributed to this category.

1.4.2.20. Wastelands

During the study, the area under the wasteland category was mapped at 82.57 sq. km (2.16%), which includes the subcategories of salt affected land, dense scrub, open scrub, coastal sand, and barren rocky / stony waste.

1.4.2.21. Salt affected land

Salinization can be caused by inadequate canal irrigation water management, which causes the water table to rise and, as a result, salts to build up in the root zone in arid, semi-arid, and sub-humid (dry) conditions, as well as by seawater intrusion in coastal regions and/or the use of groundwater with high salt content. They also turn salty when groundwater is salty or soils have grown on salty parent materials. The salt-affected lands are accounted for 15.88 sq. km and found western parts of the district.

1.4.2.22. 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 NIR region of the spectrum enable their separation with the salt affected land. It is found in along the coast and occupied an area of 17.68 sq. km (0.46%).

1.4.2.23. 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 2.68 sq. km and it occupies 0.07 % of the district.

1.4.2.24. 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. Hence, the portions of water body (partial or full) having emergent vegetation or observable submerged vegetation is placed in the Wetlands category. The wetland category contributes 63.36 sq. km and found along the coastal areas.

1.4.2.25. Inland Natural

These are the areas that include ox-bow lakes, cut-off meanders, playas, swamp, marsh, peat bogs etc (with vegetation). This category is contributed to 1.74 sq. km of the district total.

1.4.2.26. Inland Manmade (Waterlogged, saltpans etc.)

For the majority of the year, these are the areas flooded or prone to flooding by fresh, brackish, or standing water, with specific vegetation coverage consisting of low shrub, semi-ligneous, or herbaceous species. Waterlogged areas (seasonal and perennial) are formed as a result of the negative effects of human management practices and are vegetated. Waterlogged areas (seasonal and perennial) created due to negative effect of human management practices and are present with vegetation. This is attributed an area of 12.41 sq. km.

1.4.2.27. Coastal - Lagoon, creeks, mud flats etc.

These are the areas which are submerged by high tides at some stage of the annual tidal cycle. Non-wooded areas tidally, seasonally or permanently

waterlogged with brackish or saline water. These include estuaries, lagoons, creek, backwater, bay tidal flat/mud flat, mangrove, salt marsh/marsh with vegetation and other hydrophytic vegetation. These are contributed an area of 33.47 sq. km.

1.4.2.28. Coastal - Saltpans

The saltpans are flat expanses of salt-covered land, usually white under the Sum. Saltpans are manmade saline ecosystem from which crude salt is extracted during summer. These are un-drained, usually small and shallow, natural depression or hollow in which brackish water accumulates and evaporates leaving behind salt deposits. About 15.74 sq. km of area is occupied by this category in the district along the coast.

1.4.2.29. Water Bodies

This category comprises areas with surface water, either impounded in the form of ponds, lakes, and reservoirs or flowing as streams, rivers, canals, etc are delineated. These can be seen clearly in the satellite image in blue to dark blue or cyan depending on the depth of the water. This category includes rivers, streams, canals, lakes, ponds, reservoirs, and tanks. The total area of water bodies, including all sub-categories, is about 158.78 sq. km (4.15%).

1.4.2.30. 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. The rivers/streams that flow continuously throughout the year are considered as perennial. It contributes an area of 37.37 sq. km. The important river and rivulets in the District are the Krishna. The River Krishna flows through the district in a north-south direction for about 39 kilometres.

1.4.2.31. River/Stream-Non-Perennial

When the water covers the surface for less than nine months each year, it is considered non-perennial. This also includes the dry part of the river generally characterized by the presence of sand or exposed rocks. It contributes an area of 33.26 sq. km under this category.

1.4.2.32. 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 the coastal plains with an area of 28.70 sq. km.

1.4.2.33. 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, flood control, either singly or in combination. Tanks are small lakes of impounded waterways constructed on land surfaces for irrigation. They are associated with croplands, lowlands, 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. The reservoir/tanks-permanent category was delineated with an area of 19.34 sq. km. These are the one of the sources of the irrigation and spread over the district.

1.4.2.34. Reservoir/Tanks-Seasonal

Dry reservoirs/tanks are those which do not have water spread throughout the year and such are considered seasonal. During the mapping period, where the water spread not found in the three seasons, those areas are mapped in this category. Many of the tanks are found to be seasonal, with a total area of 39.17 sq. km.

1.4.2.35. Lakes/Ponds-Seasonal

Lakes/ponds are those that retain water in them either for one season or throughout the year and are usually not subject to extreme fluctuation in water level. Ponds are a body of water limited in size, either natural or artificial, regular in shape, smaller in size than a lake, generally located near settlements. These accounted for an area of 0.83 sq. km only.

1.4.2.36. 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 or throughout the year and usually not subjected to extreme fluctuation in water level. Ponds are body of water limited in size, either natural or artificial, regular in shape, smaller in size than a lake, generally located near settlement. This category contributes tiny area of 0.10 sq. km.

1.4.3 Forest Cover Distribution

The forest cover maps were created by interpreting multiple sources of topographical maps and satellite data. 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. Forest is defined by the presence of trees and the absence of other dominant land uses within the notified forest boundaries. The trees should be able to reach a minimum height of 5 m within the notified forest boundaries. The spatial distribution of forest cover and its statistics are presented in Figure-8, details are given Table-6 and as per the Forest Department, Government of Andhra Pradesh the Forest boundary map is presented in Figure-9.

Table 6 Forest cover distribution in Bapatla District

S. No	Type of Forest	Area in sq. km	% to district total
1	Deciduous (Dry/Moist/Thorn)-Dense/Closed	3.87	0.10
2	Deciduous (Dry/Moist/Thorn)-Open/Closed	3.38	0.09
3	Forest Plantation	18.97	0.50
4	Scrub Forest	22.49	0.59
5	Swamp Forest (Mangrove)-Dense	37.70	0.98
6	Swamp Forest (Mangrove)-Open	34.72	0.91
7	Tree Clad Area-Dense/Closed	0.64	0.02
8	Tree Clad Area-Open	1.47	0.04
	Total Forest	**123.24**	**3.22**

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

The district's forest cover is primarily found along the coast and in a few isolated locations in the west. The predominant categories are mangrove dense and open forests, which contribute 37.70 sq. km and 34.72 sq. km, respectively. These are mostly concentrated along the coast. The forest plantations like Cashew, Casuarina, etc have been mapped within the notified forest areas. The forest plantations category covers an area of 18.97 sq. km of the district. Distributed in the northeast and north-western parts of the district. The area contributed is about 7.42 sq. km (0.30%) and are scrub forests.

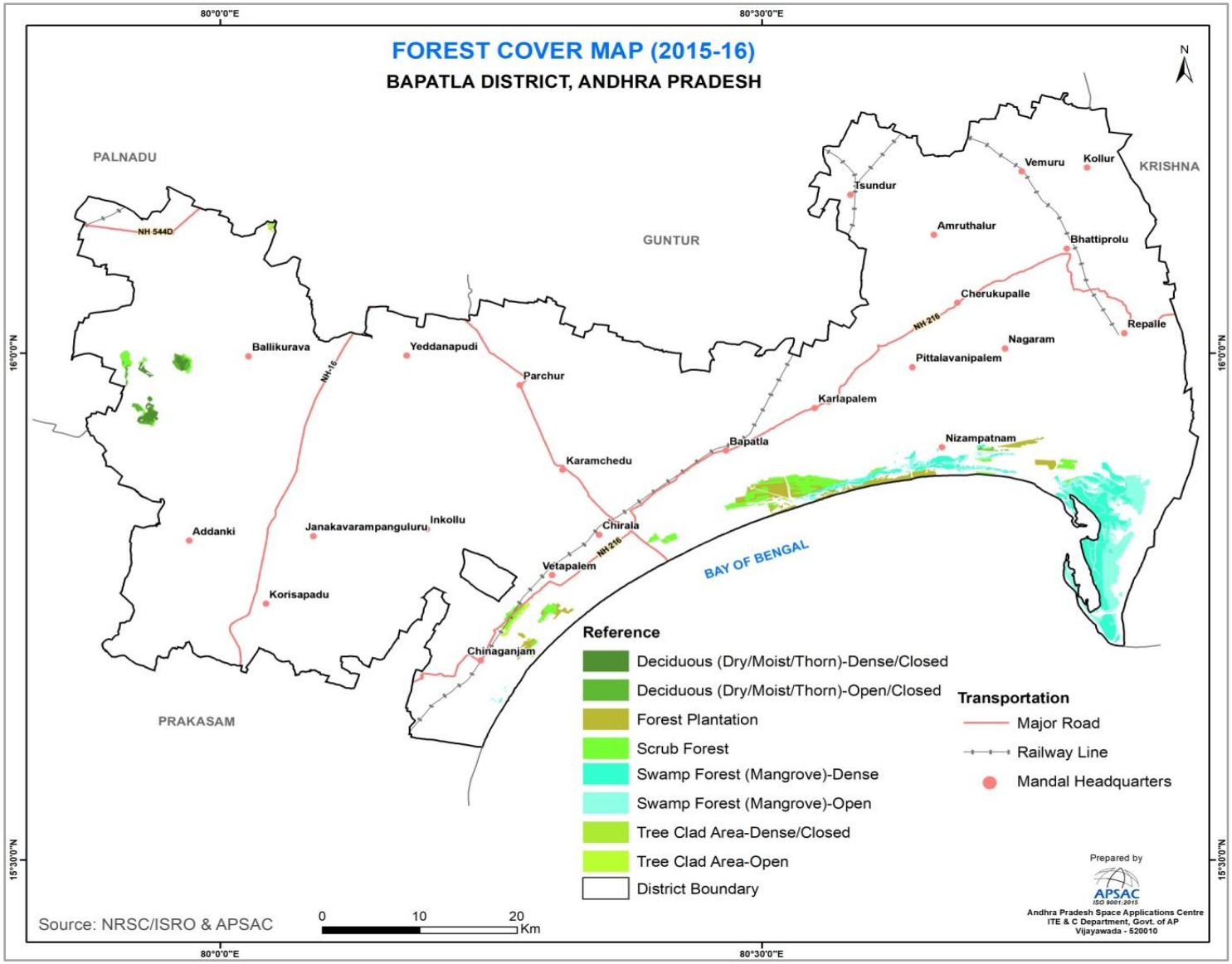


Figure-8: Forest cover map of Bapatla District

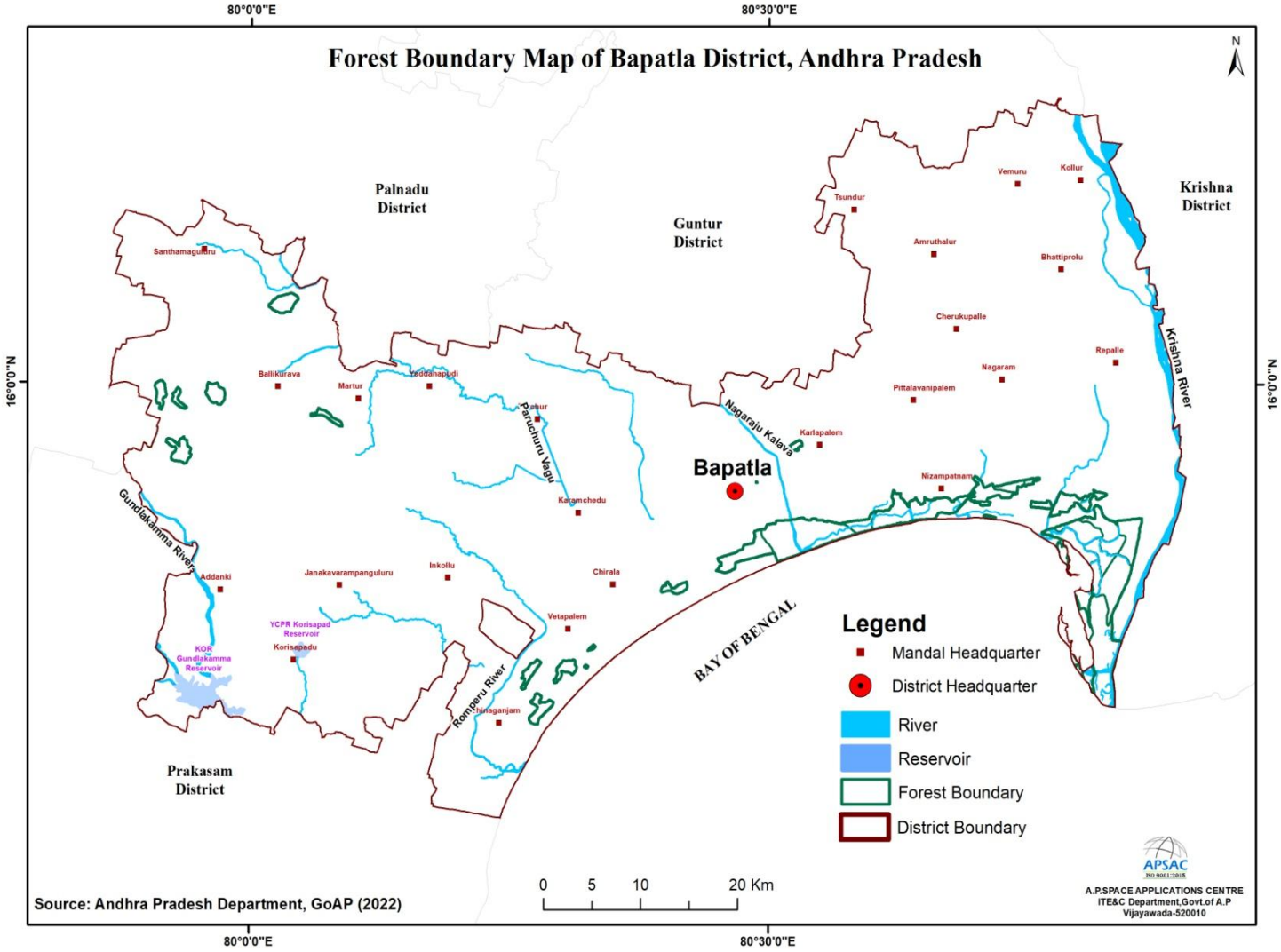


Figure-9: Forest boundary map of Bapatla District

1.4.4 Agricultural Resources in Bapatla District

Remote sensing technology has been successfully used by APSAC during the last two decades in the areas of agriculture both in the spatial and temporal domain under various projects. The vegetation conditions and ranges are shown in the 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

1.4.5 Soil Resources of Bapatla District

The different types of soils are encountered in the Bapatla district of Andhra Pradesh. The predominant soil types in the district are loamy to clayey skeletal deep reddish brown soils (1169.52 sq. km) followed by moderately deep calcareous black soils (828.63 sq. km), clayey to gravelly clayey moderately deep dark brown soils (744.6 sq .km), deep black clayey soils (681.83 sq. km), dark grayish brown moderately deep stratified loamy soils (145.83 sq.km), moderately deep calcareous moist clayey soils (100.8 sq.km.), shallow gravelly red soils (67.8 sq.km.), very dark brown moderately deep wet silty soils (55.29 sq.km.), light gray deep sandy soils (39.44 sq.km.) and shallow loamy to gravelly clay red soils (5.91 sq.km). The soil resource map of the district is shown in Figure-10 and the soil category with area given in Table-8.

Table 8 Soil classes in Bapatla district

S.No	Classification	Area in Sq.km
1	Clayey to gravelly clayey moderately deep dark brown soils	744.6

2	Dark grayish brown moderately deep stratified loamy soils	145.83
3	Deep black clayey soils	681.83
4	Light gray deep sandy soils	39.44
5	Loamy to clayey skeletal deep reddish brown soils	1169.52
6	Moderately deep calcareous black soils	828.63
7	Moderately deep calcareous moist clayey soils	100.8
8	Shallow gravelly red soils	67.8
9	Shallow loamy to gravelly clay red soils	5.91
10	Very dark brown moderately deep wet silty soils	55.29

Data Source: APSAC, Vijayawada

1.4.6 Salt-affected land:

The term 'salt-affected soil/land' refers to soils in which salts interfere with normal plant growth. Salt-affected soils can be divided into saline, saline-sodic and sodic, depending on salt amounts, type of salts, the amount of sodium present, and soil alkalinity. (Reference FAO Soils Portal)

These lands contain an excessive concentration of salts (soluble salts or exchangeable saline or both). Salinization can result from improper management of canal irrigation water, resulting in the rise of the water table and consequent accumulation of salts in the root zone in arid, semi-arid, and sub-humid (dry) conditions and ingress of seawater in coastal regions and/or use of high-salt containing groundwater. They also become saline when soils have developed salt-containing parent materials or have saline groundwater. Coastal saline soils may be with or without ingress or inundation by seawater. The salt-affected soil/ land area in the Bapatla district is 11,894 hectares. Figure-11 illustrates the spatial distribution of salt affected soil in Bapatla district.

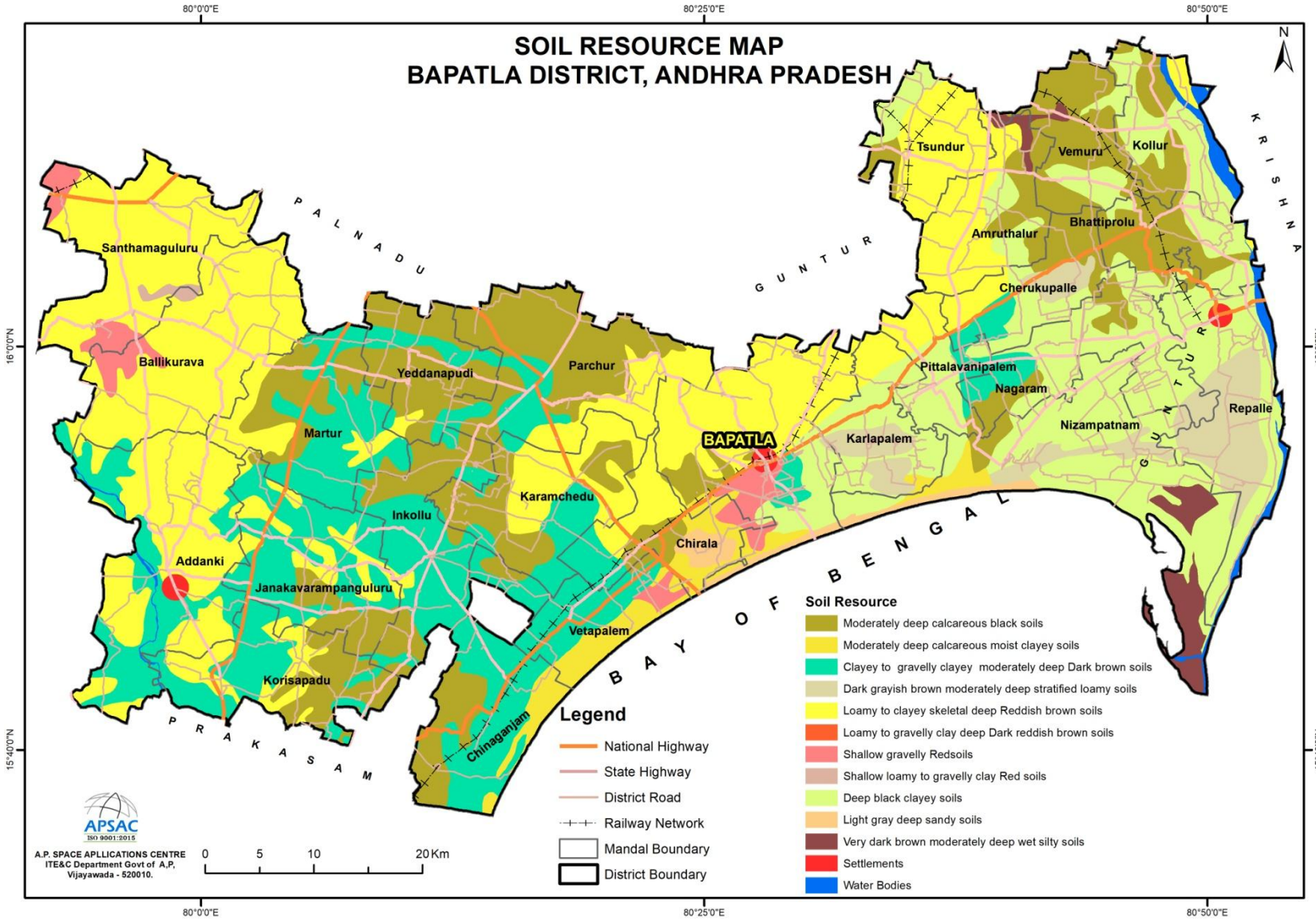


Figure-10: Soil resource map of Bapatla District

1.4.7 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 treesand lawns.

In the Bapatla district, Sweet Orange is the major horticulture crop, cultivated in an area of 7.31 ha. Followed by Mangoes (7.31 ha.), Coconut (6.2 ha.), Banana (4.25 ha.), Guava (2.26 ha.) and Acid lime (2.03 ha.). The total area under horticulture (fruit) crops is 33.71 ha. The horticulture crop-wise detail is shown in the Table-9.

Table 9 Area of horticultural crops in Bapatla district

S.No	Crop	Area in ha
1	Jamun	0.77
2	Dragon Fruit	1.25
3	Banana	4.25
4	Custard Apple	1.33
5	Sweet Orange	8.31
6	Mangoes	7.31
7	Guava	2.26
8	Acid Lime	2.03
9	Coconut	6.2
	Total Area	**33.71**

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

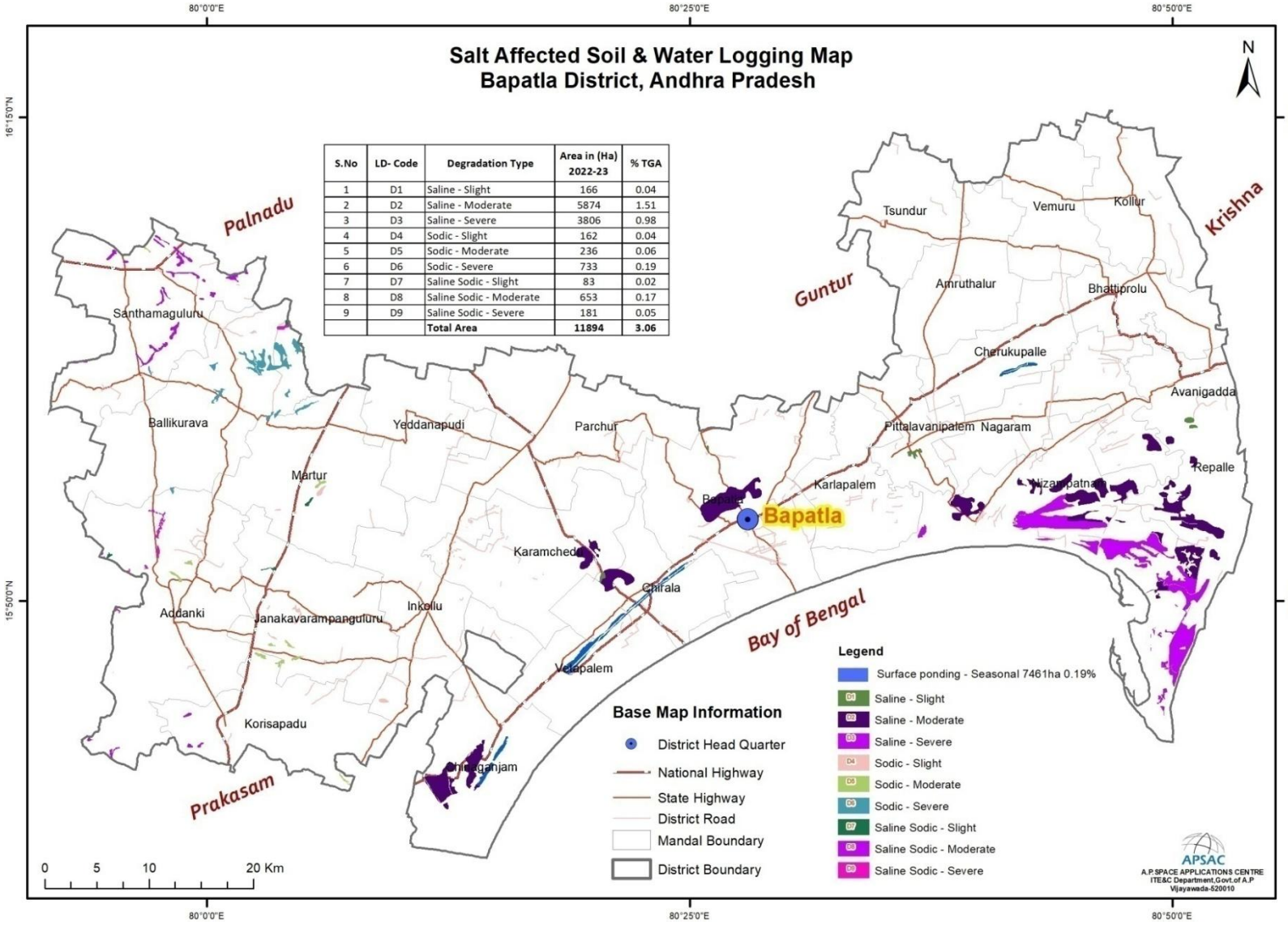


Figure-11: Illustrates the spatial distribution of salt affected soil in Bapatla district.

1.4.8 Eco-sensitive areas of Bapatla District

1.4.8.1 Shoreline Change Status of Bapatla District

The shoreline change estimation was carried out for entire Bapatla coast which is about 104.08 km in length. In this study, shorelines were extracted from satellite images for 1989, 1999, 2005, 2010 and 2012 by visually interpretation. The coast- line rate of change was calculated using Digital shoreline Analysis software (DSAS) and two different statistical techniques; End Point Rate (EPR) and Linear Regression Rate of Change (LLR). The Base lines were constructed seaward of and parallel to the general trend of the shorelines. Using DSAS transects were spaced 200m apart. Rates of shoreline change were calculated at each transect using linear regression. As a result of the analyses, the most significant changes were observed at Bapatla coast. Summary statistics for the rate of change is given in Table-10 and shown in Figure-12. Shoreline changes are presented with an emphasis on shoreline erosion, because it is an important natural coastal risk along coastal wetland. Table-10 Summarizes shoreline change statistics, including both erosion and accretion. The coastal area land loss is arising primarily because of natural changes in the coastal system, and because of human activities such as agriculture, irrigation, reclamation and fisheries.

Table 10 Shoreline Characteristics and statics for Bapatla Coast

Classification of Coast	Extent (km)	Percentage of Coast (%)	Cumulative (%)
Length of coastline Including River Mouth and Ports	104.08		
High Erosion	5.26	5.05	
Moderate Erosion	8.44	8.11	
Low Erosion	3.19	3.06	*16.22
Stable	26.69	25.64	25.64
Low Accretion	25.08	24.10	
Moderate Accretion	21.26	20.43	
High Accretion	14.17	13.62	$ 58.14
Number of port/Harbour	1		
Number of Breakwater / Groyne /Seawall	0		

** (High Erosion % + Medium Erosion % + Low Erosion %)*
$(High Accretion % +Medium Accretion % + Low Accretion %)
Data Source: APSAC, Vijayawada

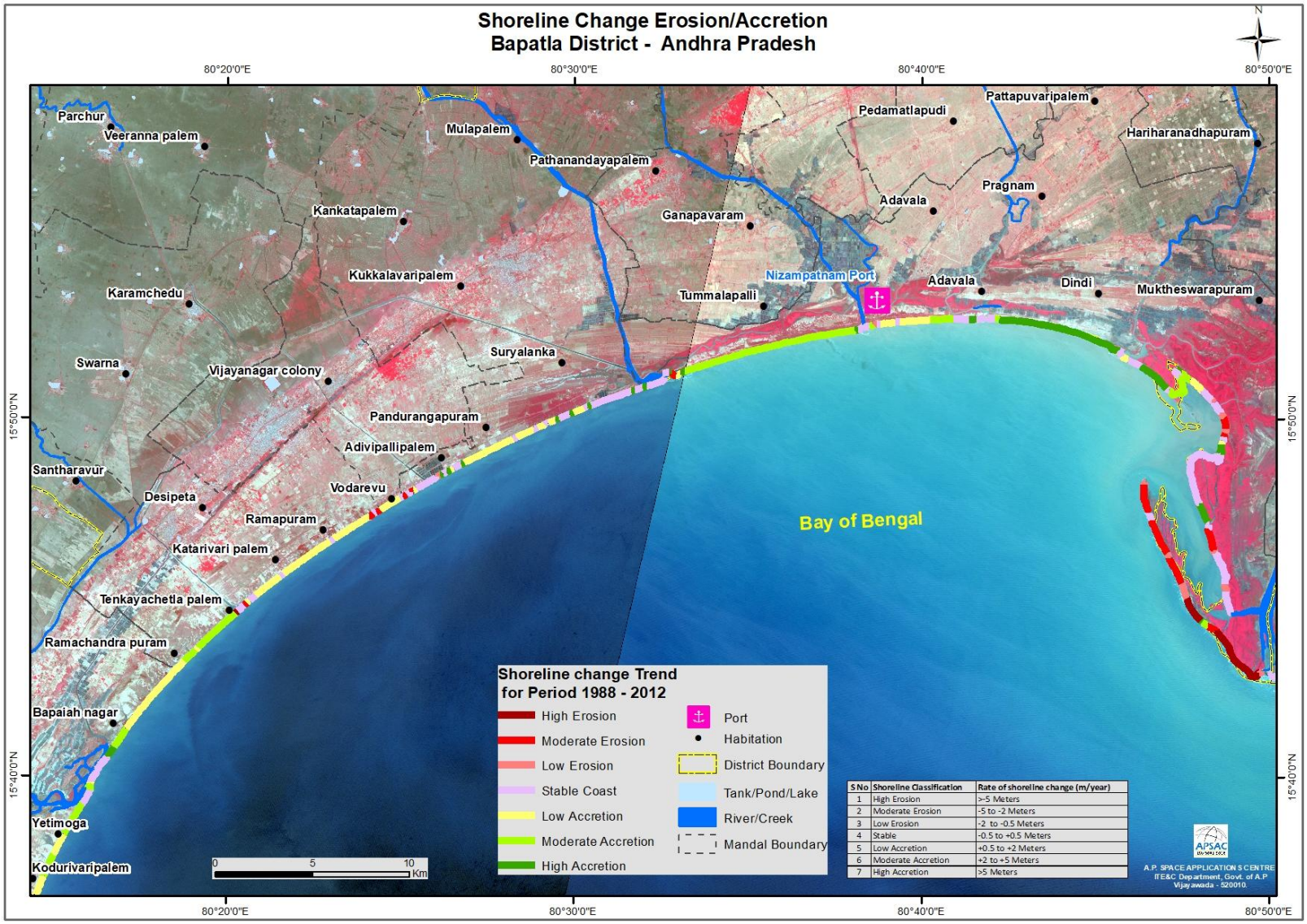


Figure-12: shoreline changes along the coastline of Bapatla district

1.4.8.2 Aquaculture in Bapatla District

Using high resolution satellite data coupled with ground survey existing aquaculture sites, potential areas for aquaculture development and abandoned aquaculture regions are mapped in the Bapatla district and mandal wise/ village wise area statistics are generated and shown in the following Table-11.

The spatial distribution of the aquaculture is shown in Figure-13. It is observed that the total area suitable for acquaculture in the district is 16303 Ha, of which 7634 Ha is presently under Aquaculture, 7749 Ha under abandoned /dry/ potential aqua area. The predominant area suitable for acquaculture is distributed in Chinaganjam, Nizampatnam, Repalle and Karlapalem mandals. The maximumum extent of aquaculture area is distributed in Nizampatnam Mandal i.e 5880 Ha, of which 3159 Ha is presently under acquaculrure and 2721 Ha is under abandoned /dry / potential. The least extent is noticed in Bhattiprolu mandal i.e 4.73 Ha.

Table 11 Mandal wise Aquaculture in Bapatla District (Area in Ha)

SNo	Mandal Name	Aquaculture (Hectares)	Dry/ Abandoned/ Potential (Hectares)	Saltpans (Hectares)	Total (Hectares)
1	Addanki	85.62	345.65		431.26
2	Amruthalur	17.51			17.51
3	Ballikurava	47.37	19.59		66.96
4	Bapatla	282.70	218.61		501.31
5	Bhattiprolu	4.73			4.73
6	Cherukupalle	66.23			66.23
7	Chinaganjam	1041.14	1692.54	921.09	3654.78
8	Chirala	42.36	126.43		168.79

9	Karlapalem	828.10	377.77		1205.86
10	Nagaram	165.98	144.14		310.12
11	Nizampatnam	3159.02	2721.14		5880.16
12	Pittalavanipalem	225.03	287.22		512.25
13	Repalle	1371.37	1347.80		2719.17
14	Santhamaguluru	49.83	39.02		88.85
15	Vetapalem	246.65	429.03		675.68
Total		**7633.64**	**7748.94**	**921.09**	**16303.66**

Data Source: District Mines and Geology Officer, Bapatla District

1.5 Ground Water Prospects in the District:

Ground water occurs in almost all geological formations and its potential depends upon the nature of geological formations, geographical setup, and incidence of rainfall, recharge and other hydrogeological characters of the aquifer. In consolidated formations, ground water occurs under unconfined to semi-confined conditions. Ground water is developed in these formations by dug wells, dug cum bore wells and bore wells tapping weathered and fractured zones. The groundwater prospects are very good in delta area, good to moderate in the middle, moderate to poor in westren the parts district and poor to negligible in the upland areas of Ballikurava, Santamanguluru, Addanki and its surroundings. The ground water prospects map of the Bapatla district shown in Figure-14.

