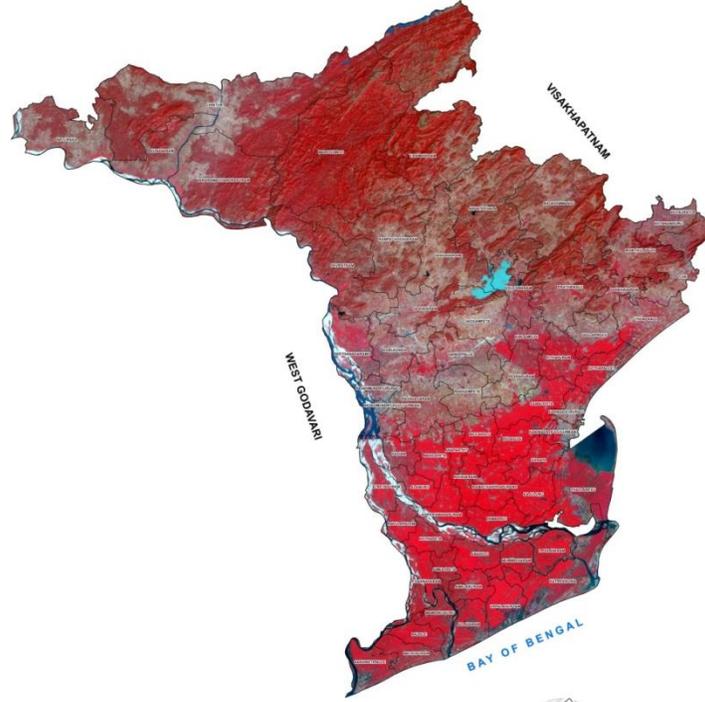


# DISTRICT SURVEY REPORT

## EAST GODAVARI DISTRICT



Prepared by



**ANDHRA PRADESH SPACE APPLICATIONS CENTRE (APSAC)**

**ITE and C Department, Govt. of Andhra Pradesh**

**Submitted to**



**DEPARTMENT OF MINES AND GEOLOGY**

**Government of Andhra Pradesh**

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## PREFACE

The Natural resource inventory is the assessment of the status or the state of a given natural resource and environment feature of an area at a given point in time. Ever growing 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 macro/ 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, ground water prospects, ground water quality, geological information, and minerals resource in East Godavari district, Andhra Pradesh, based on the satellite remote sensing data coupled with collateral data in addition to socio-economic details.

In the present study, the Department of Mines and Geology (DMG), GoAP requested 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 emphasized and updated the major and minor minerals in all the districts of AP. The District Survey reports are updated in accordance with the Sustainable Sand Mining guidelines issued in 2016 and 2020 and SO 741 of 2016 of MoEF and CC provided by DMG. The comments received (if any) 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, APSAC working in various projects. I heartily congratulate them for bringing it out as a report. Finally, I sincerely place on a record that this report will provide to be very useful in the implementation of various development activities in the district and the contents of the report are being made available to the user community online also.

(Dr. Sundar Balakrishna, IFS)

Vice Chairman

APSAC

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

**APSAC**

### List of Abbreviation

**AD:** Assistant Director

**APSAC:** Andhra Pradesh Space Applications Centre

**APMMC:** Andhra Pradesh Minor Mineral Concession

**AWiFS:** Advanced Wide Field Sensor

**APWALTA:** Andhra Pradesh State Water, Land and Trees Authority

**APMDC:** Andhra Pradesh Mineral Development Corporation

**BT Road:** Bituminous Road

**CC Road:** Cement concrete.

**CRZ:** Coastal Region Zone

**CPSU:** Central Public Sector Undertaking

**CGWB:** Central Ground Water Board

**DSR:** District Survey Report

**DMG:** Directorate of Mines and Geology

**DES:** Directorate of Economics and Statistics

**DEM:** Digital Elevation Model

**EIA/EMP:** Environmental Impact Assessment

**FAC:** Full Additional Charge

**FASAL:** Forecasting Agricultural output using Space, Agrometeorology  
and Land-based observations

**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

**LU/LC:** Land Use / Land Cover

**m:** meter

**mi:** mile

**mm:** millimetre

**MT:** Million Tonne

**MoEF:** Ministry of Environment and Forests

**MSL:** Mean Sea Level

**NH:** National Highway

**NRSA:** National Remote Sensing Agency

**NRSC:** National Remote Sensing Centre

PR Road:

**PESA:** Panchayats Extension to Scheduled Areas

**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

**Sq.Km:** Square kilometer

**TIN:** Triangular Irregular Network

**TGA:** Total Geographical Area

**TIS:** Tank Information System

**WBM:** Water Bound Macadam

## 1. Salient Features of East Godavari District

East Godavari District which is the largest and the most populous district in the state of Andhra Pradesh, was successively ruled by Mauryas, Sathavahanas, Vishnu Kundins, Eastern Chalukyas, Cholas, Kaktiyas, Musunuri Chieftains, Kondaveeti Reddy Kings, Gajapathis, Kutubshahis, and then by the British.. East Godavari is the richest district of the state, in terms of **Gross Domestic Product (GDP)** is both the cultural and tourist hub of the state. East Godavari is in the Coastal Andhra region of Andhra Pradesh, India. Its district headquarters is at Kakinada. As per Census 2011, it is the most populous district of the state. Rajahmundry and Kakinada are the two largest cities in the Godavari districts in terms of population.

The district of Rajahmundry (present name Rajamahendravaram) was reorganised in 1859 into two districts of Godavari and Krishna. Godavari District was further bifurcated into East and West Godavari districts in 1925. In November 1956, Andhra Pradesh was formed by combining parts of Naizam, Ceded and Circars in 1959. The Bhadrachalam revenue division, consisting of Bhadrachalam and Naguru Taluqs (2 Taluqs in 1959 but later subdivided into Wajedu, Venkatapuram, Charla, Dummugudem, Bhadrachalam, Nellipaka, Chinturu, Kunavaram, and Vara Rama Chandra Puram mandals) of East Godavari district were merged into the Khammam district. After June 2014's reorganisation and division of Andhra Pradesh, the Mandals of Bhadrachalam ( except Bhadrachalam Temple), Nellipaka, Chinturu, Kunavaram, and Vara Rama Chandra Puram were made a part of East Godavari District.

The East Godavari District is bordered by the river Godavari on West and Bay of Bengal on Eastern side. The district is endowed with fertile soils, good rain fall, perennial rivers, mountains, forests, and the sea coast. The district is enriched by huge water resources of River Godavari and major streams like Yeleru, Suddagedda, Pampa, and Thandava. The Delta coastal line is around 150 Kms in the Eastern sea board of India with minor ports at Kakinada and Odalarevu. The mean annual rainfall precipitation is 1219 mm and is mostly confined to the period from June to November.

### **1.1.Administrative Setup**

East Godavari District lies in between 16° 30' to 17° 00' N Latitude and 81° 30' to 82° 30'E Longitude and occupies a geographical area of 10,807 Sq.Km. with a population of 51.515 lakhs (2011 census). The district has been divided into 64 mandals (Fig. 1). These 64 mandals consists of 1,374 villages, 2 Municipal Corporation, 7 municipalities, and 10 census towns. It is one of the two districts, alongside Chittoor district to possess two municipal corporations namely, Kakinada and Rajahmundry. The 7 municipalities in the district include, Amalapuram, Mandapeta, Peddapuram, Pithapuram, Ramachandrapuram, Samalkota, and Tuni. After the mergers of Dowleswaram, Hukumpeta, and Katheru into Rajahmundry Municipal Corporation, there are 7 census towns exist of Arempudi, Bandarulanka, Chidiga, Morampudi, Ramanayyapeta, Rampachodavaram, and Suryaraopeta.

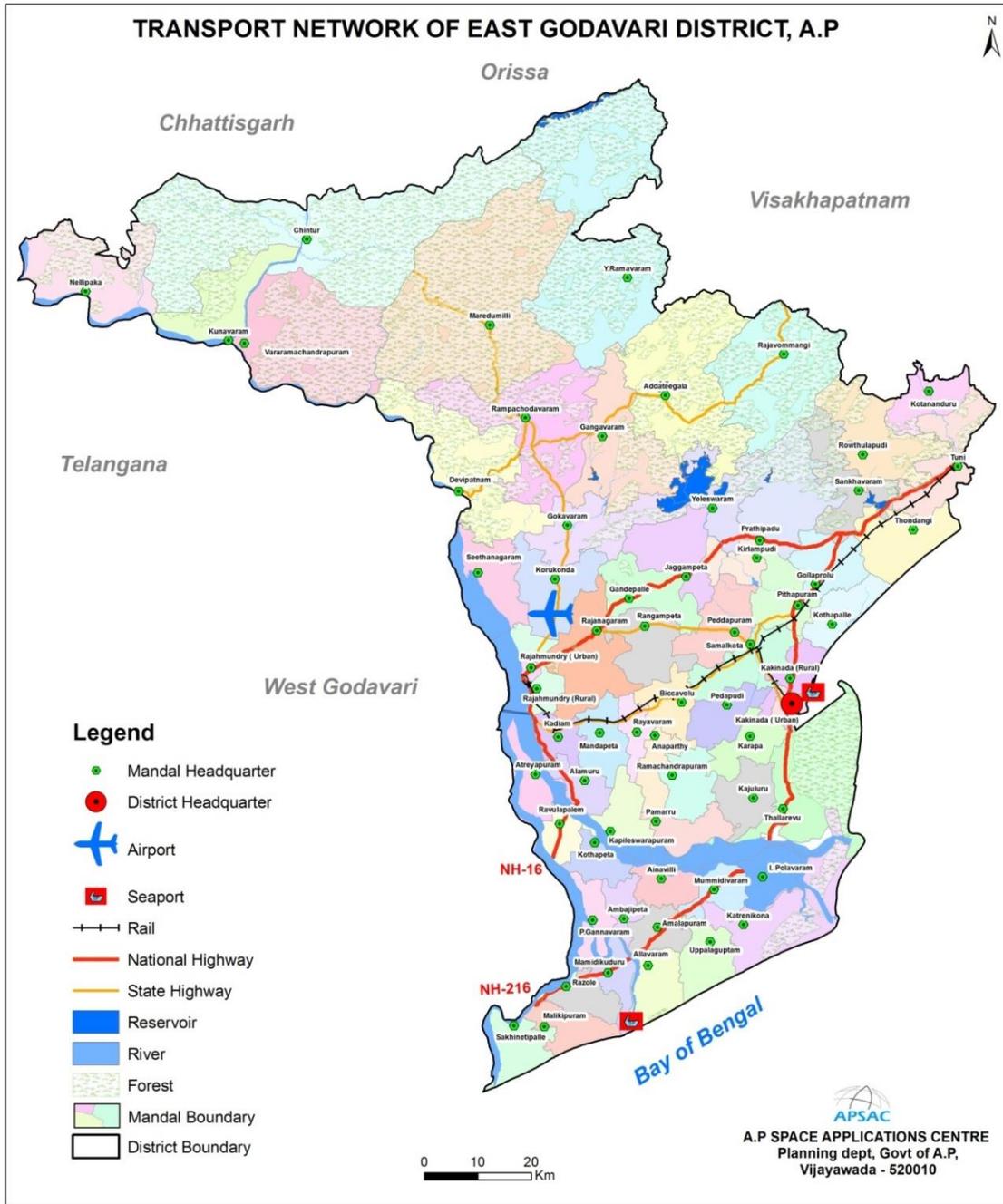


Fig. 1 Administrative Boundaries of East Godavari District

## 1.2.Drainage

The famous river Godavari flows through this District (Fig.2). Within the state of Andhra Pradesh, it flows through the hilly terrain of the Eastern Ghats known as the Papi hills which explains the narrowing of its bed as it flows through a gorge for a few km, only to re-widen at Polavaram. Before crossing the Papi hills, it receives its last major tributary Sabari River on its left bank. The river upon reaching the plains begins to widen out until it reaches Rajamundry. Arma Konda or Jindhagada Peak (1,680m or 5,510 ft) above MSL) located near Paderu is the highest peak in the Godavari river basin as well as in Eastern Ghats. After crossing Rajahmundry, the Godavari splits into two branches which are called Vriddha Gautami (Gautami Godavari) and Vasishta Godavari. Again the Gautami branch splits into two branches namely Gautami and Nilarevu. Similarly, the Vasishta splits into two branches named Vasishta and Vainateya. These four branches which join the Bay of Bengal at different places are forming a delta of length 170 km (110 mi) along the coast of the Bay of Bengal and is called the Konaseema region. This delta along with the delta of the Krishna River is called the Rice Granary of South India.

Table 1: Area drained and percent area drained

Si.No	Name of River	Area Drained (Sq. Km)	Percentage (%) Area Drained
1	Godavari River	250	17.06

Data source: AD, DMG, East Godavari District

Table 2: Details of Godavari River in the East Godavari District:

## a. Rivers:

Sl. No	Name Of River	Total Stretch of River (in Km)	Total Length (in Km) in the East Godavari District.	Type of River (Perennial or Non-Perennial )	Place of Origin	Altitude at Origin (m)
1	Godavari	1465	250	Perennial	Triambakeshwar, Maharashtra	1,067

Data source: AD, DMG, East Godavari District

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

Name of Reservoir/ Dams	Maintain/ Controlled by State Govt./ PSU etc.	Location	District	Tehsil	Village	Size (Ha)
Sir Arthur Cotton Barrage	State Govt.	Dowlaiswaram	East Godavari District.	Rajamahendravaram Urban and Rural	Dowlaiswaram	--

Data source: AD, DMG, East Godavari District

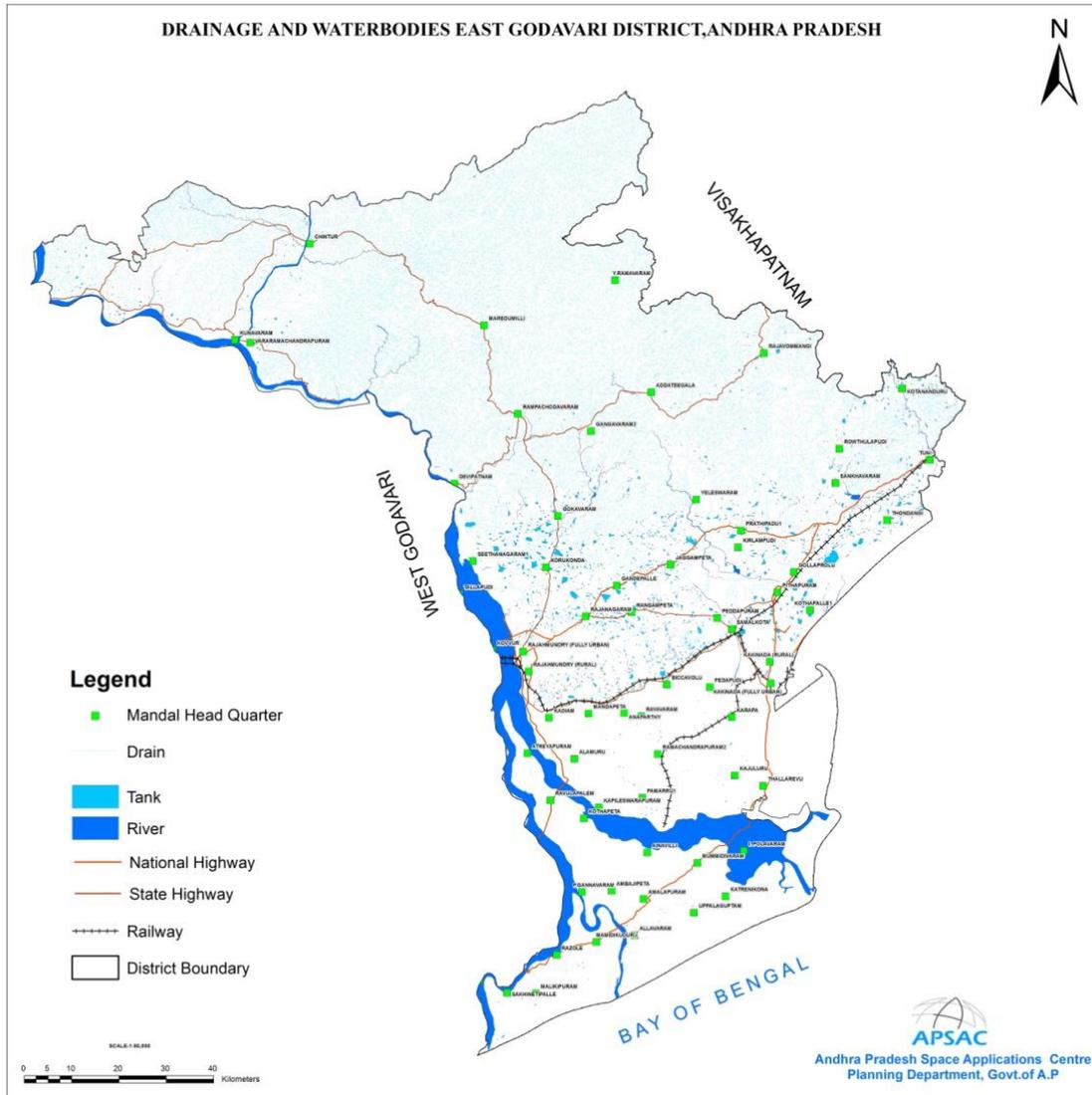


Fig. 2 Drainage Network and Surface Water bodies of the District

The Kolleru Lake having a shallow depression area of about 388.5 Sq. Km lies in Kaikaluru and Kalidindi Mandals. It is located between Krishna and Godavari delta and spans into two districts - Krishna and West Godavari. It acts as a reservoir for drainage water of surrounding delta areas during monsoon and it dries up in summer. Kolleru Lake is the largest freshwater lake in Asia. The lake serves as a natural flood-balancing reservoir for these two rivers. The lake is fed directly by water from the seasonal Budameru and Tammileru rivers and is connected to the Krishna and Godavari systems by over 68 inflowing drains and channels. The lake is an important habitat for an estimated 20 million residents and migratory birds. It is known the world over for the famous Kolleru Bird Sanctuary.

### 1.3.Climate and Rainfall

The Climate is comparatively moderate throughout the year except during the months of April to June when the temperature reaches a maximum of 48 degrees Centigrade. The normal rainfall of the district is 1280.0 mm. More than half of the rainfall is brought by South-West Monsoon, while a large portion of the district receives rainfall from the North-East monsoon, , during October and November. Almost mandal automatic weather station (AWS) is established by the A.P. State Developmental Planning Society (APSDPS), Planning Department, Govt. of A.P. (Fig.3), and the data from these stations are received every day. The isohytes map shows the rainfall status in East Godavari district (Fig. 4).

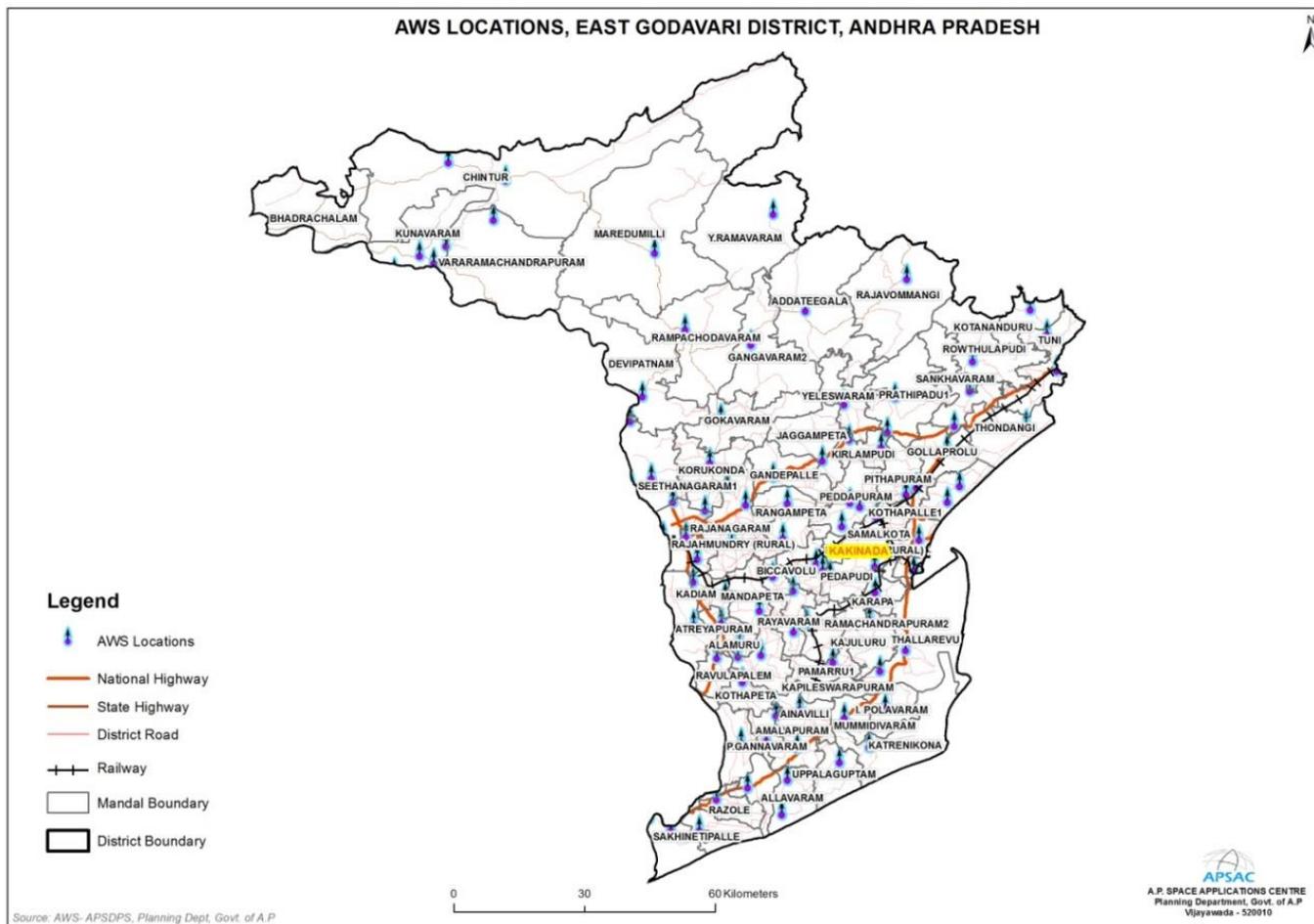


Fig. 3 Automatic Weather Stations of East Godavari District

Table-3 Average Rainfall (mm) in the East Godavari district

Sl.No	Months of 2019	Monthly rainfall (mm)
1	JAN	4.1
2	FEB	0.0
3	MAR	13.3
4	APR	33.7
5	MAY	2.6
6	JUN	97.6
7	JUL	275.4
8	AUG	275.8
9	SEP	223.6
10	OCT	256.7
11	NOV	7.1
12	DEC	1.3
	Average Rainfall (mm)	1191.0

( Data Source: Central Ground Water Board (Ministry of Jal Shakti Department of Water Resources, River Development and Ganga Rejuvenation Govt. of India -Ground Water Year Book 2019-20 Andhra Pradesh) )

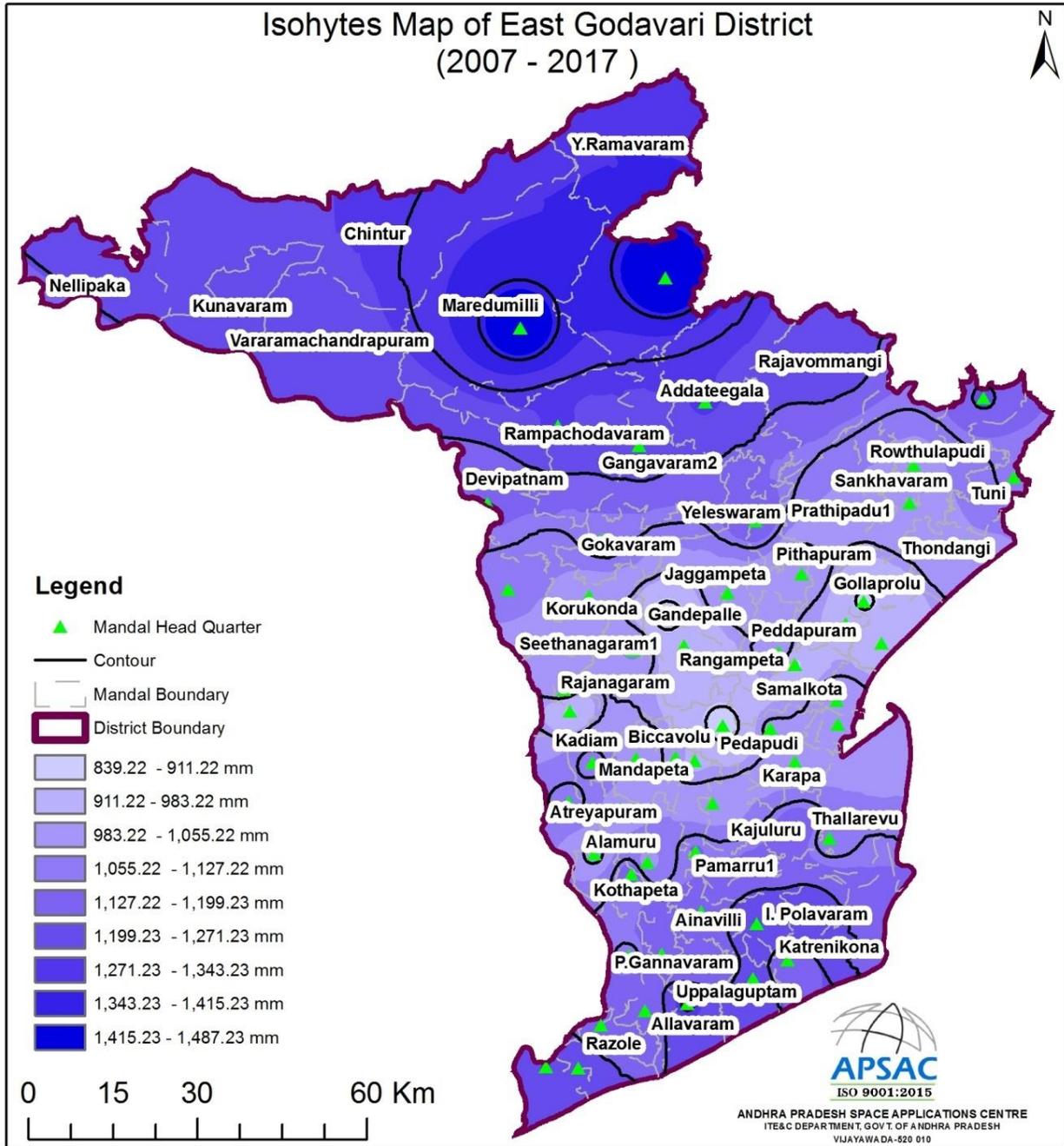


Fig. 4 Distribution of Rainfall in East Godavari District, Andhra Pradesh

#### **1.4. Transport and Communications**

It is observed that the district is having good road network connectivity in central region and less in the northern part covered with hilly region. The East Godavari district covering an area of 10,807 sq. km consists of 2,897 habitations in 64 mandals. It is noticed that 601 habitations are not having connectivity with BT and CC roads. The total number of PR road is 2,779 having a spatial length of 6,418 km, of which 1,545 km is with BT, 220 km CC, 1,280 km WBM, 1,186 km Gravel, and 1,018 km with Earthen surface. NH16 and NH214A are passing through the district and covers a length of 343 km. The National Highway 5 connecting Chennai and Howrah passes through this district. Rajahmundry, Tuni, and Samalkot are the railway junctions in the district. The Chennai to Howrah rail line also passes through this district. (Fig 5).

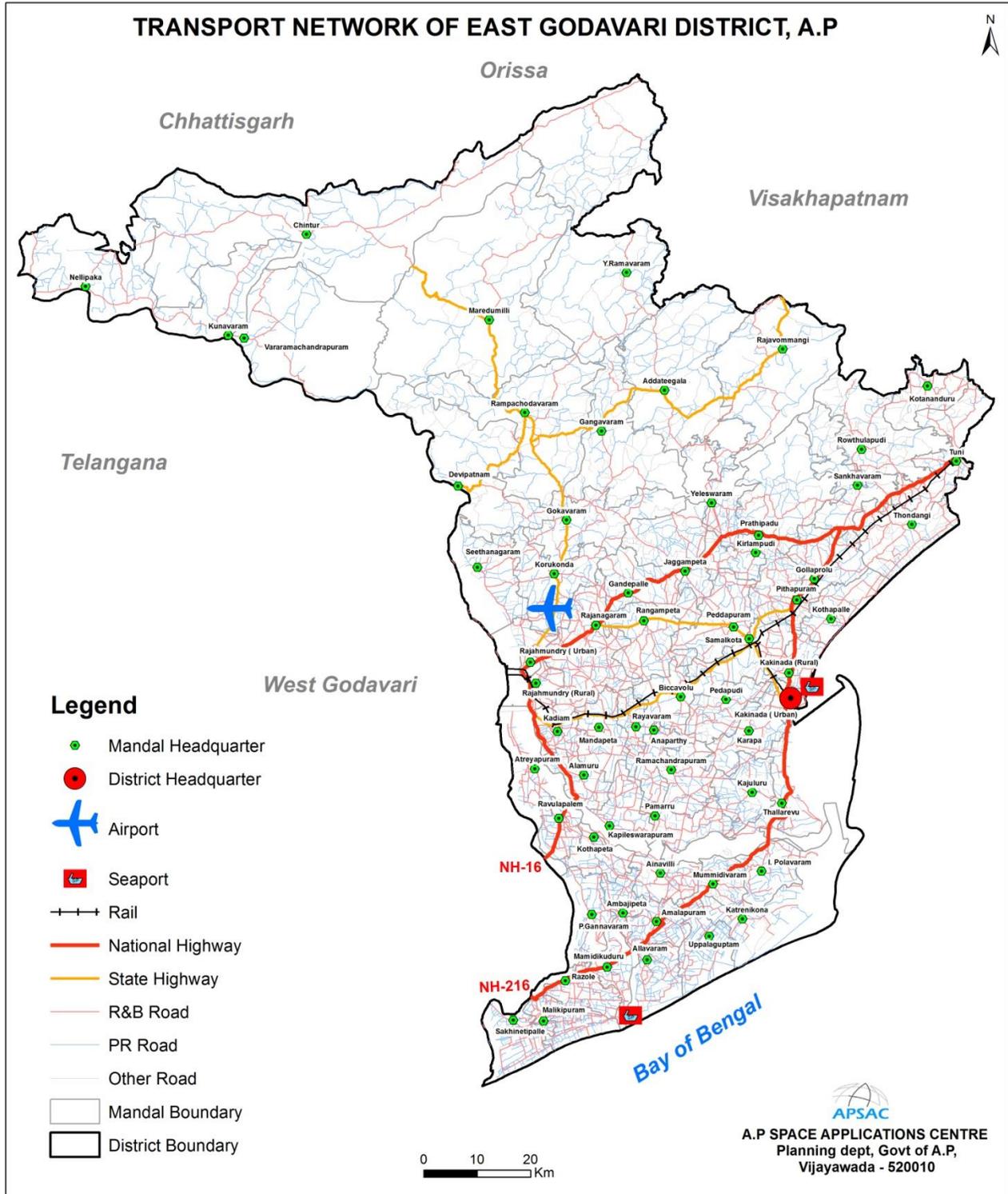


Fig. 5 Transport Network of East Godavari District, Andhra Pradesh

## 1.5. Population and Literacy

An official Census 2011 detail of East Godavari, a district of Andhra Pradesh has been released by Directorate of Census Operations in Andhra Pradesh. Enumeration of key persons was also done by census officials in East Godavari District of Andhra Pradesh. In 2011, East Godavari had population of 5,154,296 of which male and female were 2,569,688 and 2,584,608 respectively. In 2001 census, East Godavari had a population of 4,901,420 of which males were 2,459,640 and remaining 2,441,780 were females. The East Godavari District population is constituted 6.09 percent of total Maharashtra population. There was a change of 5.16 percent in the population compared to population as per 2001. In the previous census of India 2001, East Godavari District recorded an increase of 7.93 percent to its population compared to 1991(Fig.6) The Average literacy rate of East Godavari in 2011 as was 70.99 compared to 65.48 of 2001 The male and female literacy were 74.51 and 67.52 percent respectively. For 2001 census, same figures stood at 70.00 and 60.94 percent in East Godavari District. The total literate in East Godavari District were 3,288,577 of which male and female were 1,716,933 and 1,571,644 respectively. In 2001, East Godavari District had 2,807,728 literates in its district. Mandal wise spatial distribution of schedule caste population and types of SC student hostels and residential schools in East Godavari District, Andhra Pradesh is shown in Fig.6.