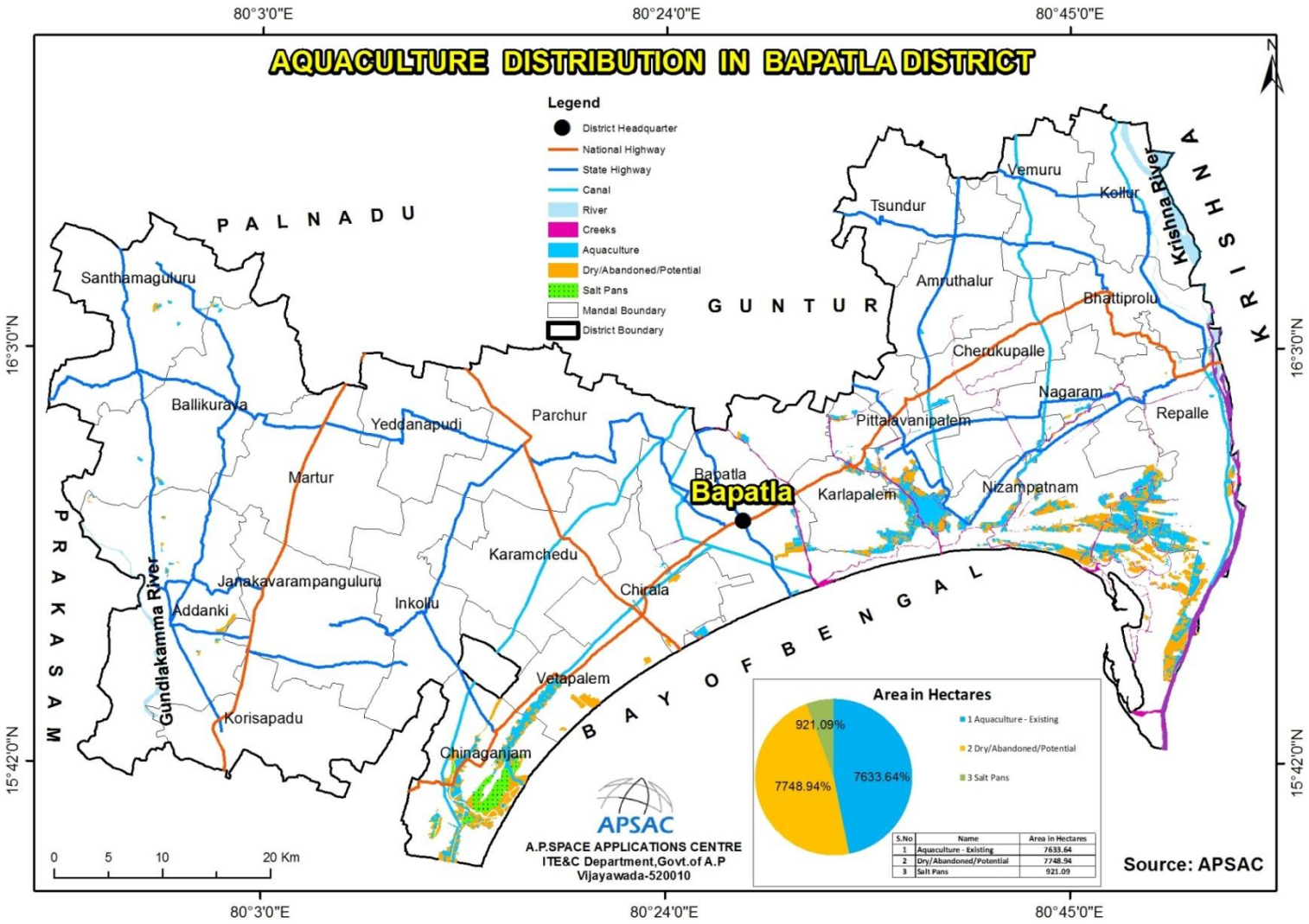


Figure-13: Area of Aquaculture Distribution in Bapatla District

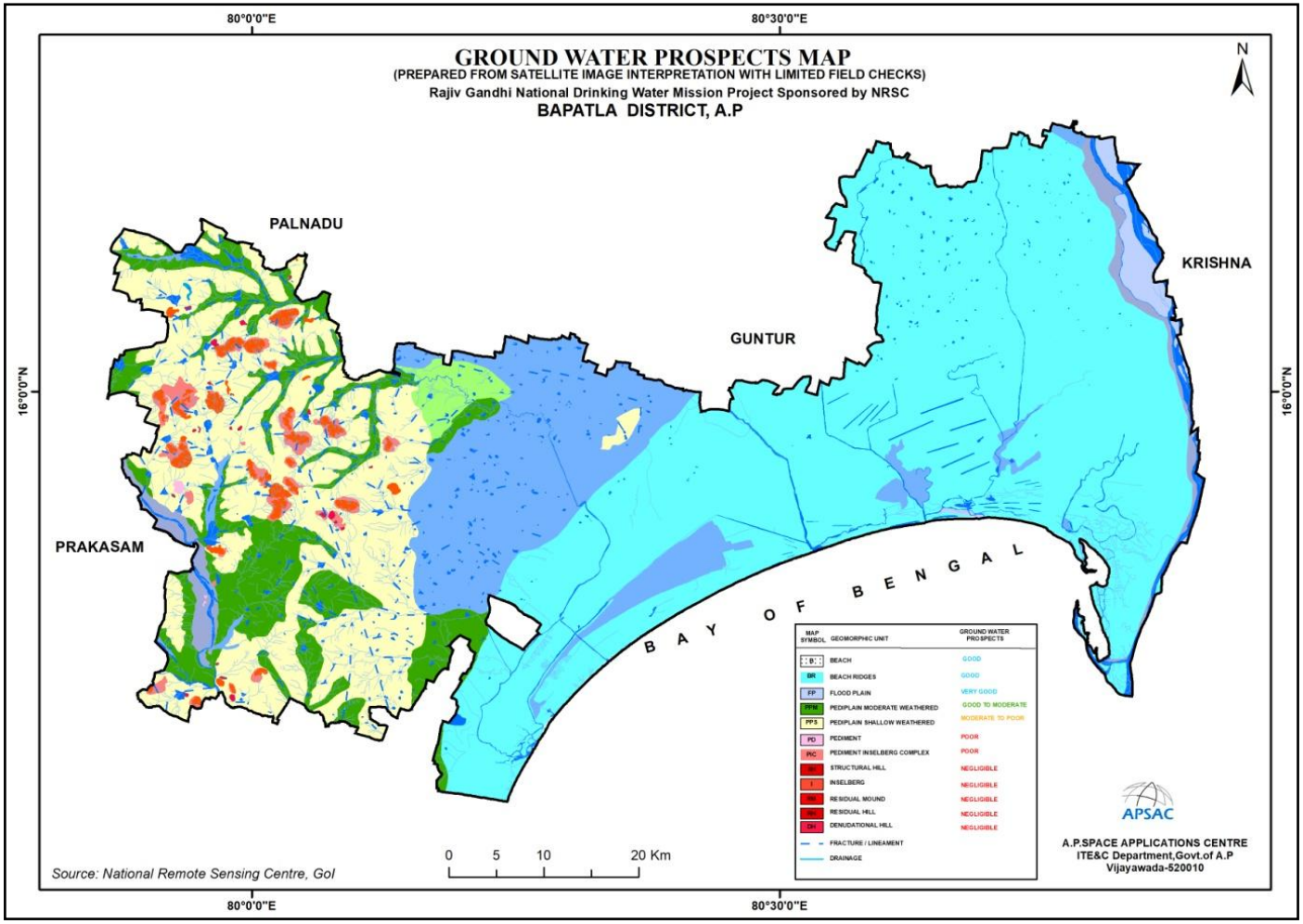


Figure-14: Ground Water prospects in Bapatla District, Andhra Pradesh

1.6 Infrastructure

1.6.1 Transport Network

Bapatla district has a well-connected by various modes of transportation such as Road, Rail and Seaports. Transport network map is given in Figure-15. The details of each transport network distribution in the district is 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 Bapatla district has a well-developed road network that facilitates connectivity to all 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 8,980.16 km. Of which, the length of the National Highways is about 193.13 km, State Highways is having a length of about 512.92 km connecting all major towns and cities in the district. The district roads are connecting all towns and mandals having a length of 1,461.16 km. The length of each road category covered in the district is shown in Table-12.

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

1.6.1.1.1. National Highway 216 (NH216): The former highways of NH 214 and 214A were merged and renumbered as NH 216 in the state of Andhra Pradesh. This highway starts from NH 16 junction at Kathipudi in Kakinada district and passes through Pithapuram, Kakinada and Thallarevu mandals in Kakinada District, Mummidivaram, Amalapuram and Razole mandals in Konaseema district, Narasapuram and Mogalthur mandals in West Godavari district, Bantumilli, Pedana, Machilipatnam and Mopidevi in Krishna district before enters in Bapatla district, The highway enters in the district at Repalle mandal and passes through Bhattiprolu, Cherukupalle, Bapatla, Chirala, Vetapalem and Chinaganjam mandals and it connects NH 16 junction at Ongole mandal in Prakasam district.

1.6.1.1.2. 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 NH starts at Odisha border which passes through the coastal districts in Andhra Pradesh and enters at Ichchapuram Mandal in Srikakulam district and passes through the Srikakulam, Vizianagaram, Visakhapatnam, Anakapalli, Kakinada, East Godavari, Eluru, Krishna, Guntur and Palnadu districts with covers major mandals namely Tekkali, Etcherla, Bhogapuram, Anandapuram, Pendurthi, Anakapalle, Tuni, Prathipadu, Rajahmundry, Devarapalli, Eluru, Gannavaram, Vijayawada, Mangalagiri, Guntur and Chilakaluripet. It traverses through Bapatla District via Martur and Korisapadu mandals and connects Prakasam, S.P.S. Nellore and Tirupati districts before connects to Tamil Nadu Border at Tada in Tirupati district.

1.6.1.1.3. National Highway 544D (NH544D): The NH starts at Karnataka border and enters at Rayadurg mandal in Anantapuramu district, and passes through the Nandyal, Prakasam and Palnadu districts, it connects the Junction with NH44 near Anantapuramu and passes through the mandals Singanamala, Tadipatri in Anantapuramu district, Kolimigundla, Owk and Banaganapalle mandals in Nandyal district. It traverses through Giddalur, Bestawaripeta, Cumbum and Tripurantakam mandals in Prakasam district and passes through Vinukonda, Savalyapuram and Narasaropeta mandals in Palnadu district, and enters at Santhamaguluru mandal in Bapatla district and connects NH16 at Guntur mandal in Guntur district via Narasaraopet and Phirangipuram mandals.

1.6.1.1.4. National Highway 167A (NH167A): The Highway Passes through the junction with Andhra Pradesh and Telangana border and enters at Dachepalle in Palnadu district and traverse through mandal headquarters such as Piduguralla, Nekarikallu, Narasaraopet, Chilakaluripet and Enters in Parchur mandal in Bapatladistrcit It traverse through Karamchedu mandal and connects at NH-216 near Chirala mandal passing through Bapatla district.

Some important State Highway segments covered in the district are given below.

Paruchuru – Pedajagarlamudi – Purimetla Road (SH071)
Narketpally - Addanki - Medarmetla Road (SH036)
Addanki-Santamagalur Road via Dharmavaram (SH342)

Tenali- Vellaturu - Peddapulivaru - Penumudi road (SH265)
Bapatla - Parchuru Road (SH281)
Brahmanakoduru - Bhatiprolu (NH-216) Road (SH269)

Table 12 Road Category wise Lengths

S.No	Road Type	Length in Km
1	National Highway	193.13
2	State Highway	512.92
3	District Road	1461.16
4	Village Road	3853.12
5	Cart Track	2279.62
6	Foot Path	527.60
7	City Road	152.61
Total Length		**8980.16**

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

1.6.1.2. Railways: The Indian Railway line traversing from North to South in Bapatla district covering the various stations to cater the transportation needs of the people. The length of rail network in the district is about 107.71 km covering 20 railway stations. Among these are the important railway stations in the district are Bapatla, Bhattiprolu, Chinnaganjam, Chirala, Pallikona, Repalle, Tsunduru, Vemuru, Vetapalem; and the railway stations are Appikatla, Ipurupalem, Jandrapeta, Kadavakuduru, Kotta Pandillapalli, Modukuru, Penumarru, Stuartpuram, Uppugunduru, Vellalcheruvu Halt and Zampini Halt.

Bapatla 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 Bapatla district is Vijayawada- Gudur section railway line that connects the stations Kondapalle, Vijayawada, Pedavadlapudi, Duggirala, Tenali Junction in Guntur & NTR districts. It passes through T.Sunduru, Bapatla, Chirala, Vetapalem, Chinnaganjam in Bapatla district and connects Ongole,

Tanguturu, Singarayakonda, Kavali, Bitragunta, Vedayapalem in Prakasam& S.P.S. Nellore districts, and destination to Gudur junction in Tirupati district.

In addition to the main line, there are various branch lines and spur lines namely Tenali - Repalle that extend from the main line to connect specific towns such as Vemuru and Bhattiprolu with in Bapatla district. These lines provide local connectivity and transportation services to different parts of the district.

1.6.1.3. Sea port: Andhra Pradesh has the 2nd longest coastline of 974 km in the eastern peninsular India, which accounts for 12% of the country's total coastline with one major port at Visakhapatnam under the administrative control of Central government and 15 notified ports inclusive of 3 captive ports under the control of state government with has development in the public-private partnership (PPP) mode. Bapatla district has two Green Field ports namely Nizampatnam and Vodarevu. The description of each port is as given below:

Nizampatnam Port is one of the minor ports (Green field port) located in the state of Andhra Pradesh. It is situated in the Nizampatnam area at a distance of about 32 km from head quarter.

Vodarevu Port, also known as Vodarevu beach port, is one of the underdevelopment ports in the state of Andhra Pradesh, near Vodarevu. It is located at a distance of about 15 km from the district headquarters. On completion of the construction, it would cater to various industries and facilitate the movement of goods, thereby boosting trade and economic activity in the region.

1.6.2 Irrigation

1.6.2.1. Major and Medium Irrigation Projects in Bapatla district:

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-13 and Figure-16.

1.6.2.1.1. Major Irrigation Projects:

There are three major irrigation projects in Bapatla district i.e., Krishna Delta System (KDS), Nagarjunasagar Project (NSRC) and KandulaObula Reddy Gundlakamma Reservoir Project. The Krishna Delta System (KDS) an ayacut of 3, 63,946 Ac, Nagarjunasagar Right Canal (NSRC - AddankiBranch) an ayacut of 1,69,874 Ac and KandulaObula Reddy Gundlakamma Reservoir Project (Combined District) an ayacut of 80,060 Ac .

1.6.2.1.2. Medium Irrigation Projects:

There was one medium irrigation project in Bapatla district i.e., Yerram China Poli Reddy Korisapadu Lift Irrigation Scheme under an ayacut of 14,000 Ac (YCR Korisapadu LIS).

There are 105 minor lift irrigation schemes in the district under Andhra Pradesh State Irrigation Development Corporation Limited (APSIDC), covered an ayacut of 96,291 Ac. And also 41 nos of minor irrigation tanks covered in the district (Water Resources Dept.) covered an ayacut of 9,482 Ac.

Table 13 Major and Medium Irrigation Projects in Bapatla District

S. No	Project Type	Name of the Project	Status	Ayacut in Ac
1	Major	Krishna Western Delta (KDS)	Completed	3,63,946
2		Nagarjunasagar Project (NSRC)		1,69,874
3		KandulaObula Reddy Gundlakamma Reservoir Project **(Combined District)**	Ongoing	80,060
4	Medium	YCR Korisapadu LIS		14,000
5	Minor	Lift Irrigation Schemes under APSIDC (105 Nos)	Ongoing	96,291
6		Minor Irrigation Tanks - Water Resources Dept. (above & bellow 100 Acres-41 Nos)	Completed	9,482
			Total	**7,33,653**

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

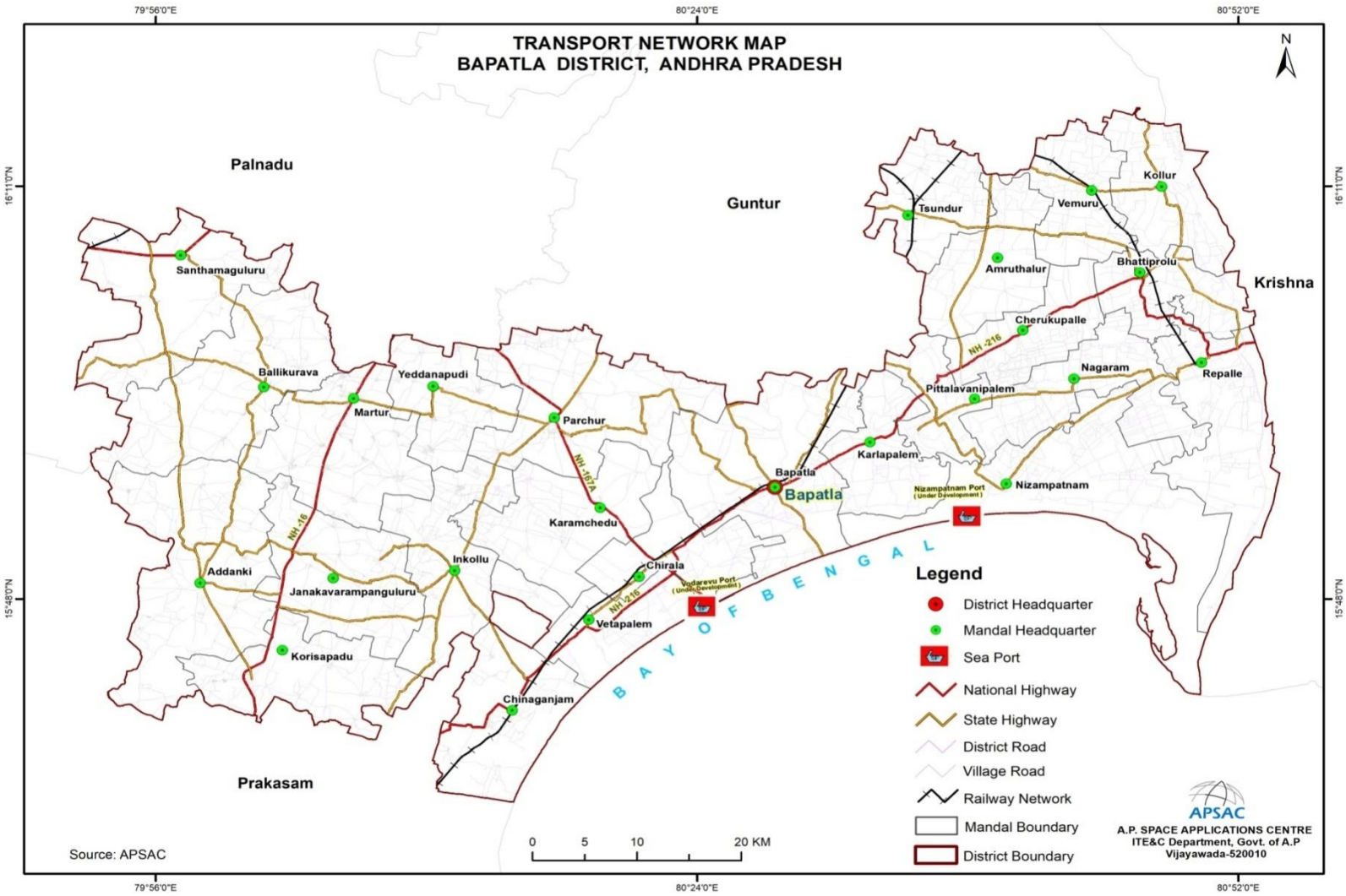


Figure: 15 Transport Network of Bapatla district, Andhra Pradesh

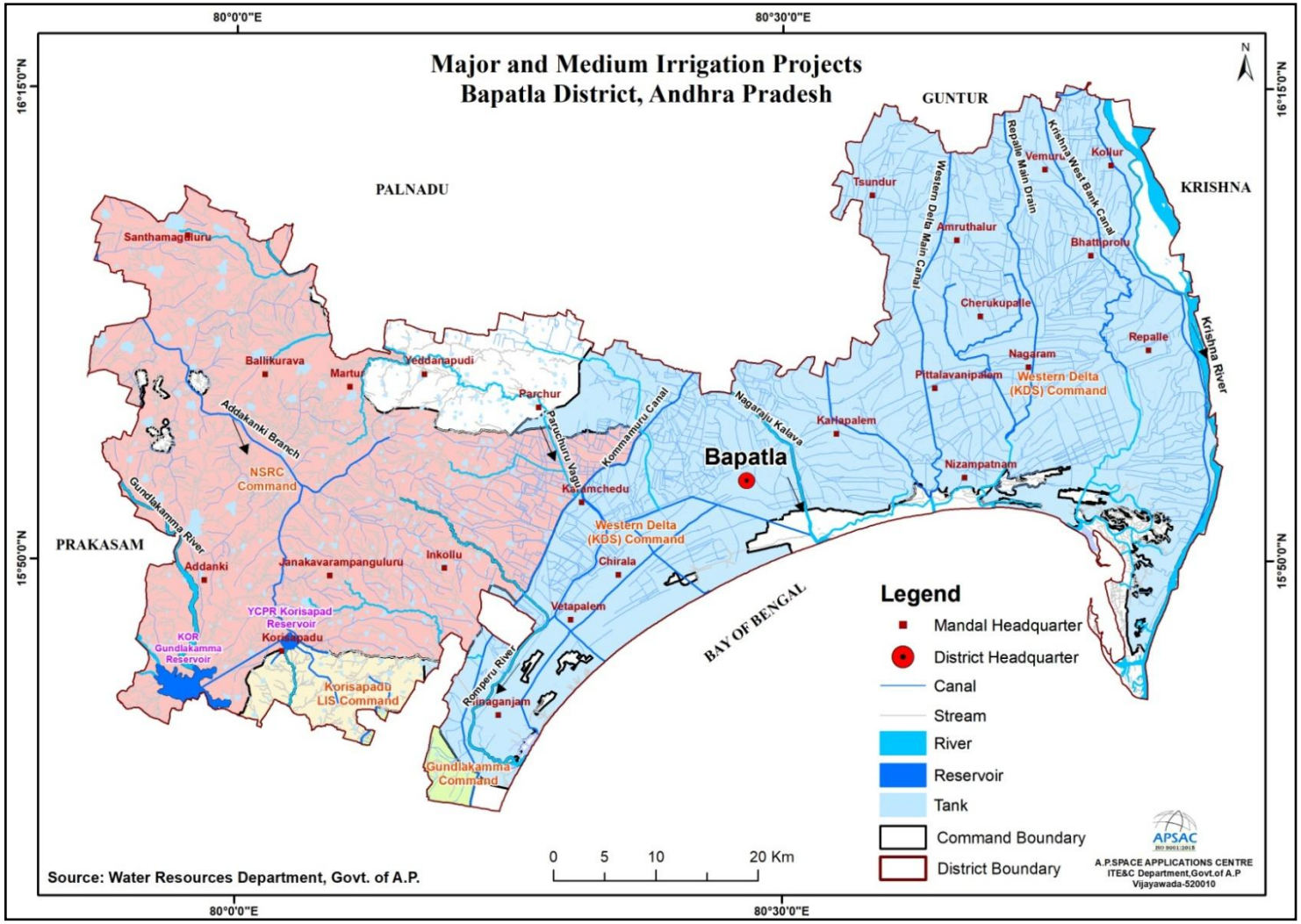


Figure-16: Major and Medium Irrigation Projects of Bapatla District

1.6.2.2. 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 Bapatla districts have 46 minor irrigation tanks covered in Addanki and Parchur Assembly Constituencies. The Designed Storage Capacity of minor irrigation tanks in Bapatla district is 951.82 mcft and Current Storage Capacity is 666.42 mcft. The mandal wise minor irrigation tanks details of Bapatla district are shown in Table-14.

Table 14 Mandal wise Minor Irrigation Tanks details of Bapatla district

S.No	Mandal	No.of MI Tanks	Designed Storage Capacity (mcft)	Current Storage Capacity (mcft)
1	ADDANKI	14	315.93	202.83
2	BALLIKURUVA	9	272.93	175.12
3	JANAKAVARAMPANGULU	6	97.76	73.87
4	KORISAPADU	4	39.53	22.34
5	MARTUR	4	43.45	30.24
6	PARCHUR	1	15	11.25
7	SANTHAMAGULURU	7	162.2	145.74
8	YEDDANAPUDI	1	5.02	5.02
	TOTAL	**46**	**951.82**	**666.42**

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

1.6.3 Eco-Sensitive and Important places

Bapatla 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 Bapatla district are shown in the Table-15 and the geographical location of each place is depicted in Figure-17.

Table 15 Important places of Tourism in Bapatla district.

S.No	Name	Village	Mandal
1	Bapatala Bhava Narayan Swami Temple	Bapatla (M)	Bapatla
2	Chandolu Siva Temple	Arumbaka	Cherukupalle
3	Nijampatnam Beach	Dindi	Nizampatnam
4	Nijampatnam Harbor	Dindi	Nizampatnam

S.No	Name	Village	Mandal
5	Repalli SivaTemple	Repalle (M)	Repalle
6	Sri Prassana Anajneya Swamy Temple	Bapatla (M)	Bapatla
7	Suryalanka Beach	Dindi	Nizampatnam
8	Vodarevu Beach	IpuruPalem (Rural)	Chirala

Data Source: Tourism Department, Government of Andhra Pradesh.

A brief description of certain tourist places are given below:

1.6.3.1. Suryalanka Beach: Suryalanka beach or Bapatla beach is located approximately 9 km from Bapatla. The place has many resorts close to the beach. The beach is famous for the sweeping views of the sun, sea and sand. It is also ideal for swimming.

1.6.3.2. Vodarevu Beach: It is located 8 Km from Chirala and about 19.4 km to the district headquarter i.e. Bapatla. Vodarevu is one of the most visited beaches, offering exciting water sport activities and fishing options including boat rides.

1.6.3.3. Ramapuram Beach: Ramapuram beach is located at a distance of about 21 km from the district headquarter i.e. Bapatla. It is considered to be one of the cleanest and most peaceful beaches.

1.6.3.4. Nizampatnam Beach: Nizampatnam beach is located at a distance of about 32 km from the district headquarter i.e. Bapatla. Nizampatnam Beach is a popular beach situated in the Nizampatnam town. It is known for its natural beauty and serene environment, making it a favoured destination for tourists and locals alike.

1.6.3.5. Nizampatnam Harbour: Nizampatnam Harbour is located at a distance of about 32 km from the district headquarter. Nizampatnam Harbor, also known as Nizampatnam Port, is a significant fishing harbor located in the Nizampatnam town. It is one of the oldest and largest fishing harbors in the region.

Nizampatnam Harbor plays a crucial role in supporting the fishing industry, as it provides a base for numerous fishing vessels and boats to operate from. The harbour is strategically situated on the eastern coast of India along the Bay of Bengal, making it a favourable location for fishing activities. The harbour not only facilitates local fishing operations but also contributes to the economy of the region through fish trade and export. It serves as a crucial link in the seafood supply chain, helping to transport and distribute fresh fish to various markets within India and for export to other countries.

1.6.4 Places of Religious and Cultural importance

1.6.4.1. Prasannanjaneya swamy temple: Prasannanjaneya swamy temple is located at a distance of about 54 km from the district headquarter. It is situated at Singarayakonda near Addanki and is a popular pilgrimage centre. This temple was said to be constructed in 15th century by Vijayanagara king Devarayalu. Mahasivaratri is celebrated in a grand manner at Ganga Bhramarambha Sameta Malleswara Swamy temple at Manikeswaram.

1.6.4.2. BapatlaBhavanarayana Swamy Temple: Bapatla Bhavanarayana Swamy Temple is located 350 meters away from the district headquarter. It is an ancient temple dedicated to Venugopala Swamy. Pavitrotsvam and Rathotsavam will be celebrated in a grand; thousands of devotees participate in these festivals. Currently, this temple is under the control of Archaeological Survey of India department. The main deity KsheeraBhavanarayana Swamy is residing here with His consort Sundarvalli. The deity here is Swayambhu.

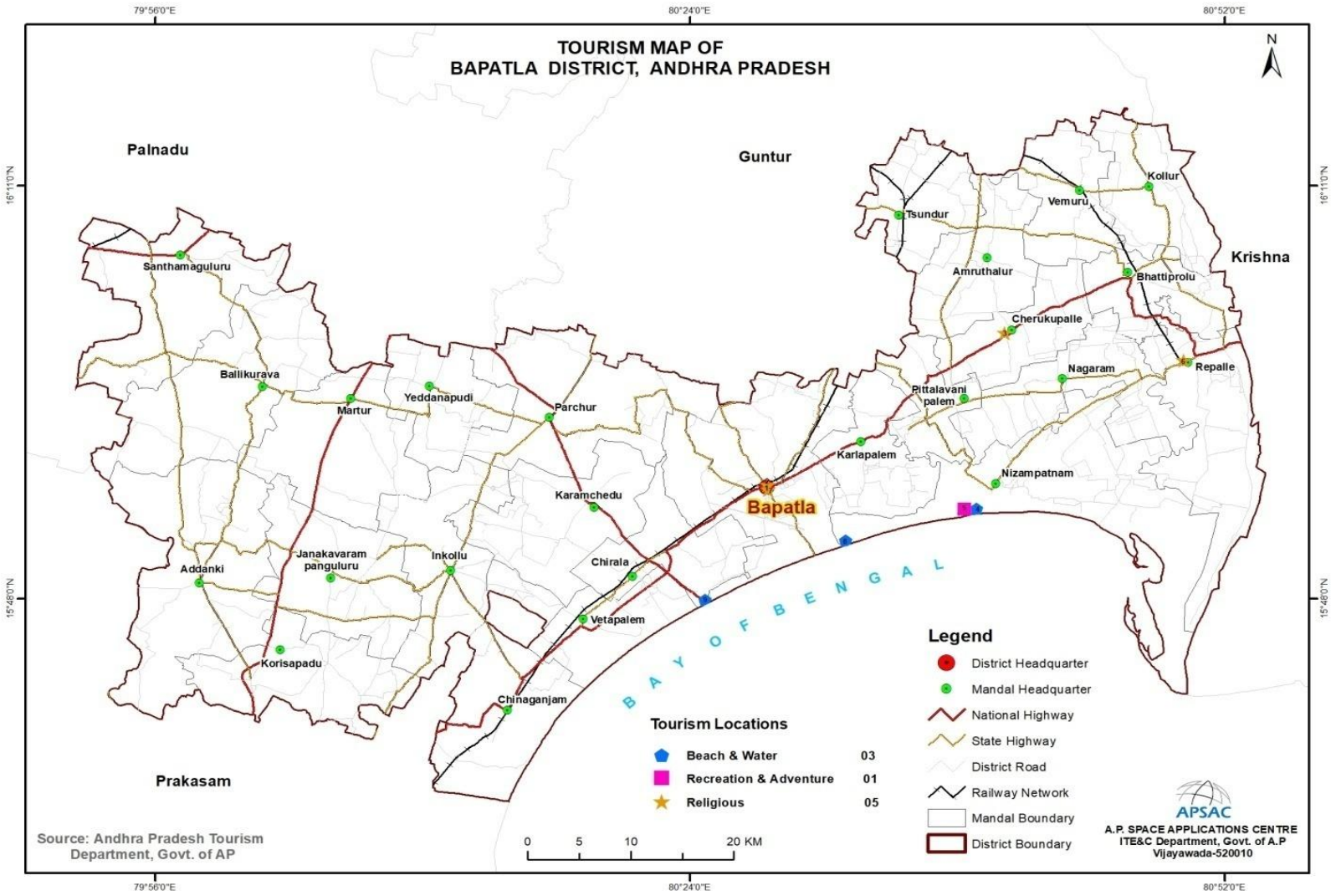


Figure-17 : Tourist Map of Baptala District, Andhra Pradesh

1.7 Drainage Pattern

1.7.1 Drainage

The district is bounded on the North by Guntur District, on the West by Palnadu/Narasaraopet and Prakasam Districts, on the South by Bay of Bengal, on the East by Krishna Western Delta. The Krishna River, Romperu and VogeruVagu are major rivers flows in the district. The Krishna River is west side border of the district, Krishna river enters into north east part of the district near Chilumuru village, Kolluru mandal and joining to Bay of Bengal near Gangadipalem village, Nizampatnam mandal in Bapatla district.

The VogeruVagu is Major River in the district and the tributaries are NallamadaVagu, NakkaVagu. The NallamadaVagu and NakkaVagu originated near Gouthikonda hills, Nekarikallu of Palnadu district and enter into north part of the Bapatla district, merged with NagarajuKalva and joining to Bay of Bengal near Perali in Bapatla district.

The Romperuis Major River in the district and the tributaries are Aleru Nala, ParuchuruVagu, RamayyaVagu and SakkiVagu rises near Nagarajupalli hills and Bapana Konda, Martur in Bapatla district and merged into Romperu drain in Bapatla district. Figure-18 illustrates the drainage system and the surface water bodies.

1.7.2 Geomorphology of the District:

Using IRS satellite data and GIS detailed geological, geomorphological and structural map of Bapatla District was generated as per Rajiv Gandhi National Drinking Water Mission (RGNDWM) guidelines on 1:50,000 scale. The objective of is to map lithology, geomorphology and structural characteristics of an area on 1:50,000 scale and to integrate the same to locate potential ground water prospect zones and to recommend suitable structures for ground water recharge. Various hydrogeomorphic units are delineated and suitable recharge structures are proposed at drinking water affected villages under this project. The description of geomorphic units of different origins (Figure-19) mapped in the Bapatla District are presented below.