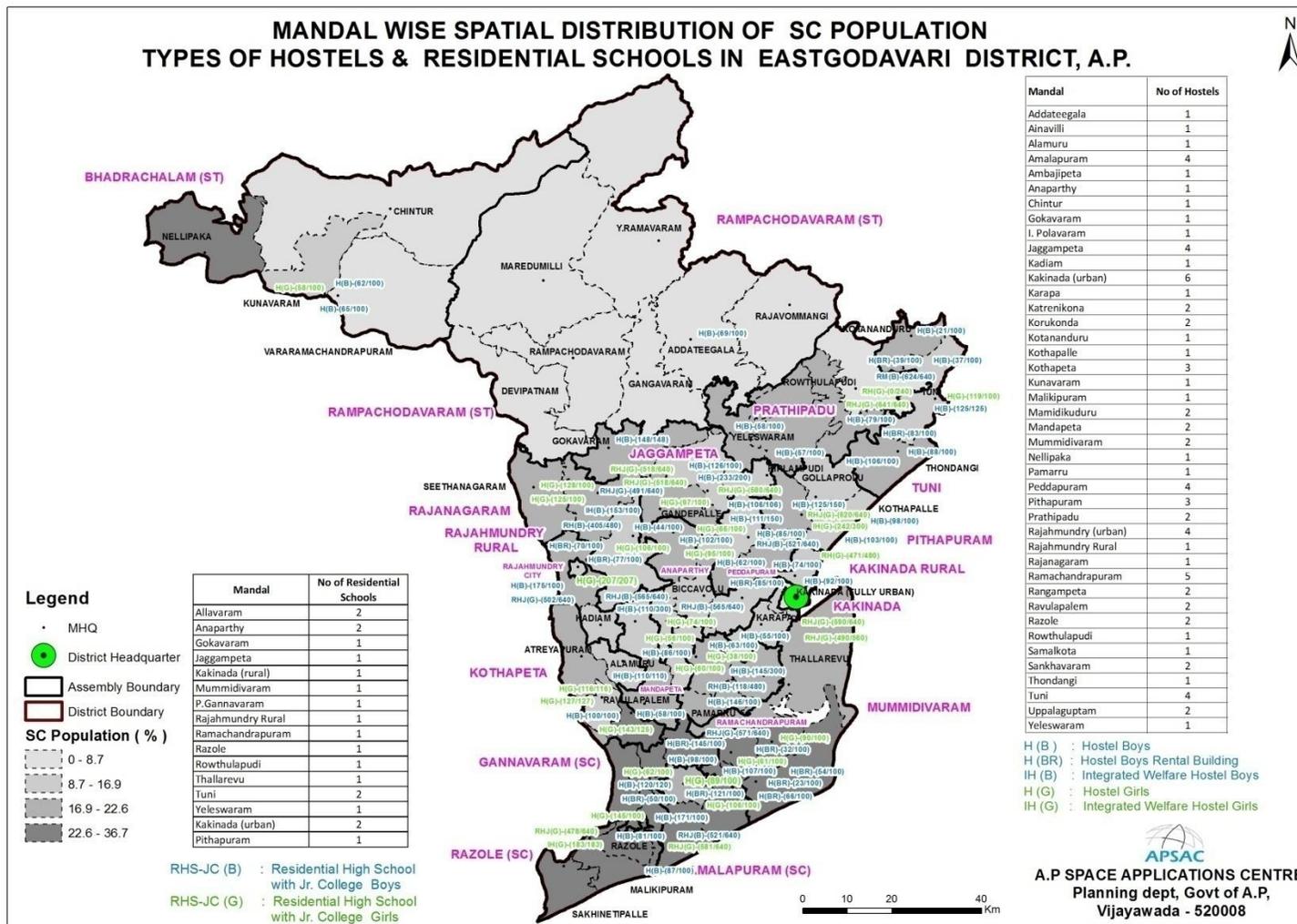


Fig. 6 Distribution of Schedule Caste Population, Types of Hostels and Residential Schools

## 1.6. Important Places

### 1.6.1. Places of Tourist Interest

Religious tourism is also referred to as pilgrimage tourism, where the primary purpose of travel is pilgrimage to Temples, Churches, or Masjids. East Godavari is a notable place with its rich and varied temples and shrines. It is a place of rich tradition, heritage, and historical significance. Here, we provide a list of some historical, most visited, and famous pilgrimages in East Godavari district along with their details. The locations of important tourist places in East Godavari District are shown in Fig.7.

**Ainavilli:** It is located at a distance of 72km from Kakinada. It is a land of unspoiled beauty. . It is dedicated to Sri Siddhi Vinayaka Swamy. Devotees take a vow to visit the temple again if their wishes are fulfilled. It has two gopurams (towers) sculpted skillfully with tales and idols. It is said that the Vyasa Maharishi installed the Ganapathi idol.

**Antharvedi:** It is located about 130km from Kakinada. It is flanked by beautiful waters of sea to the east, the Godavari to the west, and Raktakulya River to the north. There are some well known spots belonging to this holy shrine such as Sagar Sangam and Chakrateertham. It is also called Mukti Kshetra of Lord Narasimha and the Annual Mela runs for about nine days when Antarvedi seems to be the Kaliyuga Vaikunta.

**Appanapalli:** A remote village in Mamidikuru which is 72km from Kakinada via Yanam. Being the abode of Lord Balaji, it has acquired a reputation as second Tirupati of Konaseema. It is flanked by Godavari on 3 sides. We can find good accommodation at decent guest houses and TTD Choultries. This shrine derives its name after a Rishi.

**Muramalla:** Muramalla is located about 20km from Amalapuram and is home to the popular shrine Sri Veereswara Swamy Vari Idol which attracts people. It is believed that devotees who are unmarried, who find it difficult to get good marriage proposals, get married with just a mere visit to this temple. Childless couples, and couples who do not get along also visit the shrine to find respite from their problems.

**Palivela:** Palivela is located about 90km from Kakinada is known for the temple where Lord Uma Kouppulingeswara Swamy idol is situated. It is believed that the idol was installed by Maharshi Agastya. There used to be 7 Mandapas which are named after 7 days of the week.

**Ryali:** Ryali is located 74km from Kakinada. It is an enchanting place situated between the rivers Vashista and Gowtami. In this temple, the exquisite idol of Jaganadh Swamy is made of black stone. It has MahaVishnu in front and Jagan Mohini on the back side and can also catch a glimpse of ten incarnations of concerts, Thumbara, Narada, Rambha, Urvasi, Garuda, Ganga, and many more. This shrine is referred to as “Swayambhu”.

**Vanapalli:** Vanapalli is located about 21km from Amalapuram and 70km from Kakinada via Ravulapalem. The temple of lord ‘Pallalamma’ Ammavaru is said to have divine powers of healing. A statue of jackal was found under the idol.

**Draksharama:** Draksharama is located 28km from Kakinada, situated on the Eastern bank of Godavari. It is a history of sacred pilgrimage dealt within Skanda Purana. It is a rare view where god and goddess (Astadasa Shakti Petas) equally shower blessings. There is one such in Varanasi, second in SriSailam, and third in Draksharama with Bhimanatha and Manikyamba. This is ‘Swayambhu’ and is one of the ‘Pancharamas’.

**Samalkot:** Samalkot is about 12km from Kakinada. It is famous and one of the ‘Pancharamas’. This was built in the 9<sup>th</sup> century. Lord Bhimeswara Swamy appears as Ekashila Shiva Linga along with Ekashila Nandi. Darshan of Shiva Linga is on first floor, along with goddess Shri Bala Tripura Sundari, and Pushkarini (lake) can be seen.

**Talupulamma Lova:** Talupulamma Lova is often claimed as “gods own district” located not far from Annavaram town. It is an abode of Talupulamma Thalli. People believe she would protect them from accidents and dangers. It is said to be “Swayambhu”. It is a fascinating and irresistible destination for lovers of nature and adventure and is located 70km from Kakinada.

**Pandavula Metta:** Pandavula Metta is a hillock nearer to Peddapuram. This hill was in midst of a jungle. It is believed that Pandavas had lived here for some time during their exile. One

can also see Bhimas's feet even today. One should climb 108 steps to reach the temple and can find two natural caves on a hill facing east. It is about 20km from Kakinada.

**Annavamam:** Annavamam is one of the most famous holy shrines enjoying popularity next to Tirupati. The temple is built in Dravidian style. The Lord Satyadeva with Anantha Lakshmi and Lord Shiva on other side took his abode on Ratnagiri. Every Hindu performs 'Sri Satya Narayana Vratham' throughout India for wealth, education, and success. Especially, the newly married couple comes here and performs poojas for a good and healthy relationship. It is also very famous for the god's "prasadam" which is served in dried leaves till today.

**Bikkavolu:** Bikkavolu temple is dedicated to Lord Vinayaka. The main deity inside the temple is 7 feet tall. This is a "Swayambhu". It is located 30kms from Kakinada. It is believed that the idol was installed during 849 AD and has been increasing year by year. Here the devotees whisper their wishes in the lord's ear. The other fascinating thing is the water that comes out from the bottom portion of left leg of the lord.

**Gollala Mamidada:** Gollala Mamidada is located 20kms from Kakinada. It is in the midst of coconut groves and green fields. Suryanarayana Swamy temple is situated here. It has 170 feet high gopuram. The temple is situated on 16 acres. The whole gopuram consists of 100's of carvings which are said to be an eye feast and takes a lot of time to see every carving which is constructed based on different epics of god and goddess. It is also known as 'Chinna Bhadrachalam'.

**Markandeya Temple:** One of the ancient temples of Rajahmundry. It is about 70kms from Kakinada. The temple was rebuilt in 1818 which shows Lord Shiva along with all other deities in one place. It is located near Ghats of Godavari. Devotees generally have a dip in river Godavari before they enter the temple.

**Mandapalli:** After the huge battle between demons and Shani, Shani won the battle. To get rid of 'Bhramahatyapaatakam', he installed a Shiva linga which he called Mandeswara Swamy. It is about 66km from Kakinada. Devotees offer prayers in wide range on "Shani Trayodhasi" believing that their sins are washed off.

**Kukkuteswara Swamy Temple:** It is dedicated to Lord Shiva. It is a 'Swayambhu' in the form of a clock's head. It is located in Pitapuram which is 56km away from Rajahmundry. People from many parts of the state throng to the temple during 'Maha Shiva Raathri'.

**Vadapalli:** Vadapalli is located 10km from Ravulapalem. The roof around the temple is filled with Govindanamaalu. It is believed Lord Venkateswara is pleased and fulfills their wishes if the devotees perform 11 pradakshinas.

**Tholi Tirupati:** It is said that there are 108 Tirupatis throughout the country and this is the first of all. It is about 27km towards the north of Kakinada. We can see smiling posture of Lord Venkateswara, Shanka and Chakra are in altered positions in comparison with other Balaji idols.

**Andhra Sabarimala:** This is a replica of Swamy Ayyappa temple in Kerala. It is about 64kms from Kakinada. It is said that the devotees who cannot go to Sabarimala (Kerala) can offer their prayers here. There are many other temples located on the same premises.

**Korukonda:** It is located about 60kms from Kakinda and 25kms from Rajahmundry. It is an ancient historic temple known as Vaishnava Divya Kshetram. It is dedicated to Lord Vishnu. It is a 'Swayambhu' idol situated at the top of a hill which can be accessed only through a long flight of 650 steps. The temple was constructed 800 years ago.

**Adurru (Buddha Stupas):** It is a 2400-year-old Buddhist site located on the west of Vianetaya. Amongst the 3 most popular Buddhist Stupas in the world, the first is in Adurru, the second is in Ranchi, and the last one in Sarnath. The famous Mahastupa was built like a giant wheel with 17 feet diameter.

**Royal Mosque:** The Royal Mosque which is situated amid Rajahmundry was built in 1305 AD by Sumera Sahib, son of Mohammad Bin Tughlak and is one of the oldest monuments worth seeing. It has completed 700 years and it stood as a centre for religious harmony and brotherhood.

### 1.6.2. Places of Religious and Cultural importance

The culture of East Godavari district is a rich traditional one in all parts of the district and reflects the true culture of Andhra Pradesh. It is known for Veda-pandits, the Godavari River, and the hospitality of the people. The Telugu language originated in this district (in Rajahmundry or Rajamahendri) East Godavari District has produced several stalwarts in areas of culture, music, art, and cinema. The Poet and writer Devulapalli Krishnasastri, musician and singer M.Bala muralikrishna (Mangalampalli Balamurali Krishna), P. B. Sreenivas, Adurthi Subba Rao, C. Pullaiah, painter N. V. Reddi Naidu, actress Jaya Prada, and Freedom fighter, social worker, and politician Durgabai Deshmukh belong to this district.. Culture has always been a major object of travel. Culture plays an important role in tourism. Cultural heritage tourism is the fastest growing segment of the tourism industry because there is a trend towards an increase in the specialization among tourists towards Culture.

#### Kakinada Beach Festival

Kakinada beach which was later named the NTR beach is a good destination for beach lovers. The event is expected to see a large number of tourists. The centre of attraction during the four day event will be the actors and guests from Telugu Film Industry. The horticulture from Kadiyam adds more color to the festival. The water sports that are organized with the support of aqua sector and Goa state administration are a special attraction.

#### Konaseema festival

Konaseema Utsav is celebrated in a grand manner at Muramalla village, Polavaram mandal. Thousands of people from different parts of the region and other districts participate in the fest. The Utsav showcases the beauty and culture of this area. The 2k run is organized and the replicas of prominent temples are arranged and several cultural programs are also organized.

#### Manyam Jatara

It is a three-day fair that reflects the customs, traditions, and culture of the tribal community. To promote tourism, both the Godavari district administration and Integrated Tribal Development Agency are jointly organizing 'Manyam Jatara'. The Jatara comprises 60 percent of local tribes and 40 percent of people from other districts. Food items and different varieties of bamboo products would be exhibited during the festival.

### **Peruru**

It is a small village located near Amalapuram in East Godavari district of coastal AP. Taking a walk in Peruru is akin to a walk in century's old Andhra town. It is filled with huge mansions which are quite old and resemble heritage houses.

### **Pandava Metta**

Not much known to people is Pandava Metta, a hillock nearer to Peddapuram, a small town in this district. This hillock tells us about the exile period of Pandavas. On their way to Rameswaram, they stayed in Peddapuram on a hill. That's the reason this hill was named after their name.