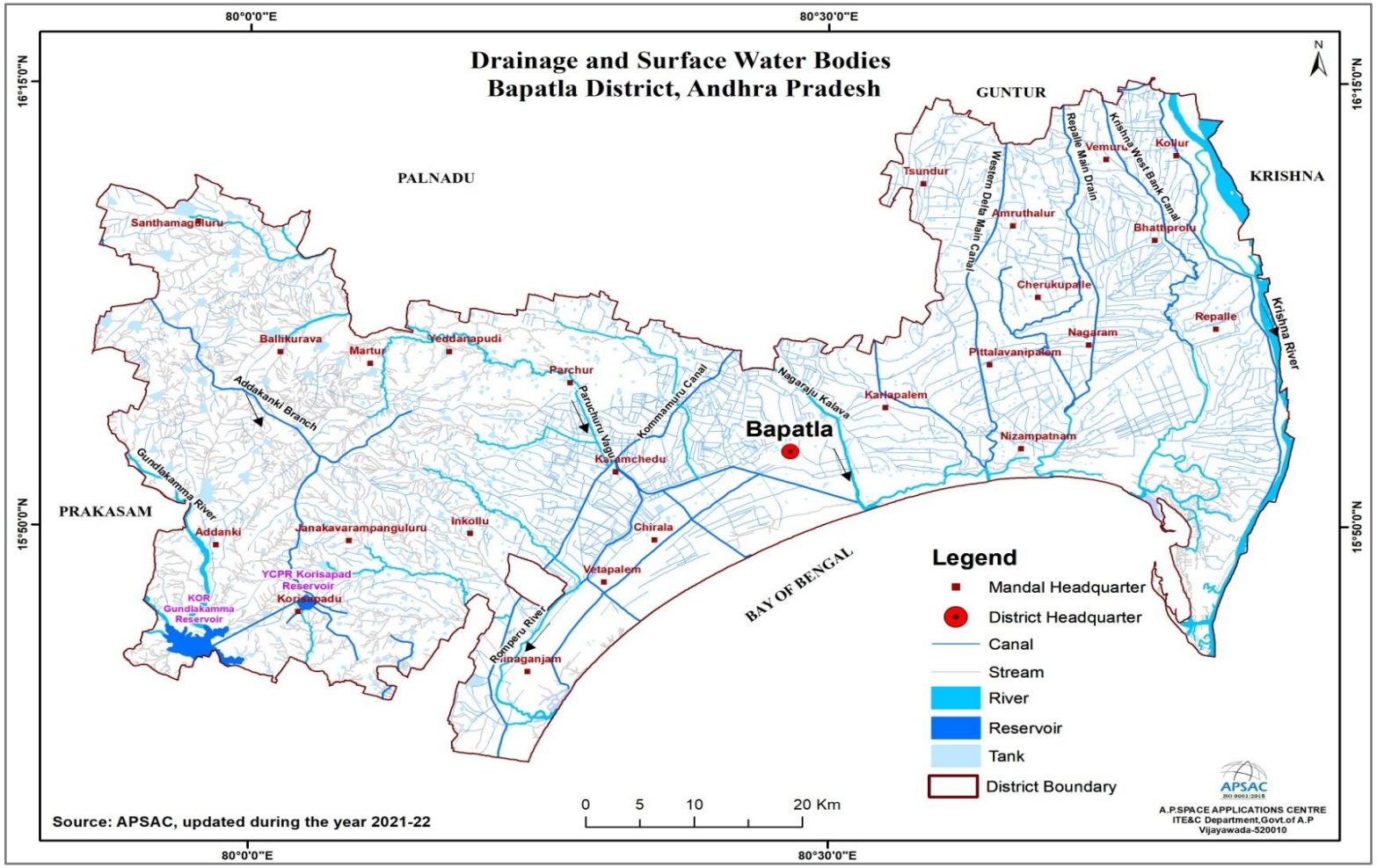


Figure - 18: Drainage Network and Surface Water Bodies of the Bapatla District

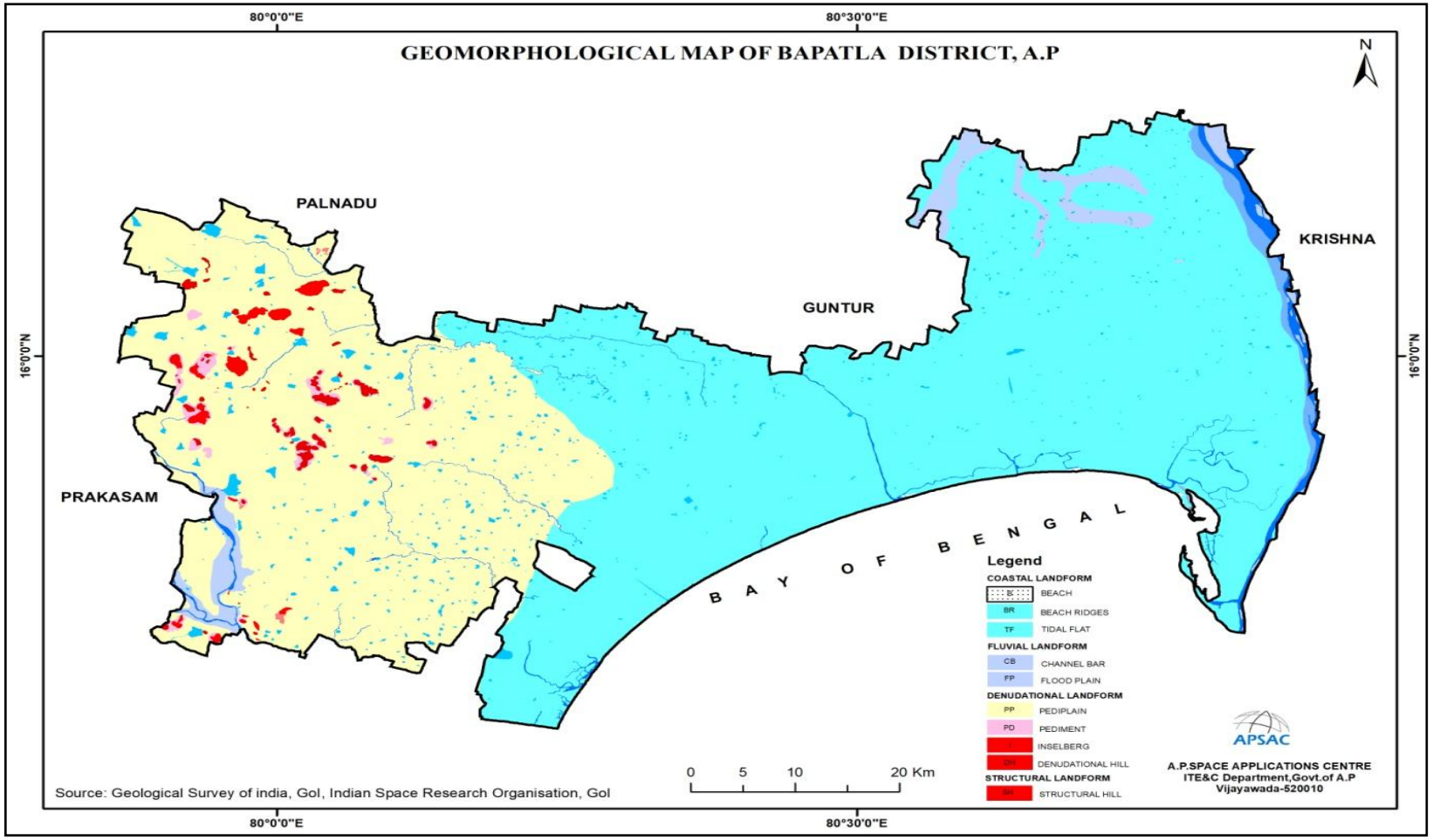


Figure 19: Geomorphology of Baptala District, Andhra Pradesh

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 is small at one time during the year, very large volumes of water move through the channel and they form 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 connection 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 that 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 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.

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 a considerable area enclosed and crossed by many distributaries of the main river. Perhaps extending beyond the general trend of the coast, and resulting 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 the action of ocean waves. 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 as a result of 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. Higher the wind speed and 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 therefore possess. Long open ocean waves or swells travel faster than short, locally generated sea waves. They also have longer wave periods and this is how they are distinguished from the short sea waves on reaching the coast. Long swells, which have travelled hundreds of kilometres, 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, therefore, remains unaffected by the floor. 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 and 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 do the 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 movement of beach material laterally. 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 build up 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 long shore currents. The movement of sediment is known as long shore drift, which is distinct from the beach drift described earlier, which operates on land at the beach. The combined movement of sediment via long shore 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. Long shore drift, long shore currents, and tidal currents in combination determine the net

direction of sediment transport and areas of deposition. Using multi-temporal satellite data can bring out 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 of 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, and 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

Landform of structural origin is related to the structural aspect of the area. Most of the landforms under this class have genesis related to the underlying structure. Structure plays an important role in reducing the resistance of rock which manifests itself in different geomorphic forms. Some of the variations is minor and some are in mega-scale. The mega-scale forms have a dramatic effect on the genesis of landforms and hence mapping of such forms indirectly indicates the structural setup of the area. The mega-scale structural features like fault and fold depending on their type play an important role in the genesis of structural landform. The influence of geologic structures on the development and appearance of landscapes is prominent. The influence of geologic structures ranges from large features, which exert a dominant influence on the form of an entire landscape, to small features, which affect an individual landform and the geomorphic processes operating on it. The structural control could be active structures whose form is directly impressed on the

modern landscape or ancient structural features whose influence on a modern landscape is due primarily to differential erosion (NRSA, 2007).

1.7.5.1. Structural Hills: Hills and valleys, which are originated due to the tectonic process and are highly dissected by the drainage lines. This 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 Bapatla District

Bapatla District has consolidated formations which include Crystallines (Khondalites, Charnockites and granitic gneisses) and Meta sediments (Dolomites, Shales, Phyllites and Quartzites) of Archaean and Pre-cambrian periods, respectively. The Khondalite Group of rocks are seen as prominent hill ranges (strike ridges) south of Vijayawada, extending towards north and northeast. The rocks of Khondalite and Charnockite groups, and the layered complex show foliation trending dominantly North-South with local swerves to NE(Northeast)-SW (Southwest) and NW (Northwest)-SE (South east) (GSI, 2000). The semi consolidated formations are represented by Tertiary formations (Rajahmundry and Gollapalli sandstones) and unconsolidated formations comprise deltaic alluvial deposits of the Quaternary period (CGWB, 2013). The Structural map of the Bapatla District is shown in Figure-20.

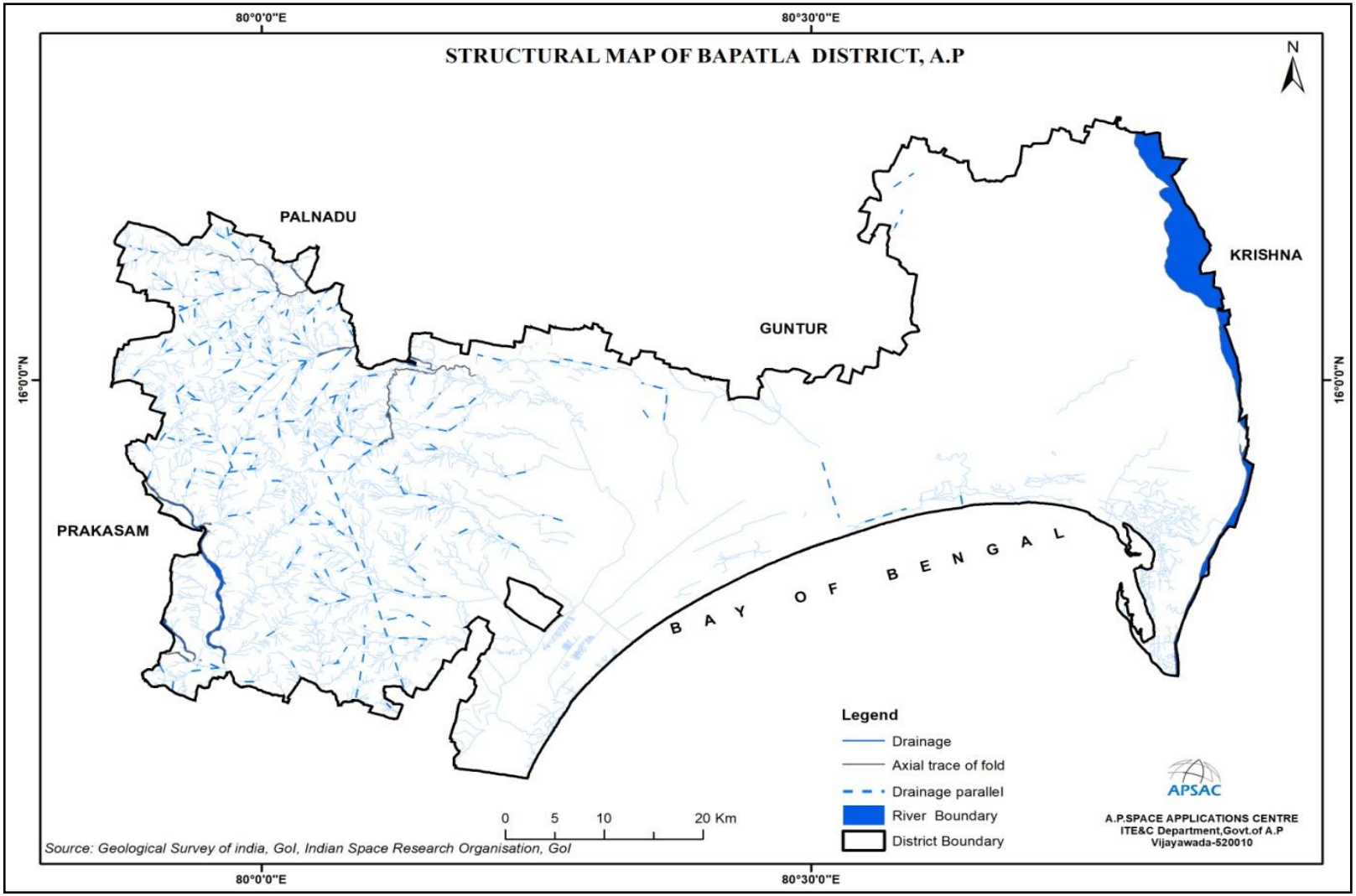


Figure-20 : Structural Map of Bapatla District, Andhra Pradesh

1.7.8 Ground Water Quality in the Bapatla District

Ground water quality laboratory analyzed for physico-chemical parameters like Total Dissolved Solids (TDS), Cl, NO_3, pH, F, Fe, TA and SO_4 using standard techniques, and ground water quality samples were collected for two seasons i.e., post-monsoon and pre-monsoon in December 2017 to June 2019 from Rural Water Supply and Sanitation Department (RWS and S) and compared with the Bura BIS (2015), in terms of desirable, permissible and non-potable classes. Blue, yellow and red colours 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 the ground water is polluted in pre-monsoon and post-monsoon about 15% of the area is under non-potable category due to high concentration of Fluoride, Nitrate, Iron, Total Hardness and alkalinity. About 75% of the area is potable category remaining 10% of the area is covered in hills and water bodies of entire the District. The occurrence and movement of ground water in an area is governed by several factors such as topography, lithology, geological structure, depth of weathering, the extent of factures, drainage pattern, climate conditions and inter relationship between these factors. The ground water quality map of Bapatla district shown in Figure-21.

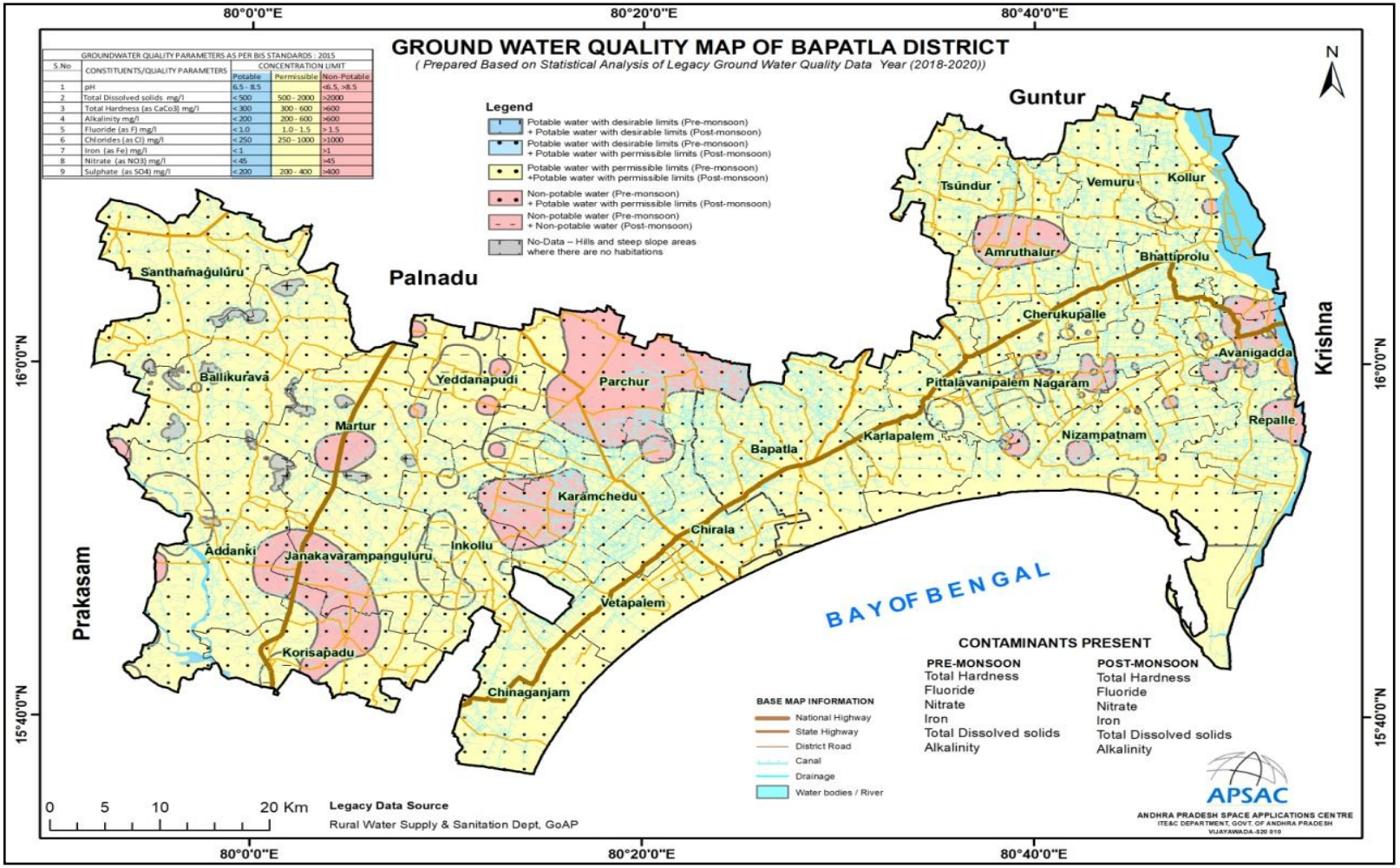


Figure-21: Ground Water Quality Map of Bapatla District

Chapter – II Minor Minerals

2.1 Overview of Mining Activity

The following leases exist in this Bapatla 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

Bapatla District is one of the chief minor minerals producing districts in the state and endowed with rich & varied minor mineral resources such as dimensional stone granite, silica sand, road metal, gravel and brick earth.

There are 156 minor mineral leases in force covering an area of about 459 Hectares. It is estimated that during the year 2022-23, 1,50,000 Cum of Color Granite, 36,750 Cum of Black Granite are produced and Department Collected Rs.81 Crores towards Minor Mineral Revenue Collections. About 1,000 Granite cutting & polishing units are operating in the district and acts as an important socio-economic zone.

2.2 Geology of the District

Generalized Litho-stratigraphic Succession of Andhra Pradesh

Geological Time (a)	Supergroup (b)	Group (c)	Formation (d)
Holocene	-	-	Alluvium, river terraces, beach

sands and soils				
Pleistocene		-	-	Laterite and Gravel
Mio-Pilocene		-	-	Rajahmundry Fm.
Late Cretaceous to 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, Sriperambadur Fms) Gollapalle Fm. (Satyavedu Fm.) Kamthi Fm. Barren Measures, Barakar Fm. Talchir Fm.
		Lower Gondwana	Kota Fm. Maleri 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	Charnockite with megacrystic k-feldspar charnockite
			Khondalites	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, Veligallu		Pyroclastic Rocks, local conglomerate / event conglomerate Metabasalt (Pillowed), Acid volcanics, minor and esite, dacite, rhyodacite, amphibolites, metaultramafics, minor

		Peddavuru Schist Belts & W.Part of Nellore Belt.	quartzite, calcsilicates, phyllites, intrusives of basic rocks and granites, rare lamprophyres.
Middle Archaean (3100-2900 y.m)	Older Supracrustals (Sargur)	Eastern and Southern parts of Nellore.	High Grade schists include includes 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.

Sargur Supracrustals is the oldest rock in Southern India. They are mostly present as enclaves. They occur as enclaves within the migmatitic gneiss. These supracrustals are exposed in the eastern and southern part of the Nellore schist best. The lithology of Sargur mostly comprises of garnet, staurolite, kayanite schists, BIFs, quartzites, granulites, amphibolites. The gneissic complex comprises of banded tonalite trondhjhemite gneiss which is the basement rock of the study area along with migmatitic gneiss and biotite granite 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. The Dharwarian rocks in Andhra Pradesh are exposed in the western part of the Nellore belt and in many other areas like Ananatapur, Ramagiri-Penakacherla, Kolar, Kadiri, Gadwal-Narayanpet, Jonnagiri, Veligallu Peddavuru Schist Belts and western part of Nellore Belt. The lithology mostly comprises of Metabasalt (Pillowed), Acid volcanics, minor and esite, dacite, rhyodacite, amphibolites, metaultramafics, minor quartzite, calcsilicates, phyllites, intrusives of basic rocks and granites, rare lamprophyres also some

Pyroclastic Rocks and local conglomerate / event conglomerate defining hiatus in stratigraphy is observed in the study area. Rocks of middle Proterozoic to late Archaenare exposed in the eastern ghat mobile belt, they are extremely high grade and fall under granulite metamorphic facies. They mostly include khondalites and charnockites. The metamorphic facies of rocks of eastern ghats goes upto granulite facies. Charnockite with megacrystic k-feldspar, Two pyrozene granulite / amphibolite, Calc-silicate / granulite, Garnet-sillimanite-quartz-graphite gneiss (Biotite-k-feldspar, Quartzite (gernet, sillimanite) and were exposed in most of the state. Cuddapah basin is a part of Dharwar craton and is the second largest Purana basin of Peninsular India. It marks the profound unconformity Eparchaen unconformity in early literature. The Cuddapah basin formation exposes rocks of late Proterozoic to upper Proterozoic. The Cuddapah basin is divided into four groups, Nallamalai, Chitravathi, Papaghni and Kurnool. Papaghni comprises of dolomite and limestones, Chitravathi comprises of shale, dolomite and quartzites, Nallamalai comprises of shale, quartzites and arkosic sandstones, Kurnool comprises of shales, quartzites and limestones. The Cuddapah basin is characterised by rhythmic pattern of quartize-shale-carbonates cycle. Uraniferous limestone is also reported from Cuddapah basin. The major exposures of purana rock formations were in Prakasam, Kurnool, Cuddapah, Chittoor, and Nellore. The Deccan traps are found in East and West Godavari districts, exposures are near Rajahmundry. Outcrops Tertiary formations are found in East and West Godavari and Visakhapatnam districts and the Quaternary sediments occurring as thick blankets of alluvium are found in the river valleys, deltas and along the East coast.

Formations are the only formal lithostratigraphic units into which the stratigraphic column everywhere should be divided completely based on lithology. The contrast in lithology between formations required to justify their establishment varies with the complexity of the geology of a region and the detail needed for geologic mapping and to work out its geologic history. There are no formation is considered justifiable and useful that cannot be delineated at the scale of geologic mapping practiced in the region. The thickness of formations may range from less than a meter to several thousand meters.

Groups are a succession of two or more contiguous or associated formations with significant and diagnostic lithologic properties in common. Formations need not be aggregated into groups unless doing so provides

a useful means of simplifying stratigraphic classification in certain regions or certain intervals. Thickness of a stratigraphic succession is not a valid reason for defining a unit as a group rather than a formation. The component formations of a group need not be everywhere the same.

The term "supergroup" may be used for several associated groups or for associated groups and formations with significant lithologic properties in common.

The western part of the District is characterised by NNE (North North - East)-SSW (South- Southwest) trending structural ridges rising to an altitude of 842 m. Yenugukonda hill is the highest peak point in the district (422 m) which situated in Mallayapalem Village of Ballikurava Mandal. Another hill Virlakonda falls in the toposheet No. 65D/4 (1:50000) and height of the Virlakonda (250M) from the ground level and situated in NE of the Kondayapalem Village. The eastern part of the area is a pediplain, bordered by Quaternary sediments forming an alluvial plain. Gundlakamma and Musi rivers and their tributaries form the natural drainage.

The area comprises rock units of the Khondalite Group and Charnockite Group of the Eastern Ghats Super Group and Unclassified Metamorphics and Dharwar Super Group of Archaean age, Younger Igneous Intrusives, Cuddapah Super Group and Kurnool Group of Proterozoic age, Upper Gondwana sequence of Upper Cretaceous age, Cainozoic laterite and Recent Alluvium. The Khondalite Group is represented by garnet-sillimanite-cordierite gneiss, associated with minor quartzite, exposed at the periphery of basic intrusive near Chimakurti. Hypersthene gneiss, pyroxene granulite, and magnetite quartzite of Charnockite Group are exposed near Addanki. Migmatised quartz-feldspar-mica Schist associated with amphibolite, comprising the Unclassified Metamorphics, occupies the east and southeast. The rocks are intensely migmatised, at places especially in the south-central part. The upper unit, Kyanite-staurolite-biotite-muscovite schist with some garnet porphyroblasts of Unclassified Metamorphics, associated with ferruginous quartzite and crystalline limestone occurs in the south-central part.

The eastern ghat belt, extending in a NE-SW direction from Ongole in the southern part of the Andhra Pradesh to Brahmani River in Orissa, Parallel to the east coast of India, over a distance of 900 km, it encompasses parts of the eastern coastal Districts of Prakasam, Bapatla, Guntur, Krishna, East and West Godavari, Visakhapatnam, Vizianagaram and

Srikakulam and is more than 600 Km in length with a maximum width of 100 km, in the northern part. It tapers down to less than 50 km in the south. It has a broad arcuate trend with a westward convezity, in conformity with the shapes of the Nellore schist belt and the eastern margin of the Cuddapah basin, on the west.

The mobile belt is divided into three longitudinal zones viz., the Western Charnockite Zone (WCZ), the Central Khondalite Zone (CKZ) and the Eastern Migmatite Zone (EMZ).

SUCCESSION OF THE EASTERN GHATS SUPERGROUP

<table>
<tr><td rowspan="2">Granitoid Suite</td><td>Granitoid with megacrystic k-feldspar</td><td>Intrusives</td><td>Layered anorthosite and associated mafic and chromiferousultramafics.</td></tr>
<tr><td rowspan="3">Undifferentiated (with migmatiticdiatexite, augen / porphyroblastic granite, gneisses, garnet + biotite homophanous granite / gneiss leptynite, local charnockiticneosomes and relicts.</td><td>Charnochkite Group</td><td>Charnokite with magacrystic k-feldspar
Charnockite Two pyroxene granulite / amphibolite</td></tr>
<tr><td rowspan="2">Khondalite Group</td><td>Calc-silicate, granulite</td></tr>
<tr><td></td><td>Garnet + sillimanite + quartz + biotite + k-feldspar + graphite gneiss (khondalite)

Quatzite + garnet + sillimanite</td></tr>
</table>

(P.K.Ramam and V.N. Murthy)

Data Source: District Mines and Geology Officer, Bapatla District

Quaternary deposits occupy the coastal tract and are classified under three environments namely residual, marine and fluvial. The residual environment is represented by residual soils, fluvial sediments include flood basins and active channel deposits, and the marine environment includes paleotidal flat. The palaeobeach and active beach ridge, buff coloured volcanic ash occurs discontinuously along terrace of Gundlakamma River, which is correlated to Toba volcanic activity. The Rich haul of fossils, comprising limb bones of Bovides, Cervides. The Eephus and Equs molar and also pre-molars of Equshorn of stag and shell of turtle were made from Gundlakamma river valley.

The Archaean schists and gneiss show foliation varying from North-East (NE)-Southwest (SW) to Northwest (NW)-Southeast (SE) with moderate to steep dips on either side. The general disposition of the plutonic bodies is concordant with the axes of folds. The layering in gabbro and nepheline syenite is conformable to the regional trend of the adjacent quartzo-feldspathic mica schist. The rocks of the Cuddapah Super Group show north and south plunging broad antiforms and narrow synforms. These antiforms resemble domal structures in some cases. The eastern contact of this Super Group with the schists shows en-echelon thrusts, sub-parallel or oblique to the basin margin, with moderate to steep dips towards east. Srisailam Quartzite is traversed by several WNW-ESE faults.

The Geological Survey of India (GSI, 2000) gave a detailed account of the geology/lithothogy of the district with a map on 1:250,000 scale (Figure-22) and an elaborate legend with stratigraphic sequence as below.

2.3 Minor Mineral Resources of Bapatla District:

The following minerals are available in Bapatla District.

Bapatla district is endowed with Good Mineral resources belonging to Nellore Mica schist belt of Dharwar Super Group, Part of Eastern-Ghat rocks and Eastern Margin of Cuddapah group of rocks.

The main mineral resources in the district are Granite (Black & Colour), Iron Ore (Magnetite), Quartz, Silica Sand, Road Metal and Minor occurrences of Laterite, Gravel, Ordinary Sand and Brick Earth shown in Figure-23.

i. **Dimension Stone Granite:** Any rock that is suitable for cutting polishing and useful for Building purposes and having with aesthetic look is called dimension stone granite.

a) Black Granite:

It is used for facades, floors, bathrooms and all kinds of funerary art. The Black granite is available in Sankaralingamgudipa villages in Ballikuruva mandal, Vaidana villages in Ballikuruva mandal, Gurijepalli Villages in Santhamaguluru mandal.

b) Color Granite:

Colour granite variety that is predominantly used for Monuments and also as dimension stones for flooring and wall tiling purposes are Black Pearl, Steel Grey. These minerals are available in

Dhenuvakonda village in Addanki mandal, Ballikurava, Chennupalli, Konidena, Kopperapalem, Mallayapalem, Uppumagulur villages in Ballikuruva mandal, Vaidana villages in Ballikuruva mandal, Rajupalem Villages in Martur mandal, Gurijepalli, Kommalapadu, Kopparam, and Tangedumalli villages in Santhamaguluru mandal.

ii. **Road Metal:** The road metal utilized as construction purpose, also it is used for railway ballast. The Road metal available in Dharmavaram village in Addankimandal, Guntupalli, Konidena, Mukteswaram villages in Ballikuruvamandal, Bodduvaripalem villages in Korisapadu Mandal, Bobbepalli, Jangamaheswarapuram, Valaparla villages in Martur mandal.

iii. **Silica Sand**: Silica sand utilized for all types of glasses, and minerals is available in Chinaganjam, Kadavakuduru villages in Ballikuruva Mandal, Kadavakuduru villages in Chinaganjam mandal.

iv. **Ordinary Earth**: Used for filling or levelling purposes in construction of embankments, roads, railways and buildings. It is available in Chinaganjam villages in Ballikuruva mandal, Pandillapalli villages in Vetapalem mandal.

v. **Gravel:** The Gravel minerals are used for formation of kacha roads and filling low level areas. It is available in Chebrole, Sekur villages in Dharmavaram, Dhenuvakonda villages in Addanki mandal, Bodduvaripalem villages in Korisapadu Mandal, Bobbepalli, Kolalapudi, Valaparla villages in Martur mandal.

vi. **Mineral Based Industries:**

A total number of 526 mineral dealer licenses are existing in this office jurisdiction for Granite Cutting and Polishing units.

Sl.No	Name of the area	No. Working MDLs	No. of Non-working MDLs	Total
1	Marturu	266	09	275
2	Ballikurava & Upmaguluru	161	12	173
3	Santhamaguluru & Gurijepalli	63	15	78
4	Total			**526**

Data Source: District Mines and Geology Officer, Bapatla District

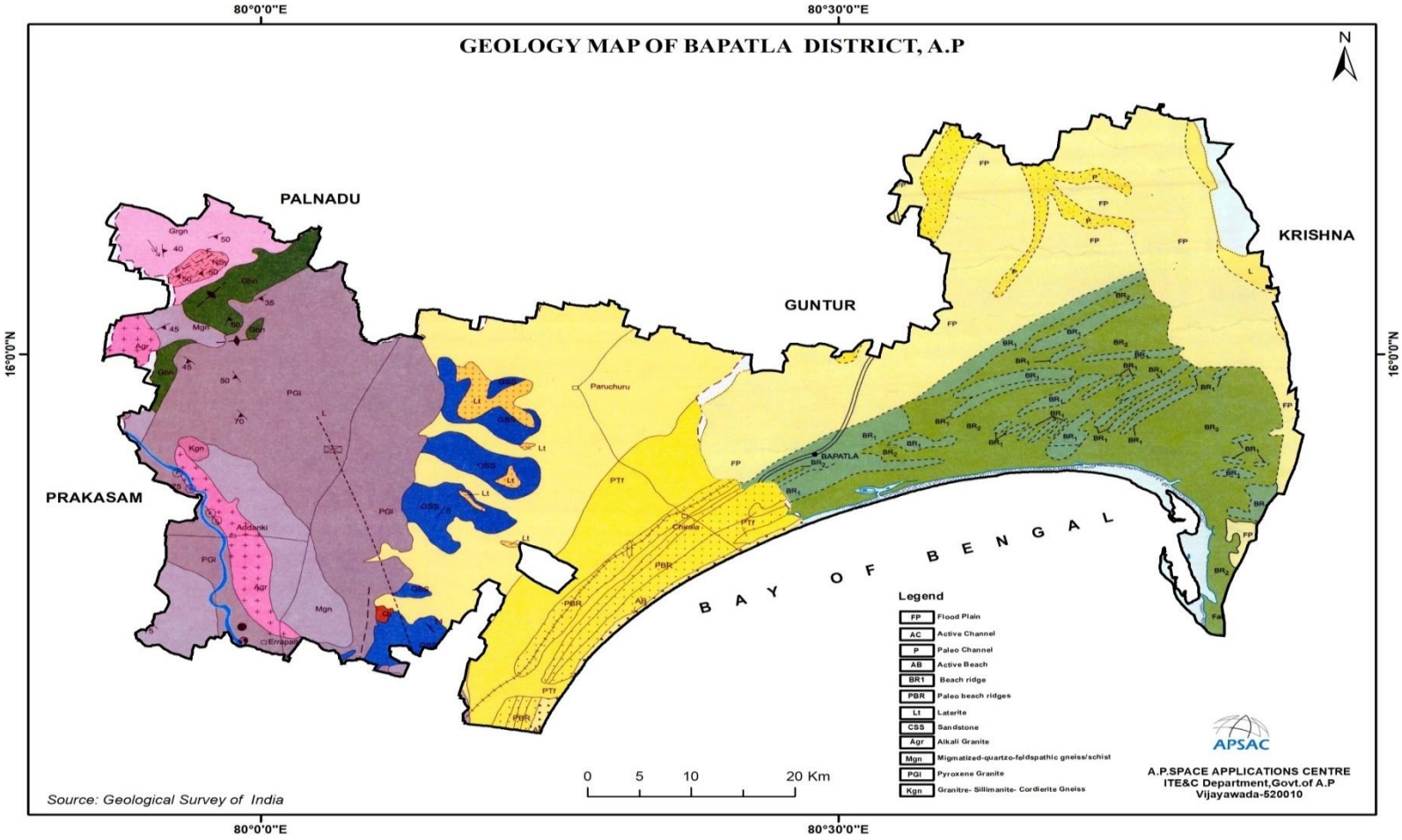
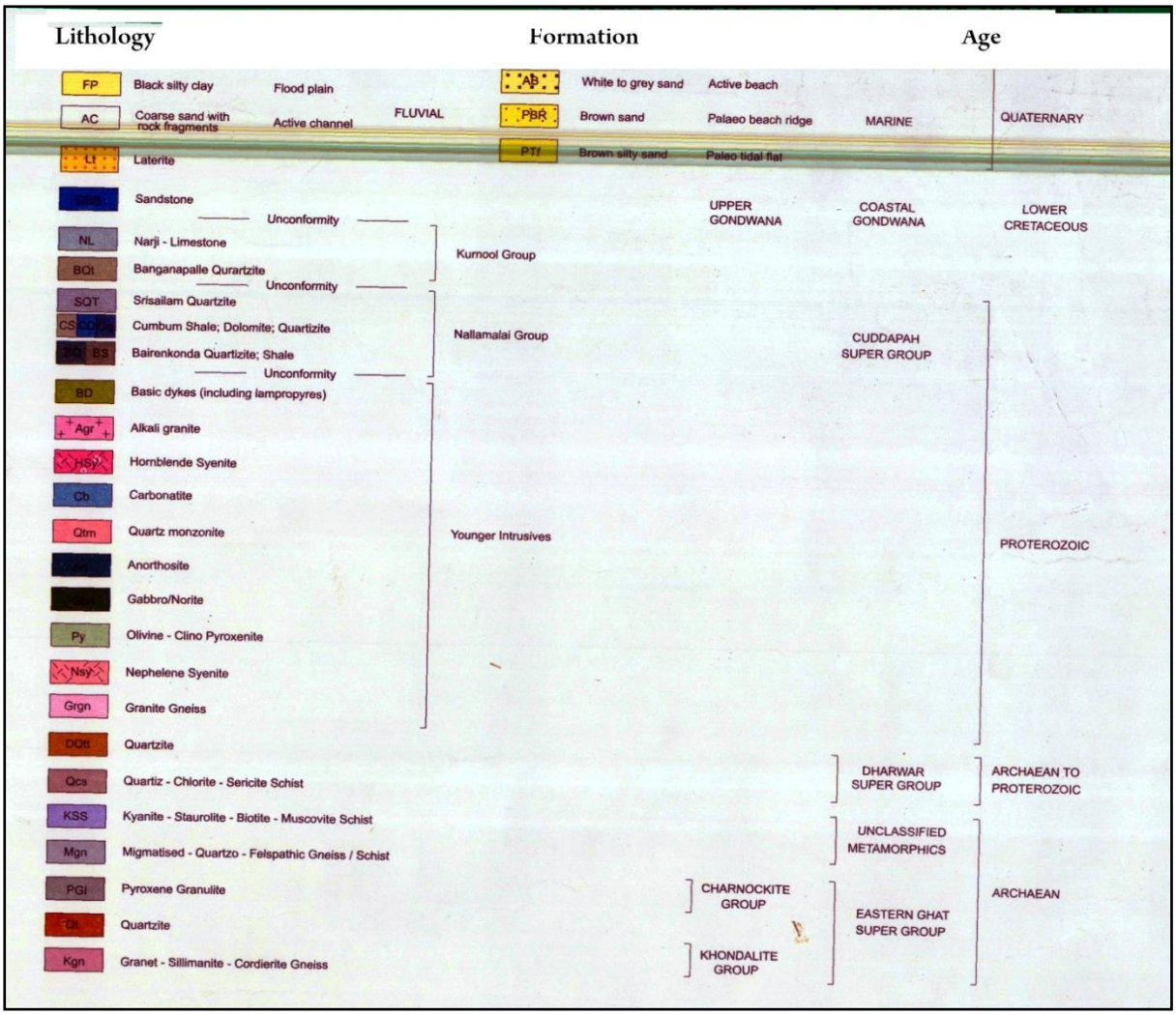