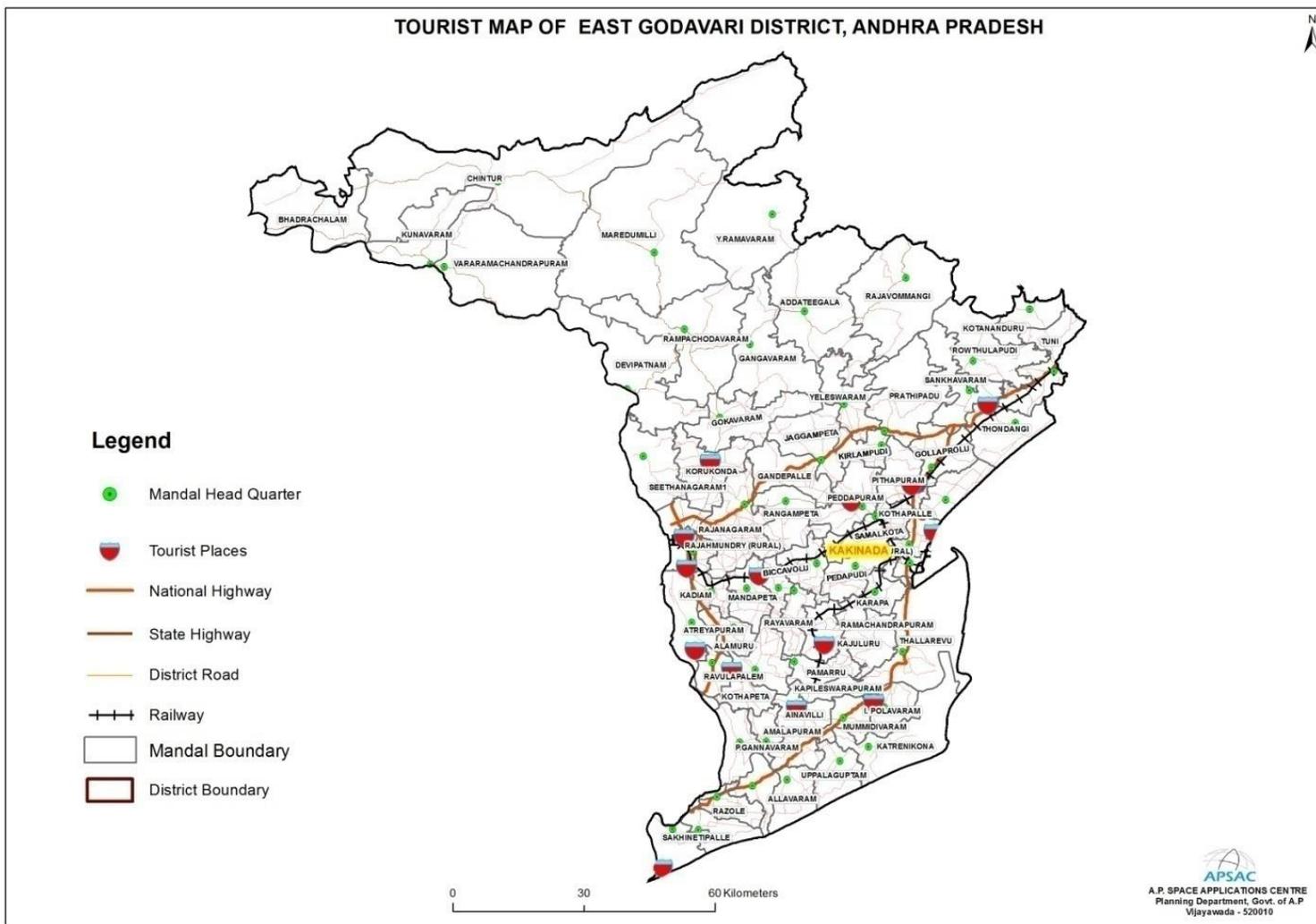


Fig. 7 Some Important Tourist Places in East Godavari District, Andhra Pradesh

## 2. Land Utilization, Forest and Slope East Godavari District

The Land Use / Land Cover (LULC) pattern of any region is an outcome of various physical, cultural factors and their utilization by a 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 concerning various natural characteristics. But land cover describes the vegetal attributes of land. The land use/land cover data is essential for planners, decision makers, and those concerned with land resources management.

The proper understanding of the influence of the various human-induced land use practices about environmental change, is essential to help simulate the land use changes. Remote sensing technology is considered most effective as it provides timely and authentic information about the spatial distribution of land use/land cover, while Geographical Information System (GIS) provides a flexible digital environment for collecting, storing, visualizing, and analyzing the spatial data. Remote sensing as a vital tool helps for rapid assessment and monitoring of a natural resource. When combined with GIS, it makes it possible to map land use/cover phenomena in detail for further planning, development, and decision-making, which is essential for meeting the increasing demands and welfare of the ever-growing population (NRSA, 2006).Land Use / Land Cover Classification.

Various land use/land cover categories have been delineated by using three seasons (Kharif, Rabi, and Zaid) satellite data under level-3 classification. For on-screen digitization,

visual image interpretation techniques (size, shape, color, tone, texture, association, and pattern) have been used for classifying the land use/land cover map (NRSA, 2006). This information is used for general planning purposes at district/mandal level. The broad categories are built-up, agricultural, forest, wastelands, wetlands, and water bodies. The spatial distribution of land use/land cover of the East Godavari district is shown in Figure-8 and area statistics are presented in Table-4.

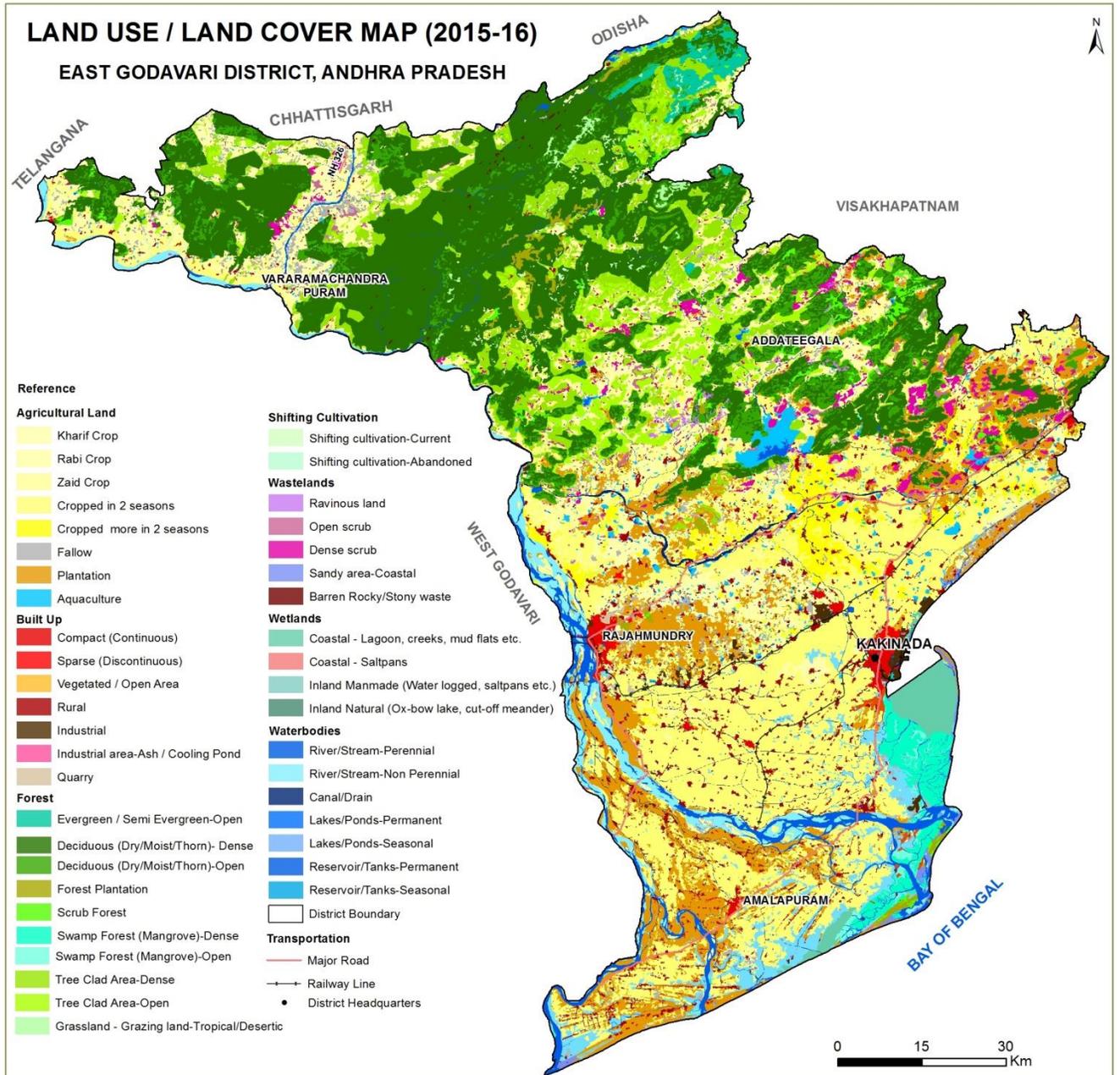


Fig. 8 Land Use / Land Cover Map of East Godavari District during 2015-16

Table 4: Categorywise distributions of Land use/Land cover during 2015-16

Sl.No	Land Use Categories	Year 2015-16	
		Area (sq.km)	Percentage (%)
1	Compact (Continuous)	81.06	0.63
2	Sparse (Discontinuous)	16.68	0.13
3	Vegetated / Open Area	7.51	0.06
4	Rural	331.90	2.59
5	Industrial	57.93	0.45
6	Industrial area-Ash / Cooling Pond	1.27	0.01
7	Quarry	14.63	0.11
<b>Built Up</b>		<b>510.98</b>	<b>3.99</b>
8	Kharif Crop	1368.28	10.69
9	Rabi Crop	107.97	0.84
10	Zaid Crop	8.74	0.07
11	Cropped in 2 seasons	2575.91	20.12
12	Cropped more in 2 seasons	298.33	2.33
13	Fallow	227.72	1.78
14	Plantation	1110.83	8.68

15	Aquaculture	262.85	2.05
<b>Agricultural Land</b>		<b>5960.63</b>	<b>46.55</b>
16	Evergreen / Semi Evergreen-Open	97.04	0.76
17	Deciduous (Dry/Moist/Thorn)-Dense	2707.61	21.15
18	Deciduous (Dry/Moist/Thorn)-Open	645.47	5.04
19	Forest Plantation	92.97	0.73
20	Scrub Forest	87.03	0.68
21	Littoral/Swamp Forest (Mangrove)-Dense	163.79	1.28
22	Littoral/Swamp Forest (Mangrove)-Open	39.99	0.31
23	Tree Clad Area-Dense	700.93	5.47
24	Tree Clad Area-Open	449.56	3.51
25	Grass and Grazing land-Tropical/Desertic	38.55	0.30
<b>Forest</b>		<b>5022.94</b>	<b>39.23</b>
26	Ravinous land	16.95	0.13
27	Dense scrub	172.66	1.35
28	Open scrub	56.22	0.44
29	Coastal	33.67	0.26
30	Barren Rocky/Stony waste	4.82	0.04

<b>Wastelands</b>		<b>284.31</b>	<b>2.22</b>
31	Inland Natural (Ox-bow lake, waterlogged etc.)	1.28	0.01
32	Inland Manmade (Water logged, saltpans etc.)	4.31	0.03
33	Coastal - Lagoon, creeks, mud flats etc.	129.20	1.01
34	Coastal - Saltpans	14.09	0.11
<b>Wetland</b>		<b>148.88</b>	<b>1.16</b>
35	River/Stream-Perennial	343.11	2.68
36	River/Stream-Non Perennial	250.56	1.96
37	Canal/Drain	64.13	0.50
38	Lakes/Ponds-Permanent	0.09	0.00
39	Lakes/Ponds-Seasonal	0.53	0.00
40	Reservoir/Tanks-Permanent	50.42	0.39
41	Reservoir/Tanks-Seasonal	152.75	1.19
<b>Waterbodies</b>		<b>861.58</b>	<b>6.73</b>
42	Current	14.42	0.11
43	Abandoned	1.12	0.01
<b>Shifting cultivation</b>		<b>15.54</b>	<b>0.12</b>
<b>Grand Total</b>		<b>12805</b>	<b>100.00</b>

Data source: APSAC, Vijayawada

## Built-Up

These are the areas of human habitation that have a cover of buildings, transport and communication, utilities in association with water, vegetation, and vacant lands. It consists of built-up (Compact and Sparse), Vegetated / Open Area, Rural, Industrial, and Mining/Quarry. It occupies an area of 510.98 sq. km, which is about 3.99% of the total geographical area of the district. Of which, rural area contributes 2.59% which is 64.91% of the built-up category.

### Built up - Compact (Continuous)

Most of the land is covered by buildings, roads, and artificially surfaced area and cover almost all the ground. The builtup - compact class is assigned when the urban structures and transport network (i.e. impermeable surfaces) occupies more than 80% of the surface area. This category is occupied 81.06 sq. km, which are found in urban areas.

### Built up - Sparse (Discontinuous)

Most of the land is covered by the structures like buildings, roads, and artificially surfaced areas associated with vegetated areas and bare soil, which occupy discontinuous but significant surfaces. Between 30 to 80% of the total surface should be impermeable. The Scattered blocks of residential flats, hamlets, and small villages are delineated under this category. It contributes an area of 16.68 sq. km, which is found in peri-urban areas.

## Vegetated / Open Area

These are vegetated areas within urban agglomeration (situated within or in contact with urban areas). The vegetation cover of trees, shrubs, and herbs covers at least 5% of the

total surface area, it has been delineated. 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 occupies an area of 7.51 sq. km.

### **Built-Up – Rural**

These are the lands used for the human settlement of size comparatively less than the urban settlements of which more than 80% of the people are involved in the primary activity of agriculture and associated with non-commercial and with allied classes are identified as built up (rural) category. The rural area contributes is about 331.90 sq. km.

### **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 57.93 sq. km, which is observed in and around towns.**Industrial area-Ash / Cooling Pond**

These are the portions of an industry that are used for the temporary storage of ash, contaminated soil, rubble, cooling of hot water, or tailing pond associated with the industry. The areas where industrial waste is permanently kept, categorized as other waste which is delineated under this category. A stockpile of a storage dump of industrial raw material or slag/effluents or waste material or quarried/mixed debris from earth's surface is considered under this category. It is observed that this category is found around the industrial areas with an area of 1.27 sq. km.

### Mining – Active

Mining areas encompass areas under surface operations. The recognizable impacts of these activities on the landscape are unmistakable giant pit mines covering vast areas. The active mining areas are presently large-scale surface operations of removal of economically important ores and presently going on. The active mining area contributes an area of 2.19 sq. km.

### Mining – Abandoned

These are the areas where large-scale surface operations of removal of economically important ores are carried out in the past, but presently kept abandoned due to various reasons like economical, operational, viability, disturbances, etc. Only 1.26 sq. km has been contributes under this category.

### Quarry

These are manifestations of surface mining operations wherein small-scale excavation of land surface for sand, gravel, clay-phosphate mines, limestone quarries, etc. are taking place. They are mostly characterized by their nearness to urban areas. It contributes an area is about 14.63 sq. km.

### Agricultural Land

The land use category is primarily used for the production of food, fiber, and other commercial and horticultural crops. It includes land under crops namely cropland, fallow land, agricultural plantation, and aquaculture. The agricultural category is found as the major

category covering 5960.63 sq. km (46.55%) during 2015-16. It is also found that double-cropped area is about 20% of the district total.

### **Kharif Crop**

Agricultural area cultivated between June/July to September/ October coinciding with SoutWest monsoon season is considered as Kharif crop. It is associated with rain-fed crops under dryland farming with limited or no irrigation and areas of rain-fed paddy and other dry crops. Kharif is found to be the second major agricultural category with an extension of 1368.28 sq. km (10.69%).

### **Rabi Crop**

These areas are cultivated between November/December to February/March. It is associated with areas under assured irrigation irrespective of the source of irrigation. However, Rabi cropped areas also occur in rain-fed regions, under residual soil moisture conditions especially in black soil areas with high rainfall during the Kharif season. The extent of the Rabi cropped area is about 107.97 sq. km (0.84%).

### **Zaid Crop**

These are the areas that are cropped during summer (April – May) which are mostly associated with irrigated areas with fertile soils, confined to plains/delta areas. The areas are found in 8.74 sq. km during 2015-16.

### **Cropped in two seasons**

These are the areas that are cropped during two cropping seasons that are often seen associated with irrigated areas. Three combinations are possible in this category viz., - Kharif

+ Rabi, Kharif + Zaid, and Rabi + Zaid. It is found that this is the major agricultural category with an extent of 2575.91 sq. km (20.12%).

### 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, pineapple, etc., are considered under this category. It contributes an area of 298.33 sq. km (2.33%).

### Fallow land

The agricultural land which is being used for cultivation but is temporarily allowed to rest or un-cropped for one or more seasons, but not less than a year, and for not more than five years is referred to as fallow land. The fallow land occupies an area of 227.72 sq. km.

### Agricultural Plantation

These are the areas under agricultural tree crops planted adopting 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 are separable from cropland, especially with the data acquired during rabi/zaid season. Plantations appear in dark-red to red tones of different sizes with regular and sharp edges indicating the presence of a fence around it. It is found that 8.68% of the land was under plantation crops during 2015-16.

### Aquaculture

These are the areas where fish and shrimps are bred and reared for commercial purposes. Aquaculture ponds are located mostly along the coast or in lakes, rivers, and estuaries. This category is mostly found along the coast with an area of 262.85 sq. km (2.05%).

### Evergreen/Semi Evergreen-Dense/Open

These are the area comprise of thick and dense canopy of all tall trees, which predominantly remain green throughout the year. It includes both coniferous and tropical broadleaved evergreen species. Semi-evergreen is a forest type that includes a combination of evergreen and deciduous species with the former dominating the canopy cover. In East Godavari, It is attributed an area of 97.04 sq. km (0.76%).