Figure 22: Geology of Bapatla District, Andhra Pradesh (Source: GSI, 2000)



Detailed Legend with Stratigraphic Sequence of Bapatla District

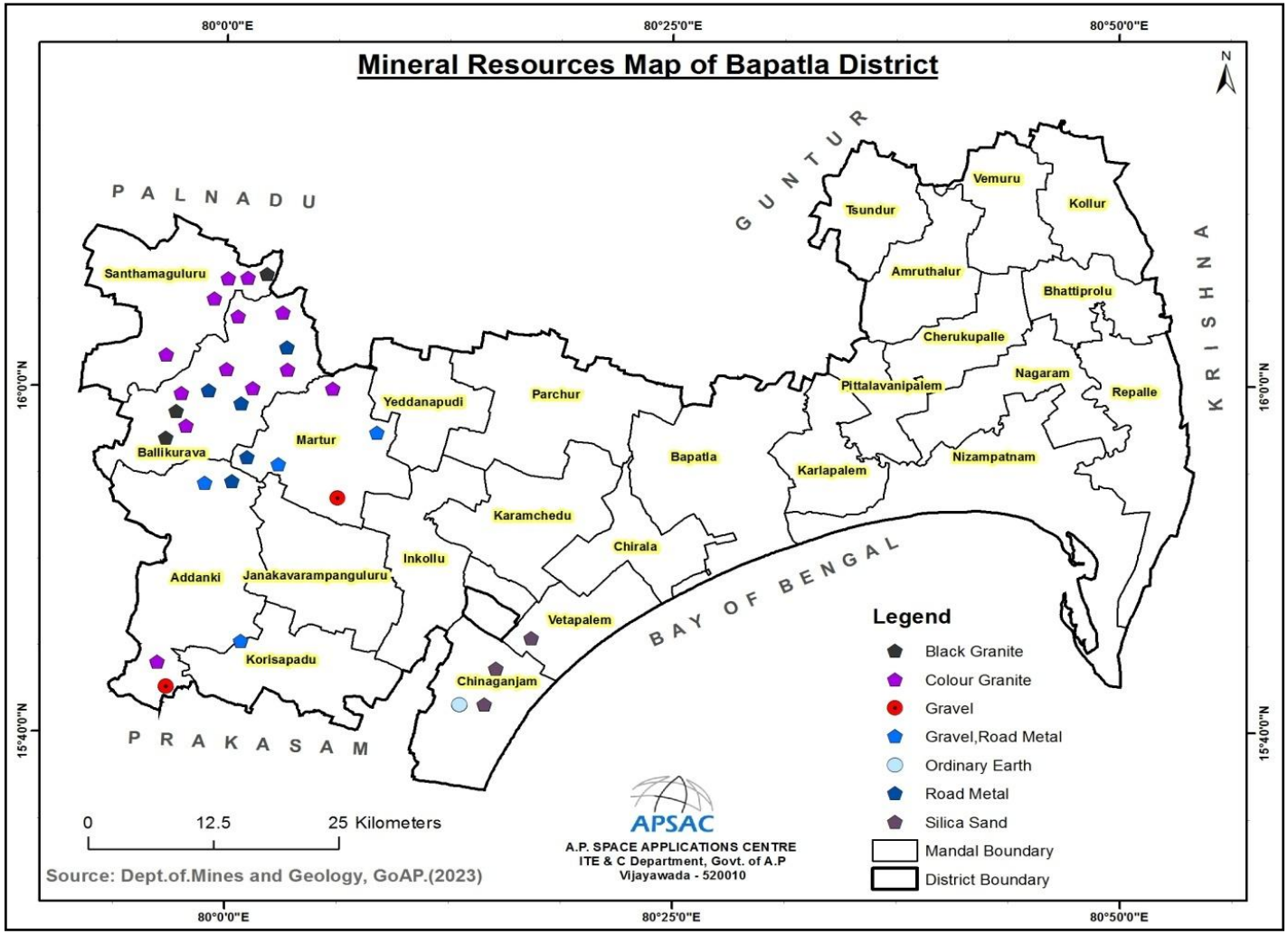


Figure-23: Mineral Resurce Map of Bapatla District

The Details List of statement showing the Leases wise for Minor Minerals during the period described in Table-16:

Table 16 Statement showing the List of details Leases wise for Minor Minerals during the Period (Present Status)

S.No.	Name of the Mineral	Name of the Lessee	Address & Contact No. of the Lessee	Mining Lease Grant order No. & Date	Sy.No.	Area of mining lease (ha)	Period of Mining Lease (Initial)		Period of Mining Lease (1st & 2nd ...renewal)	
							From	To	From	To
1	2	3	4	5	6	7	8	9	10	11
1	Black Granite	Archana Granites Mg. Partner Sri SiddaVenkateswara Rao,	S.V.R. Complex , M.M. Road, Ongole, Prakasam District. Ph No. 98481 52909.	8174/R3-2/09 dt.26-3-2009	123 and 141/3P, 141/4P	3.995	9/14/2009	9/13/2027	-	-
2	Black Granite	Archana Granites, Prop: Sri S. Venkateswara Rao,	No.1, Vasavi Residency, Lawyerpet, Ongole, Prakasam District.	32281/R2-2/2011, dt. 30-06-2014.	123/P	0.615	8/21/2014	8/20/2034	-	-
3	Black Granite	Astra Rocks & Minerals Private Limited, Mg. Director T. Satish Chandra,	59A-10-9, Plot No. 27, K.P. Nagar, Vijayawada, Krishna District.	10464/R3-2/2015, dt. 13-04-2016	95/2, 99/2 & 107/2A	5.362	6/10/2016	6/9/2036	-	-
5	Black Granite	K. B. Rocks Prop Sri Karanam Venkatesh,	# 1&2, Ground Floor, Sarojidevi Apartments, Santhapet, Ongole.	1226/R3-1/2011, dt:30-03-2012	78/3 & 78/4	2.481	4/19/2012	4/18/2032	-	-

6	Black Granite	K. B. Rocks Prop Sri Karanam Venkatesh, (T.F.Baba Exports)	# 1&2, Ground Floor, Sarojidevi Apartments, Santhapet, Ongole. Ph.No. 81425 53355	14232/R3(2)/ 2007 dt.18-5-07	78/3 &78/4	1.000	6/30/2007	12/22/2024	-	-
7	Black Granite	Kamepalli Exports., Managing Partner: Sri Kamepalli Lakshmi Prasad,	6-20-84, 8/1, Arundalpet, Gayathri Enclave, Guntur – 522 002, Andhra Pradesh.	9113/R3-1/2012, Dt.25-08-2012	396/1P,3P, 4P	#####	10/23/2012	10/22/2032	-	-
8	Black Granite	Kishore Granites, Mg. Director G. Rahika,	G T Road, Ganapavaram, Chilakaluripet, Guntur District . Ph.No. 94404 06995	10478/R3-2/2015	100/1P	1.068	6/8/2016	6/7/2036	-	-
9	Black Granite	Kishore Granites, Mg. Partner G. Ravi Kumar,	G T Road, Ganapavaram, Chilakaluripet, Guntur District . Ph.No. 94404 06995	10611/R2-2/14, dt.15-10-2014.	107/1, 95/P, 108/P, 112/P, 113/2P, 113/3P	4.100	11/19/2014	4/17/2028	-	-
10	Black Granite	Krishna Sai Exports (P) Ltd Director Sri SiddaVenkateswara Rao,	Road No. 12, MLA Colony, Banjara Hills, Hyderabad. Transfer from M/s. Kumaran Granties, Prop: Sri S.V. Prasad,	12109/R2-2/2015 dt.20-06-2015	125/5(P),6, 7,8A,9A & 130/1A	3.838	11/21/2003	11/20/2023	-	-
11	Black Granite	Manu Granites, Prop: Sri M. Subba Rao, S/o Srihari Rao,	4th lane, Vidyanagar, Guntur -7 (Three leases clubbing single lease) Ph.No. 95503 46666	51162/R3-1/2010 dt.19-05-2011	123/p, 130/2C&123P,141/1P, 141/2P	2.545	5/30/2011	1/8/2024	-	-
12	Black Granite	Om Sri Enterprises (Amalgamation of 02 QLs), Mg. Partner S. Bharth Kumar,	TF Raghavendra Granites, Flot No. 7, Mahalakshmi Towers, Main Road, Lakshmi Puram, Guntur - 522007.Ph. No. 9618888211	11524/R3-2/2018, dt.11/01/2019	100/2P	0.648	2/11/2019	11/5/2024	-	-

13	Black Granite	Sowdamini Granites (TF K.B.R. Granites), Mg.Partner Sri T. Venkateswara Rao,	Gurijepalli, Santhamaguluru Mandal, Prakasam District. Ph.No. 96181 91242	32270/R3-2/08 dt.24-11-08	101/P	1.214	1/20/2009	12/27/2022	-	-
14	Black Granite	Sowdamini Granites Mg.Partner Sri T. Venkateswara Rao,	Gurijepalli, Santhamaguluru Mandal, Prakasam District. Transfer Bishal Enterprises,	1023/R2-2/2014, dt. 12-2014	105/1, 105/2P, 105/3, 109/1P	2.290	2/28/2015	6/16/2024	-	-
15	Black Granite	Sri Vishnu Granites, Prop: Sri SiddaRagava Rao,	F.F.5 Scond Floor Sri Gurudatta Towers Lawyer pet Ongole. Ph. No. 98490 55556	11288/R3(2)/2005 dt.30-3-2005	123/P	2.024	4/23/2005	7/4/2024	-	-
16	Black Granite	Sri Vishnu Granites, Prop: Sri Sidda Venkata Sudheer Kumar	D.No. 8-24, Dhenuvukonda Street, Ongole	7513/R3-2/2013, dt. 18-03-2014.	578/1B, 579/11C, 579/1D, 580/A2, 581/1	3.897	5/14/2014	5/13/2034	-	-
17	Black Granite	Stonage Granites, Prop: Sri S.V. Prasad,	Siddavari Street, Chimakurthy(P.O, V&M), PrakadamDisrict. Ph.No. 92464 68528	15902/R3-1/2008, dt:20-05-2011	123/P	1.210	7/11/2011	12/23/2028	-	-
18	Black Granite	Thrikoteswara Granites (T. F from Prasannanjaneya Granites), Mg. Partner Smt. A. Koteswaramma	D .No.297/2A, Flot No.102, Venkateswara Residency, Srinivasa Nagar, Narasaraopet, Guntur District.	28271/R3-1/10 dt.27-7-10	123	0.404	1/25/2010	1/24/2030	-	-
19	Black Granite	Thrikoteswara Granites (T. F from Prasannanjaneya Granites), Mg. Partner Smt. A. Koteswaramma,	D .No.297/2A, Flot No.102, Venkateswara Residency, Srinivasa Nagar, Narasaraopet, Guntur District. Ph. No. 99481 81222	28270/3-1/10 DT.27-7-2010	118/3P & 123/P	0.623	8/25/2010	2/26/2027	-	-

20	Black Granite	Veera Shiva Granites & Exports (P) Ltd, Prop: Sri Veerapratap Reddy,	101, Siva Sai Sannidhi, Opp. Shirdi Saibaba Temple, Hindinagar, Panjagutta, Hyderabad. Ph.No. 98495 33533.	30891/R3-1/12, dt. 13-11-2013	76/2C3P	1.898	11/27/2013	11/26/2033	-	-
21	Black Granite	Veera Shiva Granites & Exports (P) Ltd, Prop: Sri Veerapratap Reddy,	3A, Siva Sai Sannidhi, Plot No. 32,Opp. Shirdi Saibaba Temple, Hindinagar, Panjagutta, Hyderabad.	27575/R3-1/2011 dt:27-08-2012	97/2, 98/2	1.943	9/1/2012	8/31/2032	-	-
22	Black Granite	Veera Shiva Granites & Exports (P) Ltd, Prop: Sri Veerapratap Reddy,	3A, Siva Sai Sannidhi, Plot No. 32,Opp. Shirdi Saibaba Temple, Hindinagar, Panjagutta, Hyderabad. Ph.No. 98495 33533.	37975/R3-1/08 dt.1-5-09	96/3, 97/2, 98/1, 98/2	2.000	5/13/2009	5/12/2029	-	-
23	Black Granite	Veera Shiva Granites and Exports (P) Ltd, Prop: Sri G.V.Siva Reddy,	101, Siva Sai Sannidhi,Opp. Shirdi Saibaba Temple, Hindinagar, Panjagutta, Hyderabad.	10729/R3-2/2016, dt.11/12/2018	97/1A	0.729	2/7/2019	2/6/2038	-	-
24	Black Granite	Veerabadra Minerals (P) Limited, MD. G. Pratap Reddy,	# 3A, Siva Sai Sannidhi, Plot No. 32,Opp. Shirdi Saibaba Temple, Hindinagar, Panjagutta, Hyderabad.	5581/R3-1/2013, dt. 26-02-2014	78/4, 97/1, 97/2 & 98/1	2.113	3/5/2014	3/4/2034	-	-
25	Black Granite	Veeranjaneya Granites, Prop: Sri S.Koteswara Rao,	Gurijepalli Village, Santhamaguluru Mandal, Prakasam District.	16428/R3-2/2005 dt.4-11-2006	105/2P & 109/1P	1.000	4/20/2007	4/19/2027	-	-
26	Black Granite	Veeranjaneya Granites, Prop: Sri S.Koteswara Rao,	Gurijepalli Village, Santhamaguluru Mandal, Prakasam District.	19375/R3-1/2011 dt:20-03-2012	109/P	1.841	4/26/2012	4/25/2032	-	-
27	Black Granite	Veeranjaneya Granites, Prop: Sri S.Koteswara	Gurijepalli Village, Santhamaguluru Mandal,	19378/R3-1/2011, 26-	106/P	1.651	4/15/2013	4/14/2033	-	-

		Rao,	Prakasam District.	02-2013						
28	Black Granite	Kamepalli Granites and Exports, Mg.Part. Sri K.Lakshmi Prasad	D.No.6-20-84, 8/1 Arundapet, 3rd Floor, Gayatri Enclave, Guntur.	22745/R3-2/2015, dt.16/04/2018	103/2A, 104/1 to 5 & 104/6B	3.791	5/2/2018	5/1/2038	-	-
29	Black Granite	Sri Dharam Rama Rao, S/o. Ramaiah,	D.No.1-130/A, Gurijepalli (V), Santhamagulur(M), Prakasam Dist.	7549/R3-2/2017, dt.30/08/2018	99/1B	1.205	9/22/2018	9/21/2038	-	-
30	Black Granite	Sowdamini Granites, Mg.Part. Sri T.Venkateswara Rao,	D.No.16-591, Beside Ajireddy Hospital, Piduguralla (V&M), Guntur Dist.	28673/R3-2/2017, dt.30/08/2018	106/P	0.404	10/11/2018	10/10/2038	-	-
31	Black Granite	Sowdamini Granites, Mg.Part. Sri T.Venkateswara Rao,	D.No.16-591, Beside AjireddyHospital, Piduguralla (V&M), Guntur Dist.	28672/R3-2/2017, dt.30/08/2018	105/4A & 105/4B	0.817	10/11/2018	10/10/2038	-	-
32	Black Granite	Gagan Minerals, Prop.SriHariom Agarwal,	S.No.329/B1, RajupalemDonka Road, NH-5, Martur (M), Prakasam District	1530/D9/2019, dt.04/08/2020	115/1A	1.576	8/28/2020	8/27/2040	-	-
33	Black Granite	Brundavan Granites, Mg. Partner Sri Sidda Pandu Ranga Rao,	H.No. 5-105A, Kotatlavari Street, Chimakurthy	665/D9/2018, 03/01/2022	74/1A(P), 74/2, 77/1A(P),	3.407	1/24/2022	1/23/2042	-	-
34	Black Granite	Sri Vishnu Granites, Prop: Sri S.V.V. Sudheer Kumar,	D.No. 8-24, Dhenuvukonda Street, Ongole	441/D9/2019, 03/01/2022	141/6A(P)	0.789	1/24/2022	1/23/2042	-	-
35	Black Granite	Sri Vishnu Granites, Prop: Sri S.V.V. Sudheer Kumar,	D.No. 8-24, Dhenuvukonda Street, Ongole	442/D9/2019, 03/01/2022	121/3, 145/1	1.926	1/28/2022	1/27/2042	-	-
36	Gravel	SmtGudibandi Venkata Ramani	H.No. 13-40-2, Gopal Nagar, near water tank, Kothapet Village, Vetapalemmandal,Bapatla District	4446/Q1/2021 dated:19.04.2023	360/P	1.9	22.06.2023	21.06.2028	-	-

37	Gravel & Road Metal	Sri Kandi Ch Kumar Reddy,	H. No. 6-118, Pandillapalli Village, Vetapalem Mandal, Prakasam District	899/Q1/2021, dt:19.04.2023	387/11-C	2.926	4/27/2023	4/26/2028	-	-
38	Road Metal	M/s Venkata Sai Stone crusher	Plot No. 406, Brundavan Plaza, 4th line, Brundavan Gardens, Guntur - 522006.	1651/Q1/2017, Dt:19-02-2021	647	3.266	1/25/2023	1/24/2033	-	-
39	Silica Sand	Sri K Venkateswara Rao	Plot No. 17 & 18 Silpa RS Residency, Flat No. 201, Vivekananda Nagar Colony, Near New ERA High School, Kukatpally, Hyderabad.	17642/D9/2017, dt. 22-09-2022	342/10, 12, 349/9, 10 & 344/12	0.627	10/12/2022	10/11/2042	-	-
40	Gravel & Road Metal	Sri BillaVenkateswarlu	H.No. 6-209, Jagarlamudivaripalem Village, J. Pangulur Mandal, Prakasam District.	872/Q1/2020, dt. 30-06-2022	USH	2.617	9/17/2022	9/16/2032	-	-
41	Road Metal & Ballast	M/s. BSCPL Infrastructure Limited., Mg. Director: Sri SeenaiahBollineni,	SY No. 788/2(P), NH -5, Bodduvanipalem Village, Korisapadu Mandal, Prakasam District.	4681/Q1/2021, dated:10.01.2023	788/1P	3.300	1/24/2023	1/23/2038	-	-
42	Road Metal & Ballast	M/s. BSCPL Infrastructure Limited., Mg. Director: Sri SeenaiahBollineni,	SY No. 788/2(P), NH -5, Bodduvanipalem Village, Korisapadu Mandal, Prakasam District.	4682/Q1/2021, dated:05-12-2022	788/1P	3.300	12/27/2022	12/26/2037	-	-
43	Road Metal, Ballast & Gravel	M/s. BSCPL Infrastructure Limited., Mg. Director: Sri SeenaiahBollineni,	SY No. 788/2(P), NH -5, Bodduvanipalem Village, Korisapadu Mandal, Prakasam District.	4683/Q1/2021, dated:05-12-2022	788/1P	4.300	12/27/2022	12/26/2037	-	-
44	Road Metal	BSCPL Infrastructure Limited., Project Incharge: G. Krishnaiah	Anamanamuru Village, Korisapadu Mandal, Prakasam District	9017/Q1/2020, dt. 08/11/2021	788/1	1.667	12/1/2021	11/30/2031	-	-
45	Silica Sand	Tarus Silica Sand Processing Unit, Prop.N.VeeraRaghavulu	D.No.5/142/1, Kadavakuduru(V),	25600/R3-2/2017,	296/6 & 335/4	0.991	9/29/2018	9/28/2038	-	-

			Chinnaganjam (M), Prakasam Dist.	dt.24/09/2018						
46	Road Metal	Sri T Sri Rama Koteswara Reddy	D.No. 9-171, JangamguntlaPalem, Medikonduru Village and Mandal, Guntur District	950/Q1/2020, dated: 30-05-2022	USH	2.000	8/23/2022	8/22/2032	-	-
47	Road Metal	Vennla Stone Crushers , Prop: Smt P. Venkata Lakshmi	Dharamavara(V), Addanki (M), Prakasam District.	4641/Q1/2021, dt. 02/02/2023	598/P	1.500	3/3/2023	3/2/2038	-	-
48	Ordinary Earth	Sri Surya M.P. MACS Ltd	D.no.6-49/3, Mulaganivaripalem, H/o Chinaganjam V & M	4351/Q1/2021, dt.07.04.2022	608/10	3.879	4/20/2022	4/19/2027	-	-
49	Gravel	KandimallaKondala Rao	H. No. 5-68/A, Main Bazar, Kolalapudi Village, Martur Mandal, Prakasam District	12045/Q1/2021, dt. 14-03-2022	360/P	3.900	4/11/2022	4/10/2027	-	-
50	Colour Granite	M/s. V.K Granites, Mg. Partner: Damacherla Venkata Krishna Rao	D.No. 3-6, ThurpuNaidupalem Village, Tangutur Mandal, Prakasam District.	829/D9/2019, dt. 07-02-2022	536/B(P) & 535/1(P)	4.850	2/17/2022	2/16/2042	-	-
51	Road Metal & Gravel	Sri SK Stone Crusher, Mg. Partner. Sri M. Srinivasa Reddy	D.No. 3-110, Medagamvari Street, Dharamavaram Village, Addanki Mandal, Prakasam District	12002/Q1/2020, dt. 08-10-2021	USH	2.000	12/22/2021	12/21/2031	-	-
52	Colour Granite	M/s. Lakshmi Simha Ganapathi Exports., Mg. Partner: A. Venkateswarlu	H.No. 09/79/2A, MallayapalemVillage, Ballikurava Mandal, Prakasam District.	5208/D9/2021, dt.30.06.2022	866-3A(P) , 995/3B(P)	3.350	8/26/2022	8/25/2042	-	-
53	Road Metal	Venkata Ramana Stone Crusher Prop: Sri C Surya Bhaskar Rao	Ramanjaneyapuram Village, Ballikurava Mandal, Prakasam District	3644/Q1/2012, dt. 15-03-2021	144/P	1.650	6/11/2021	6/10/2031	-	-
54	Road Metal and Gravel	SkAjeem	Valaparla Village, Martur Mandal	6051/Q1/2020, 30/09/2021	558/P	3.000	10/18/2021	10/17/2031	-	-

55	Colour Granite	M/s Lakshmi Granites, Prop: Sri Sidda Raghava Rao	D.No. 8-24, dhenuvukondavari Street, opp: Bethun Nursing Home, Ongole, Prakasam Dist.	8522-2/D9/2021, dt:17.04.2023	103/P	0.186	17.04.2023	16.04.2043	-	-
56	Colour Granite	M/s Lakshmi Granites, Prop: Sri Sidda Raghava Rao	D.No. 8-24, dhenuvukondavari Street, opp: Bethun Nursing Home, Ongole, Prakasam Dist.	8522-1/D9/2021, dt:17.04.2023	103/P	0.461	17.04.2023	16.04.2043	-	-
57	Road metal	Namburi Srinivasa Rao	D.No.6-90, Edlapadu(V), Guntur District	5120/Q1/2016, dt.22/07/2020	647/P	2.021	10/3/2020	10/2/2031	-	-
58	Road metal	Vennla Stone Crushers , Prop: Smt P. Venkata Lakshmi	Dharamavara(V), Addanki (M), Prakasam District.	9716/Q3/2008, dt:08.06.2011	598/P	1	9/3/2011	9/2/2026	-	-
59	Road Metal & Gravel	T Yugandhar	H.No. 4-2, Bodipalem(V), Kakumanu(M), Guntur District	5338/Q3/2016, 29/09/2017	558/39	6.811	10/31/2017	10/30/2027	-	-
60	Colour Granite	Vijaya Sai Granites, Mg. Partner: Mutyala Venkata Rao	Flat No. 402, Datta sai Towers, NTR Centre, Chilakaluripet, Guntur District	8073/D9/2018, dt:04.05.2023	4/1P, 4/3 & 17P	4.604	6/19/2021	6/18/2041	-	-
61	Colour Granite	Vijaya Sai Granites, Mg. Partner: Mutyala Venkata Rao	Flat No. 402, Datta sai Towers, NTR Centre, Chilakaluripet, Guntur District	8072/D9/2018, dt: 01-02-2023	in Sy. No. 17(P), 18(P) 19/P	4.526	2/14/2023	2/13/2043	-	-
62	Road Metal	Siva Stone Crusher, Mg. Partner Smt. Kalli Satyavathi	D.No. 12-121, Medikonduru (M), Guntur District	949/Q1/2020, dt.08-10-2021	USH	4.600	11/29/2021	11/28/2031	-	-
63	Road Metal	Sri Venkateswara Stone Crusher	Ramanjaneyapuram(V), Kommlapadu, Ballikurava(M)	6546/Q3/2010, dt.27/11/2018	14/P	2.600	1/25/2019	1/24/2029	-	-
64	Silica Sand	M/s. D. Mining, Mg. Partner D. Hitesh Chenchu Ram	H.No. 8-2-674/2/B/29, Flat No. 65, Banjara Hills, Road No. 13, Hyderabad.	9783/D9/2018, dt. 21-01-2022	566/2P	0.744	2/24/2022	2/23/2042	-	-
65	Silica Sand	M/s. D. Mining, Mg. Partner D. Hitesh Chenchu Ram	H.No. 8-2-674/2/B/29, Flat No. 65, Banjara Hills, Road No. 13, Hyderabad.	9784/D9/2018, dt.21-01-2022	592/1, 594/2P	0.96	2/24/2022	2/23/2042	-	-
66	Road metal &	KunchapuVeeranjaneyulu	H.No. 4-178, Bobbepalli Village, Martur Mandal,	811/Q1/2021, dt. 04-05-2022	387-C11(P)	3.504	5/11/2022	5/10/2032	-	-

	Gravel		Prakasam District							
67	Gravel &Road Metal	Sri Kandi Prabhakara Reddy	H. No. 6-118, Pandillapalli Village, Vetapalem Mandal, Prakasam District	898/Q1/2021, dated: 28-09-2022	387/11-C	2.530	11/26/2022	11/25/2027	-	-
68	Road Metal	Sri Ch Siva Rami reddy	H.No.4.341, mallayapalem village, Prathipadumandal, Guntur dist	10010/Q1/2020 dated:18.10.2022	Un Surved Hill	2.04	01.06.2023	31.05.2033	-	-
69	Gravel	YarramothuRamu	D.No. 10-26, Rajupalem v, Marripudi M, PrakasamDist	1055/Q1/2021, dt. 19-05-2022	360/P	3.000	6/4/2022	6/3/2027	-	-
70	Gravel	P. Ramesh Babu,	Yedugundlapadu (V), Maddipadu Mandal, Prakasam District.	1611/Q1/2019, dt.09/07/2020	257/4P	4.565	1/29/2020	1/28/2025	-	-
71	Road metal	M. Syam Babu	Kukunamuru, V&M Guntur District.	2533/Q/2009, dt.	72/P	1.554	3/8/2010	3/7/2020	-	-
72	Road metal	Srinivasa Stone Crusher	Kondamanjuluru(V), J. Panguluru Mandal, Prakasam District.	4548/Q/2010, dt. 11-06-2014	795(P)	2.000	9/9/2014	9/8/2029	-	-
73	Colour Granite	A. Narsimha Rao, Ganesh Mechanical works, Opp RTC Bus Stand, Kovvur Road, Kandukur(V&M), Prakasam District.	8885545143	4717/R3-2/2013, dt. 26-04-2014.	1025/B2, 1025/1A,1B	1.991	6/13/2014	6/12/2034	-	-
74	Colour Granite	Amulya Minerals, Prop: Sri D. Ramagovindu, D.No. 4-76, Kondayapalem(V), Chenupalli(P) Ballikurava(M), Prakasam District.	7799393456	10186/R3/2011, dt. 25-09-2013	233/P, 235/P, 236, & 237/P	1.000	10/15/2013	10/14/2033	-	-
75	Colour Granite	B.V.L Rocks and Minerals, Mg. Partner Sri B. MonoJ Kumar, D.No.3/1/4 1st floor, Ravursomaiah House, Chellamathota, Tangutur	9490175444	52972/R3-1/2012, dt. 04-10-2013	934/7/3	3.796	11/16/2013	11/15/2033	-	-

		V&M, Prakasam District.								
76	Colour Granite	D Srikanth, Kondayapalem Village, Ballikurava Mandal, Prakasam District.	7288965566	16136/R3-2/2006, dt:05-10-2006	230/BP, C5 &234	1.000	10/16/2006	10/15/2026	-	-
77	Colour Granite	Giriraj Granites, Mg.Part. Sri R. Raja Ramanjan, Flat No. 405, Padma Towers, South Bypass Road, Ongole.	9490690000	2264/D9/2020, dt.29/09/2020	228/1A, 229/A1 to A3 230/C1 to C4 and 231	1.963	10/16/2008	10/15/2028	-	-
78	Colour Granite	Giriraj Granites, Mg.Part. Sri R. Raja Ramanjan, Flat No. 405, Padma Towers, South Bypass Road, Ongole.		2265/D9/2020, dt.29/09/2020	103	2.000	1/29/2022	1/28/2042	-	-
79	Colour Granite	Giriraj Granites, Mg.Part. Sri R. Raja Ramanjan, Flat No. 405, Padma Towers, South Bypass Road, Ongole.			103/P	1.000	5/10/2016	5/9/2036	-	-
80	Colour Granite	Imperial Granites Ltd (TF Galaxy Enterprises), No.76 Cathedral Road, Chennai -600086.	9849982368	26207/R3-3/04, dt:17-10-2007.	103	0.630	10/26/2007	8/1/2024	-	-
81	Colour Granite	Imperial Granites Ltd, Power of Attorney Sri R. Guna Sekaran, Tr from Galaxy Enterprises , No.76 Cathedral Road, Chennai - 600086.	9849982368	13223/R3-1/2008 dt:25-08-2012.	103	3.000	1/4/2009	1/3/2029	-	-
82	Colour Granite	Imperial Granites, Power of Attorney Sri R. Guna Sekaran, No.76 Cathedral Road, Chennai -	9849982368	42653/R3-2/2008, dt:23-01-2009.	103/P	1.494	10/24/2009	2/4/2029	-	-

		600086.								
83	Colour Granite	Kishore Slabs & Tiles, G T Road, Ganapavaram, Chilakaluripet, Guntur District Ph.No. 94404 06995		20185/R3-1/2012, dt:28-09-2012	103/P	6.400	11/19/2012	12/15/2024	-	-
84	Colour Granite	Kishore Granites (P) Ltd,Mg. Partner Sri G. Radhika, G T Road, Ganapavaram, Chilakaluripet, Guntur District Ph.No. 94404 06995		10849/R3-2/2013, dt. 04-04-2014.	103/P	3.093	8/24/2006	8/23/2026	-	-
85	Colour Granite	Krishna Sai Exports (P) Limited, Mg.Partner Sri SiddaVenkateswara Rao, SVR Complex 1st Floor, M.M. Road, Ongole, Prakasam District.		5163/R2-2/2015, dt:24-03-2015.	103/P	4.384	4/13/2015	4/15/2023	-	-
86	Colour Granite	Krishna Sai Exports (P) Ltd (T.F Lakshmi Granites)M.D. Sri SiddaHanumantha Rao S.V.R. Complex , M.M. Road, Ongole, Prakasam District.	8886633309	4152/R3-1/10, dt: 28-02-2010	103	0.607	3/18/2010	11/16/2029	-	-
87	Colour Granite	Krishna Sai Exports (P) Ltd Mg. Partner Sri SiddaVenkateswara Rao, (Lakshmi Granites Transfer from)S.V.R. Complex , M.M. Road, Ongole, Prakasam District.		22809/R2-2/13, dt:18-04-2015.	103	1.880	4/16/2014	4/15/2034	-	-
88	Colour Granite	Lakshmi Granites, Mg. Director of Sri SiddaRagava Rao, (Tr, from L B Rocks), F.F.5 Scond Floor Sri Gurudatta Towers Lawyer		46462/R3-2/2008, dt: 23-02-2008	103/P	1.327	9/17/2008	9/16/2028	-	-

		pet Ongole.								
89	Colour Granite	Lakshmi Granites, Mg. Director of Sri SiddaRagava Rao, 5th lane, Dhenuvukondavari Street Lawyer pet Ongole.		7514/R3-2/2013, dt. 16-4-2014	1025/B, 1026/5D	3.549	6/2/2014	6/1/2034	-	-
90	Colour Granite	MaramVenka Reddy Granites, Prop: Sri M. Venka Reddy, 7-344, Reddy, Bazar, Chimakurthy Mandal, Prakasam District.	9849000978	14980/R3-(2)/2004, dt:11-06-2004.	103	2.000	12/29/2004	12/28/2024	-	-
91	Colour Granite	MaramVenka Reddy Granites, Prop: Sri M. Venka Reddy, 7-344, Reddy, Bazar, Chimakurthy Mandal, Prakasam District.		36371/R2-2/2011, 31-03-2015	1029/P	0.647	4/23/2015	4/22/2035	-	-
92	Colour Granite	MaramVenka Reddy Granites, Prop: Sri M. Venka Reddy, 7-344, Reddy, Bazar, Chimakurthy Mandal, Prakasam District. Ph.No. 98490 00978		31856/R3-2/2006, dt:24-10-2006.	103/P	2.077	12/22/2006	12/21/2026	-	-
93	Colour Granite	HANUMAN EXPORTS (Transfer from N.V Exports , Mg. Partner Smt. N. Jyothi, Kurnnool Road, Ongole.)	9849349005	6467/R3-2/2018, dt.15/10/2018	934/29 (P)	2.632	6/13/2011	4/7/2024	-	-
94	Colour Granite	Lakshmi Granites., Prop: Sri Sidda Raghava Rao, H. No. 8-24, Denuvakondavari Street, Ongole. Tranfer in favour of P.V. Subba Rao,		8409/D9/2021 dt 15-3-2022	103	1.000	2/28/2011	1/3/2029	-	-
95	Colour Granite	Pokarna Granites Limited, Chairman & Mg. Director Goutam Chand Jain 105,	9848349299	37435/R3-1/06 dt:08-12-2008.	203, 204/1,2, 207/1,7, 208/4,	12.877	2/5/2009	2/4/2029	-	-

		Surya Towesrs, SP Road, Secenderebed			208/5, 209/3,7, 371/P, 372/1,2,3					
96	Colour Granite	Pokarna Granites Limited, Chairman & Mg. Director Goutam Chand Jain 105, Surya Towesrs, SP Road, Secenderebed	9848349299	8480/R3-(2)/2002, dt:26-09-2002.	103	4.271	10/31/2002	10/30/2022	-	-
97	Colour Granite	Pokarna Granites Limited, Chairman & Mg. Director Goutam Chand Jain 105, Surya Towesrs, SP Road, Secenderebed		25718/R3-2/2007, dt:20-12-2008.	103	4.000	6/21/2008	6/20/2028	-	-
98	Colour Granite	R.K Granites, Mg. Partner Smt. A. Swarajya Bharathi, D.No. 19-8-140/23, Hathiramji Colony, North Bairagipatteda, Tirupathi, Chittoor District, Andhra Pradesh.	9440271311	16358/R3-2/2010, dt. 05-07-2016.	32/5	1.461	8/24/2016	8/23/2036	-	-
99	Colour Granite	Sai Krishna Granites, Mg Partner Sri B. Chalapathi Rao, S/o Butchaiah, Perecherla (V), Madikonduru(M), Guntur District.		42647/R3-1/08, dt:28-02-2009.	391/P	2.340	7/1/2010	6/30/2030	-	-
100	Colour Granite	Sai Stones (Transfer from Sri ASGS Sandilya) Mg Partner: R. Lakshminarayana, 405, Padama Towers, South By Pass Road, Ongole. Ph. 94906 90000		3859/R3-1/2009, dt:12-02-2009.	103/P	0.632	8/30/2004	8/29/2024	-	-

101	Colour Granite	Satya Krishna Granites, Mg. Partner Sri M Venkateswara Rao, H.No. 6-122/1, Balaji Appartment Road, Srinagar, Martur Village and Mandal, Prakasam District. Lease tranfer M/s. Satya Krishna Granites. Prop: N. Krishna Murthy, D.No:1-45, Chennupalli Village, Ballikurava Mandal Prakasam District.		8813/D9/2019, dt:07-02-2022	103	2.000	12/22/2008	12/21/2028	-	-
102	Colour Granite	SR Constructons Company, Mg.P.K. Rama Mohana Rao, Door No:4-498(16), 2nd Line, Pandaripuram, Ongole, Prakasam District. Ph.No. 98661 31059.	9491511874	29374/R3-2/2004, dt:18-05-2005	103	14.680	8/5/2005	8/4/2025	-	-
103	Colour Granite	SR Constructons Company, Mg.P.K. Rama Mohana Rao,	Door No:4-498(16), 2nd Line, Pandaripuram, Ongole, Prakasam District. Ph.No. 98661 31059	29367/R3-2/2004, dt;20-05-2005	821	5.060	8/5/2005	8/4/2025	-	-
104	Colour Granite	Sreenivasa Granites Mg Partner Sri D.V. Naga Raja, Raju Complex, Dibbala Road, Ongole.		35304/R3-1/11, dt. 11-07-2013	539-B & 546/P	5.010	7/25/2013	7/24/2033	-	-
105	Colour Granite	Sri G Ankamma Chowdary, G T Road, Ganapavaram, Chilakaluripet, Guntur District, Ph.No. 94404 06995		854/R3-1/2008, dt:04-03-2009	103	4.000	3/7/2009	3/6/2029	-	-
106	Colour Granite	Suraksha Granites, Mg. Partner Sri Kilaru Suresh Babu, D.No. 6-20-84, 8/1 Arundelpet, Guntur, lease		5418/D9/2021, dt:22-06-2021	103/P	3.032	1/31/2013	8/26/2024	-	-

		tranferred from M/s. Raghavendra Granites								
107	Colour Granite	Sri Sai Lakshmi Granites, Mg Part. Sri Kamepalli Lakshmi Prasad, D. No. 9-204, Chowdary Colony, Martur Mandal, Prakasam District. Ph.No. 99490 44429.		19782/R3-1/2007 dt:20-10-2009.	872/1P &2, 873/1	4.500	12/17/2009	12/16/2029	-	-
108	Colour Granite	MaramVenka Reddy Granites, Prop.SriMaramVenka Reddy (Transfer from Sri Sai Vijayakrishna Granites), D.No.7-344, Reddy Street, Chimakurthy (V&M), Prakasam District.		4462/D9/2019. dt.13/02/2020	103	0.486	2/29/2020	6/22/2031	-	-
109	Colour Granite	Sri Srinivasa Granites (Prop Smt M Adilakshamma) (1St Ren) Kothapeta, Kanigiri, Prakasam District.		6366/R3-1/2009, dt:07-05-2009	103/P	5.000	9/8/2009	9/7/2029	-	-
110	Colour Granite	Sri Srinivasa Granites Prop Smt M. Adilakshamma, D.No. 8-123/4 Kothapeta, Kanigiri, Prakasam District.		17564/R2-2/2011, dt. 27-03-2015	1029/P	0.700	4/16/2015	4/15/2035	-	-
111	Colour Granite	Sri Srinivasa Granites, (Prop Smt M Adilakshamma (Sri Srinivasa Granites TF Sri M Jayarami Reddy), Kothapeta, Kanigiri, Prakasam District.		2214/R3(2)/2004, dt:28-10-2004.	103/P	2.000	12/23/2004	12/22/2024	-	-
112	Colour Granite	Sri Srinivasa Granites, (Prop Smt M Adilakshamma (Sri Srinivasa Granites TF Sri M Jayarami Reddy), Kothapeta, Kanigiri, Prakasam		24069/R3 (2)/2003, dt:18-08-2004.	103/P	1.631	8/20/2004	8/19/2024	-	-

		District. Ph.No. 90107 63777								
113	Colour Granite	Sri Vasavi Slabs and Tiles, Mg. Partner: Sri K. Hanumantha Rao, D. No. 4-78, Anjaneyaswamy Temple, Jonnathali Village, Martur Mandal, Prakasam District Transferred in favour of Vemula Prasad,	9885803433	8288/D9/2021, 28/01/2021	475/P (Old No. 68)	3.889	5/15/2015	5/14/2035	-	-
114	Colour Granite	Vishista Minerals, Partner Vemula Prasad, D.No. 19/10, Thimoorthy Street, T. Nagar, Chennai -600017.		12252/R2-2/10, dt. 06-05-2015	475/P (Old No. 68)	9.873	5/15/2015	5/14/2035	-	-
115	Colour Granite	Amrutha Granites (T.F Abhi Minerals Private Limited), Mg.Part.Sri Burra Madhusudhana Rao, Plot No.22, Flat.No.202, Sai Lakshmi Residency, Old Vasavi Nagar, Secuderabad.		5532/R3-2/2019, dt. 29-10-2019	549/1B3(P), 549/2(P), 549/3, 490/B/1B, 490/B/3, 457/B/1 and 457/B/2(P)	6.454	11/26/2019	7/26/2037	-	-
116	Colour Granite	Sri. K. Samba Siva Rao, S/o Venkata Rao, H.No. 57-8-8-3, Kurravari Street, Patamata, Vijayawada.	9440943936	9089/R3-2/2017, dt. 22/11/2017	288/P	9.466	1/20/2018	1/19/2038	-	-
117	Colour Granite	Vijaya Sai Minerals, Prop. Sri T. Mallikarjuna Rao, D.No. 7-11-20(F), Beside MLA House, Lawyerpet, Ongole, Prakasam District.		15866/R3-2/2016, dt.18-12-2017	1/P	8.900	2/14/2018	2/13/2038	-	-
118	Colour Granite	C.R. Granites, Mg.Part. Sri C. Vijaya Saradhi, D.No. 1-762, Krishna Nagar, 1st lane, Chilakuripet, Guntur District.		14348/R3-2/2017, dt.24-01-2018	447/2, 448, 451/A1 & 451/B	3.380	2/17/2018	2/16/2038	-	-

119	Colour Granite	Sri Prasannanjaneya Granites, Mg.Part: S. Anantha Lakshmi, D.No.1-19, New Damavaripalem(V), Addanki(M), Prakasam District.	9246468200	22939/R3-2/2017, dt.22-05-2018	105/P	4.000	6/29/2018	6/28/2038	-	-
120	Colour Granite	Sri Sai Srinivasa Minerals, Mg.Part.SriVemulapalli Srinivasa Rao (TF Sri I Chinna Elumalai) F.No.B-62, Sai Srinivasa Residency, Guntur.		9741/R3-2/2016, dt.29-05-2018	532/B	2.000	3/7/2021	3/8/2041	-	-
121	Colour Granite	Smt. DesaboinaUshasri, W/o BalaSubba Rao, Flat No. 302-1, Mahalakshmi Residency, Bhagya Nagar 2nd Lane, Ongole.		8435/R3-2/2017, dt.22/05/2018	105/P(USH)	1.980	7/16/2018	7/15/2038	-	-
122	Colour Granite	Sri T. Mallikarjuna Rao, D.No.7-11-20(F), Beside MLA House, Lawyerpet, Ongole	9848152818	15865/R3-2/2016, dt.11/06/2018	1/P	4.000	8/7/2018	8/6/2038	-	-
123	Colour Granite	Lucky Mines, Mg.Part: Smt. M.Swapna, W/o. Siva Prasad, D.No.2-24A, Beside of Elementary School, Rice Mill Road, East Veerayapalem Village, Darsi Mandal, Prakasm Dist.	9550092092	17492/R3-2/2016, dt.24/01/2018	105/P (USH)	4.000	7/7/2018	7/6/2038	-	-
124	Colour Granite	Sri K.Satyanarayana,	D.No.3-17, Kondaiahpalem (V), Chennupalli Post, Ballikurava (M), Prakasam Dist.	26629/R3-2/2016, dt.22/05/2018	1025/A1	1.262	7/10/2018	7/9/2038	-	-
125	Colour Granite	Sri K. Srinivasa Rao, C/o Subba Rao,	D.No.5-66-13/7, Flat No.4A, Ambessy Apartments, Ashok Nagar, Guntur - 522007	28021/R3-2/2017, dt.28/06/2018	359/P	9.926	8/25/2018	8/24/2038	-	-

126	Colour Granite	Kishore Slabs and Tiles, Prop. Smt. G.Jhansi,	G.T.Road, Ganapavaram, Chikaluripet, Guntur District	29303/R3-2/2017, dt.18/09/2018	347/1	1.881	10/29/2018	10/28/2038	-	-
127	Colour Granite	Hanuman Exports, Mg.PartSmt.T.Tulasi, (Transfer from N.V. Exports Mg.Partner Sri N. Venkateswara Reddy),	Behind G.P. Boild Mill, Martur-523301	3070/R3-2/2019, dt.28/06/2019	934/28(P)	2.157	7/24/2019	11/8/2038	-	-
128	Colour Granite	MaramVenka Reddy Granites, Prop: Sri M. Venka Reddy, 7-344, Reddy, Bazar, Chimakurthy Mandal, Prakasam District.		4805/r3-2/2018, dt.09/11/2018	103/P	1.618	11/14/2018	11/13/2038	-	-
129	Colour Granite	MaramVenka Reddy Granites, Prop: Sri M. Venka Reddy, 7-344, Reddy, Bazar, ChimakurthyMandal, Prakasam District.		4806/R3--2/2018, dt.09/11/2018	103/P	1.900	11/14/2018	11/13/2038	-	-
130	Colour Granite	SR Constructions Company, Part.SriNalluri Padma Rao, 307, Liberty Plaza, Basheerbagh, Hyderabad.	9866131059	4807/R3-2/2018, dt.09/11/2018	103/P	1.821	11/19/2018	11/18/2038	-	-
131	Colour Granite	Vybhav Granites, Mg.Part. Sri ChallagundlaHanumantha Rao, D.No.11-609/1, 4th Lane, Annapurna Nagar, Near Venkateswara Swamy Temple, Gorantla, Guntur (D)	9948517724	1824/R3-2/2018, dt.25/03/2019	1075/P	6.790	5/16/2019	5/15/2039	-	-
132	Colour Granite	VejayaSaai Granites, Prop. Smt. Thera Anitha Devi, W/o.Venkata Veer Raghava Reddy, D.No.7-96-5, Near Govt. College, Rajugaripalem		1825/R3-2/2018, dt.25-03-2019	1075/P	6.900	5/16/2019	5/15/2039	-	-

		Road, Martur, Prakasam District.								
133	Colour Granite	Tirumala Sai Chandana Granites, Mg.Part.SriMotupalli Srinivasa Rao, S/o. Ramaiah, H.No.3-45, Timmayapalem Village, Addanki Mandal, Prakasam District	7702327707	1823/R3-2/2018, dt.07/06/2019	1075/P	7.760	8/2/2019	8/1/2039	-	-
134	Colour Granite	Sai Srinivasa Minerals, (TF Sri I Chinna Elumalai), Mg.Part.SriV.Srinivasa Rao, Flat No. B-62, Sai Srinivasa Residency, SVN Colony, Main Road, Guntur		39/D9/2021, dt.07/01/2021	532/B	3.238	1/21/2021	7/8/2039	-	-
135	Colour Granite	Marvel Granites, Mg.Part.SriS.Kishore Babu, D.No.7-5-20, 1st Lane, MM Donka, Ongole, Prakasam District.		9902/R3-2/2017, dt.18/09/2018	282/P	8.180	12/19/2020	12/18/2040	-	-
136	Colour Granite	Vintar Granites, Prop.Smt.Kakkera Savitri, W/o.Anjaneyulu, H.No.3-2-20/1, Near Ramalayam, Kondayapalem(V), Chennupalli, Ballikurava Mandal	98857147777	2135/D9/2019, dt.04/03/2020	243/C2, 243/C5, 243/C8 & 243/D	2.148	4/24/2020	4/23/2040	-	-
137	Colour Granite	Sri Sivarama Granites, Mg.Part.SriDhulipalla Srikanth, S/o. Rama Govindu, H.No.4-76, Kondayapalem Village, Ballikurava Mandal	7288965566	2766/D9/2019, dt.04/03/2020	230/B/P, 233/P, 237/P, 238/P & 241/P	1.850	4/24/2020	4/23/2040	-	-
138	Colour Granite	Purna Granites, Mg.Part.SriDamacharla	9848152526	449/D9/2019, dt.09/10/2020	877/3P	3.569	11/23/2020	11/22/2040	-	-

		Satyanarayana, S/o Purna Chandra Rao, H.No.37-1-391/2, Dharavari Thota, Ongole								
139	Colour Granite	D Srikanth, S/o. Ramagovindu, H.No. 4-76 Kondayapalem Village, Ballikurava Mandal, Prakasam District.	7799393456	9086/D9/2018, dt. 21/09/2021	235/P	0.307	9/29/2021	9/28/2041	-	-
140	Colour Granite	Vijaya Sai Granites, Mg. Partner: Mutyala Venkata Rao, S/o. Satyanarayana, Flat No. 402, Datta sai Towers, NTR Centre, Chilakaluripet, Guntur District	9849241369	8073/D9/2018	4/1P, 4/3 & 17P	4.604	6/19/2021	6/18/2041	-	-
141	Colour Granite	M/s. V.K Granites, Mg. Partner: Damacherla Venkata Krishna Rao, D.No. 3-6, ThurpuNaidupalem Village, Tangutur Mandal, Prakasam District.		829/D9/2019, dt. 07-02-2022	536/B(P) & 535/1(P)	4.850	2/17/2022	2/16/2042	-	-
142	Colour Granite	Smt. K Rajeswari, W/o. Ram Mohan Rao, D.No. 8-498, 2nd Line, Pandaripuram, Ongole, Prakasam District	9866131059	4808/D9/2018, dt. 11-02-2022	103/P	2.550	4/1/2022	3/31/2042	-	-
143	Colour Granite	Elchuri Ravindra Babu, S/o. Venkateswarlu, Chenupalli Village, Ballikurava Mandal, Prakasam District	8985871617	3065/D9/2019, dt. 22-02-2022	632/1, 634/6, 635/5 & 633/4	2.000	4/18/2022	4/17/2042	-	-
144	Colour Granite	Gorantla Srinivasa Rao, D.No. 3-327, Kondayapalem Street, Ballikurava Village and Mandal, Prakasam District	9885913336	10102/D9/2021, dt. 20-05-2022	225/1P, 3P, 4P, 5, 6P & 7P	2.150	5/25/2022	5/24/2042	-	-

145	Colour Granite	Subrahmanyeswara Mines and Minerals, Mg. Partner Smt. MopideviAruna, W/o. Venkata Ramana Rao, D.No. 664/1, Totakuravari Street, Undavalli Center, Undavalli Village, Tadepalli Mandal, Prakasam District	9154302345	2858/D9/2021, dt. 12/05/2022	934/25-1, 934/25-2, 934/25-3, 934/25-4A, 934/25-4B, 934/25-4C, 934/25-4D, 934/25-4E, 934/25-4F, 934/25-4G & 934/25-4H(P)	1.639	5/25/2022	5/24/2042	-	-
146	Colour Granite	Subrahmanyeswara Mines and Minerals, Mg. Partner Smt. MopideviAruna, W/o. Venkata Ramana Rao, D.No. 664/1, Totakuravari Street, Undavalli Center, Undavalli Village, Tadepalli Mandal, Prakasam District	9154302345	2857/D9/2021, dt. 12-05-2022	934/20-1A(P), 934/20-1B, 934/20-1C, 934/20-1D, 934/20-1E, 934/20-1F, 934/20-1G, 934/20-1H, 934/20-1I, 934/20-2, 934/20-3, 934/20-4	2.045	5/25/2022	5/24/2042	-	-
147	Colour Granite	K. Samrajyam, D.No.4/5/29/75-B, Gayatri Nilayam, 4/4 Vidhya Nagar, Guntur		5140/D9/2021, dt. 18-05-2022	865/4P, 997/2P	4.970	6/1/2022	5/31/2042	-	-
148	Colour Granite	M/s. Veera Bhadra Mines and Minerals, Prop: Sri Allu Govinda Reddy, Flat No.601, Green Space Fortune, Opp. Scholers Int, Puppalaguda (V),	9701766659	7088/D9/2019, dt: 28-06-2022	247/3P2 249/2P2 250/P 254/P 257/P and 258/P	3.444	8/18/2022	8/17/2042	-	-

		Rajedendranagar(M), Rangareddy District, Telangana State-500089.								
149	Colour Granite	M/s. Lakshmi Simha Ganapathi Exports., Mg. Partner: A. Venkateswarlu, H.No. 09/79/2A, Mallayapalem Village, Ballikurava Mandal, Prakasam District.		5208/D9/2021, dt: 30-06-2022	866-3A(P) , 995/3B(P)	3.350	8/26/2022	8/25/2042	-	-
150	Colour Granite	M/s Aarna Stones, Mg. Partner Sri Aluri Sri Hari, S/o Chenchu Krishna Rao, D.No. 42-1-162 (1), ThurupuKammaPalem, Ongole, Prakasam District.		6203/D9/2020, dt. 23-08-2022	871/1, 871/3, 871/4 871/5, 871/6, 871/7 , 871/8, 871/9 , 871/10 & 871/11	3.350	9/20/2022	9/19/2042	-	-
151	Colour Granite	M/s. Vijaya Sai Granites, Mg. Partner Sri Mutyala Venkata Rao, Flat No. 402, Datta Sai Towers, NRT Centre, Chilakaluripet Village and Mandal, Guntur District.		8072/D9/2018, dt: 01-02-2023	in Sy. No. 17(P), 18(P) 19/P	4.526	2/14/2023	2/13/2043	-	-
152	Colour Granite	Sowdamini Enterprises, Mg. Partner: Sri Aleti Prasad Rao, D.No. 7-382/16, Main Road, Chilakaluripet, Guntur District	961819242	14903/D9/2017, dt.01/02/2023	21, 22 & 23 (P)	10.025	3/31/2023	3/30/2043	-	-
153	Colour Granite	M/s Lakshmi Granites, Prop: Sri Sidda Raghava Rao, S/o Sri Venkateswarlu, D.No. 8-24, dhenuvukondavari		8522-1/D9/2021, dt:17.04.2023	103/P	0.461	17.04.2023	16.04.2043	-	-

		Street, opp: Bethun Nursing Home, Ongole, Prakasam Dist.								
154	Colour Granite	M/s Lakshmi Granites, Prop: Sri Sidda Raghava Rao, S/o Sri Venkateswarlu, D.No. 8-24, dhenuvukondavari Street, opp: Bethun Nursing Home, Ongole, Prakasam Dist.		8522-2/D9/2021, dt:17.04.2023	103/P	0.186	17.04.2023	16.04.2043	-	-

Data Source: District Mines and Geology Officer, Bapatla District

(Cont. of Table-16)

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
9/14/2009	Working	Non-Captive	SEIAA/AP/PKM-/2013-6328, Dt. 26-03-2013	16°06'30.74"	80°02'03.92"	Opencast
				16°06'26.48"	80°02'03.57"	
				16°06'27.40"	80°01'58.32"	
				16°06'30.96"	80°01'59.29"	
				16°06'30.91"	80°01' 59.40"	
				16°06'32.05"	80°01' 59.69"	
				16°06'34.88"	80°01' 07.73"	
8/21/2014	Working	Non-Captive	SEIAA/AP/PKM-147/MIN/2013-3118, Dt. 12-08-2013	16°06'37.90"	80°02'07.50"	Opencast
6/10/2016	Working	Non-Captive	SEIAA/AP/CTR-305/2015, Dt. 10.06.2016	16°06'25.30"N	80°02' 36.80"E	Opencast
				16°06' 26.26"N	80°02' 33.77"E	
				16°06' 27.11"N	80°02' 33.82"E	
				16°06' 29.01"N	80°02' 34.74"E	
10/24/2009	Working	Non-Captive	SEIAA/AP/PKM/MIN/10/2016/220, Dt. 27.02.2017	16°06'39.93747"	18°02'12.91437"	Opencast

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
4/19/2012	Working	Non-Captive	SEIAA/AP/PKM-90/2013, Dt. 10.06.2013	16°06'37.87299"N	80°02'49.86191" E	Opencast
				16°06'43.71674"N	80°02'50.86622" E	
				16°06'44.33529"N	80°02'46.81081" E	
				16°06'40.00141"N	80°02'45.31892" E	
6/30/2007	Working	Non-Captive	SEIAA/AP/PKM-90/2013, Dt. 30.04.2013	16°06'27.06"	80°02'43.62"	Opencast
10/23/2012	Working	Non-Captive	SEIAA/AP/PKM-281/2015-2804, Dt. 03-08-2015	16°05'03.03"N	79°58'39.08"E	Opencast
				16°05'05.06"N	79°58'44.02"E	
				16°05'03.09"N	79°58'44.07"E	
				16°05'03.04"N	79°58'45.05"E	
6/8/2016	Non Working	Non-Captive	SEIAA/AP/PKM-294/2015-4068, Dt. 21-09-2015	16°06'22.72651"	80°02'32.12961"	Opencast
11/19/2014	Non Working	Non-Captive	DEIAA/AP/PKM/30/MIN/2017-129, Dt. 13-11-2017	16°06'30.30"	80°02'31.80"	Opencast
11/21/2003	Working	Non-Captive	SEIAA/AP/PKM-309/2015, Dt. 15.10.2015	16°06'38.49339"N	80°02'07.53552" E	Opencast
				16°06'39.98886"N	80°02'01.55519" E	
				16°06'45.22587"N	80°02'03.91218" E	
				16°06'43.01473"N	80°02'12.90027" E	
5/30/2011	Working	Non-Captive	DEIAA/AP/PKM/06/MIN/2017-64, Dt. 03.08.2017	16°06'35.18"N	80°01'59.35"E	Opencast
				16°06'34.19"N	80°02'01.78"E	
				16°06'35.49"N	80°02'02.21"E	
				16°06'36.03"N	80°02'00.46"E	
2/11/2019	Working	Non-Captive	SEIAA/AP/PKM-191/2013, Dt. 23.10.2013	16°06'23.16101" N	80°02'47.83922" E	Opencast
				16°06'26.43260" N	80°02'49.56101" E	
				16°06'26.98311" N	80°02'43.99052" E	

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
				16°06'23.24363" N	80°02'47.55820 ″ E	
1/20/2009	Working	Non-Captive	SEIAA/AP/PKM-192/2013, Dt. 23.10.2013	16°06'18.85170"	80°02'45.48720	Opencast
2/28/2015	Working	Non-Captive	SEIAA/AP/PKM-193/2013, Dt. 23.10.2013	16°06'19.82283	80°02'40.24461	Opencast
				16°06'20.25772	80°02'36.74652	
				16°06'18.02361	80°02'35.86521	
				16°06'18.06120	80°02'35.75230	
				16°06'17.76349	80°02'35.67021	
				16°06'17.79871	80°02'35.21763	
4/23/2005	Working	Non-Captive	SEIAA/AP/PKM-101/2013-822, Dt. 08.05.2013	16°06'24.66"N	80°01'10.24"E	Opencast
				16°06'23.61"N	80°02'10.14"E	
				16°06'20.64"N	80°02'08.07"E	
				16°06'20.90"N	80°02'06.69"E	
5/14/2014	Working	Non-Captive	SEIAA/AP/PKM-210/2013, Dt. 25.10.2013	16°05'22.07"N	80°01'50.07"E	Opencast
				16°05'20.07"N	80°01'50.01"E	
				16°05'19.05"N	80°01'54.07"E	
				16°05'17.08"N	80°01'54.02"E	
7/11/2011	Working	Non-Captive	SEIAA/AP/KNL-310/2015, Dt. 15.10.2015	16"06'41.50	80°02'08.34	Opencast
				16"06'40.96	80°02'09.56	
				16"06'40.90	80°02'10.77	
				16"06'40.31	80°02'10.64	
				16"06'40.32	80°02'11.75	
				16"06'39.99	80°02'12.83	
1/25/2010	Working	Non-Captive	SEIAA/AP/PKM-105/2013/216.05&213.02, dt. 06.05.2023	16°06'33.36"N	80°02' 14.20"E	Opencast
				16°06' 39.58"N	80°02' 14.28"E	
				16°06' 36.88"N	80°02' 15.77"E	
				16°06' 34.89"N	80°02' 14.67"E	

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
8/25/2010	Working	Non-Captive	SEIAA/AP/PKM-104/2013, Dt. 20.05.2013	16°06'33.36"N	80°02' 14.20"E	Opencast
				16°06' 34.89"N	80°02' 14.67"E	
				16°06' 36.88"N	80°02' 15.77"E	
				16°06' 35.42"N	80°02' 16.55"E	
11/27/2013	Working	Non-Captive	SEIAA/AP/PKM-99/2013, dt. 08.05.2013	16°06'45.87"N	80°02'45.26"E	Opencast
				16°06'45.26"N	80°02'48.78"E	
				16°06'44.08"N	80°02'48.50"E	
				16°06'44.33"N	80°02'46.81"E	
9/1/2012	Working	Non-Captive	DEIAA/AP/PKM/84/MIN/2018-238, Dt. 24.07.2018	16°06'35.34"N	80°02'52.20"E	Opencast
				16°06'37.17"N	80°02'47.82"E	
				16°06'36.25"N	80°02'45.79"E	
				16°06'35.72"N	80°02'47.20"E	
5/13/2009	Working	Non-Captive	SEIAA/AP/PKM-163/2013, Dt. 03.10.2013	16°06'31.53"N	80°02'48.84"E	Opencast
				16°06'30.79"N	80°02'47.53"E	
				16°06'32.04"N	80°02'45.06"E	
				16°06'33.53"N	80°02'45.77"E	
2/7/2019	Working	Non-Captive	SEIAA/AP/PKM/MIN/05/2018/598, Dt. 15.10.2018	16°06'40.91"N	80°02'43.27"E	Opencast
				16°06'38.87"N	80°02'47.69"E	
				16°06'37.57"N	80°01'46.99"E	
				16°06'39.39"N	80°01'42.48"E	
3/5/2014	Working	Non-Captive	SEIAA/AP/PKM-186/2013, Dt. 23.10.2013	16°06'40.00"N	80°02'50.05"E	Opencast
				16°06'37.09"N	80°02'49.08"E	
				16°06'36.09"N	80°02'52.03"E	
				16°06'36.08"N	80°02'52.05"E	
20.04.2007	Working	Non-Captive	SEIAA/AP/PKM-196/2013, Dt. 25.10.2013	16°06'23.95 N	80°02'32.82 E	Opencast
				16°06'23.19 N	80°02'35.98 E	
				16°06'22.24 N	80°02'35.52 E	
				16°06'20.75 N	80°02'35.29 E	

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
				16°06'19.79 N	80°02'33.26 E	
				16°06'22.11 N	80°02'31.48 E	
				16°06'22.14 N	80°02'31.54 E	
				16°06'22.89 N	80°02'32.16 E	
4/26/2012	Working	Non-Captive	SEIAA/AP/PKM-197/2013, Dt. 25.10.2013	16°06'15.40 N	80°02'27.92 E	Opencast
				16°06'16.00 N	80°02'23.60 E	
				16°06'16.72 N	80°02'23.85 E	
				16°06'16.54 N	80°02'24.57 E	
				16°06'19.19 N	80°02'26.15 E	
				16°06'19.94 N	80°02'26.65 E	
				16°06'18.78 N	80°02'29.41 E	
				16°06'21.36 N	80°02'30.79 E	
				16°06'19.65 N	80°02'33.26 E	
				16°06'17.87 N	80°02'29.08 E	
4/15/2013	Working	Non-Captive	SEIAA/AP/PKM-199/2013, Dt. 25.10.2013	16°06'22.91 N	80°02'39.52 E	Opencast
				16°06'23.49 N	80°02'36.10 E	
				16°06'24.18 N	80°02'36.32 E	
				16°06'25.11 N	80°02'36.92 E	
				16°06'25.78 N	80°02'37.75 E	
				16°06'27.23 N	80°02'39.01 E	
5/2/2018	Working	Non-Captive	SEIAA/AP/PKM/MIN/01/2018 /492-650, Dt. 01.03.2018	16°06'19.65"N	80°02'33.22"E	Opencast
				16°06'17.71"N	80°02'35.12"E	
				16°06'17.71"N	80°02'35.59"E	
				16°06'18.03"N	80°02'35.69"E	
9/22/2018	Working	Non-Captive	DIA/AP/MIN/9754/2017, Dt. 11.06.2018	16°06'32.43692"N	80°02'40.71284" E	Opencast
				16°06'30.90135"N	80°02'44.28299" E	
				16°06'26.98311"N	80°02'43.99052" E	
				16°06'29.29670"N	80°02'41.04301" E	

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
10/11/2018	Working	Non-Captive	SEIAA/AP/PKM/MIN/03/2018/557, Dt. 16.06.2023	16°06'22.6N	80°02'41.5 E	Opencast
				16°06'22.9 N	80°02'39.5 E	
				16°06'24.8 N	80°02'40.3 E	
				16°06'24.4 N	80°02'42.4 E	
10/11/2018	Working	Non-Captive	SEIAA/AP/PKM/MIN/03/2018/558, Dt. 16.06.2023	16°06'17.1 N	80°02'39.0 E	Opencast
				16°06'18.0 N	80°02'35.8 E	
				16°06'20.6 N	80°02'36.8 E	
				16°06'19.7 N	80°02'40.2 E	
8/28/2020	Working	Non-Captive	SEIAA/AP/PKM/MIN/08/2019/1220/168.02 & 165.07, Dt. 22.11.2021	16-06-30.65150	80-02-24.23542	Opencast
				16-06-30.89591	80-02-23.38603	
				16-06-31.41849	80-02-22.82117	
				16-06-34.99028	80-02-26.13005	
				16-06-38.73605	80-02-26.12457	
				16-06-38.94859	80-02-25.25813	
				16-06-39.00606	80-02-26.66994	
				16-06-39.26121	80-02-27.86544	
				16-06-39.47456	80-02-27.00569	
1/24/2022	Working	Non-Captive	SEIAA/AP/PKM/MIN/12/2018-250, Dt. 24.01.2022	16-06-44.17524	80-02-54.47719	Opencast
				16-06-45.13292	80-02-51.48952	
				16-06-45.40040	80-02-54.89041	
				16-06-47.24956	80-02-50.93210	
				16-06-47.35748	80-02-50.68703	
				16-06-47.57651	80-02-51.30672	
				16-06-52.11530	80-02-57.27013	
				16-06-53.75086	80-02-53.02062	
1/24/2022	Working	Non-Captive	SEIAA/AP/PKM/MIN/01/2020/1661-, Dt. 28.01.2022	16-06-22.48731	80-02-03.26110	Opencast
				16-06-23.55070	80-02-03.28301	
				16-06-23.85353	80-02-00.03352	

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
				16-06-23.87613	80-02-02.06960	
				16-06-24.06473	80-02-01.42652	
				16-06-24.42752	80-02-03.34300	
				16-06-24.72902	80-02-02.33362	
				16-06-24.99769	80-02-57.62530	
				16-06-25.08311	80-02-01.31641	
				16-06-25.95351	80-02-57.98162	
				16-06-26.13643	80-02-58.02850	
				16-06-14.72660	80-02-06.04681	
				16-06-14.82251	80-02-06.58479	
				16-06-15.77732	80-02-03.40960	
				16-06-15.89312	80-02-03.20489	
				16-06-16.23433	80-02-07.81530	
				16-06-16.58622	80-02-03.46821	
				16-06-17.04060	80-02-08.14769	
				16-06-17.90111	80-02-08.14769	
				16-06-18.19230	80-02-04.24690	
				16-06-18.74879	80-02-04.44131	
				16-06-18.88724	80-02-06.87561	
				16-06-19.09861	80-02-04.63552	
				16-06-19.43072	80-02-05.14841	
				16-06-20.37870	80-02-08.19242	
				16-06-20.38172	80-02-07.43490	
				16-06-20.62400	80-02-07.46282	
				16-06-20.66261	80-02-07.98931	
				16-06-20.96972	80-02-07.46282	
				16-06-21.04772	80-02-05.94671	
				16-06-21.35719	80-02-06.14592	

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
				16-06-23.53551	80-02-08.62073	
				16-06-23.84222	80-02-09.66363	
				16-06-23.85155	80-02-10.23173	
				16-06-24.16500	80-02-09.75201	
1/28/2022	Working	Non-Captive	SEIAA/AP/PKM/MIN/06/2020-537, Dt. 28.01.2022	16°06'16.23	80°02'07.81	Opencast
				16°06'14.82	80°02'06.58	
				16°06'14.73	80°02'06.05	
				16°06'15.78	80°02'03.41	
				16°06'18.19	80°02'04.25	
				16°06'24.17	80°02'09.75	
				16°06'23.85	80°02'10.23	
22.06.2023	Working	Non-Captive	SEIAA/AP/PKM/MIN/BPT/11/2022/4726/211.46&208.32, dt:02.03.2023	15-53-39.08711	80-05-32.62556	Opencast
				15-53-37.54110	80-05-37.13228	
				15-53-33.25716	80-05-29.93038	
				15-53-35.50782	80-05-26.60798	
4/27/2023	Working	Non-Captive	SEIAA/AP/PKM/MIN/8/2022/4584/198.03/195.03 dt.07.10.2022	15-57-10.12873	80-07-49.79804	Opencast
				15-57-06.29478	80-07-55.52330	
				15-57-05.88885	80-07-56.06410	
				15-57-02.67120	80-07-53.19436	
				15-57-07.09566	80-07-46.95662	
1/25/2023	Working	Non-Captive	DEIAA/AP/PKM/82/MIN/12/2018-235 dt:27.11.2018	15-58-59.55950	80-02-06.67032	Opencast
				15-58-57.74687	80-02-09.63184	
				15-58-55.12024	80-02-14.27916	
				15-58-53.57898	80-02-13.74007	
				15-58-51.96130	80-02-13.52720	
				15-58-52.18883	80-02-11.52256	
				15-58-52.34022	80-02-10.18609	
				15-58-55.91972	80-02-04.68353	