### Deciduous (Dry/Moist/Thorn)-Dense

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 areas where the canopy cover/density is more than 40% and contributed 2707.61 sq. km.

### 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 percent. An area of 645.47 sq. km is attributed to this category.

### Forest Plantation

These are the areas of tree species of forestry importance, raised and managed especially in notified forest areas. Most of these are located in uplands, coastal areas within notified areas. Many of these can be identified based on the sharp boundary exhibited by them. The distribution of forest plantations is 92.97 sq. km.

### Scrub Forest

These are the forest areas that are generally seen at the fringes of dense forest cover and settlements, where there is biotic and abiotic interference. Most times they are located closer to habitations. Forest blanks which are the openings amidst forest areas, devoid of tree cover, observed as openings of assorted size and shapes as manifested on the imagery are also included in this category. Scrubs cover an area of 87.03 sq. km (0.68%).

### Swamp Forest (Mangrove)-Dense

These are the areas with the plants evergreen in nature, halophytic, dense, or woody in nature, occurring along tidal waters/creeks, estuaries, and along the delta in coastal areas. They are densely colonized in coastal on tidal flats, estuaries and salt marshes, etc. This category includes all the areas where the canopy cover/density is more than 40%. This category is found along with the coastal areas with an account of 163.79 sq. km.

### Swamp Forest (Mangrove)-Open

These are the areas with the plants evergreen in nature, halophytic, dense, or woody in nature, occurring along tidal waters/creeks, estuaries, and along the delta in coastal areas. They are densely colonized in coastal on tidal flats, estuaries, and salt marshes, etc. This

category includes all the forest areas, where the canopy cover/density ranges between 10 - 40 percent. It is found that 39.99 sq. km area under this category.

### Tree Clad Area-Dense

Areas with tree cover lying outside the notified forest area with a woody perennial plant with a single, well-defined stem carrying a more-or-less-defined crown and being at least 3 m tall. Plants essentially herbaceous but with a woody appearance (e.g. bamboos and ferns) are also classified as trees if the height is more than 5 m and as shrubs, if the height is less than 5 m. This category includes all the areas where the canopy cover/density is more than 40%., and occupies an area of 700.93 sq. km.

### Tree Clad Area-Open

Areas with tree cover lying outside the notified forest area with a woody perennial plant with a single, well-defined stem carrying a more-or-less-defined crown and being at least 3 m tall. Plants essentially herbaceous but with a woody appearance (e.g. bamboos and ferns) are also classified as trees if the height is more than 5 m and as shrubs, if the height is less than 5 m. This category includes all the forest areas where the canopy cover/density ranges between 10 - 40 percent, and covers an area of 449.56 sq. km.

### Wastelands

Wasteland is described as degraded land which can be brought under vegetative cover with reasonable effort and which is currently underutilized and land which is deteriorating for lack of appropriate water and soil management or on account of natural causes. Wastelands can result from inherent/imposed disabilities such as location, environment, chemical and

physical properties of the soil, or financial or management constraints. The area under this category is 148.88 sq. km (1.16%).

### **Dense scrub**

The scrub is usually confined to topographically elevated areas, on the hill slopes generally surrounded by agricultural lands. These areas possess shallow and skeletal soils, at times chemically degraded, extremes of slopes, severely eroded and lands subjected to excessive aridity with scrubs dominating the landscape. It is found with varying sizes of small to large areas having a contiguous or dispersed pattern. The dense scrub is mostly identified on the hills and occupied an area of 172.66 sq. km.

### **Open scrub**

This category has a similar description as mentioned in the dense scrub excepting that they possess sparse vegetation or are devoid of scrub and have a thin soil cover. The open scrub is found in foothills surrounded by agricultural lands and accounts for 56.22 sq. km.

### **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 enables their separation with the salt-affected land. It is found along the coast and occupies an area of 33.67 sq. km (0.26%).

### **Barren Rocky/Stony waste**

The barren rock exposures are especially confined to hilly terrain with down slopes with rock outcrops, stony waste, and fragments. The area under this category is 4.82 sq. km.

## Wetlands

All submerged or water-saturated lands, natural or man-made, inland or coastal, permanent or temporary, static or dynamic which necessarily have a land-water interface, are defined as wetlands. The wetlands category is found to have 148.88 sq. km with four subcategories.

### Wetland - Inland - Natural

These are the areas that include ox-bow lakes, cut-off meanders, playas, swamps, marsh, peat bogs, etc (with vegetation). This category contributes 1.28 sq. km of the district total.

### Wetland - Inland- Manmade

Waterlogged areas (seasonal and perennial) are created due to the negative effect of human management practices and are present with vegetation. This category contributes an area of 4.31 sq, km.

### Wetland – Coastal

These include estuaries, lagoons, creek, backwater, bay tidal flat/mud flat, mangrove, salt marsh/marsh with vegetation, and other hydrophytic vegetation, and accounts for 129.20 sq. km (1.59%)

### Coastal - Saltpans

Saltpans are flat expanses of areas covered with salt usually white under the Sun. Saltpans are a 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. This category is near Machilipatnam and covers 14.09 sq. km.

## 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. These are seen clearly on the satellite image in blue to dark blue or cyan color depending on the depth of water. The waterbody category occupies an area of about 861.58 sq. km with 6.73% of the district.

## River/Stream-Perennial

Rivers/streams are the natural course of water flowing on the land surface along a definite channel/slope regularly or intermittently towards a sea in most cases or a lake or an inland basin in desert areas or a marsh or another river. These are the rivers/streams that flow continuously throughout the year as considered perennial, and spread over 343.11 sq. km.

## River/Stream-Non Perennial

The water covers the surface for less than nine months in each year considered as nonperennial. This also includes the dry part of river generally characterized by the presence of sand or exposed rocks. It is found that most of the streams are under non perennial category and contribute an area of 250.56 sq. km.

## 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 coastal plains with an area of 64.13 sq. km.

### 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, low lands, and reservoirs surrounded by hills without vegetation. This includes all reservoirs/tanks with water spread seen at least during one season in a year is considered under the permanent category. This category occupies an area of 50.42 sq. km.

### Reservoir/Tanks-Seasonal

Dry reservoirs/tanks are those, which do not have water spread throughout the year are considered seasonal. It is found that many of the tanks are under the seasonal category with an area of 152.75 sq. km.

## 2.1.Slope Map of the District

The concept of measuring slope from a topographic map is a familiar one for most professionals in the natural resources and landscape planning/management and surveying professions. A slope is a measurement of how steep the ground surface is. The steeper the ground surface the greater the slope. The slope is measured by calculating the tangent of the surface. The tangent is calculated by dividing the vertical change in elevation by the horizontal distance. The slope is normally expressed in planning as a percent slope which is the tangent (slope) multiplied by 100. Percent Slope = Height / Base \* 100

Reliable estimation of the stability of slopes and foundations is very demanding because it is important for terrain analysis to understand the natural process in the disciplines of topography, geology, soils, hydro-geology, infrastructure planning, and hazard management both at surface and subsurface. Because of this, the slope will play an important role while doing decentralized planning at a grassroots level. Traditionally contours information from 1:50,000 or 1:25,000 topographic maps is used for preparation of slope by manual procedures based on contour value difference for unit horizontal distance. With the emergence of remote sensing and GIS systems and the availability of topographic data in DEM or TIN formats, slope maps can be generated using image processing and GIS methods. Representation of slope in percentage is the understandable rationale for resource mapping and planning. Slope information is one of the GIS layers that play an important role in natural resources and the district planning process. It is proposed to generate the necessary slope layer from the available digital topographic data such as Carto DEM and open-source Digital Elevation Model data (NRSC, 2009). The slope level map of East Godavari with color categories is given in Figure 9.

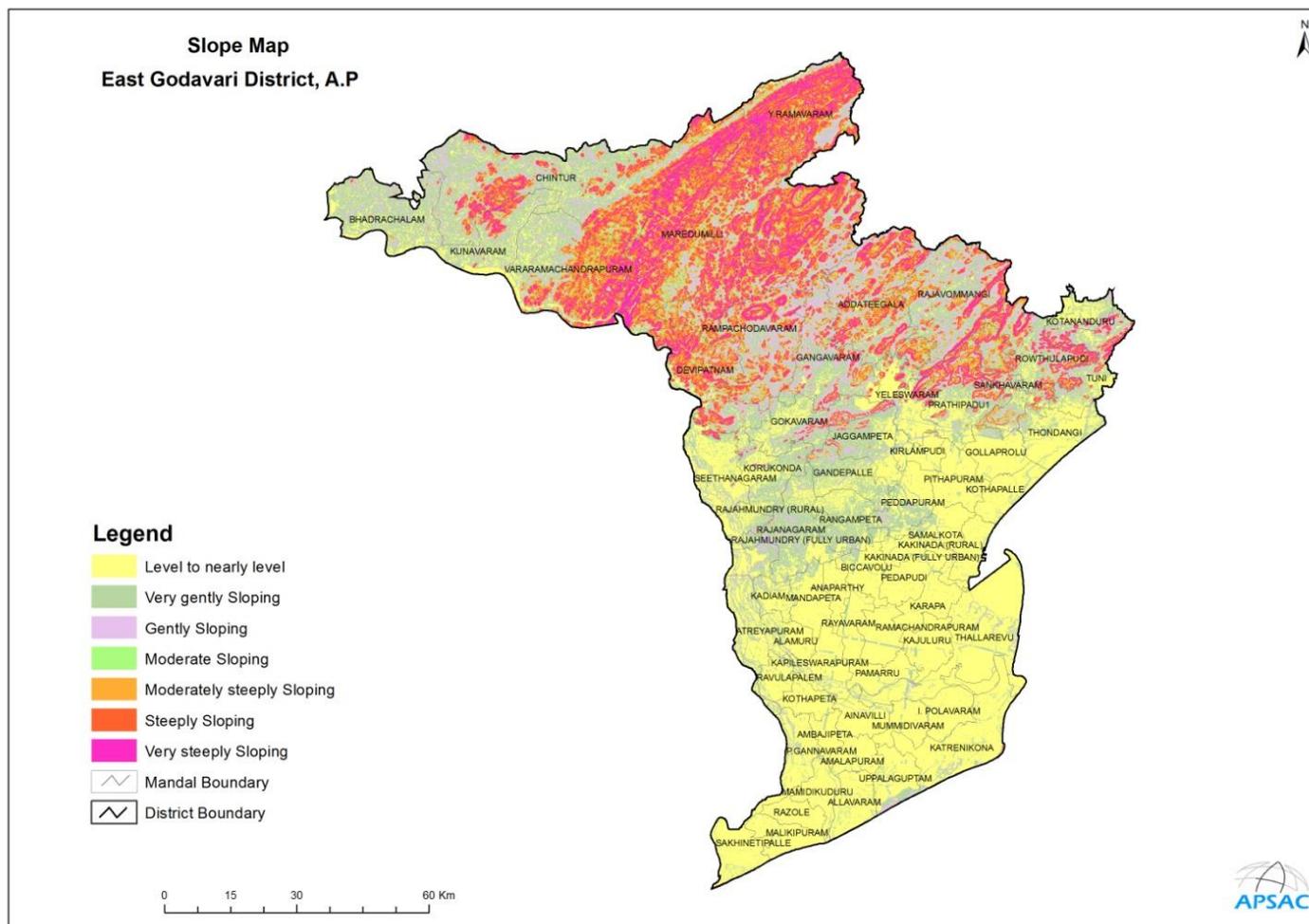


Fig. 9 General Slope of East Godavari District, Andhra Pradesh

Slope data generated from DEM using GIS techniques produces triangular nature slope polygon. To generate a meaningful slope layer it is suggested to aggregate slope polygons by using manual procedures. However, the slope generated from GIS analysis can be used directly for any decision-making planning purpose. The accuracy of the slope is dependent on the accuracy of the DEM used for slope generation. The DEM should be bare earth and should not have spikes or dips which are common in automatic DEM generation. Therefore, to use Carto DEM, conversion to bare earth DEM has to be carried out before slope layer generation.

## 2.2. Forest Cover Distribution

The term forest is used to refer to land with a tree canopy cover of more than 10 percent and 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 cover in the district based on the interpretation of IRS- R2 LISS III data (2015-16) is 5022.94 sq. km which is 39.23% of the Total Geographical Area (TGA) of the district. As per the land use manual (NRSC 2016), the forests of the district can be classified as 8 forest classes and class-wise areas are presented in Table-5. The spatial distribution of forest cover in the district is shown in Figure-10.

Table-5 Forest Cover Distribution of East Godavari District

S. No	Forest Category	Area in sq. km.	Percentage (%) TGA
1	Evergreen / Semi Evergreen-Dense/Open	97.04	0.76

2	Deciduous (Dry/Moist/Thorn)-Dense	2707.61	21.15
3	Deciduous (Dry/Moist/Thorn)-Open	645.47	5.04
4	Forest Plantation	92.97	0.73
5	Scrub Forest	87.03	0.68
6	Swamp Forest (Mangrove)-Dense	163.79	1.28
7	Swamp Forest (Mangrove)-Open	39.99	0.31
8	Tree Clad Area-Dense	700.93	5.47
9	Tree Clad Area-Open	449.56	3.51
10	Grass and Grazing land-Tropical/Desertic	38.55	0.30
	<b>Total Forest</b>	<b>5022.94</b>	<b>39.23</b>

Data source: APSAC, Vijayawada

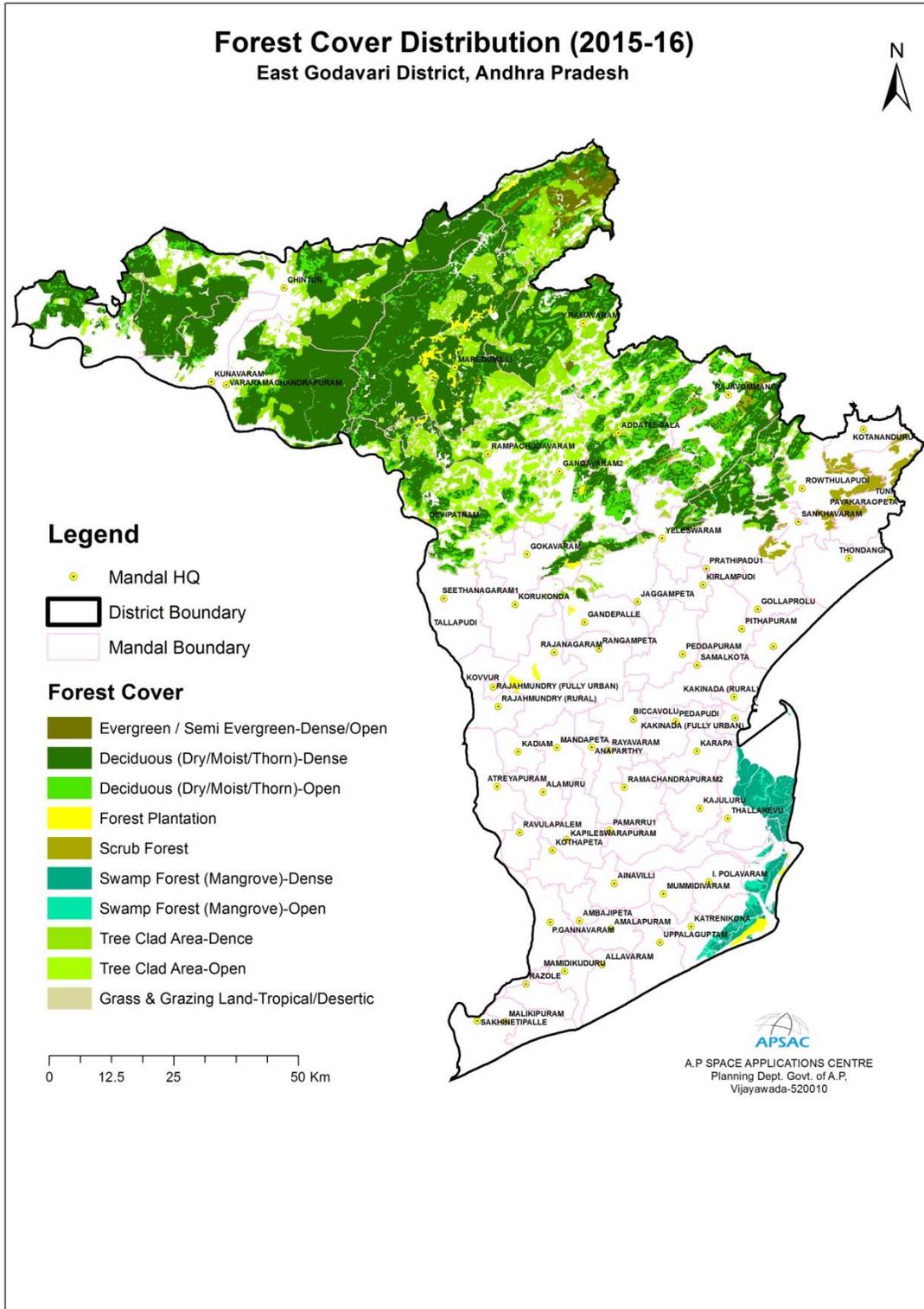


Fig. 10 Forest covers map of East Godavari District during 2015-16

### 3. Agricultural Resources in East Godavari District

Remote sensing technology has been successfully used by APSAC during the last two decades in the areas of agriculture both in spatial and temporal domains under various projects. APSAC carried out season forecasting of acreage for major crops i.e. Kharif rice, Rabi rice, cotton, and groundnut, etc., at state/ district level for the last two decades, in Andhra Pradesh to enable the administrators and planners to take strategic decisions on import-export policy matters and trade negotiations. Rice and Cotton is the most dominant crop in Andhra Pradesh in both Kharif seasons. In this connection, Department of Agriculture and Directorate of Economics and Statistics are generating data on conventional methods for estimation of crop area and production. In this regard, satellite remote sensing plays a pivotal role with limited field visits for timely estimation and monitoring the crops.