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
				15-58-57.79016	80-02-05.70451	
10/12/2022	Working	Non-Captive	SEIAA/AP/PKM/MIN/03/2019/887-494/207.16&204.11, dt:07.02.2023	15-43-51.12304	80-15-28.68035	Opencast
				15-43-51.66616	80-15-27.67732	
				15-43-52.38897	80-15-26.33834	
				15-43-53.56003	80-15-26.92527	
				15-43-54.27876	80-15-24.92039	
				15-43-53.84664	80-15-24.41449	
				15-43-51.40799	80-15-25.78141	
				15-43-50.50969	80-15-26.94993	
				15-43-50.28197	80-15-26.80160	
				15-43-49.77550	80-15-26.32785	
				15-43-49.08719	80-15-27.21371	
				15-43-49.65488	80-15-27.66415	
				15-43-50.09163	80-15-27.97391	
9/17/2022	Working	Non-Captive	SEIAA/AP/PKM/MIN/12/2646/2020/168.23/165.25 dt.22.11.2021	15-54-13.45545	80-01-57.97575	Opencast
				15-54-10.03651	80-01-59.20987	
				15-54-13.30485	80-02-09.49293	
				15-54-17.63102	80-02-07.93144	
				15-54-12.34642	80-02-02.87699	
1/24/2023	Working	Captive	SEIAA/AP/MIN/PKM/8/2022/4557/203.37/200.31 dt. 09.12.2022	15-43-53.78567	80-00-09.86486	Opencast
				15-44-01.98887	80-00-15.92694	
				15-44-00.14027	80-00-19.34044	
				15-43-52.78933	80-00-13.56828	
12/27/2022	Working	Captive	SEIAA/AP/MIN/PKM/06/2022/4357/197.54/194.45 dt.07.10.2022	15-43-52.78933	80-00-13.56828	Opencast
				15-44-00.14027	80-00-19.34044	
				15-43-58.11257	80-00-23.08169	
				15-43-51.64280	80-00-17.71670	
12/27/2022	Working	Captive	SEIAA/AP/MIN/PKM/06/202	15-43-54.17757	80-00-08.19125	Opencast

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
			2/4357/192.15/189.15 dt.03.08.2022	15-43-59.97732	80-00-09.30345	
				15-44-03.90989	80-00-12.36445	
				15-44-01.98887	80-00-15.92694	
				15-43-53.78567	80-00-09.86486	
12/1/2021	Working	Captive	SEIAA/AP/PKM/MIN/01/2021/2821/161.19 & 158.14. 467 dt.29.07.2023	15-43-58.11257	80-00-23.08169	Opencast
				15-43-56.95158	80-00-25.22152	
				15-43-51.13995	80-00-20.12067	
				15-43-51.64280	80-00-17.71670	
9/29/2018	Working	Non-Captive	DEIAA/AP/PKM/MIN/2017-247, dt:24.07.2018	15-44-19.30	80-15-35.20	Opencast
				15-44-18.90	80-15-36.10	
				15-44-15.70	80-15-41.60	
				15-44-15.10	80-15-40.90	
				15-44-17.30	80-15-35.40	
				15-44-17.30	80-15-34.40	
8/23/2022	Working	Non-Captive	SEIAA/AP/PKM/MIN/112265/2020/170.41/167.44 dt.19.01.2022	15-54-13.52815	80-01-57.65453	Opencast
				15-54-14.06044	80-01-55.30204	
				15-54-22.39434	80-01-57.08311	
				15-54-21.20934	80-01-59.78195	
3/3/2023	Working	Non-Captive	SEIAA/AP/PKM/MIN/06/2022/4338/192.06/189.06, dt03.08.2022	15-55-02.03874	80-00-32.61683	Opencast
				15-55-05.12094	80-00-29.59070	
				15-55-07.46294	80-00-31.39991	
				15-55-04.94017	80-00-35.68532	
4/20/2022	Working	Non-Captive	SEIAA/AP/PKM/MIN/2/2022/3944/179.8/177.08, dt.23.03.2022	15-41-10.03023	80-15-12.96211	Opencast
				15-41-07.56406	80-15-16.76594	
				15-41-00.07834	80-15-10.58210	
				15-41-02.52207	80-15-06.77148	
4/11/2022	Working	Non-Captive	SEIAA/AP/PKm/MIN/3/2021/2983/170.17/167.29,	15-53-50.70782	80-04-50.64107	Opencast
				15-53-50.09093	80-04-57.33777	

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
			dt:20.01.2022	15-53-42.85715	80-04-54.38712	
				15-53-47.18333	80-04-48.28499	
2/17/2022	Working	Non-Captive	SEIAA/AP/PKM/MIN/10/2019-133-141, dt:07.01.2020	16-02-22.68978	80-02-57.24040	Opencast
				16-02-18.43741	80-02-56.73165	
				16-02-12.58928	80-02-55.98716	
				16-02-16.51661	80-02-52.09775	
				16-02-18.42809	80-02-51.99344	
				16-02-24.03103	80-02-51.78035	
				16-02-28.90073	80-02-51.27278	
				16-02-28.84507	80-02-52.85260	
				16-02-23.75511	80-02-54.14064	
12/22/2021	Working	Non-Captive	SEIAA/AP/PKM/MIN/01/2021/2758/163.13&160.10-582, dt:26.08.2021	15-54-25.20210	80-01-28.98258	Opencast
				15-54-23.12175	80-01-35.47146	
				15-54-20.17878	80-01-33.95839	
				15-54-22.19241	80-01-27.67754	
8/26/2022	Working	Non-Captive	SEIAA/AP/PKM/MIN/02/2022/3983/312/182.54&179.41, dt.07.04.2022	16-01-54.60930	80-01-44.11495	Opencast
				16-01-55.18148	80-01-51.08878	
				16-01-53.46403	80-01-50.53063	
				16-01-48.99294	80-01-48.83976	
				16-01-49.36223	80-01-47.74161	
				16-01-47.69786	80-01-46.94182	
				16-01-48.34842	80-01-45.38509	
				16-01-49.66940	80-01-45.72225	
				16-01-50.83137	80-01-42.88608	
6/11/2021	Working	Non-Captive	SEIAA/AP/PKM/MIN/10/2019/1325-175, dt:07.01.2020	16-00-29.27336	79-57-28.08192	Opencast
				16-00-26.96356	79-57-27.37821	
				16-00-25.76349	79-57-28.36606	
				16-00-23.94154	79-57-28.40100	

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
				16-00-23.08787	79-57-28.95664	
				16-00-23.30959	79-57-31.43568	
				16-00-23.02015	79-57-31.58942	
				16-00-27.72888	79-57-32.18979	
10/18/2021	Working	Non-Captive	SEIAA/AP/PKM/MIN/12/2020/2719/162.75&159.64, dt:12.08.2021	15-57-04.32	80-02-16.49	Opencast
				15-57-15.79	80-02-18.59	
				15-57-15.13	80-02-21.72	
				15-57-03.63	80-02-18.78	
17.04.2023	Working	Non-Captive	SEIAA/AP/PKM/MIN/04/2022/4204/210.24&207.21, dt.22.02.2023	16-01-40.07958	80-00-58.26926	Opencast
				16-01-40.25585	80-00-58.77940	
				16-01-37.60202	80-01-00.69149	
				16-01-37.16608	80-01-00.13420	
17.04.2023	Working	Non-Captive	SEIAA/AP/PKM/MIN/04/2022/4203/210.23 & 207.20, dt. 22.02.2023	16-01-33.39987	80-00-58.23720	Opencast
				16-01-32.93238	80-00-59.69798	
				16-01-35.23716	80-01-01.36890	
				16-01-32.88153	80-01-02.87675	
				16-01-32.08571	80-01-04.07305	
				16-01-31.67475	80-01-03.76900	
				16-01-33.61214	80-01-01.04052	
				16-01-31.57463	80-00-59.52253	
				16-01-31.65445	80-00-59.37126	
				16-01-32.29850	80-00-59.83211	
				16-01-33.24758	80-00-58.25147	
10/3/2020	Working	Non-Captive	DEIAA/AP/PKM/80/MIN/2018-243, dt:24.07.2018	15-58-57.74686	80-02-09.63186	Opencast
				15-58-59.87456	80-02-11.97806	
				15-58-57.43273	80-02-16.55591	
				15-58-53.45160	80-02-16.42803	
				15-58-53.57898	80-02-13.74006	

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
				15-58-55.12022	80-02-14.27915	
9/3/2011	Working	Non-Captive	DEIAA/AP/PKM/65/MIN/2017-200, dt:12.03.2018	15-54-55.06	80-00-28.46	Opencast
				15-54-56.12	80-00-25.29	
				15-54-59.22	80-00-26.32	
				15-54-59.16	80-00-29.48	
10/31/2017	Working	Non-Captive	SEIAA/AP/PKM/MIN/03/2017/297, dt:15.07.2017	15-56-54.60	80-02-32.93	Opencast
				15-56-58.20	80-02-38.40	
				15-56-54.96	80-02-52.80	
				15-56-50.64	80-02-33.61	
6/19/2021	Working	Non-Captive	SEIAA/AP/PKM/MIN/05/2019/919-713, dt:06.08.2019	16-03-11.18143	80-03-49.41646	Opencast
				16-03-10.07958	80-03-56.94844	
				16-03-09.67259	80-04-00.42287	
				16-03-08.20203	80-04-00.09963	
				16-03-08.71432	80-03-56.02162	
				16-03-05.86662	80-03-54.58587	
				16-03-07.05206	80-03-44.49714	
				16-03-10.11144	80-03-44.93171	
				16-03-09.73382	80-03-47.90560	
				16-03-09.60555	80-03-48.92678	
2/14/2023	Working	Non-Captive	SEIAA/AP/PKM/Min/9/2021/3483/173.28/170.28, dt:09.02.2022	16-03-11.09487	80-03-49.31798	Opencast
				16-03-09.41794	80-03-00.35436	
				16-03-07.93890	80-04-00.02706	
				16-03-08.50775	80-03-55.96126	
				16-03-05.68880	80-03-54.43156	
				16-03-07.00984	80-03-44.34117	
				16-03-10.06835	80-03-44.81252	
				16-03-09.49048	80-03-48.77268	
11/29/2021	Working	Non-Captive	SEIAA/AP/PKM/MIN/10/202	15-54-13.52815	80-01-57.65453	Opencast

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
			0/2298/155.152&151.38.205, dt:22.06.2021	15-54-21.03645	80-01-59.73408	
				15-54-17.49967	80-02-07.80579	
				15-54-12.34642	80-02-02.87699	
1/25/2019	Working	Non-Captive	SEIAA/AP/PKM/MIN/05/2018/618, dt:15.10.2018	15-59-54.00	79-56-23.70	Opencast
				15-09-58.70	79-56-26.70	
				15-59-57.30	79-56-27.40	
				15-59-58.00	79-56-29.10	
				15-59-54.40	79-56-30.40	
				15-59-51.00	79-56-28.60	
2/24/2022	Working	Non-Captive	SEIAA/AP/PKM/MIN/07/2019/1061.1039, dt:13.09.2019	15-41-53.50	80-14-43.30	Opencast
				15-41-51.30	80-14-41.40	
				15-41-53.50	80-14-43.30	
				15-41-51.70	80-14-45.00	
				15-41-49.00	80-14-42.70	
				15-41-51.30	80-14-41.40	
2/24/2022	Working	Non-Captive	SEIAA/AP/PKM/Min/07/2019/1067.1040, dt:13.09.2019	15-41-50.30	80-14-49.30	Opencast
				15-41-48.90	80-14-50.90	
				15-41-43.50	80-14-56.10	
				15-41-42.90	80-14-55.70	
				15-41-48.30	80-14-50.40	
				15-41-47.30	80-14-49.50	
				15-41-48.70	80-14-47.90	
5/11/2022	Working	Non-Captive	SEIAA/AP/PKM/MIN/10/3510/2021/174.52/171.39, dt:05.03.2022	15-53-40.18	80-04-46.11	Opencast
				15-53-39.85	80-04-46.38	
				15-53-40.73	80-04-46.86	
				15-53-41.11	80-04-46.57	
11/26/2022	Working	Non-Captive	SEIAA/AP/PKM/MIN/03/2022/3995/195.14&192.10,	15-57-08.97	80-07-58.30	Opencast
				15-57-05.02	80-08-03.95	

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
			dt:30.08.2022	15-57-01.94	80-08-01.32	
				15-57-06.29	80-07-55.52	
01.06.2023	Working	Non-Captive	SEIAA/AP/PKM/MIN/02/2021/2927/163.120&160.99.628, dt:31.08.2021	15-54-33.07053	80-01-21.76263	Opencast
				15-54-40.77417	80-01-22.69327	
				15-54-40.90378	80-01-24.38957	
				15-54-41.30071	80-01-28.06584	
				15-54-36.57088	80-01-23.75598	
				15-54-35.35105	80-01-25.11585	
				15-54-35.09818	80-01-24.80840	
				15-54-32.81188	80-01-22.49375	
6/4/2022	Working	Non-Captive	SEIAA/AP/PKM/MIN/3/2022/4070/183.26/180.17,dt:16.04.2022	15-53-48.31192	80-04-56.6121	Opencast
				15-53-44.46682	80-05-04.64567	
				15-53-40.93504	80-05-02.15695	
				15-53-45.06662	80-04-55.28834	
1/29/2020	Working	Non-Captive	SEIAA/AP/PKM/MIN/12/2018/756-496, dt. 29.06.2019			Opencast
3/8/2010	Non Working	Non-Captive	SEIAA/APPKM/MIN/03/2022/4115/185.08&182.7, Dt. 18.05.2022	15°54'39.75751"	80°02'05.26875"	Opencast
9/9/2014	Working	Non-Captive		15°52'58.3"	80°04'09.1"	Opencast
6/13/2014	Working	Non-captive	SEIAA/AP/PKM-144/2013 dt:30.07.2013	16°01' 46.33"N	80°00' 31.11"E	Opencast
				16°01' 51.88"N	80°00' 33.27"E	
				16°01' 47.66"N	80°00' 35.68"E	
				16°01' 46.39"N	80°00' 37.10"E	
10/15/2013	Working	Non-captive	SEIAA/AP/PKM-142/2023 dt:30.07.2013	16°01' 25.0"N	80°00' 32.8"E	Opencast
				16°01' 26.4"N	80°00' 33.3"E	
				16°01' 26.2"N	80°00' 34.9"E	
				16°01' 27.2"N	80°00' 35.0"E	

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
11/16/2013	Working	Non-captive	SEIAA/AP/PKM-139/2013 dt:10.07.2013	16°01' 51.6"N	80°02' 31.5"E	Opencast
				16°01' 52.1"N	80°02' 34.4"E	
				16°01' 54.1"N	80°02' 35.7"E	
				16°01' 54.3"N	80°02' 36.1"E	
10/16/2006	Working	Non-captive	SEIAA/AP/PKM-206/2013 dt:25.10.2013	16°01' 21.37"N	80°00' 43.28"E	Opencast
				16°01' 22.75"N	80°00' 39.47"E	
				16°01' 22.91"N	80°00' 39.50"E	
				16°01' 23.53"N	80°00' 38.92"E	
10/16/2008	Working	Non Captive	SEIAA/AP/PKM-61/2013 dt:10.04.2013	16°01' 22.93"N	80°00' 44.04"E	Opencast
				16°01' 23.99"N	80°00' 41.72"E	
				16°01' 30.58"N	80°00' 44.74"E	
				16°01' 26.55"N	80°00' 45.00"E	
1/29/2022	Working	Non Captive	DEIAA/AP/PKM-54/MIN/2017 dt:15.12.2017	16°01' 26.55"N	80°00' 45.00"E	Opencast
				16°01' 30.58"N	80°00' 44.74"E	
				16°01' 33.03"N	80°00' 45.74"E	
				16°01' 30.61"N	80°00' 50.40"E	
5/10/2016	Working	Non Captive	SEIAA/AP/PKM-302/2015 dt:09.10.2015	16°01' 33.02"N	80°00' 44.2"E	Opencast
				16°01' 32.0"N	80°00' 49.7"E	
				16°01' 33.8"N	80°00' 50.8"E	
				16°01' 35.05"N	80°00' 45.9"E	
10/26/2007	Working	Non Captive		16°01' 36.53"N	80°00' 42.60"E	Opencast
				16°01' 38.43"N	80°00' 39.83"E	
				16°01' 40.10"N	80°00' 40.93"E	
				16°01' 38.35"N	80°00' 43.76"E	
1/4/2009	Working	Non Captive	SEIAA/AP/PKM-24/2012 dt:22.12.2012	16°02' 41.41"N	80°02' 50.21"E	Opencast
				16°02' 38.11"N	80°02' 48.04"E	
				16°02' 36.40"N	80°02' 50.57"E	
				16°02' 34.22"N	80°02' 49.34"E	

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
10/24/2009	Working	Non Captive	DEIAA/AP/PKM/35/MIN/2017 dt:13.11.2017	16°01' 41.60"N	80°00' 49.90"E	Opencast
				16°01' 38.10"N	80°00' 48.20"E	
				16°01' 36.70"N	80°00' 51.50"E	
				16°01' 34.30"N	80°00' 50.30"E	
11/19/2012	Non-Working	Non-captive	SEIAA/AP/PKM-204/2013 dt:25.10.2013	16°01'34.00"N	80°00' 38.17"E	Opencast
				16°1'33.68"N	80°00'38.84"E	
				16°1' 32.59"N	80°00' 42.45"E	
				16°01' 30.95"N	80°00' 40.33"E	
				16°01' 31.89"N	80°00' 38.28"E	
8/24/2006	Non-Working	Non-captive		16°01' 46.3"N	80°01' 15.8"E	opencast
4/13/2015	Working	Non-captive	SEIAA/AP/PKM-145/2013,DT:30.07.2013	16°01'28.5"N	80°01' 08.1"E	opencast
				16°1'25.6"N	80°01'02.8"E	
				16°1' 18.9"N	80°00' 58.9"E	
				16°01' 21.0"N	80°00'55.5"E	
				16°01' 31.6"N	80°01' 04.0"E	
				16°01' 31.3"N	80°01' 07.0"E	
3/18/2010	Working	Non-captive	DEIAA/AP/PKM/01/MIN/2017,Dt;03.08.2017	12°06' 16.6"N	77°36' 46.1"E	opencast
4/16/2014	Working	Non-captive	SEIAA/AP/PKM/-183/2013,Dt;23.10.2017	12°06' 16.6"N	77°36' 46.1"E	opencast
9/17/2008	Working					opencast
6/2/2014	Working	Non-captive	SEIAA/AP/PKM/-211/2013 Dt25.10.2013	16°01'54.60"N	80°00' 44.80"E	opencast
12/29/2004	Working	Non-captive	DEIAA/AP/PKM/04/MIN/2017,Dt:03.08.2017			opencast
				16°01' 34.09"N	80°01' 05.42"E	
4/23/2015	Working	Non-captive	SEIAA/AP/PKM-234/2014,DT:28.01.2015	16°01'11.90"N	80°01' 18.82"E	opencast
				16°1'12.54"N	80°01'17.57"E	
				16°01' 14.77"N	80°01' 13.79"E	

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
				16°01' 16.40"N	80°01' 13.52"E	
				16°01' 16.48"N	80°01' 11.02"E	
				16°01' 19.68"N	80°01' 05.76"E	
				16°01' 19.08"N	80°01' 02.43"E	
				16°01' 21.72"N	80°01' 04.07"E	
				16°01' 22.52"N	80°01' 07.40"E	
				16°01' 16.86"N	80°01' 15.77"E	
12/22/2006	Working	Non-captive	DEIAA/AP/PKM-04/MIN/2017,DT:3.08.2017	16°01'37.32"N	80°01' 00.36"E	Opencast
6/13/2011	Working	Non-captive	SEIAA/AP/PKM-21/2010-3917,Dt:29.11.2012	16°01'37.32"N	80°01' 00.36"E	opencast
				16°01'37.32"N	80°01' 00.36"E	
				16°01'37.32"N	80°01' 00.36"E	
				16°01'37.32"N	80°01' 00.36"E	
2/28/2011	Working	Non-captive		16°01'37.32"N	80°01' 00.36"E	opencast
2/5/2009	Working	Non-captive	SEIAA/AP/PKM-89/2013,Dt10.06.2013	16°01'06.43"N	80°01' 04.36"E	opencast
10/31/2002	Working			16°01'06.43"N	80°01' 04.36"E	opencast
6/21/2008	WORKING	Non-captive	SEIAA/AP/PKM-80/2013,DT;27.04.2013	16°01'11.90"N	80°01' 18.82"E	opencast
				16°1'12.54"N	80°01'17.57"E	opencast
				16°01' 14.77"N	80°01' 13.79"E	
				16°01' 16.40"N	80°01' 13.52"E	
				16°01' 16.48"N	80°01' 11.02"E	
				16°01' 19.68"N	80°01' 05.76"E	
				16°01' 19.08"N	80°01' 02.43"E	
				16°01' 21.72"N	80°01' 04.07"E	
				16°01' 22.52"N	80°01' 07.40"E	
				16°01' 16.86"N	80°01' 15.77"E	

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
8/24/2016	Non-Working	Non-captive		15°57'40.06211"N	79°56'52.18731"E	opencast
7/1/2010	Working		SEIAA/AP/PKM/MIN/12/2021/3784/177.39&174.27 Dt;17.03.2022	16°04'09.04"N	80°02' 50.81"E	openacast
8/30/2004	WORKING	Non-captive	DEIAA/AP/PKM/55/MIN/2017,DT:18.12.2027	16°01'34.00"N	80°00' 38.17"E	Opencast
				16°1'33.68"N	80°00'38.84"E	
				16°1' 32.59"N	80°00' 42.45"E	
				16°01' 30.95"N	80°00' 40.33"E	
				16°01' 31.89"N	80°00' 38.28"E	
12/22/2008	Working	Non-captive	SEIAA/AP/MIN/PKM-263/2015/195.31,DT;06.10.2022	16°01' 45.26"N	80°00' 44.23"E	Opencast
				16°01' 43.67"N	80°00' 47.19"E	
8/5/2005	Working	Non-captive	SEIAA/AP/PKM-171/2012,DT;08.10.2015	16°01' 46.0"N	80°00' 19.9"E	
				16°01'42.4"N	80°01' 24.2"E	opencast
				16°01' 38.6"N	80°01' 25.6"E	
				16°01' 37.1"N	80°01' 23.3"E	
				16°01' 34.7"N	80°01' 21.8"E	
				16°01' 30.2"N	80°01' 23.2"E	
				16°01' 26.2"N	80°01' 24.2"E	
				16°01' 23.0"N	80°01' 21.1"E	
				16°01' 20.5"N	80°01' 19.6"E	
				16°01' 17.2"N	80°01' 22.2"E	
				16°01' 16.8"N	80°01' 22.2"E	
				16°01' 12.4"N	80°01' 19.2"E	
				16°01' 11.6"N	80°01' 18.5"E	
				16°01' 39.9"N	80°01' 19.4"E	
8/5/2005	WORKING	Non-captive	SEIAA/AP/PKM-70/2013-474 Dt;17.04.2013	16°0'56.95"N	80°1' 37.97"E	opencast

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
7/25/2013	WORKING	Non-captive		16°02'48.58"N	80°02' 48.91"E	openacast
3/7/2009	WORKING	Non-captive	SEIAA/AP/PKM-248/2015,DT;18.01.2016			Opeancast
					80°1'02.8"E	
					80°00' 58.9"E	
					80°00' 55.5"E	
				16°01' 31.6"N	80°01' 04.0"E	
				16°01' 31.3"N	80°01' 07.0"E	
1/31/2013	WORKING	Non-captive		16°01' 40.97"N	80°00' 57.86218"E	opencast
12/17/2009	WORKING	Non-captive				opencast
2/29/2020	WORKING	Non-Captive	SEIAA/AP/PKM-29/MIN/2015,Dt:29.07.2021	16°01' 43.4"N	80°01' 08.0"E	opencast
				16°01' 33.0"N	80°01' 06.0"E	
				16°01' 41.8"N	80°01' 05.1"E	
9/8/2009	WORKING	Non-Captive	DEIAA/AP/PKM/40/MIN/2017-138,DT:13.11.2017	16°01' 43.80"N	80°01' 7.93"E	opencast
				16°1' 46.34"N	80°01'15.96"E	
				16°1' 39.34"N	80°01' 15.02"E	
				16°01' 36.80"N	80°01' 6.96"E	
4/16/2015	WORKING	Non-captive				opencast
12/23/2004	WORKING	Non-captive	SEIAA/AP/PKM-/2012-6313,Dt;26.03.2013	16°1' 36.80"N	80°1' 6.96"E	opencast
8/20/2004		Non-Captive	DEIAA/AP/PKM/38/MIN2017,Dt:13.11.2017			opencast
5/15/2015	WORKING	Non-captive	SEIAA/AP/PKM-228/2014-1985,Dt04.03.2015	16°00' 06.97354"N	79°58' 34.0"E	opencast
5/15/2015	working	Non-captive	SEIAA/AP/PKM-229/2014-1984, Dt;04.03.2015	16°01' 10.5"N	79°58' 46.1"E	opencast
11/26/2019	working	Non-captive	SEIAA/AP/PKM-287/2015,Dt;21.01.2017	16°02' 46.2"N	80°03' 12.0"E	opencast
1/20/2018	WORKING	Non Captive	SEIAA/AP/PKM-	16-02-38.34741	80-00-13.07213	opencast

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
			MIN/08/2017/379 dt:23.09.2017	16-02-40.07547	80-00-17.79266	
				16-02-57.00167	80-00-37.34623	
				16-02-59.44427	80-00-12.14531	
				16-02-59.64717	80-00-16.15815	
				16-03-00.17615	80-00-17.13593	
2/14/2018		Non-captive				opencast
2/17/2018	WORKING	Non-Captive	DEIAA/AP/PKM/27/MIN/2017-126 Dt;13.11.2017	16°00' 25.8"N	80°085 02.2"E	opencast
6/29/2018		Non-Captive	DEIAA/AP/PKM/64/MIN/2017,DT:12.03.2018	16°02' 55.1"N	80°01' 31.10"E	opencast
3/7/2021		Non-captive				Opencast
7/16/2018	wORKING	Non-captive		16°02' 27.40"N	79°59' 41.00"E	Opencast
8/7/2018	working	Non-Captive	DEIAA/AP/PKM/51/MIN/2017-177 dt:15.12.2017	16°02' 27.40"N	79°59' 41.00"E	Opencast
				16°02' 28.50"N	79°59' 37.90"E	
				16°02' 30.90"N	79°59' 39.60"E	
				16°02' 25.20"N	79°59' 43.50"E	
				16-02-59.59505	79°59' 46.70"E	
7/7/2018	working	Non-Captive	DEIAA/AP/PKM/28/MIN/2017-127 dt:13.11.2017	16-03-00.97448	80-01-37.76020	opencast
				16-03-03.07508	80-01-38.51370	
				16-03-03.65906	80-01-47.02592	
				16-03-03.84931	80-01-45.96797	
				16-03-04.03635	80-01-40.91757	
7/10/2018	WORKING	Non-captive				opencast
8/25/2018	WORKING	Non-captive	SEIAA/AP/PKM/MIN/01/2018/496 Dt;19.04.2018	16°02' 13.6"N	79°59' 52.9"E	opencast
10/29/2018	WORKING	Non-captive				opencast
7/24/2019	Working	Non-Captive	DEIAA/AP/PKM/86/MIN/2018-94,Dt;11.06.2020	16°01' 52.3"N	80°02' 34.4"E	opencast
				16°01' 51.6"N	80°00' 31.5"E	

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
				16°01' 57.06"N	80°02' 17.5"E	
				16°02' 00.4"N	80°02' 12.3"E	
11/14/2018	WORKING	Non-Captive				opencast
11/14/2018	working	Non-Captive	SEIAA/AP/PKM/MIN/08/2018/673 Dt;15.10.2018	16°01' 35.70"N	80°1' 2.90"N	opencast
				16°01' 35.60"N	80°1' 06.2"N	opencast
11/19/2018	WORKING	Non-captive	SEIAA/AP/VZN/MIN/06/2018/640 dt:15.10.2018	16°02' 27.40"N	80°01' 12.3"E	#NAME?
				16°01' 30.5"N	80°01' 12.4"E	
				16°01' 34.7"N	80°01' 14.9"E	opencast
				16°01' 36.1"N	80°01' 14.0"E	
				16°01' 33.8"N	80°01' 17.0"E	
				16°01' 30.9"N	80°01' 17.5"E	
				16°01' 28.7"N	80°01' 16.0"E	
5/16/2019	WORKING	Non-Captive	SEIAA/AP/PKM/MIN/10/2018/698 Dt;06.12.2018	16°03' 04.4"N	79°58' 54.3"E	opencast
5/16/2019	working					opencast
8/2/2019	WORKING	Non-Captive		16°03' 04.4"N	79°58' 54.3"E	0
				16°03' 02.4"N	79°58' 54.5"E	
1/21/2021						
12/19/2020	WORKING	Non-Captive		16-02-34.32431	80-02-02.08264	
				16-02-35.63769	80-00-05.67026	
				16-02-58.08037	80-00-00.49284	
				16-02-58.33870	80-00-04.31974	
4/24/2020	WORKING	Non-Captive	SEIAA/AP/PKM/MIN/10/2019/133404-1499,Dt;18.12.2019	16°01' 15.05"N	80°00' 31.19"E	
4/24/2020	working	Non-Captive	SEIAA/AP/PKM/MIN/08/2019/1204-1499,Dt;25.11.2019	16°01' 29.96"N	80°00' 41.54"E	
11/23/2020	wORKING	Non-captive	SEIAA/AP/PKM/MIN/08/201	16°01' 45.68757"N	80°02' 08.01146"E	

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
			9/1223,Dt:25.11.2019			
9/29/2021	wORKING	Non-captive	SEIAA/AP/PKM/MIN/12/2019-1524-78,Dt:11.06.2020	16°01' 19.45"N	80°00' 38.36"E	
				16°01' 22.38"N	80°00' 39.34"E	
				16°01' 23.27"N	80°00' 37.07"E	
				16°01' 25.50"N	80°00' 37.35"E	
6/19/2021	wORKING	Non-captive	SEIAA/AP/PKM/MIN/09/2021/3483/173.28 &170.20,Dt:09.02.2022	16°03' 16.24"N	80°04' 03.30"E	opencast
				16°03' 18.74"N	80°04' 03.30"E	
2/17/2022	Working	Non-Captive	SEIAA/AP/PKM/MIN/10/2019-133-141, dt:07.01.2020	16-02-22.68978	80-02-57.24040	opencast
4/1/2022	working	Non-Captive	SEIAA/AP/PKM/MIN/08/2018/676,DT:15.10.2018	16°01' 29.21"N	80°01' 22.83"E	opencast
4/18/2022	working	Non-Captive	SEIAA/AP/PKM/MIN/08/2019/1199,DT:25.11.2019	16°00' 26.41"N	79°59' 47.31"E	Opencast
5/25/2022	working	Non-Captive	SEIAA/AP/PKM/MIN/03/2019/4108,183.100&180.76DT :25.11.2019	16°01' 06.14345"N	80°00' 33.54214"E	Opencast
5/25/2022	WORKING	Non-Captive	SEIAA/AP/PKM/MIN/8/2021/3411/175.56 &172.36 DT:25.11.2019	16°2'09.49173"N	80°02'13.31745" E	opencast
5/25/2022			SEIAA/AP/PKM/MIN/06/2021/3261/161.53&158.38.484 Dt;29.07.2021	16°02' 10.83490"N	80°02' 22.57506"E	opencast
6/1/2022	working	Non-Captive	SEIAA/AP/PKM/MIN/01/2022/3895/179.56&177.35 Dt;24.03.2022	16°00' 57.68"N	80°00' 26.66"E	opencast
8/18/2022	working	Non-Captive	SEIAA/AP/PKM/MIN/12/2021/3715/171.39&168.54 Dt;26.01.2022	16°1'38.77"N	80°1' 42.57"E	opencast

Date of commencement of Mining Operation	Status (Working/nonworking/Temp.working for dispatch etc.,)	Captive/Non-captive	Obtained environmental clearance (YES/No), if Yes Letter No. with date of grant of EC	Location of the Mining Lease (Latitude & Longitude)		Method of Mining (Opencast/Underground)
				(Latitude	Longitude	
12	13	14	15	16	17	18
8/26/2022	Working	Non-Captive	SEIAA/AP/PKM/MIN/02/2022/3983/312/182.54&179.41, dt.07.04.2022	16-01-54.60930	80-01-44.11495	Opencast
9/20/2022	Working	Non-Captive	SEIAA/AP/PKM/MIN/07/2021/3327/162.58&161.58697, Dt:09.09.2021	16°01'57.5178"N	80°02’02.55”E	opencast
2/14/2023	Working	Non-Captive	SEIAA/AP/PKM/Min/9/2021/3483/173.28/170.28, dt:09.02.2022	16-03-11.09487	80-03-49.31798	Opencast
3/31/2023	WORKING	Non Captive	SEIAA/AP/PKM-MIN/06/2019/1018 dt:17.11.2021	16°3'0.68"N	83°3’42.63”E	opencast
				16°2'54.68"N	83°4’3.90” E	
				16°2'52.70"N	83°4’4.12” E	
				16°2'51.00"N	83°4’4.25” E	
				16°2'51.26"N	83°4’3.61” E	
				16°2'49.73"N	83°4’3.51” E	
				16°2'56.02"N	83°3’41.40” E	
				16°2'57.52"N	83°3’41.80” E	
				16°2'59.02"N	83°3’42.20” E	
17.04.2023	Working	Non-Captive	SEIAA/AP/PKM/MIN/04/2022/4203/210.23 & 207.20, dt. 22.02.2023	16-01-33.39987	80-00-58.23720	Opencast
17.04.2023	Working	Non-Captive	SEIAA/AP/PKM/MIN/04/2022/4204/210.24&207.21, dt.22.02.2023	16-01-40.07958	80-00-58.26926	Opencast

Data Source: District Mines and Geology Officer, Bapatla District

The Details of statement showing the letter of intent (LoI) in the district is showing in Table-17:

Table 17 Statement showing the list of the letter of intent (LoI) in the district

S. No	Name of the Mineral	Name of the Lessee	DMG O File No	Address & Contact No. of Letter of Intent Holder	Letter of Intent Grant order No. & Date		Area of Mining lease to be allotted	Village	Mandal	District	Extent in Hects	Validity of LoI	Use (Captive/Non-captive)	Location of the Mining lease (Latitude & Longitude)	Remarks
1	2	3		4	5	6	7	8	9		10	11	12	13	14
BAPATLA															
1	Colour Granite	Dr.E.V.Ranga Reddy			39674/D9/2006	15.07.2015	236	Devanakonda	Addanki	Bapatla	8.000	06 Months	Non-captive		The Shadow file not available in this Office
2	Colour Granite	M/s Giri Raju Granites	316/Q/2020	M/s Giri Raju Granites Mgp: Sri R.Rajaramanjan, Flat No:405, Padma towers, South Bypass Road, Ongole, Prakasam District, Phone No: 8008148666,	4837/D9/2021, dt. 14.09.2021	14.09.2021	230-B(P)&232	Ballikurava	Ballikurava	Bapatla	0.615	01 year	Non-captive	16-01-31.09, 80-00-41.95	Patta Land
3	Colour Granite	M/s. Devi Impex	6167/Q/2018	M/s. Devi Impex, Mgp: Sri V. Srinivasa Rao, S/o Sambasiva Rao,1-31-12,B-74, Plot No: 201, Suguna Homes, 4Th Line, S.V.N.Colony, Chandramouli Nagar, Guntur, Guntur District, Phone No: 9295657359	693/R3-2/2019, dt. 07.06.2019	07.06.2019	1075/P	Koparam	Santhamagulur	Bapatla	11.44	01 year	Non-captive	16-02-49.41, 79-59-10.49	
4	Black Granite	M/s. Sri Vishnu Granites	3800/Q/2015	M/s. Sri Vishnu Granites, Propo:Sri S.V.V.Su dheer Kumar, D.No:8-24. Dhenuvakonda Vari Street,Lawyerpet Extension, Ongole,Prakasam District, Sri Vishnu Granites,	442/R3-2/2019, dt. 12.06.2019	12.06.2019	121/3, 145/1 to 6	Gurijepali	Santhamagulu	Bapatla	1.926	01 year	Non-captive	16-06-16.23, 80-02-07.81	Patta land
5	Colour Granite	M/s. Kishore Exports	14976/Q/2017	Kishore Export Mg.P Sri Chrukuri Anil,S/o Brahamaiah,D.No 5-	2435/R3-2/2019, dt. 17.06.2019	17.06.2019	439/C1	Nagarajupal	Martur	Bapatla	3.652	01 year	Non-captive	15-58-06.017, 80-03-12.366	

				27/30,Baleri Residency,Sai Nager,Martur Mandal,Phone No:9440703618				li							
6	Colour Granite	Smt. Mandava lakshmi Jyothi	9169/Q/2014	Smt. Mandava lakshmi Jyothi, W/o Srinivasa Rao, D.No:1-106, Basavannapalem, Inamanamelluru, Maddipadu Mandal, Prakasam District, Phone No: 9989481945	26284/R3-2/2017, dt. 05.07.2019	05.07.2019	34/B-1E & 1C	Vaidena	Ballikurava	Bapatla	0.922	01 year	Non-captive	15-57-41.30, 79-56-54.00	
7	Colour Granite	M/s Bharath Expor, Mg.Part: Sri P.V.Srinivasa Rao	7363/Q/2018	M/s Bharath Expor, Mg.Part: Sri P.V.Srinivasa Rao, Near Main Road, Addanki, Bapatla Dist Phone No:9440058560	692/D9/2019, dt. 25.03.2019	25.03.2019	282/P	Koppara palem	Ballikurava	Bapatla	6.736	01 year	Non-captive	16-02-35.37, 80-00-04.12	
8	Black Granite	M/s Krishna Sai Expor (P) Limited	2174/Q/2018	M/s Krishna Sai Expor (P) Limited, Director: Sri Sidda Venkatesawara Rao, Plot no: 271, MLA Colony, Road No:12, Banjara Hills, Hyderabad, Phone No: 9985144444	2441/D9/2019, dt. 29.09.2020	29.09.2020	125/8C, 125/9C, 124/3D, 124/2A, 124/1A,90/1, 90/3 & 118/1B	Gurijepali	Santhamagaluru	Bapatla	4.925	01 year	Non-captive	16-06-39.49, 80-02-14.28	Patta Land
9	Colour Granite	Sri Kanduluri Nageswara Rao	3940/Q/2020	Sri Kanduluri Nageswararao,S/o Kasaiah,Do.No.1-131/1 Peda Nemalapuri Village,Rajupalem Mandal,Guntur District ,Phone No::9849665404	10355/D9/2020, dt. 04.05.2021	04.05.2021	1075/P	Koppara m	Santhamagaluru	Bapatla	4.443	01 year	Non-captive	16-03-05.62, 79-59-15.98	
10	Colour Granite	M/s C.R. Granites, Partner: Sri Ch. Vijaya Saradhi	7447/Q/2018	M/s C.R. Granites, Partner: Sri Ch. Vijaya Saradhii,9th line Pandaripuram,Chilakaluripet,Guntur Dist,522616 Phone No:7207570707	2477/D9/2019, dt. 17.09.2021	17.09.2021	446, 447	Rajupalem	Martur	Bapatla	2.554	01 year	Non-captive	16-00-19.51, 80-05-11.39	Patta Land
11	Colour Granite	M/s Giriraj Granites, Mg. Partner: Sri Raja Ramanjan	316/Q/2020	M/s Giri Raju Granites Mgp: R.Rajaramanjan, Flat No:405, Padma towers, South Bypass Road, Ongole, Prakasam District, Phone No: 8008148666,	4837/D9/2021, dt. 14.09.2021	14.09.2021	230/B/P & 232	Ballikurava	Ballikurava	Bapatla	0.615	01 year	Non-captive	16-01-31.09, 80-00-41.95	Patta Land **Double Entry**
12	Colour Granite	M/s Sarojini Granites & Expor, Mg. Partner Sri K. Satyanarayana	2274/Q/2019	M/s Sarojini Granites & Expor, Mg. Partner Sri K. Satyanarayana, Door No:3-2-17/1, Kondayapalem Village, Ballikurava Mandal,Prakasam Dist, Phone No:8886274455	3625/D9/2020, dt. 21.09.2021	21.09.2021	242/B/1I, 242/2B	Ballikurava	Ballikurava	Bapatla	2.302	01 year	Non-captive	16-01-15.63, 80-00-26.56	LoI Extension Time Vide Prce No: 3625/D9/2020; Date: 25.05.2023 Further Period 20.09.2024.
13	Colour Granit	M/s K.B. Stones, Mg. Part: Sri	1319/Q/202	M/s K.B. Stones, Mg. Part: Sri Devineni Srinivasa Rao, S/o	4809/D9/2020, dt.	21.09.2021	1023 & 1024	Konden	Ballikura	Bapatla	3.4	01 year	Non-captive	16-01-42.23, 80-00-41.71	Patta LandLoI Extension

	e	Devineni Srinivasa Rao	0	Venkaiah, H.No:2-19/4, 9th Line, Pandaripuram, Chilakaluripeta, Palanadu District, Phone No:9701522399	21.09.2021			a	va						Time Vide Prce No: 4809/D9/2020; Date: 18.05.2023 Further Period 20.09.2024.
14	Colour Granite	M/s Sri Bhanu Minerals, mg. Part: Sri Vallabhaneni Akhil	1754/Q/2021	M/s Sri Bhanu Minerals, mg. Part: Sri Vallabhaneni Akhil, D.No:5-92-43, 2nd line, Devapuram, Pattabhipuram, Gunturu,Gunturu (U) and District,Phone No: 9676694445	5139/D9/2021, dt. 21.09.2021	21.09.2021	240/B2A, 240/B2B, etc.,	Ballikurava	Ballikurava	Bapatla	1.12	01 year	Non-captive	16-01-35.33, 80-00-33.30	
15	Colour Granite	M/s K.B. Granites LLP, Mg. Partner: Sri Manne Satyanarayana Chowdary	6051/Q/2020	M/s K.B. Granites LLP, Mg. Partner: Sri Manne Satyanarayana Chowdary, 1-221-1, Srinagar NTR Road, Gannavaram, Village & Mandal, Krishna district, Phone No: 9701412345	5209/D9/2020, dt. 29.09.2021	29.09.2021	934/31-B12/P etc.,	Konidena	Ballikurava	Bapatla	3.772	01 year	Non-captive	16-02-09.15, 80-02-06.13	
16	Colour Granite	Smt Abburi Sandhya	6202/Q/2020	Smt Abburi Sandhya,Door.No: 5-347, NGO Colony, Venkateswara Nagar, Ongole, Prakasam District, Phone No:8838865231	4812/D9/2021, dt. 04.10.2021	04.10.2021	359/P and 369/P	Ballikurava	Ballikurava	Bapatla	3.312	01 year	Non-captive	16-02-46.82, 80-00-32.85	
17	Colour Granite	M/s Marvel Rocks, Mg. Part: Sri Jasti Siva Brahmam			4357/D9/2021, dt. 29.09.2021	29.09.2021	934/16-3P	Konidena	Ballikurava	Bapatla	5.438	01 year	Non-captive		The Shadow file not available in this Office
18	Colour Granite	M/s Krishna Sai Expor (P) Limited	8728/Q/2013	M/s Krishna Sai Expor (P) Limited, Director: Sri Sidda Venkatesawara Rao, Plot no: 271, MLA Colony, Road No:12, Banjara Hills, Hyderabad, Phone No: 9985144444	22649/R3-2/2015, dt. 12.08.2016	12.08.2016	20,82, etc.,	Ballikurava	Ballikurava	Bapatla	2.335	06 months	Non-captive	16-01-13.20, 80-00-58.80	Patta Land
19	Black Granite	M/s Virat Minerals & Export			17493/R3-2/2016, dt. 19.01.2017	19.01.2017	70/3P etc.,	Gurijepali	Santhamagaluru	Bapatla	2.246	06 months	Non-captive		The Shadow file not available in this Office
20	Black Granite	M/s Kamepalli Granites & Expor	7678/Q/2015	M/s Kamepalli Granites & Expor, Mgp: Sri K. Lakshmi Prasad, S/o VenkateswaRao, D.No: 6-20-84, 8/1Arundelpeta, 3rd Floor, Gayatri Enclave, Guntur, Guntur Dist, Phone: 9866555858	15138/R3-2/2016, dt. 15.02.2017	15.02.2017	101/1A2(P)	Gurijepali	Santhamagaluru	Bapatla	1.513	06 months	Non-captive	16-06-10.80, 80-02-41.30	Patta Land
21	Black	M/s Amulya	2475/	M/s Amulya Granites Prop: Ch.	14173/R3-	10.07.	562/P	Vaid	Balli	Bap	4	06	Non-	15-57-45.10,	

	Granite	Granites	Q/2013	Sarala, Flot No: 207, Roja Kishore Residency Chenchupet, Tenali, Gunturu Dist, Phone No:-----	2/2013, dt. 10.07.2017	2017		ena	kurava	atla		months	captive	79-59-16.30	
22	Colour Granite	M/s Dhanasri Associates, Mg.P.Sri K. Murali Krishna	5436/Q/2016	M/s Dhanasri Associates, Mg.P.Sri K. Murali Krishna D.No:1-78, Maddirala Village, Chilakaluripet Mandal,Gunturu District, Phone No:9866189278	18327/R3-2/2016, dt.22.11.2017	22.11.2017	1/P	Chennupalli	Ballikurava	Bapatla	5	06 months	Non-captive	16-02-06.30, 79-58-30.80	
23	Colour Granite	M/s Demeter Consultancy (P) Limited, Director: Sri Y. Janardhana Rao	2751/Q/2017	M/s Demeter Consultancy (P) Limited, Director: Sri Y. Janardhana Rao, S/o Siva Linga Prasad, Plot No:101, Road no: 10c, MLA & MP colony, Jubilee Hills, Hyderbad, Phone No: 9176442468	28020/R3-2/2017, dt. 01.12.2017	01.12.2017	282/P	Koppalem	Ballikurava	Bapatla	8.875	06 months	Non-captive	16-02-37.60, 80-00-18.30	
24	Colour Granite	M/s Sri Ramagiri Minerals (P) Limited	11577/Q/2014	M/s Sri Ramagiri Minerals (P) Limited, Director: Sri Ashs Ramachandra Anagha, Plot No:410, Road No:22, Jubilee Hills, Hyderbad, Phone No:9985140599	3665/R3-2/2017, dt. 05.03.2018	05.03.2018	1/P	Chennupalli	Ballikurava	Bapatla	4.886	06 months	Non-captive	16-02-30.70, 79-59-14.00	
25	Colour Granite	M/s Sri Ramagiri Minerals (P) Limited	11576/Q/2014	M/s Sri Ramagiri Minerals (P) Limited, Director: Sri Ashs Ramachandra Anagha, Plot No:410, Road No:22, Jubilee Hills, Hyderbad, Phone No:9985140599	3664/R3-2/2017, dt. 05.03.2018	05.03.2018	1/P	Chennupalli	Ballikurava	Bapatla	4.149	06 months	Non-captive	16-02-26.30, 79-58-58.80	
26	Colour Granite	M/s N.V. Export	1266/Q/2017	M/s N.V. Export, Mgp: Sri N.Venkateswara Reddy, Plot No: A-7/B, APIIC Industrial Eastate, Kurnool Road, Ongole, Prakasam District Phone No: 9849349005	28022/R3-2/2017, dt. 05.03.2018	05.03.2018	934/28(P)	Kondena	Ballikurava	Bapatla	1.178	06 months	Non-captive	16-01-55.70, 80-02-27.70	
27	Colour Granite	M/s Amaravathi Mines, Prop: Smt Ch. Sarala	6889/Q/2017	M/s Amaravathi Mines, Prop: Smt Ch. Sarala, W/o Chalapathi Rao, Door.No: 3-29-39/6/B, 4th Line, Krishna Nagar, Guntur, Gunturu District, Phone No:9346709990	3276/R3-2/2018, dt. 08.06.2018	08.06.2018	282/P	Koppalem	Ballikurava	Bapatla	8.2	06 months	Non-captive	16-02-41.70, 80-00-33.80	
28	Colour Granite	Sri Vadde Nagendra Babu			3268/R3-2/2018, dt. 20.06.2018	20.06.2018	1075/P	Koppam	Santhamagaluru	Bapatla	8.000	06 months	Non-captive		The Shadow file not available in this Office
29	Colour Granit	M/s Janani Rocks, Prop: Sri Nalluri	4234/Q/201	M/s Janani Rocks Prop: Sri Nalluri Satyanarayana,S/o	8486/R3-2/2018, dt.	10.10.2018	359/P	Balli kura	Balli kura	Bapatla	5.907	06 mon	Non-captive	16-02-12.62, 79-59-01.79	

	e	Satyanarayana	8	Rajarao,H.No:8-164-15/1,Srinivasa Nilayam,FlatNo:202,Rajeev Nagar,Lowerpet, Opp.Alval Apartments,Ongole, Prakasam District-523001,Cell:9966765656,	10.10.2018			va	va			ths			
30	Colour Granite	M/s Hanuman Expor, Mg. Partner: Smt Tulabandula Tulasi	6218/Q/2018	M/s Hanuman Expor, Mg. Partner: Smt Tulabandula Tulasi, W/o Srinivasa Rao, Door No: 14-122A, Nethaji Naagar, Sivalayam Street, Martur Village & Mandal, Bapatla District, Phone No: 9849000978	9311/R3-2/2018, dt. 21.03.2019	21.03.2019	934/27P	Konidena	Ballikurava	Bapatla	2.62	01 year	Non-captive	16-02-04.24, 80-02-12.81	
31	Colour Granite	M/s Lucky Granites, Prop: Sri Thalathoti Mari	4437/Q/2018	M/s Lucky Granites, Prop: Sri Thalathoti Mari, ETC Center, Gurijepalli Village, Santhamaguluru Mandal, Bapatla Dist, Phone No:9885102869	9484/R3-2/2018	21.03.2019	231 (old) 240 (New)	Kommalapadu	Santhamagaluru	Bapatla	4.7	01 year	Non-captive	16-02-40.00, 79-58-30.10	
32	Colour Granite	M/s. Mahalakshmi Granites	8032/Q/2018	M/s. Mahalakshmi Granites, Mgp:Sri D.Chaitanya, S/o Maheswara Rao, H.NO: 3-30-15/2B, Nalanda Nagar, Pattabhipuram, Gunturu,Gunturu District, Phone No: 7416873120	694/R3-2/2019	03.05.2019	282/P	Koppalepalem	Ballikurava	Bapatla	4.953	01 year	Non-captive	16-02-47.45, 80-00-35.31	
33	Colour Granite	M/s. Kishore Slabs & Tiles	6523/Q/2013	M/s.Kishore Slabs & Tiles,Prop:Smt.G.Jhansi,G.T.Road,Janathali Village,Martur Mandal,Bapatla District,Cell:9440703618	2436/R3-2/2019	03.05.2019	103P(Veerlakond) Un-Survyeed Hill	Konidena	Ballikurava	Bapatla	0.404	01 year	Non-captive	16-01-31.67, 80-00-59.38	LoI RevocationD. Dis Proceedings No:2436/D9/2019, Dated: 26.05.2023
34	Colour Granite	M/s. Bhavya Keerthana Granites	4660/Q/2018	M/s. Bhavya Keerthana Granites , Mgp: Sri Abbareddy Narayana, S/o Kotaiah, Patha Mallaya Palem Village, Balli Kurava Mandal, Prakasam Dist, Phone No:9440139278	1839/R3-2/2019	28.05.2019	1021/3B	Konidena	Ballikurava	Bapatla	1.6	01 year	Non-captive	16-01-44.72, 80-00-48.66	Patta Land
35	Silica Sand	Sri G.Anil Kumar	3477/M/2013	Sri G.Anil Kumar, S/o Sambasiva Rao, Pedavadlapudi Village, Mangalagiri Mandal, Guntur District, Phone No:9391022906	17877/D9/2013	03.07.2017	487/1B	Kadavakuduru	Chinnaganjam	Bapatla	0.663	06 Months	Non-captive	15-44-12.60, 80-15-43.30	
36	Silica	Sri A.Govinda	15229	Sri A.Govinda Rajulu, s/o	993/D9/2017	25.04.	127/4,	Pan	Veta	Bap	1.28	06	Non-	15-45-18.00,	

	Sand	Rajulu	/Q/2016	Narayana, Near old North Railway Cabin, Gollapalem, Perala, Chirala Mandal, Bapatla District,Phone No:7075134268		2017	127/7P	dillapalli	palem	atla	3	Months	captive	80-16-30.00	
37	Colour Granite	M/s Sri Bhanu Minerals, Mgp:: Sri Vallabhaneni Akhil	1527/Q/2021	M/s Sri Bhanu Minerals, Mgp: Sri Vallabhaneni Akhil, D.No:5-92-43, 2nd line, Devapuram, Pattabhipuram, Gunturu,Gunturu (U) and District,Phone No: 9676694445	4411/D9/2021	24.05.2021	233/P, 238/P, 241/P	Ballikurava	Ballikurava	Bapatla	3.687	01 year	Non-captive	16-01-34.03, 80-00-31.71	Patta Land Extension of Time Period Vide Proceeding No:4411/D9/2021; Dated: 04.10.2023 up to 23.05.2024
38	Colour Granite	M/s Sree Raghavendra Enterprises, Mg.Pt Sri N.Surya Narayana Reddy, 51, Gopal Swamy Road, Bellary, Karnataka.	15227/Q/2016	M/s Sree Raghavendra Enterprises, Mg.Pt Sri N.Surya Narayana Reddy, 51, Gopal Swamy Road, Bellary, Karnataka. Phone No:----------	16957/R3-2/2017	07.07.2017	282	Koparapalem	Ballikurava	Bapatla	6.000	06 Months	Non-captive	16-02-57.40, 79-59-56.80	
39	Colour Granite	Sri Koka.yuva Sai Kumar, S/o.Venkata Rama Rao, H.No.5-267, NGO Colony, Opp. Power office, Ongole	11783/Q/2017	Sri Koka Yuva Sai Kumar,S/o VENKATA Rama Rao,H.No5-267,N.G.O Colony,Opp.Power Office,Ongole,Prakasam District, Phone No:9849301739	1178/R3-2/2018	########	231	Kommalapadu	Santhamagulur	Bapatla	3.000	06 Months	Non-captive	16-01-56.90, 79-58-08.00	

40	Colour Granite	M/S.V.K.Granites Mgp:-D.V.Krishana Rao s/o.Anjaneyulu D.no:-3-6,thurpu naidupalem(v),tangutur(m),prakasam(dt)	7948/Q/2018	M/S.V.K.Granites Mgp:-D.V.Krishana Rao s/o.Anjaneyulu D.no:-3-6,thurpu naidupalem(v),tangutur(m),prakasam(dt) Phone No:9848152522	829/D9/2019	LOI issued	536/BP & 535/1P	Uppamaguluru	Ballikurava	Bapatla	4.850	06 Months	Non-captive	16-02-18.42, 80-02-51.99	Granted Vide Pro No: 829/D9/2019; Dated:107.02.2022
41	Colour Granite	Sri B.Sankara Rao, S/o.Prasada Rao, 8-137, 10th cross Road, Lawyer pet extension, MM Road, Ongole	4569/Q/2020	Sri B.Sankara Rao, S/o.Prasada Rao, 8-137, 10th cross Road, Lawyer pet extension, MM Road, Ongole, Phone No: 9849115116	1586/D9/2021	23.12.2021	71/2	Gurijepali	Santhamaguluru	Bapatla	1.959	01 year	Non-captive	16-07-04.44, 80-02-53.03	Patta Land
42	Colour Granite	M/s Veerabhadra Mines and Minerals, Prop. sRi A.Govinda reddy, Plot No.601, Green space fortune, Rajendra Nagar Mandal, Rangareddy Dist. Telangana.	2864/Q/2020	M/s Veerabhadra Mines and Minerals, Prop. sRi A.Govinda reddy, Plot No.601, Green space fortune, Rajendra Nagar Mandal, Rangareddy Dist. Telangana. Phone No:9701766659	2832/D9/2021	15.12.2021	192/A, 192/B & 194/4	Ballikurava	Ballikurava	Bapatla	3.635	01 year	Non-captive	16-00-48.76, 80-00-39.22	
43	Colour Granite	M/s Veerabhadra Mines and Minerals, Prop. sRi A.Govinda reddy, Plot No.601, Green space fortune, Rajendra Nagar Mandal, Rangareddy Dist. Telangana.	2865/Q/2020	M/s Veerabhadra Mines and Minerals, Prop. sRi A.Govinda reddy, Plot No.601, Green space fortune, Rajendra Nagar Mandal, Rangareddy Dist. Telangana. Phone No:9701766659	2833/D9/2021	15.12.2021	251 &192A	Ballikurava	Ballikurava	Bapatla	2.973	01 year	Non-captive	16-00-53.29, 80-00-32.05	
44	Colour Granite	M/s Mallanna Granite	5861/Q/2021	M/s Mallanna Granite , Sri K. Kalyan Chakravarthy, Flat No:301, SowmayAppartment,	11640/D9/2021	15.12.2021	1025/A	Kondena	Ballikurava	Bapatla	2.000	01 year	Non-captive	16-01-45.40, 80-00-37.24	Patta LandLoI Extension Time Vide

				Vijaynagar Colony, Vijayawada Urban, Ward:03, Krishna District,Phone No:9885159184											Prce No: 11640/D9/2021; Date: 25.05.2023 Further Period 14.12.2024.
45	Colour granite	M/S.Lakshmi granites prop:- Sri Sidda Raghava Rao s/o.Venkateswarlu ,D.no:-8-24,Denuva kona vari street opp.Bethun Nursing Home,Lawyerpet,Ongole	7577/Q/2018	M/S.Lakshmi granites prop:- Sri Sidda Raghava Rao s/o.Venkateswarlu,D.no:-8-24,Denuva kona vari street opp.Bethun Nursing Home,Lawyerpet,Ongole. Phone No: 9440269669	8522-2/D9/2021	30.12.2021	103	Kondena	Ballikurava	Bapatla	0.186	01 year	Non-captive	16-01-40.07, 80-00-58.26	Granted Vide Pro No: 8522-2/D9/2021; Dated:17.04.2023
46	Colour granite	M/S.Lakshmi granites prop:- Sri Sidda Raghava Rao s/o.Venkateswarlu ,D.no:-8-24,Denuva kona vari street opp.Bethun Nursing Home,Lawyerpet,Ongole	3684/Q/2018	M/S.Lakshmi granites prop:- Sri Sidda Raghava Rao s/o.Venkateswarlu,D.no:-8-24,Denuva kona vari street opp.Bethun Nursing Home,Lawyerpet,Ongole. Phone No: 9440269669	8522-1/D9/2021	30.12.2021	103	Kondena	Ballikurava	Bapatla	0.461	01 year	Non-captive	16-01-35.23, 80-01-01.36	Granted Vide Pro No: 8522-1/D9/2021; Dated:17.04.2023
47	Colour Granite	M/s Sri Srinivasa Granites, Mg.Pt Smt M.Adilakshmamma , W/o Kasi Reddy, D.No. 8-123/4A, Kothapeta, Kanigiri, Prakasam district	7303/Q/2014	Sri Srinivasa Granites,Mg.Pt: Smt M.Adilakshmamma,W.o Kasireddy,D.No-8-23/4A,Kothapeta,Kanigiri,Prakasam District. Phone No-9010763777	8522/D9/2021	30.12.2021	103	Kondena	Ballikurava	Bapatla	2.000	01 year	Non-captive	16-01-45.38, 80-01-11.03	
48	Colour Granite	Smt K.Sambrajayam	2208/Q/2021	Smt K.Sambrajayam, Door.No:4-5-29/75/B, Gayatri Nilayam, Guntur, Gunturu District Phone No: 9441693425	5141/D9/2021	21.09.2021	103	Gurijepali	Santhamangulur	Bapatla	1.833	01 year	Non-captive	16-06-10.92, 80 02 28.25	Patta Land, Granted Vide Pro No: 5141/D9/202

									u						1; Dated:07.09.2023
49	Colour Granite	Sri A.Narashimha rao s/o.venkata subbaiah H.no:-22-2-21/1 sai nagar,kovur road,kandukur,prakasam	5338/Q/2019	Sri A.Narashimha rao s/o.venkata subbaiah H.no:-22-2-21/1 sai nagar,kovur road,kandukur,prakasam District, Phone No:9849123639	3032/D9/2020	LOI Issued, GPS on 19-06-2020	1026/5B, 1025/C,1A,1025/1B1	Kondena	Ballikurava	Bapatla	3.290	01 year	Non-captive	16-01-57.54, 80-00-20.95	LoI Extension Time Vide Prce No: 3032/D9/2020; Date: 04.05.2023 Further Period 14.12.2024.
50	Colour Granite	Sri P.Krishna Murthy, S/o.Rangaiah, D.No.35-286/9, Ganesh Sai Srinivasa Appartment, P.No.1, Purushothapatnam, Chilakaluripet.	3497/Q/2020	Sri P.Krishna Murthy, S/o.Rangaiah, D.No.35-286/9, Ganesh Sai Srinivasa Appartment, P.No.1, Purushothapatnam, Chilakaluripet. Palanadu District, Phone No:9959089491		LOI Issued, GPS on 11-01-2022.	934/19, 20 &263	Kondena	Ballikurava	Bapatla	4.000	01 year	Non-captive	16-02-14.78, 80-02-17.85	Govt & Patta Land

Data Source: District Mines and Geology Officer, Bapatla District

2.4 Details of Royalty in last 3 years

The royalty of last three years in the Bapatla district detailed list is given in Table-18.

Table 18 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	Black Granite	967.548	483.774	120.872	19.34
2	Color Granite (Black Pearl-Prakasam and Guntur)	806.868	403.434	100.839	16.134
3	Colour Granite (Others)	2651.77	1325.885	331.226	52.996
4	Gravel	48.594	48.594	14.578	0.972
5	Ordinary Earth	101	101	30	2
6	Road Metal	102	102	31	2
7	Silica Sand	0.218	0.218	0.065	0.004
Total		**4678**	**2465**	**628**	**94**

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	Black Granite	1303.377	325.84425	162.851	26.056
2	Color Granite (Black Pearl-Prakasam and Guntur)	912.84	228.21	113.972	18.236
3	Colour Granite (Others)	3915.696	978.924	489.008	78.241
4	Gravel	5.27	2.635	1.581	0.105
5	Ordinary Earth	25.085	12.5425	7.526	0.502
6	Road Metal	25.964	12.982	7.789	0.519
Total		**6188**	**1561**	**783**	**124**

Royalty for 2020-21

S. No.	Mineral	Royalty (in Rs. Lakhs)	DMF (In Rs. Lakhs)	MERIT (in Rs. Lakhs)
1	Black Granite	1413	177	28

S. No.	Mineral	Royalty (in Rs. Lakhs)	DMF (In Rs. Lakhs)	MERIT (in Rs. Lakhs)
2	Color Granite (Black Pearl-Prakasam and Guntur)	1041	130	21
3	Colour Granite (Others)	4472	559	89
4	Gravel	5	1.5	0.01
5	Ordinary Earth	39	12	0.78
6	Road Metal	18	5	0.36
Total		**6986**	**884**	**140**

Data Source: District Mines and Geology Officer, Bapatla District

2.5 Details of Production in last 3 years

Production of last three years in the Bapatla district details is given in Table-19.

Table 19 Details of Production in last 3 years

Production for 2022-23

S. No.	Mineral	Unit	Production (in MT)
1	Black Granite	Cubic Meter	36,740
2	Color Granite (Black Pearl-Prakasam and Guntur)	Cubic Meter	28,456
3	Colour Granite (Others)	Cubic Meter	1,22,025
4	Gravel	Cubic Meter	1,07,410
5	Ordinary Earth	Cubic Meter	1,87,903
6	Ordinary Earth	MT	42,252
7	Road Metal	Cubic Meter	99,512
Total			**6,45,006**

Production for 2021-22

S. No.	Mineral	Unit	Production (in MT)
1	Black Granite	Cubic Meter	47,811
2	Color Granite (Black Pearl-Prakasam and Guntur)	Cubic Meter	31,052
3	Colour Granite (Others)	Cubic Meter	1,77,021

4	Gravel	Cubic Meter	9,721
5	Ordinary Earth	Cubic Meter	35,631
6	Road Metal	Cubic Meter	28,849
Total			**3,30,085**

Production for 2020-21

S. No.	Mineral	Unit	Production (in MT)
1	Black Granite	Cubic Meter	49,860
2	Color Granite (Black Pearl-Prakasam and Guntur)	Cubic Meter	35,440
3	Colour Granite (Others)	Cubic Meter	1,91,815
4	Gravel	Cubic Meter	10,209
5	Ordinary Earth	Cubic Meter	60,148
6	Road Metal	Cubic Meter	19,751
Total			**3,67,223**

Data Source: District Mines and Geology Officer, Bapatla District

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 recontouring 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 ensures 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 monitorthe 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

2.9.1. Mineral Regulatory:

The important functioning of District Mines and geology Officer, Bapatla 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 Bapatla District

3.1.1 General Sand Mineral Details Bapatla District

(Prepared as per Sustainable Sand Mining Management Guidelines 2016 and 2020)

In Bapatla District, there is 03 Major River, i.e., Krishna River, Romperu and Vogeru Vagu River and total length of 1036 kms. These rivers are the major contribute for sand deposits. The said Rivers are perennial flowing in full spate during flood season whereas in the remaining period of the year, it flows in small channels, resulting in exposure of the sand deposits on the River-bed. There are 166 existing check dams and 02 Major Reservoirs across the River Krishna. The Table-20 shows details of sand Production in last three years in the Bapatla district.

Table 20 Details of Production of Sand in last year in the district

Details of Production of Sand in year 2022-23 in the Baptla District			
Si. No.	**Category**	**Production of Sand in MT**	**Revenue Generated (in Rs)**
1	**Open Reach**	3,52,900	**3,10,55,200**
2	**De-siltation**	1,86,283	**1,63,92,904**

Data Source: District Mines and Geology Officer, Bapatla District

3.1.2 River Basins in Baptla District

The deposition of sand is a continuous process and gets replenished every year. The State of Andhra Pradesh is endowed with various Rivers/streams. Mainly Krishna River, Romperu and Vogeru Vagu are major rivers flows and their tributaries. Every year, Rivers in their course of action carries sediments from their catchment areas and deposit the sediments wherever the River currents are slowed and in favourable areas. The State being adjacent to Bay of Bengal, many rivers deposit huge deposits of sand carried from their origin and various drainage basins over the length of the River and showing in Table-21. The drainage system with description is showing in Table-22. The length of

the River in the district is showing in Table-23. The silent features of the districts and its rivers are showing in Table-24.

Table 21 Hydrological units of Bapatla District

S.No	Major Basin	Minor Basin	Catchment Area (Sq.km)	No of. Tanks
1	Gundlakamma	Gundlakamma	499.75	82
2	Krishna	Krishna Basin in Guntur District	402.59	166
3	Minor Drainages Joining Direct to Sea in Guntur District	Minor Drainages Joining Direct to Sea in Guntur District	675.89	429
4	Romperu	Romperu	1,534.49	556
5		Vogeru Vagu	788.84	358
Total			**3,902**	**1,591**

Data source: APSAC, Vijayawada

Table 22 Drainage System with Description of main rivers

S. No	Name of the Minor Basin	Area Drained (Sq. Km)	% Of Area Drained in the District
1	Krishna Basin in Bapatla District	402.59	10.319
2	Gundlakamma	500.05	12.817
3	Vogeru Vagu	788.54	20.211
4	Romperu	1,534.49	39.330
5	Minor Drainages Joining Direct to Sea in Bapatla District	675.89	17.323

Data source: APSAC, Vijayawada

As per the WALTA Rules 2004, the sand mining is permitted in the III Order Streams such as Gundlakamma River, Vogeru Vagu, Romperu Vagu, only if the deposition of sand is more than 5,000 Cum. The sand excavated in these areas are only allowed for local use and not for commercial purposes. Therefore, undertaking replenishment studies for the streams of III and below orders are not required.

Table 23 River Lengths in Bapatla District

S.No	Name of the Major Basin	Name of the Minor Basin	Name of the River	River Length in Km
1	Gundlakamma	Gundlakamma	Chilakaleru River	34.49
2			Dornapu Vagu	30.35
3			Gundlakamma River	164.55
4			Idara Vagu	22.30
5			Male Vagu	16.35
6	Krishna	Krishna Basin in Guntur District	Jannala Nala	5.38
7			Kodikoyya Chinika	2.45
8			Kottapalem Nala	20.04
9			Krishna River	353.57
10			Muttayya Kaluva	8.21
11			Pedda Nala	8.78
12			Uppu Revu	21.86
13		Minor Drainages Joining Direct to Sea in Guntur District	Pala Revu	16.10
14			Uppu Revu	0.39
15		Vogeru Vagu	Boddula Vagu	14.21
16			Nagaraju Kalava	12.58
17			Nallamada Vagu	27.03
18			RallaKaluva	10.57
19			UpputeruNadi	11.81
20			VogaruVagu	66.30
21	Romperu	Romperu	Aleru Nala	24.57
22			ChinnaVagu	15.88
23			IsukaVagu	3.59
24			KappalaVagu	14.61
25			Nalla Vagu	25.09
26			ParuchuruVagu	33.17
27			RamayyaVagu	17.79
28			Romperu River	27.59
29			SakkiVagu	26.70
Total				**1,036.31**

Data source: APSAC, Vijayawada

Table 24 Salient Features of Important Rivers in Bapatla District

S.No	Name of the River	Place of Origin	Altitude at Origin (m)
1	Krishna	Western Ghats, Mahabaleswar hills, Sattar District, Maharashtra State	1,400
2	VogeruVagu	Nekarikallu of Palnadu district	358
3	Konda Vagu	Kondaveedu Hills, Edlapadu, Palnadu district	359
4	Rama Vagu	Kondaveedu Hills, Edlapadu, Palnadu district	510
5	TummalapalemVagu	Kondaveedu Hills, Edlapadu, Palnadu district	510
6	Romperu	Janakavarampanguluru&Martur of Bapatla district	217
7	ParuchuruVagu	Bapana Konda, Martur of Bapatla district	278

Data source: APSAC, Vijayawada

3.1.2.1. The Krishna River: After the Ganga, Godavari, and Brahmaputra, the Krishna River is the fourth-largest river in terms of watercourses and river basin in India. The river, also called Krishnaveni, is around 1,288 kilometers (800 miles) long. In India's Maharashtra, Karnataka, Telangana, and Andhra Pradesh, it is a significant source of irrigation. Krishna River enters into north east part of the district near Chilumuru village, Kolluru mandal and joining to Bay of Bengal near Gangadipalem village, Nizampatnam mandal in Bapatla district.