#### 3.1.Crop Acreage Estimation

The major crops cultivated in the East Godavari district are paddy, coconut, and pulses. In addition to Kharif rice and Rabi Rice are estimated using optical remote sensing and microwave data in East Godavari District.

#### 3.2.Kharif Rice Acreage Estimation

Andhra Pradesh Space Applications Centre (APSAC) has carried out Kharif rice crop acreage estimation over East Godavari district using Microwave Remote Sensing (Sentinel-1A) data under FASAL project. Sentinel-1A Synthetic Aperture Radar (SAR) VV polarization data (Spatial Resolution 20m) is used for the analysis (fig.11). The rice acreage using sentinel-1 microwave remote sensing data for East Godavari district is 5,24,486 acres.

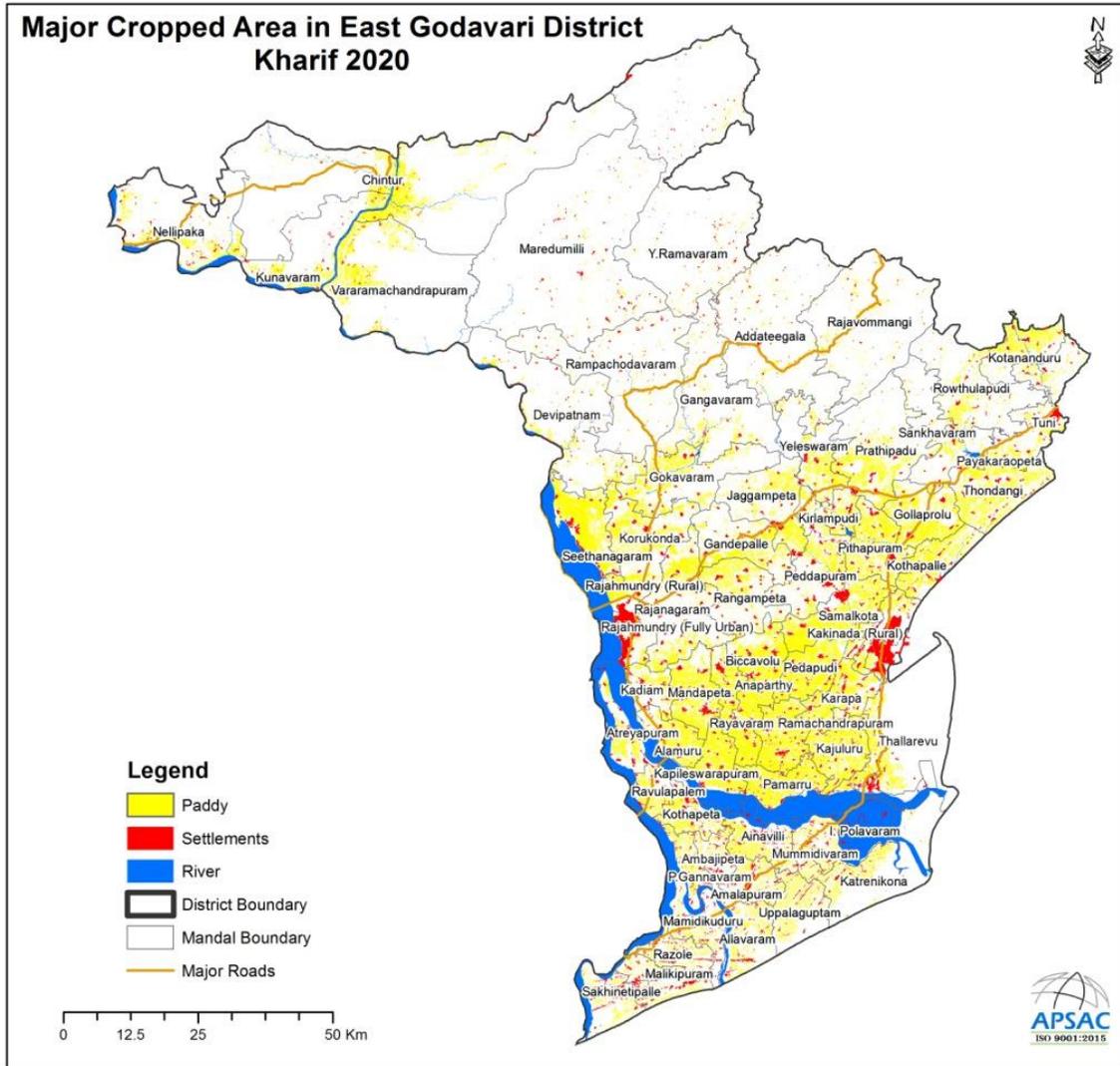


Fig.11. Distribution of Rice crop in East Godavari District- Kharif 2020

### 3.3.Rabi Rice Acreage Estimation

Andhra Pradesh Space Applications Centre (APSAC) has carried out Rabi rice crop acreage estimation over East Godavari district using AWiFS sensor (56m) and Sentinel-2 (10m) data under FASAL project (fig.12). The estimated Rabi rice acreage is 4, 37, 586 acres.

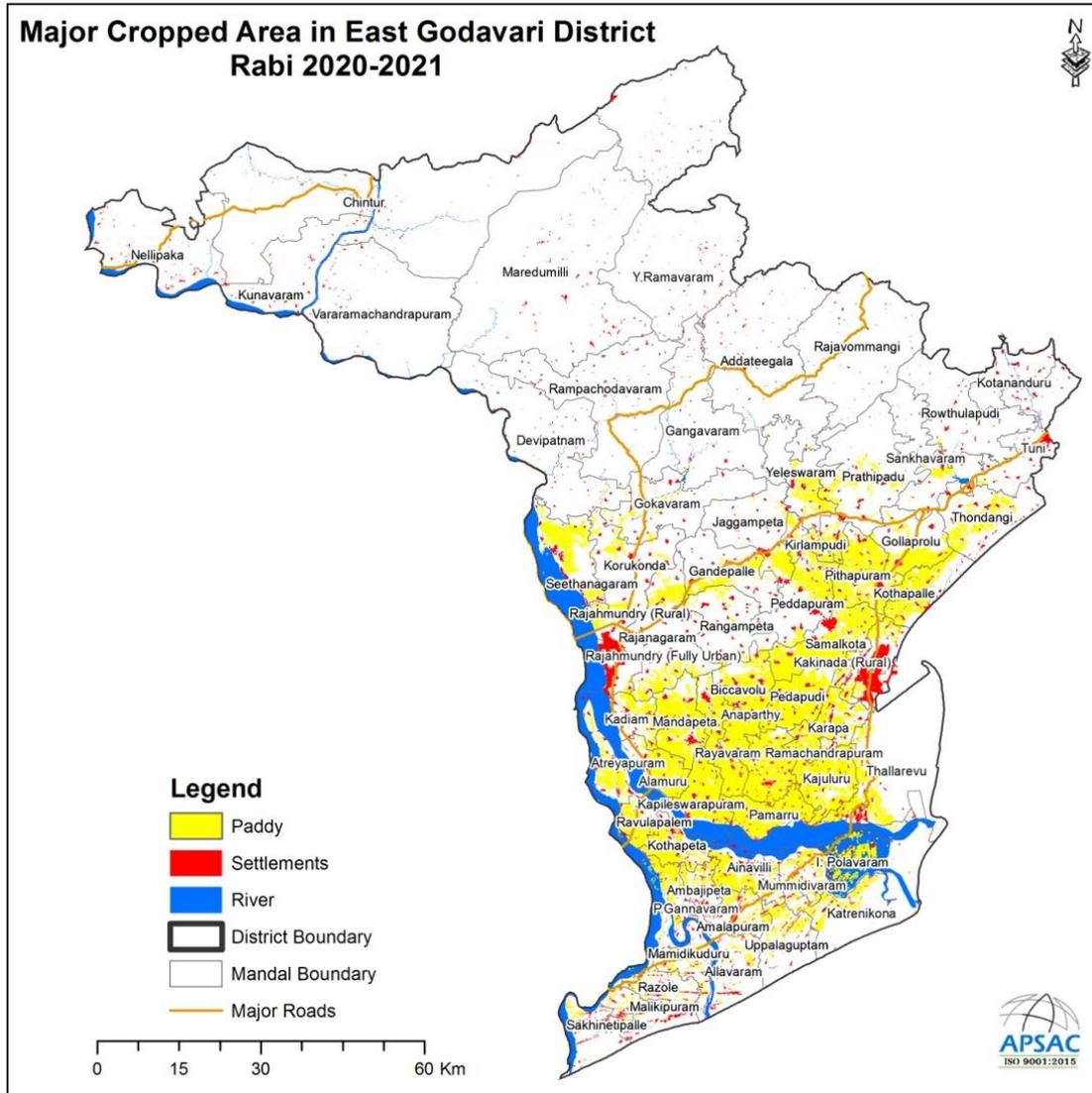


Fig.12. Distribution of Rabi rice crop in East Godavari District, 2020-21

### 3.4. Soil Resources of East Godavari district

The main soils in the district are alluvial (clay loamy) red soils, sandy loams, and sandy clay. There are mostly alluvial soils in Godavari delta area and sandy clay soils at tail end portions of Godavari. There are red loamy soils in uplands and agency areas of the district. As per the soil irrigation potential, 20.5 percent area has moderate soil limitations for sustained use under irrigation; whereas 30.2 percent of lands have moderate to severe soil limitations. As per the Land Irrigability Class, 37.4 percent of lands have moderate to severe limitations for sustained use under irrigation followed by 18.0 percent of lands with few limitations. The soils of most of the district are mostly under Inceptisols order followed by Entisols, Alfisols, and Vertisols. The area under very deep soils is 77.5 percent followed by moderately deep soils covering 8.1 percent and deep soils with 2.6 percent area coverage. (Source: Report SRM-19, Soil and Land Use Survey of India). The Soil resource map is shown in figure 1.

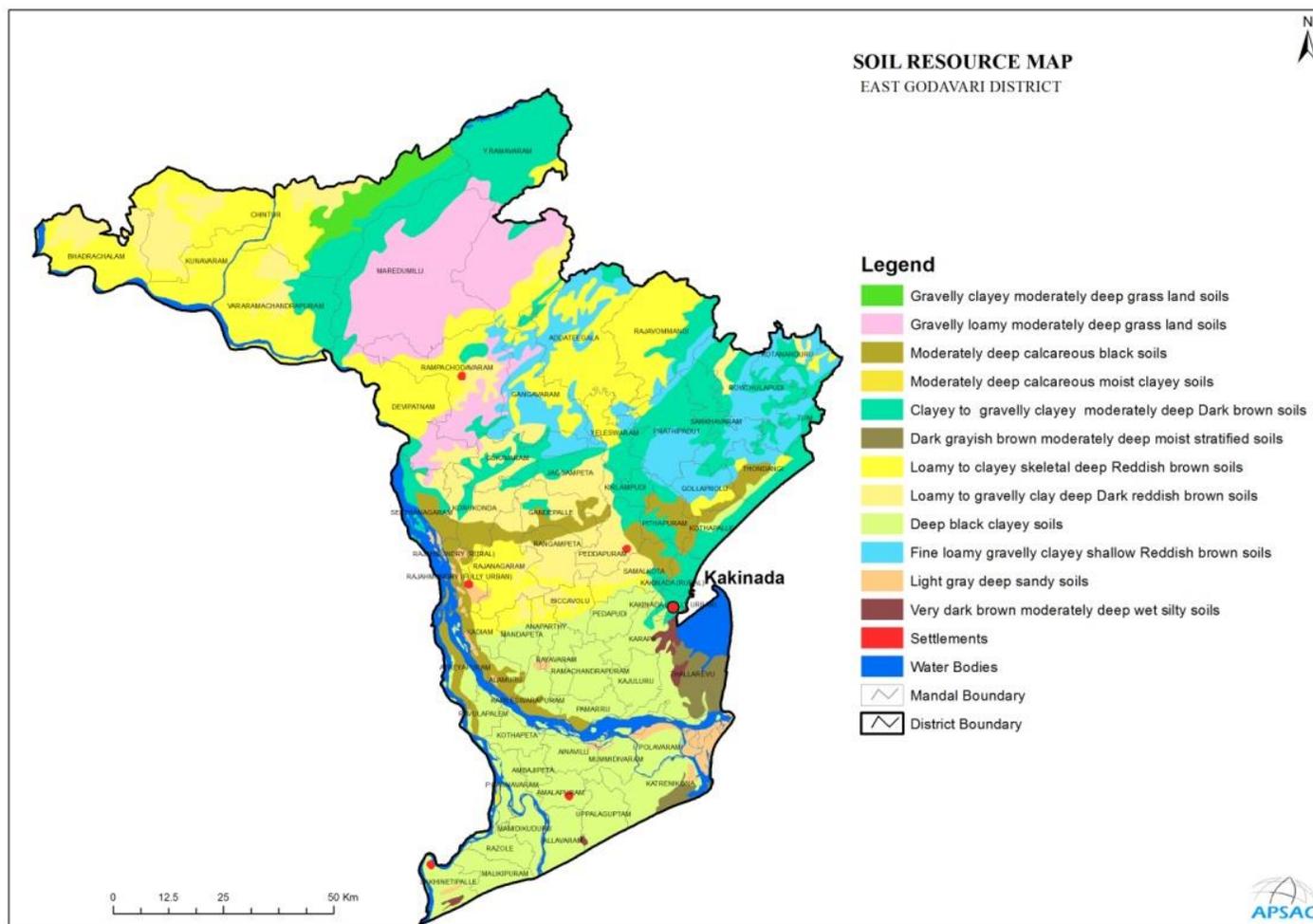


Fig. 3: Soil Resource map of East Godavari district

## 4. Coastal and Aquaculture Scenario of East Godavari District

### 4.1. Shoreline Change Status of East Godavari District

The district of East Godavari, which is located in the Eastern Ghats, is a part of the old Godavari district. The district is also called Konaseema, because it is the cradle of coconut plantation in Andhra Pradesh. Two main branches of the Godavari pass through the district to join the Bay of Bengal. The head quarter of the district is Kakinada. The East Godavari district lies on the North East coast of Andhra Pradesh. It is bounded by the Visakhapatnam district and the state of Orissa in the north; in the east and south by the Bay of Bengal; and Khammam and West Godavari districts in the west. The shoreline change estimation was carried out for entire East Godavari coast which is about 200.35 km in length. In this study, shorelines were extracted from satellite images for 1989, 1999, 2005, 2010, and 2012 by visual interpretation. Shoreline changes are presented with an emphasis on shoreline erosion because it is an important natural coastal risk along coastal wetlands. Table: 6 the analysis discovered that about 43.97% of the coastlines were under accretion, whereas remaining 40.39% region was experiencing varying erosion and 15.64% of the coast has stable form. While near Southside of Kakinada port and north portion of Vasishta river area has a high accretion, the North side of Kakinada port area has more erosion areas. (fig.14)

Table: 6 Shoreline Characteristics and statics for East Godavari Coast

Classification of Coast	Extent (km)	Percentage of Coast (%)	Cumulative (%)
High Erosion	36.45	18.19	
Medium Erosion	20.94	10.45	
Low Erosion	23.54	11.75	* 40.39

High Accretion	61.14	30.52	
Medium Accretion	17.53	8.75	
Low Accretion	9.42	4.70	\$ 43.97
Stable Coast	31.33	15.64	15.64
Number of port/Harbour	1		
Length of Breakwater ‘ / Groyne /Seawall	4.11		
Length of coastline Including River Mouth and Ports	200.35		

Source: APSAC, Vijayawada

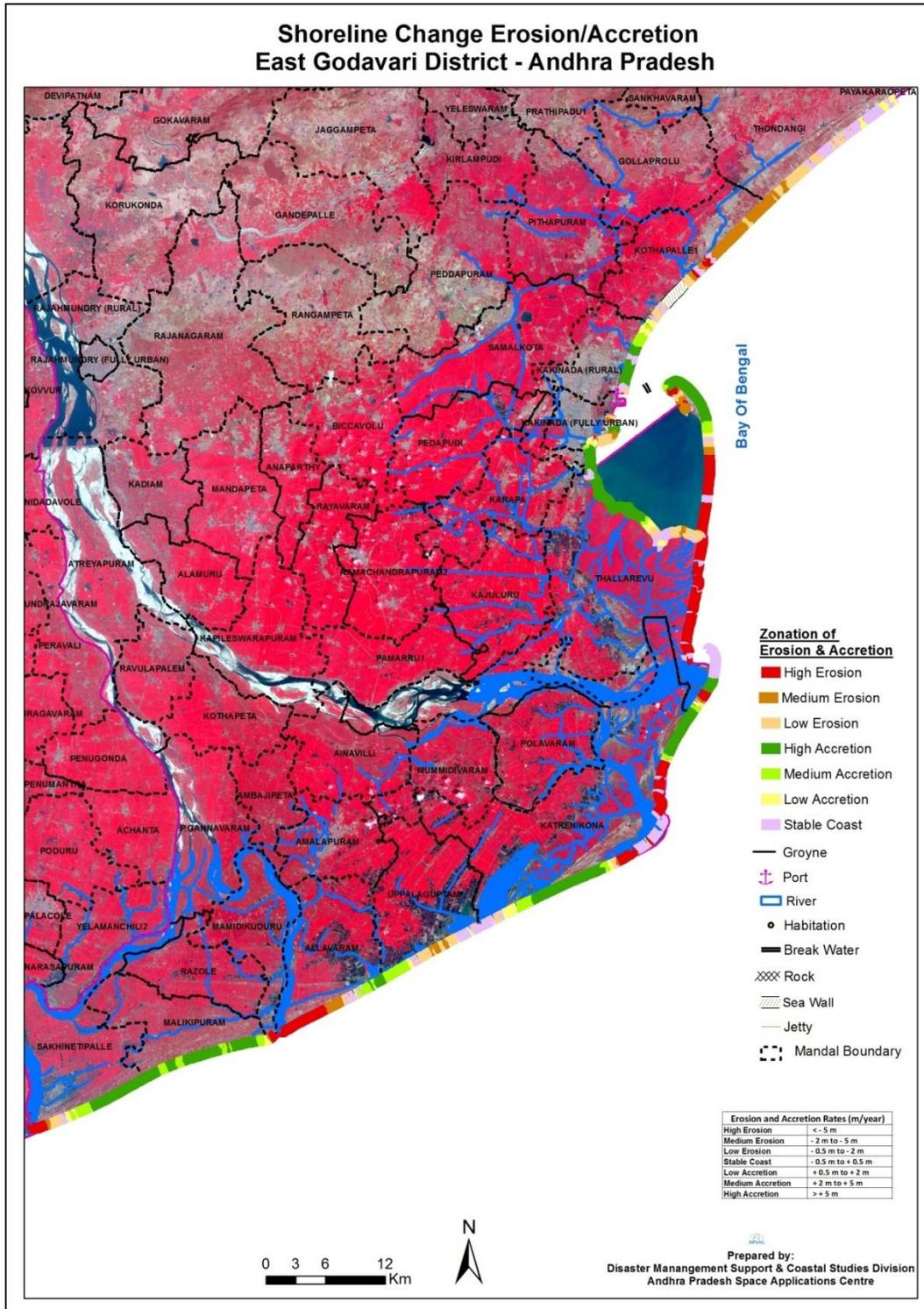


Fig. 11 Status of shoreline change in East Godavari district

## 4.2. Aquaculture in East Godavari District

Nine percent of aqua area of Andhra Pradesh has been distributed in East Godavari district along Vasishta Godavari, Vainateyam Godavari, Gautami Godavari, Gaderu River, Bandaru Kaluva, Kunavaram Drain, Nimmakayala Kottapalli Channel, Vasalatippa Drain, Lower Kausika Drain, Samantakurru Channel, Gundipudi Channel, Adivipalem Branch Channel, Gudimula Channel and other small rivers, streams, drains and Canals. In East Godavari, 15,533 ha Aquaculture, 7763 ha Abandoned/dry/Potential, 27 ha Saltpans, and 23,324 ha total aqua area are distributed (Table: 7). In East Godavari district, the highest aquaculture area is distributed in Uppalaguptam Mandal i.e. 2,629 ha aquaculture, 964 ha Abandoned/dry/Potential and total 3,593 ha area is distributed and least is in Ambajipeta Mandal 2 ha, Samalkota 5 ha, Rayavaram 6 ha aquaculture and Abandoned/dry/Potential area has been distributed. (Fig.15)

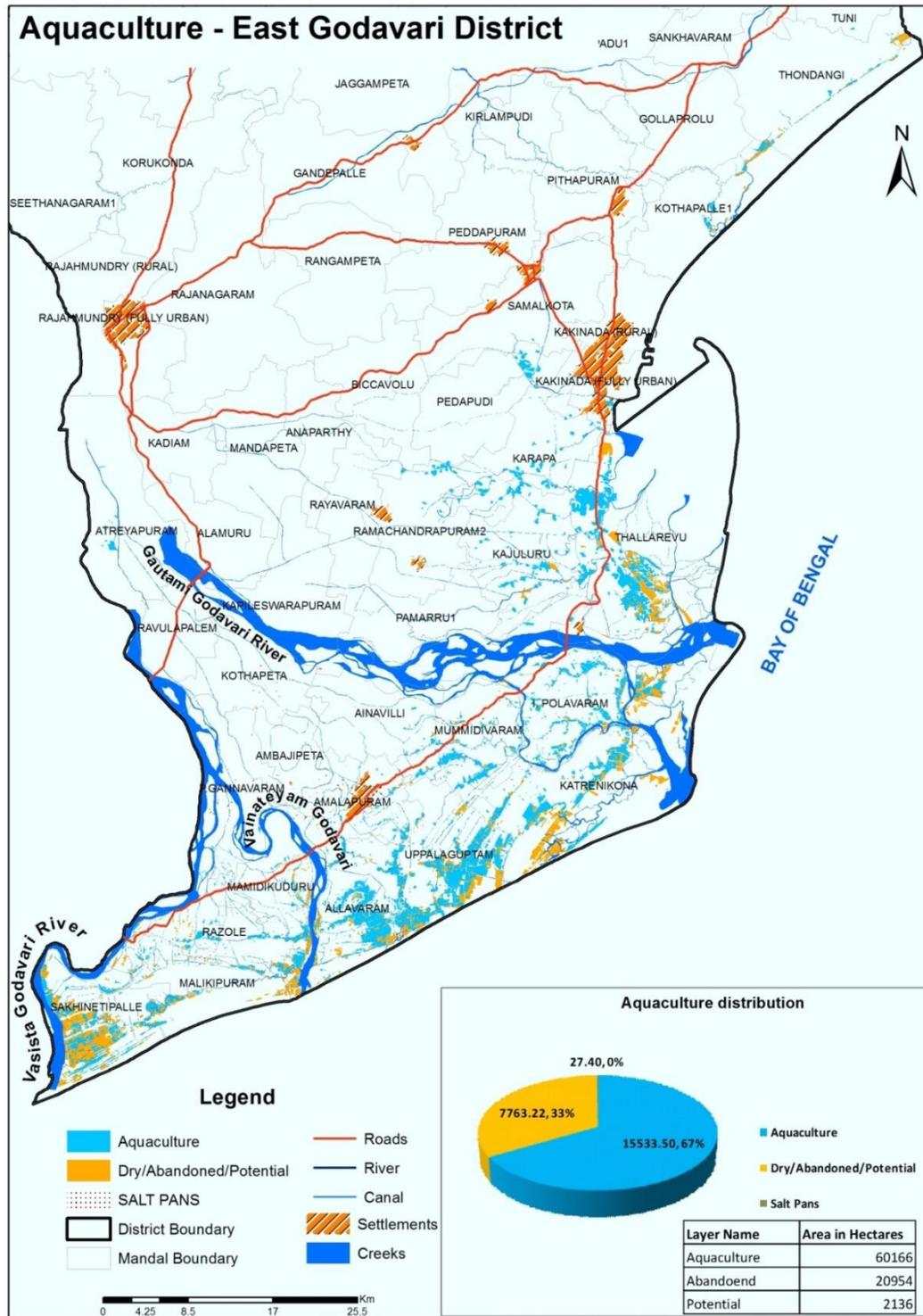


Fig. 15 Aquaculture distributions in East Godavari district

Table.7 Mandal - wise Aquaculture distribution in East Godavari district

Mandal - wise Aquaculture in East Godavari (Area in ha)					
Sl.N	Mandal Name	Aquaculture	Dry/Abandoned /Potential	Salt pans	Total
1	Ainavilli	69	11		79
2	Allavaram	2122	531		2653
3	Amalapuram	191	32		223
4	Ambajipeta	2	0		2
5	Atreyapuram	72	0		72
6	I. Polavaram	1114	146		1260
7	Kajuluru	567	95		662
8	Kakinada (Fully Urban) (M)	39	5		44
9	Kakinada (Rural)	19	0		19
10	Karapa	416	0		416
11	Katrenikona	2124	1792	27	3944
12	Kothapalle	153	125		278
13	Malikipuram	361	324		685
14	Mamidikuduru	409	412		821
15	Mummidivaram	379	89		467
16	P.Gannavaram	51	0		51
17	Pedapudi	235	0		235
18	Ramachandrapuram	134	0		134
19	Rayavaram	6	0		6
20	Razole	414	109		523
21	Sakhinetipalle	1456	1960		3416
22	Samalkota	5	0		5
23	Thallarevu	2443	1001		3444
24	Thondangi	114	169		284
25	Tuni	7	0		7
26	Uppalaguptam	2629	967		3596
	<b>Total (ha)</b>	<b>15,534</b>	<b>7,764</b>	<b>28</b>	<b>23,325</b>

Data source: APSAC, Vijayawada

## 5. Water Resources in East Godavari District

### 5.1. Surface Water Resources of East Godavari district

Andhra Pradesh state is rich in water resources. River Godavari is the largest and broadest river in southern India, which originates at Triambakeshwar near Nasik in Maharashtra. The Delta coastal line in the district is around 150 Kms in the Eastern sea board of India with minor ports at Kakinada and Odalarevu. The details of major and medium projects of East Godavari district are given below:

#### 5.1.1. Major and Medium Irrigation Projects in East Godavari 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 projects.

#### 5.1.2. Major Irrigation Project

The major irrigation projects covering East Godavari district are Godavari Eastern Delta. The district is enriched by huge water resources of River Godavari and major streams like Yeleru, Suddagedda, Pampa, and Thandava. The Delta coastal line is around 150 Km in the Eastern

Seaboard of India with minor ports at Kakinada and Odalarevu. Sir Arthur Cotton Barrage an extent of 483199 acres, Yeluru reservoir project an extent of 53017 acres, Thandava reservoir project an extent of 16947 acres, and Chagalnadu Lift Irrigation Scheme an extent of 22846 acres are the major projects of East Godavari districts (Fig.16). The overall coverage under a major irrigation project is 576009 acres. The major ongoing irrigation project is Indra Sagar (Polavaram) project, under this ongoing project about 71000 acres and second major ongoing project is Venkatnagaram Lift Irrigation project and the area about 24,000 acres covered under this project.

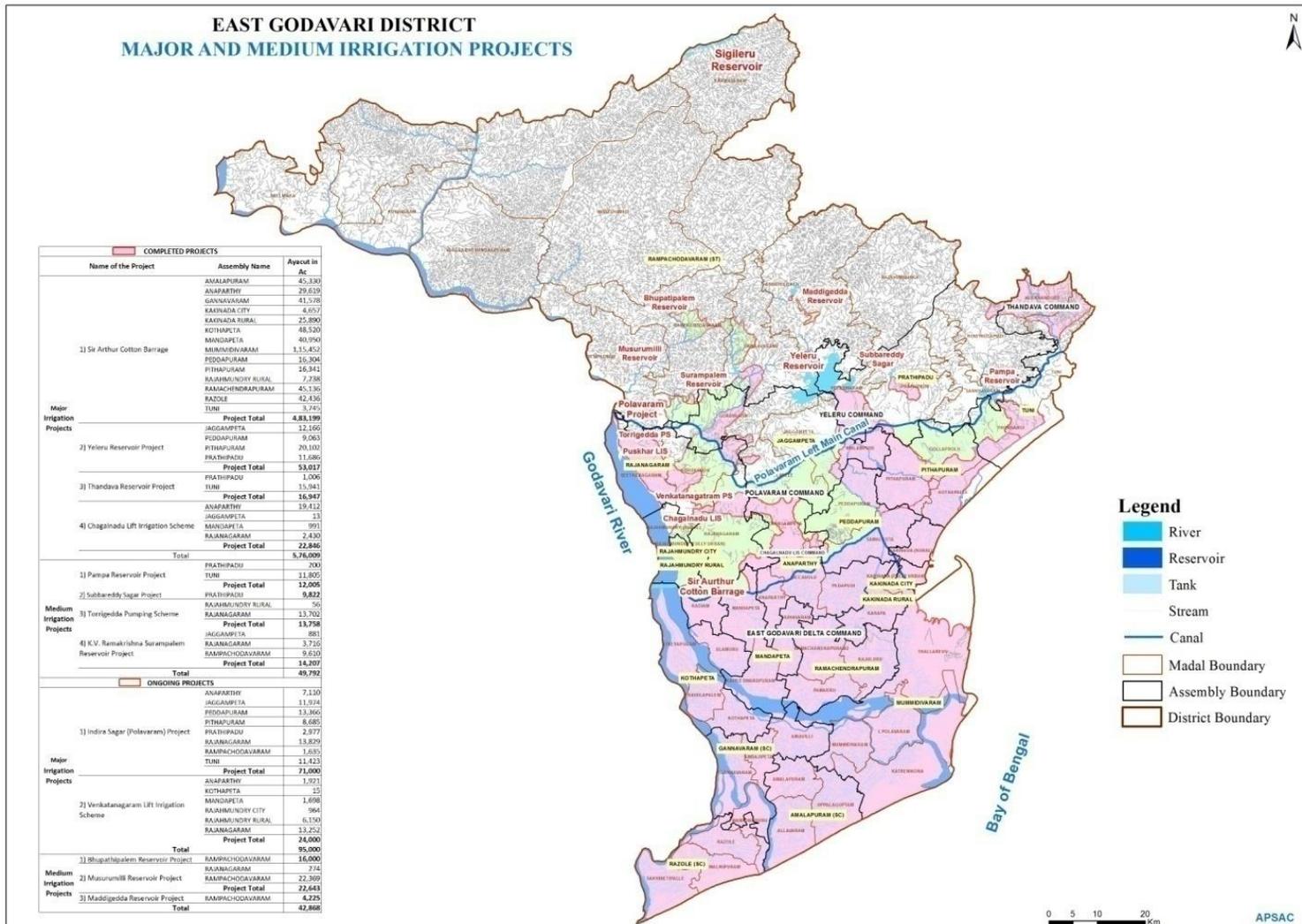


Fig. 12 Major and Medium Irrigation Projects of East Godavari District

### 5.1.3. Medium Irrigation Project

The Medium Irrigation projects are Pampa reservoir Project, Subbareddy Sagar project, Torrigedda pumping scheme, and K.V. Ramakrishna Surampalem reservoir Project. These medium irrigation projects are falling under eight assemblies with an ayacut of 49,792 acres. The medium ongoing projects are Bhupathipalem reservoir project, Musurumilli reservoir project, and Maddigedda reservoir project. These medium irrigation projects are falling under four assemblies with an ayacut of 42,868 acres.