The Krishna Delta is sub-arcuate and lobate type occupying an area of 4600 km2 extending from Baptla District in the west to Kaikalur in the east and the apex centred near Vijayawada. A slope of 0.0002 is estimated for the delta and it has 125 km long coastline. The geological formations in the Krishna River basin are mainly Deccan Trap, in the upper reaches, and Archaean Kadapa and Krnool, Upper Gondwana and Tertiary formations in the lower reaches.

3.1.2.2. Gundlakamma River: The Gundlakamma rises in the Nallamalla Range of the Eastern Ghats. After crossing the mountains, it enters the plains and flows in a northeasterly direction past Markapur to

the Coromandel Coast of the Bay of Bengal, into which it empties 12 miles (19 km) east of Ongole, after a course of 140 miles (225 km). Numerous Mountain streams join it as it descends down the thickly forested hills through a series of curves and tight bends. It follows a north-easterly direction and enters the plains near Cumbum, after flowing through a town named after it. Gundlakamma is the largest of all the rivers that originate from the Nallamalla Hills.

3.1.2.3. The Vogeru Vagu is Major River in the district and the tributaries are Nallamada Vagu, Nakka Vagu. The Nallamada Vagu and Nakka Vagu originated near Gouthikonda hills, Nekarikallu of Palnadu district and enter into north part of the Bapatla district, merged with Nagaraju Kalva and joining to Bay of Bengal near Perali in Bapatla district.

3.1.2.4. The Romperu is Major River in the district and the tributaries are Aleru Nala, Paruchuru Vagu, Ramayya Vagu and Sakki Vagu rises near Nagarajupalli hills and Bapana Konda, Martur in Bapatla district and merged into Romperu drain in Bapatla district. Figure-6 is illustrates the drainage system and the surface water bodies.

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 are ubiquitous. Sediment in the water column reduces transparency and can be deposited downstream and exacerbate flooding (Figure-24). 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 of river is 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**.

The bedload contains two main components:

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

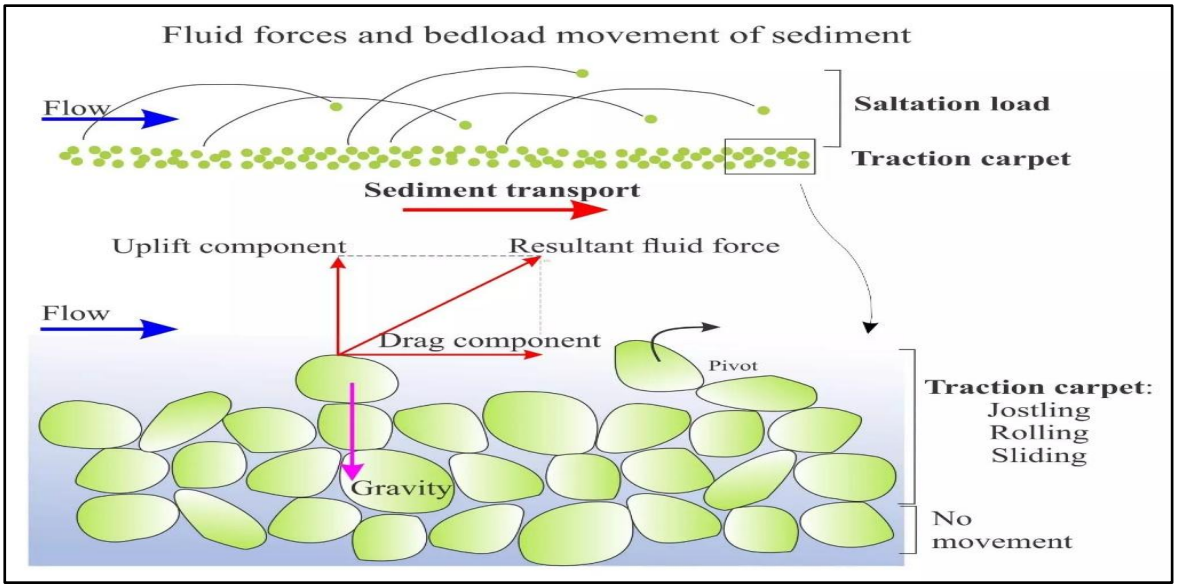


Figure-24: Bedload Movement of Sediment

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 and shows in Figure-24.

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.

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-25).

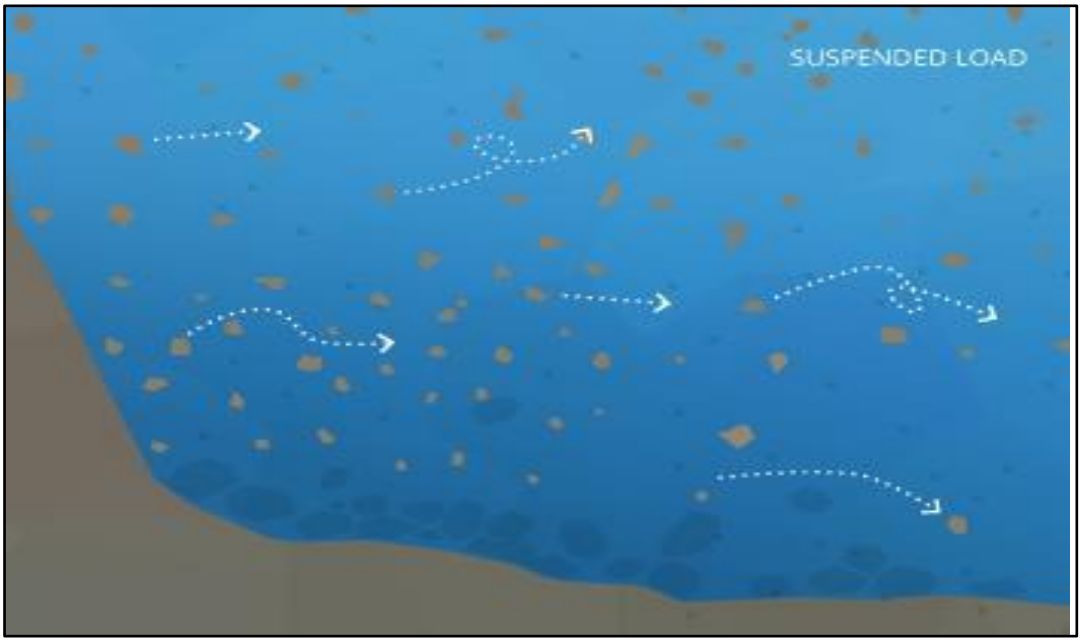


Figure-25: Sediment Load

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-26).

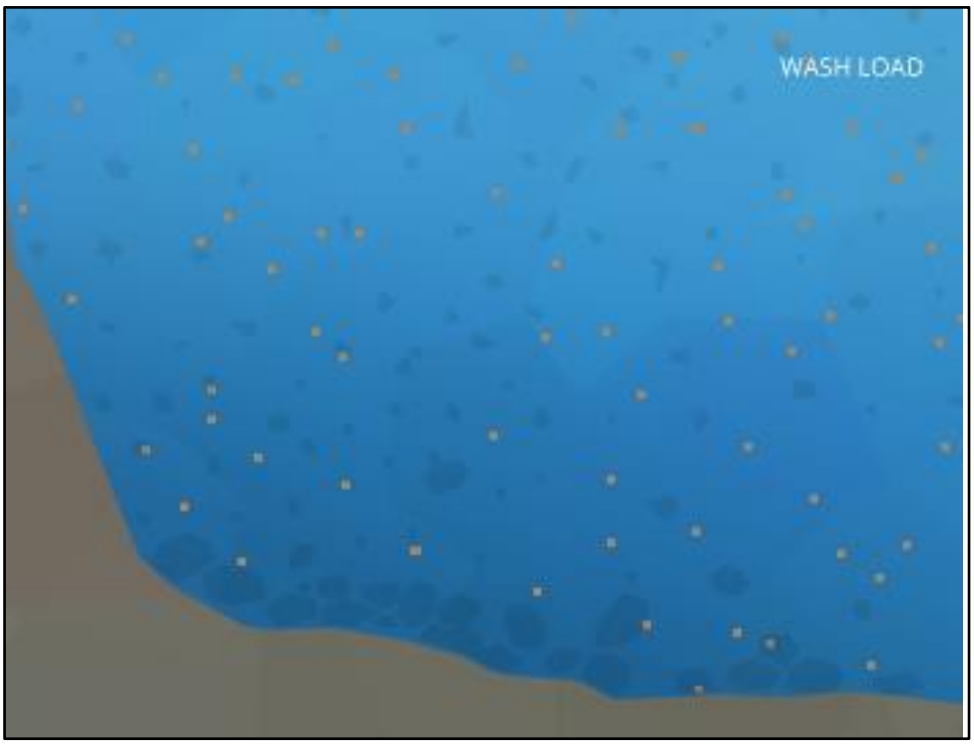


Figure-26: Wash Load

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-27).

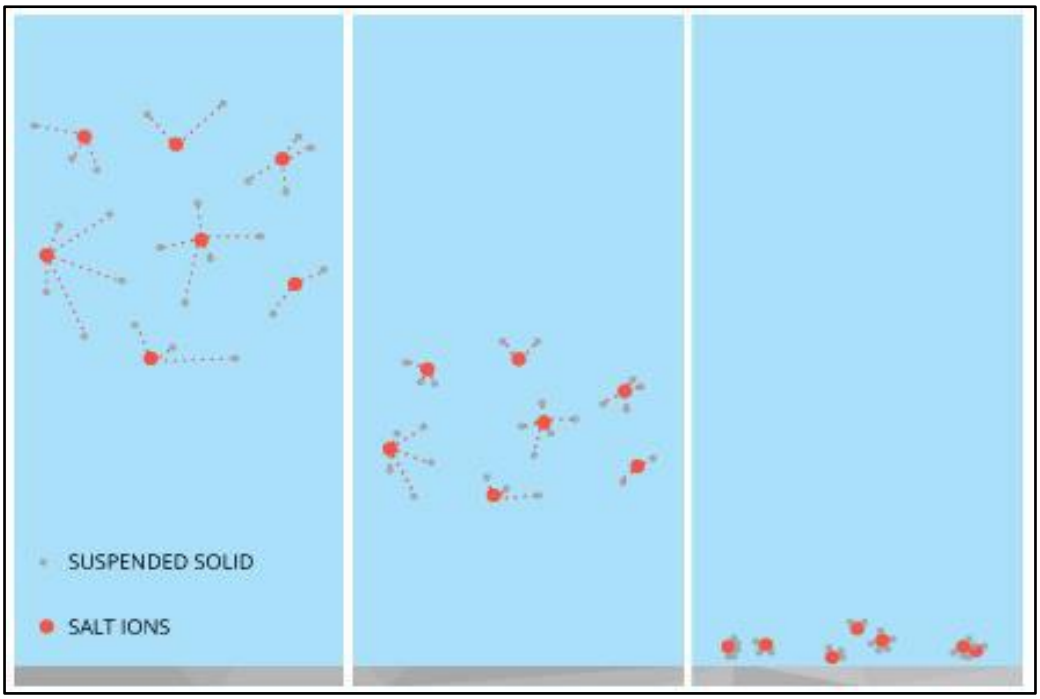


Figure-27: Settleable Solids

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, flows 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 (Figure-28).

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)

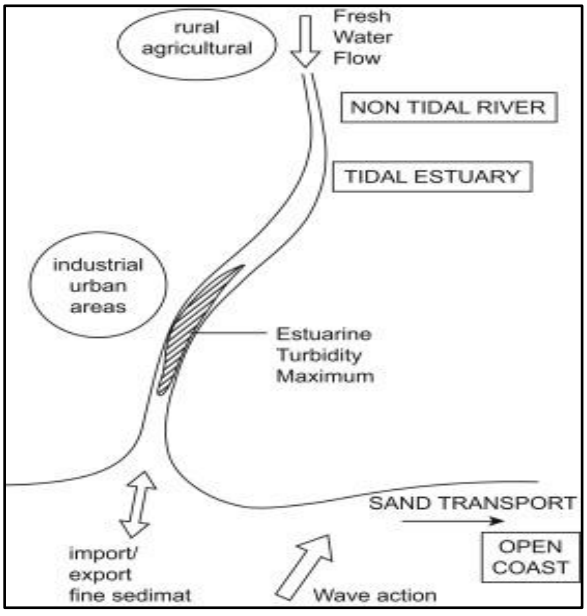


Figure-28: Sediment Deposition Process

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 are assumable 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.

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 in the 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 transport rate 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 25.

Table 25: Sediment Transport Equations and its remarks

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 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.

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

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.

The drainage area of Krishna River in Bapatla district is situated downstream of the Prakasam Barrage. The Water Resource Department of Andhra Pradesh records the surplus discharge from the Prakasam Barrage, which is considered as the downstream run-off the river Krishna. For calculation of sediment yield, the total surplus discharge of the Prakasam Barrage for water year 2022-23 (June 2022 to May 2023) of 1330 TMC is taken as run-off.

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 Krishna River in Bapatla District is arrived based on the above Dendy Bolton Equation or Formula (B). Sedimentation yield for Krishna River in Bapatla District is shown in Table-26.

Table 26 Sedimentation yield for Krishna River in Bapatla 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 (tonne)
Krishna	402.59	128.29	448.62	1,80,611*

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

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 river Krishna is the main source of sand in the district flowing in the eastern side of the Bapatla district through following mandals

Sl.No	Mandals
1	Kollur
2	Bhattiprolu
3	Repalle
4	Nizampatnam

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

***Note**: The sedimentation yield was calculated manually by APSAC and the value is **1,99,070 Tones/ year**. The details are provided as an Annexure at page number 158-159.

The details of Potential Sand Mining Leases are shown in Table-27.

Table 27: The detail of Potential Sand Mining Leases

Potential Sand Mining Leases (Existing and Proposed) Rivers			
River Details	**Lease Details**	**Geo-Coordinates**	**Existing/ Proposed**
Krishna River	Potharlanka-4	16° 08' 16.27" N 80° 50' 59.08" E 16° 08' 29.98" N 80° 51' 07.93" E 16° 08' 31.73" N 80° 51' 05.15" E 16° 08' 17.81" N 80° 50' 56.43" E	Proposed for Joint Inspection

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

Probable Sand bearing areas in the district shown in Table-28 and map is shown in Figure-32. 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 28 : Probable Sand bearing reaches in the District

S.No	Name of the River	Sand Bearing Area	Central Coordinates		Area in Ha.
			Latitude	Longitude	
1	Krishna River	A	16° 12' 52.165" N	80° 49' 24.712" E	3.78
2	Krishna River	B	16° 12' 28.043" N	80° 49' 21.457" E	2.35
3	Krishna River	C	16° 9' 46.145" N	80° 50' 48.043" E	4.19
4	Krishna River	D	16° 9' 36.251" N	80° 50' 40.847" E	2.70
5	Krishna River	E	16° 2' 2.728" N	80° 52' 40.316" E	2.26
6	Krishna River	F	16° 1' 18.185" N	80° 52' 54.707" E	1.36

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

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

The detail of potential of de-siltation location in Bapatla District is shown in Table-29.

Table 29 List of Potential De-Siltation Location: (Lakes/Ponds/Dams etc.) (Existing and proposed)

Name of the Reservoir/Dams	Maintain/ Controlled by State Govt./PSU etc.	Location	District	Tehsil	Size (Ha)	Quantity MT/Year	Existing/ Proposed
Krishna River	EE Irrigation K.C Division, Vijayawada	Oleru	Bapatla	Bapatla	2.813	28,127	Proposed, letter Submitted to DM& G.

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

3.1.7 Details of Patta Lands in the District:

The detail list of Patta Lands in the Bapatla District is shown in Table-30.

Table 30 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, Bapatla District, Andhra Pradesh

3.1.8 Details of M-Sand Plants in the District:

The details list of Manufacturing Sand in Bapatla district is shown in Table-31.

Table 31 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 Bapatla office jurisdiction						

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

3.1.9 Details of Cluster of Sand Mining Leases

The area of Cluster of Mining Leases in Bapatla jurisdiction is shown in Table-32.

Table 32 Details Cluster of Mining Leases in Bapatla 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, Bapatla District, Andhra Pradesh

3.1.10 Details of Contiguous Clusters

The area of Contiguous Cluster of Sand Reaches in Bapatla jurisdiction is shown in Table-33.

Table 33 Details of Contiguous Cluster of Sand Reaches in Bapatla 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, Bapatla District, Andhra Pradesh

3.1.11 Sand Reaches Details in Bapatla District

The Department of mines and geology has already identified sand reach points in Bapatla. The sand reaches points locations details are given by District Mines and Geology Officer, Bapatla. Based on the locations details the sand reaches points are shown in Figure-29, Figure-30. Apart from the existing, new sand reaches identified and shown in Figure-31. 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. The Probable Sand bearing areas in the Bapatla District is showing in Figure-32.

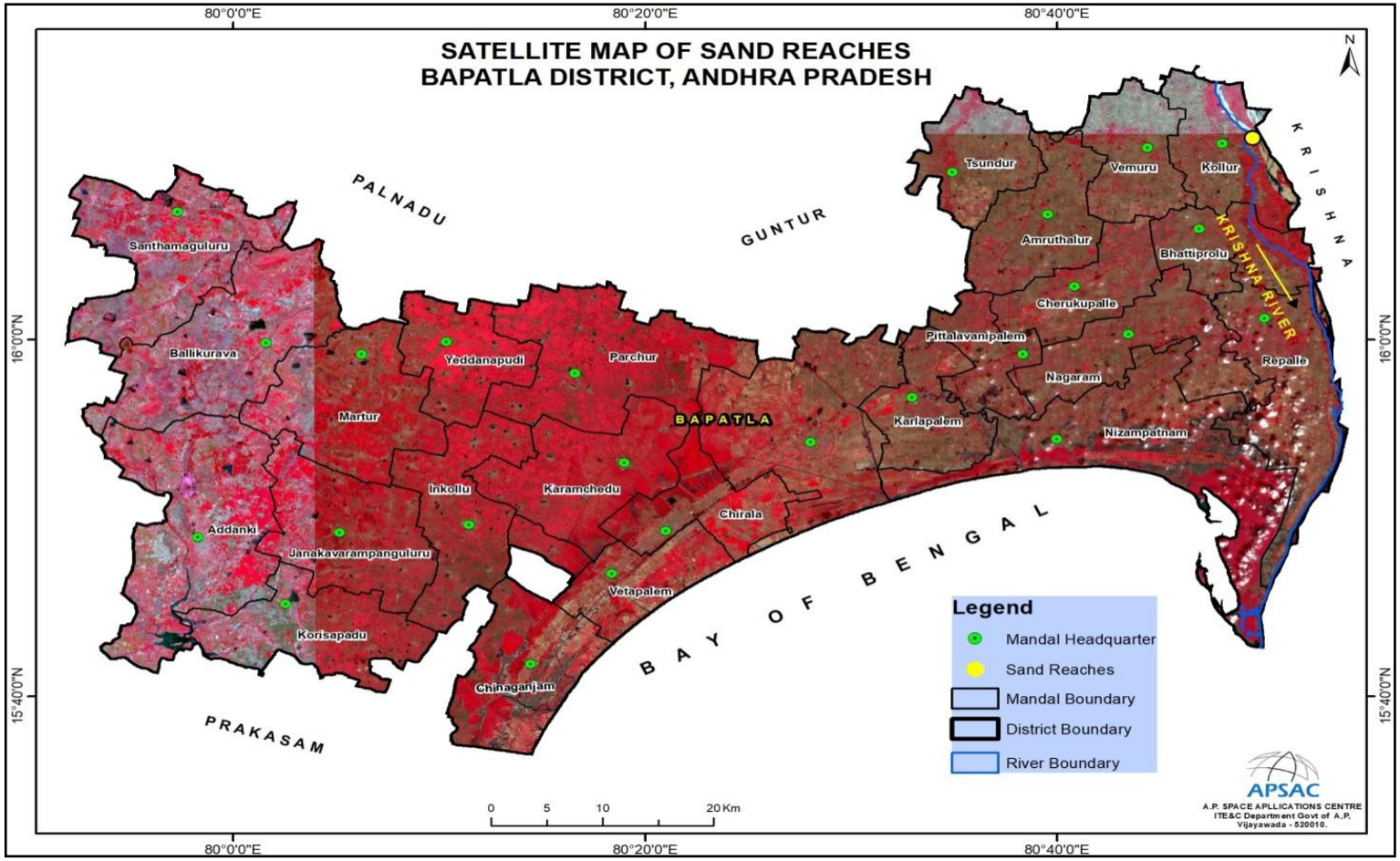


Figure-29: Satellite View of Krishna River map in Bapatla District

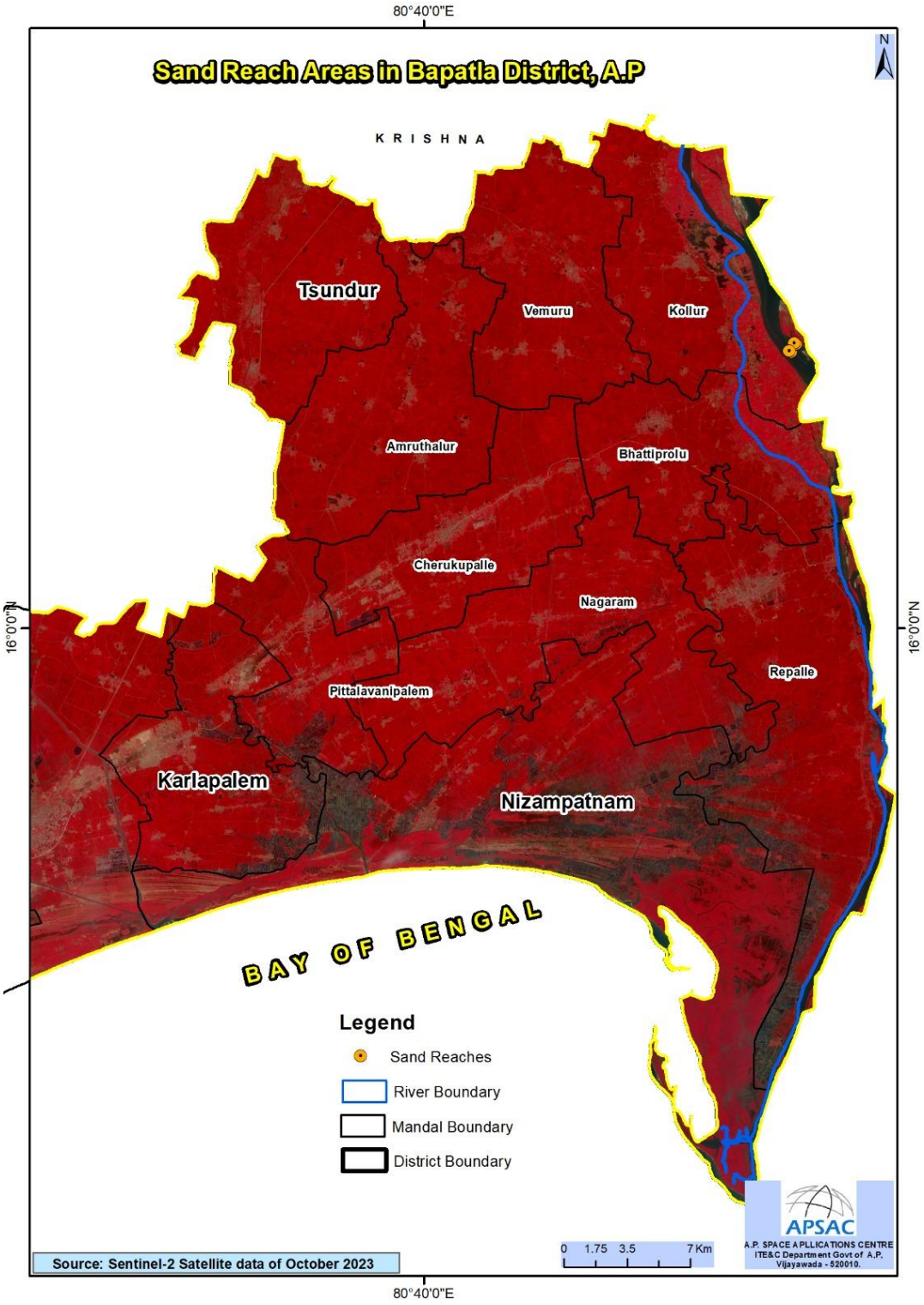


Figure-30: Satellite Map of Sand reaches in Bapatla District

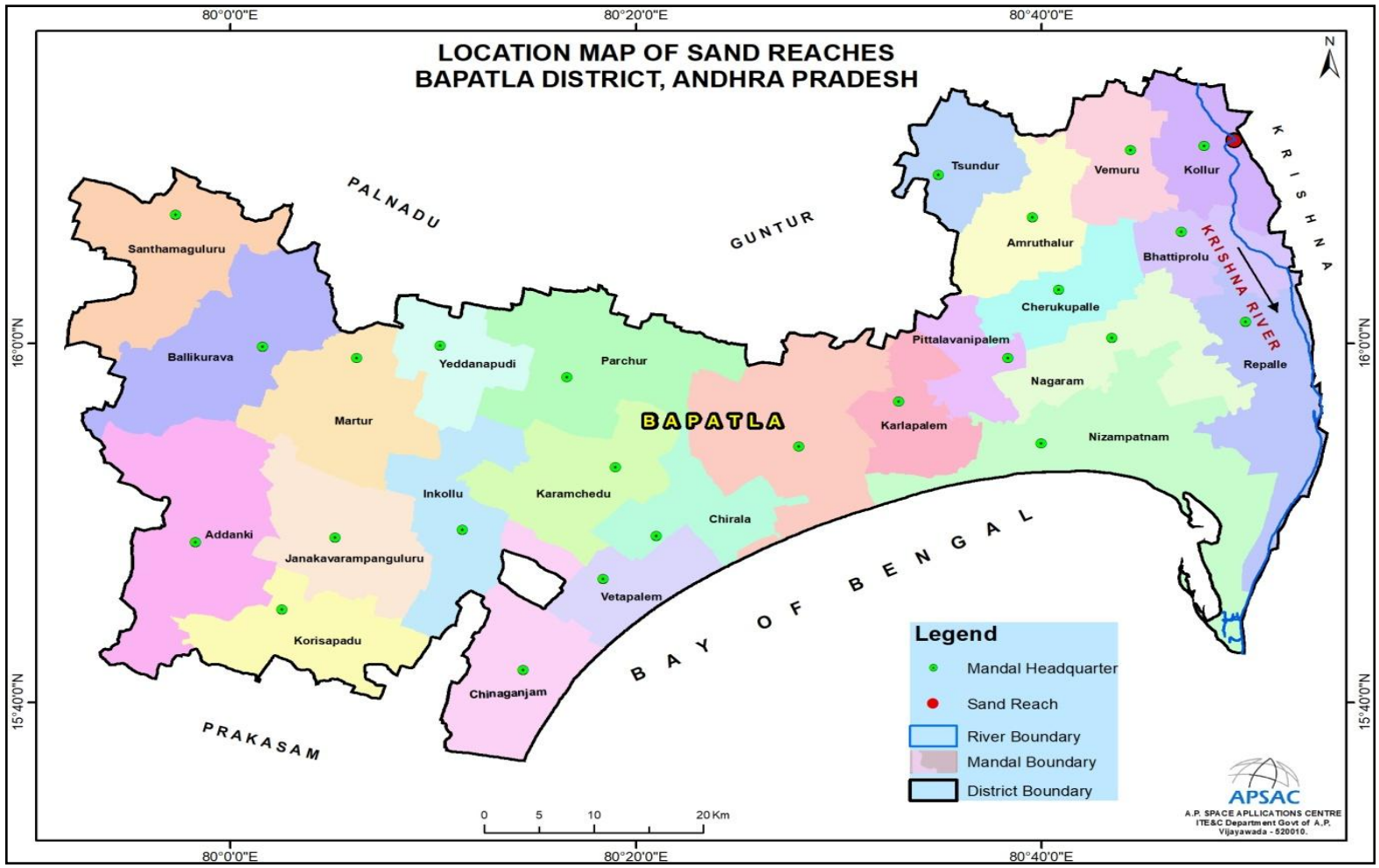


Figure-31: Mandal wise Sand Reaches map in Bapatla District

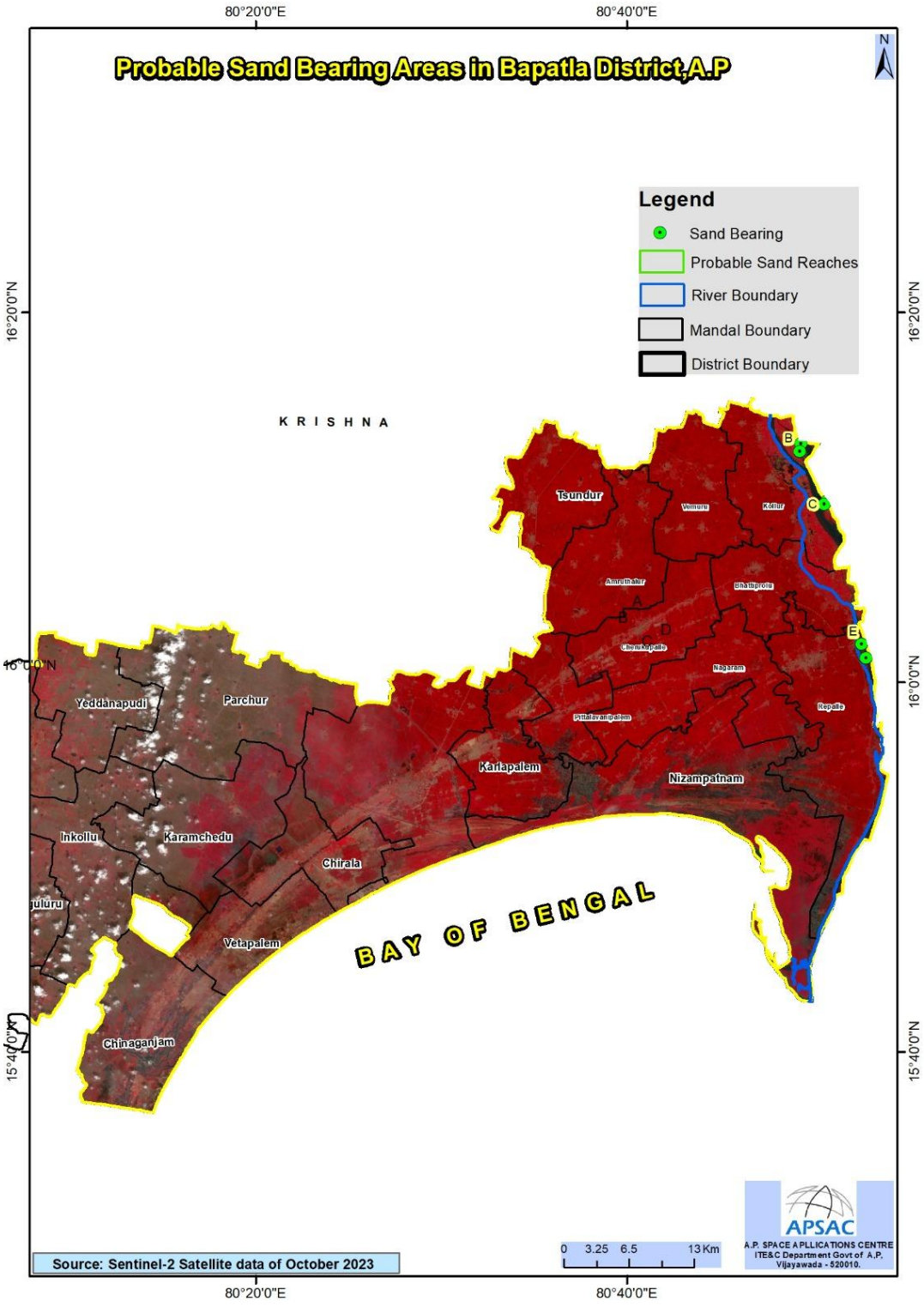


Figure-32: Probable Sand bearing areas in the Bapatla District

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ANNEXURE

As the average annual run-off more than 2" in the Bapatla District, the sedimentation yield for Krishna River in Bapatla District, APSAC arrived manually based on the above Dendy Bolton Equation or Formula and is given below.

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

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

Name of the River	Area Drained (sq. km)	Mean Annual Run-off (in mm)
Krishna	402.59	128.29

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

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

$$S = 1965 \times (e^{-0.055 \times Q}) [1.43 - 0.26 \log(A)]$$ **Tones/sq.mile/year**

Drainage Area (A) = 402.59 sq. Km (1 Sq.km = 0.386 Sq.mile)
= 402.59 x 0.386
A = 155.400 Sq.mile ----------(1)

Mean Annual Run-off (Q) = 128.29 mm (1 mm = 0.0393 inches)
= 128.29 x 0.0393
Q = 5.0417 inches ----------(2)

e is Euler's number and the value is =2.718 ----------(3)

$$S = 1965 \times (e^{-0.055 \times Q}) [1.43 - 0.26 \log(A)]$$ **Tones/sq.mile/year**

$$S = 1965 \times (2.718^{-0.055 \times 5.0417}) [1.43 - 0.26 \log (155.400)]$$

Log 15 of 5 = 0.1903
0.4 = 11
As per base, the value = 2.0000
_____(+)
Log 671.864=2.1914 ----------(4)

$= 1965 \times (2.718^{-0.055 \times 5.0417}) [1.43 - 0.26 \times 2.1914]$

$= 1965 \times (2.718^{-0.2773}) [1.43 - 0.56978]$

$= 1965 \times (2.718^{-0.2773}) [0.86022]$

The value of $2.718^{-0.2773}$

$1/2.718^{0.2773}$ = 0.75785 ----------(5)

$= 1965 \times 0.7578 \times 0.695$

$= 1281.022$

S = 1281.022 **Tones/sq.mile/year** ----------(6)

For total district Sedimentation Yield =

Per Sq.mile Sedimentation Yield (6) x Total Drainage Area (1)

1281.022 x 155.400 = 1,99,070

As the Sedimentation yield calculated manually,

The sedimentation in the total River in the Bapatla District = **1,99,070 Tones/ year**

****END****