### 5.1.4. Tank Information System

Andhra Pradesh Space Application centre was developed Web Portal GIS for Tank Information System (TIS) in Andhra Pradesh. In web portal minor irrigation tanks are classified as more than 40 ha, 10 to 40 ha, and less than 10 ha command. In Andhra Pradesh nearly 15,000 tanks information has been published on APSAC website. For East Godavari district so far 454 tanks information has been published on the website, pertaining to the 10 to 40 ha categories. Etank wise information are lthe location details, hydrological details, and other standard information related to the tank shown on website. (<https://apsac.ap.gov.in/dashboard-staging/ap-water-resources/>).

## 5.2. Ground Water Scenario and Quality of the District

### 5.2.1. Geomorphology of the District

Geomorphologically, the district is divisible into (1) a low lying deltaic and coastal plain, having a gentle easterly slope in the south, (2) a sediplain region with mesas, structural hills, pediment, and piedmont complex, comprising valleyfins, taluscones, and fans in the middle and pediment / pediplain complex, with structural and denudational hills in the north.

The deltaic plain shows a relief between 15m, at its apex to 2m, near the coast. The upland plain (plateau) of Rajahmundry Formation rises to a height of 45m to 70m, near Rajahmundry. The deltaic and coastal plains are characterised by landforms of both fluvial and marine regimes. Amongst the fluvial landforms, active channels (Gautami Godavari and Vasistha Godavari) with associated braided/ channel bars and levees form a part of the sub aerial top-set beds of the delta. Of all the levees, the one developed near Dowleswaram, 500m wide, and 2m high over the ambient flood plain is worth noting. Using IRS satellite data and GIS detailed geomorphological and structural map of Krishna District was generated as per Rajiv Gandhi National Drinking Water Mission (RGNDWM) guidelines on a 1:50,000 scale. The objective of this mapping is to map lithology, geomorphology, and structural characteristics of an area on a 1:50,000 scale and to integrate the same to locate potential ground water prospect zones and to recommend suitable structures for groundwater 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 (Fig.17) mapped in East Godavari District are described as follows.

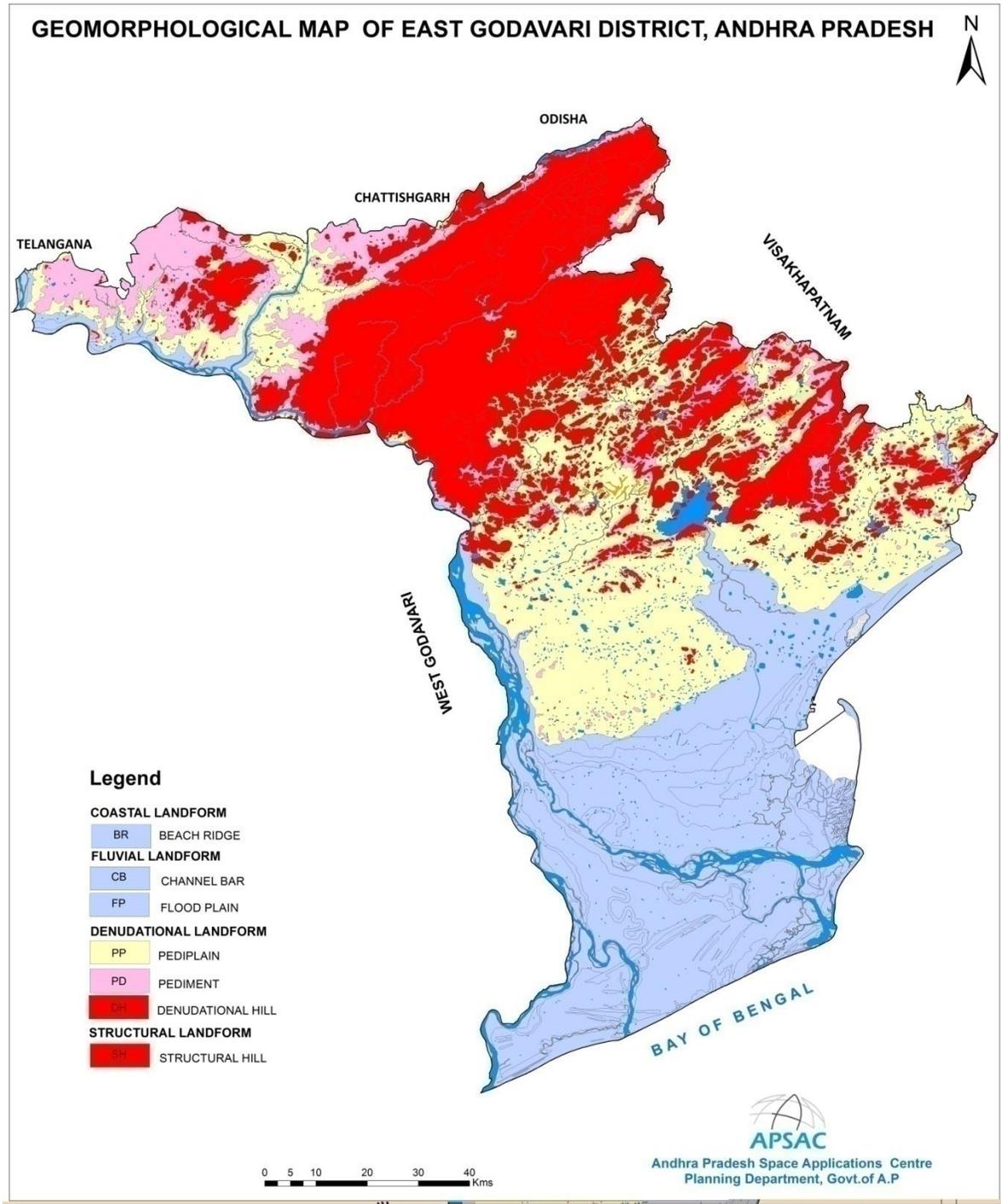


Fig. 1713 Geomorphology of East Godavari District, Andhra Pradesh

### 5.2.3 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).

**Alluvial plain:** A level or gently sloping tract or a slightly undulating land surface produced by extensive deposition of alluvium, usually adjacent to a river that periodically overflows its banks; it may be situated on a flood plain, a delta, or alluvial fan. This landform is predominantly seen in the southern part of the District.

**Palaeochannel:** Deep valleys cut in the bedrock terrain and today filled largely with alluvium, glacial outwash gravels, and sands or with tills. These are good sources of underground water.

**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.

**Delta:** The low, nearly flat, and alluvial tract of land deposited at or near the mouth of a river, commonly forming a triangular or fan shaped plain of the 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.

**Valley fills:** The unconsolidated sediment deposited by any agent to fill or partly fill a valley.

#### 5.2.4 Landforms of coastal origin

Coasts are also the loci of a unique assemblage of erosional and depositional processes. The 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. The higher the wind speed and the longer the fetch or distance of open water across which the wind blows and waves travel, the larger the waves and the more energy they 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 traveled hundreds of kilometers, may have wave periods of up to 20 seconds. Smaller sea waves have wave periods of 5 to 8 seconds. Where ocean depths are greater

than the length of the waves, the wave motion does not extend to the ocean floor and 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 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). **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).

**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.

**Coastal plain:** A low, generally broad but sometimes narrow plain that has its margin on the shore of a large body of water (esp. the ocean) and its strata either horizontal or very gently sloping toward the water, and that generally represents a strip of recently emerged sea floor or continental shelf.

**Dune and Swale Complex:** It is a large complex of parallel wetland swales and upland beach ridges (dunes) found in a coastal embayment and on large sand spits along the shorelines of the Great Lakes. The upland dune ridges are typically forested, while the low swales support a variety of herbaceous or forested wetland types, with open wetlands more common near the shoreline and forested wetlands more prevalent further from the lake.

**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.

### 5.2.5 Landforms of Structural Origin

Landform of structural origin is related to structural aspect of the area. Most of the landforms under this class had a genesis related to 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 type plays an important role in 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).

**Dome:** A general term for any dome-shaped landform or rock mass, such as a smoothly rounded rock-capped mountain summit, roughly resembling the dome of a building.

**Structural Hills:** Hills and valleys, which are originated due to 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.

**Dyke Ridge:** Intrusive features that are emplaced within the pre-existing fractures or where the fluid pressure is great enough for them to form their fracture during emplacements. They are discordant bodies.

**Cuesta:** A hill or ridge with a gentle slope on one side and a steep slope on the other; specifically an asymmetric ridge with one face (dip slope) long and gentle and conforming with the dip of the resistant bed or beds that form it, and the opposite face (scarp slope) steep or even cliff-like and formed by the out crop of the resistant rocks, the formation of the ridge being controlled by the differential erosion of the gently inclined strata.

### 5.2.6 Landforms of denudational origin

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 a 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 the physical and chemical processes. 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 raw material for the sedimentary rock and soil (NRSA, 2007).

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

**Inselberg:** A prominent, isolated, steep-sided, usually smoothed and rounded, residual knob, hill, or small mountain of circumdenudation rising abruptly from 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.

**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 a and discontinuous veneer of alluvium derived from the upland masses and in transit across the surface.

**Pediment-Inselberg Complex:** The pediments are dotted by numerous inselberg of small sizes, which makes it difficult to distinguish from the pediments. Hence it is called a complex of pediment and inselberg.

**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.

**Residual Hill:** A small remnant hill, which has witnessed all forms of denudation.

### 5.3 Structural Features of East Godavari District

East Godavari 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 are Khondalite, Charnockite groups and the layered complex shows foliation trending dominantly N-S with local swerves to NE-SW and NW-SE (GSI, 2000). The semi consolidated formations are represented by Tertiary formations (Rajahmundry and Gollapalli sandstones) and unconsolidated formations comprise deltaic alluvial deposits of Quaternary period (CGWB, 2013). The structural map (Fig.18) of East Godavari District is given below:

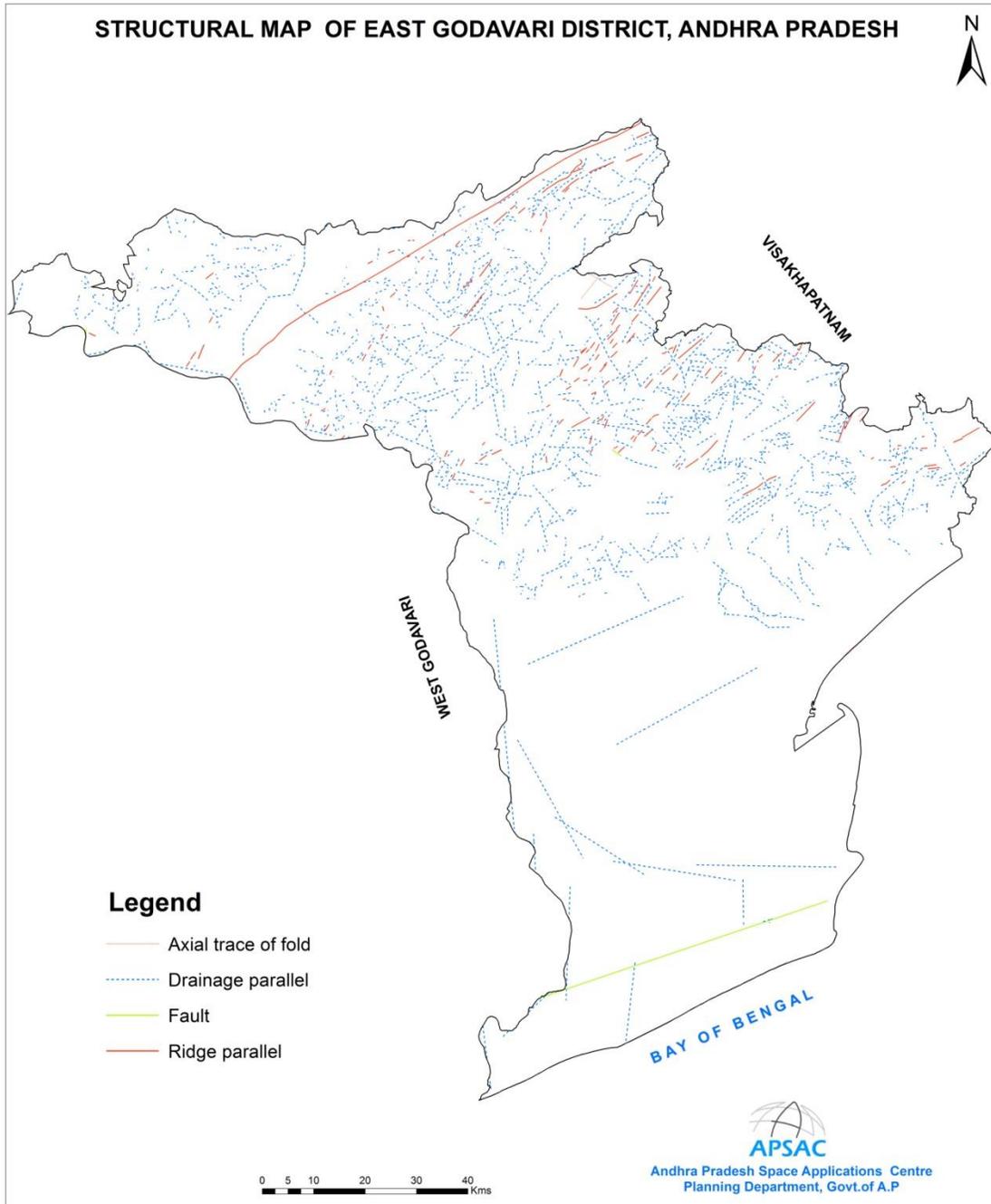


Fig. 18 Structural Map of East Godavari District, Andhra Pradesh

## 5.4 Ground Water Prospects in the District

Ground water occurs in all most 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 yields are in the range from 20 to 70m<sup>3</sup>/ day. The occurrence of fractures in the crystalline formations is limited down to 30 to 40m bgl and occasionally extends down to 70 - 100m bgl. The bore wells constructed in the crystalline formations generally tap the weathered and fractured zones. The yields of the bore wells generally range between 80 to 400 m<sup>3</sup>/ day. The higher yields are limited to the available thickness of fractured and jointed zones. In the Meta sediments, the yields are very limited and are in the range from 10 to 80 m<sup>3</sup>/ day. Higher yields occur in limestone formations. Ground water in semi-consolidated formations occurs under unconfined to confined conditions. Ground water is developed in these formations by dug -cum tube wells and tube wells. These formations are potential aquifers. The yields of the dug- cum tube wells are in the range from 30 to 45 m<sup>3</sup>/ day. The granularity of the sandstone bed is the deciding factor of the yield potential as the higher yields are recorded in the Rajahmundry sandstones tapping coarse sandstone beds. The yields of the tube wells in Gollapalli sandstones and Rajahmundry sandstones are in the range from 60 to 200 m<sup>3</sup>/ day and 600 to 1500 m<sup>3</sup>/ day respectively. The deltaic area is underlain by alluvium of recent age consisting of varying proportions of clay, silt, sand, and gravel. The thickness of alluvium ranges from few meters to about 600 m followed by tertiary formations. In deltaic areas ground water, an occurrence is controlled by landforms. In deltaic

area also a lot of heterogeneity in hydrogeological conditions exist both spatially and vertically. Fresh water is generally limited to shallow to moderate depths only, whereas in the southern part of the delta it occurs as pockets and lenses. The deep aquifers are generally saline. Palaeo-channels are favourable locations for fresh water aquifers. Ground water occurs under phreatic to confined conditions and is developed through shallow dug wells, filter point wells, and shallow tube wells. The depth of dug wells ranges from about 2 to 7 m, while the depth of filter point wells varies from 5 to 13 m, and the depth of tube wells varies from 40 to 80 m. The yields generally range in this aquifer between 250 to 400 m<sup>3</sup>/ day. Occasionally high yields of up to 15 lps exist in the palaeo-channels. The transmissivity value of the aquifer in the semi and unconsolidated formations varies from 2.5 to 5560 m<sup>2</sup>/day.

**Water Level Scenario** The depth to water levels during pre-monsoon season (May 2012) in the district ranges between 2 and 10 m bgl. The Ground water department established an extensive network of piezometer observation wells throughout Andhra Pradesh for monitoring the ground water levels (Fig.20).

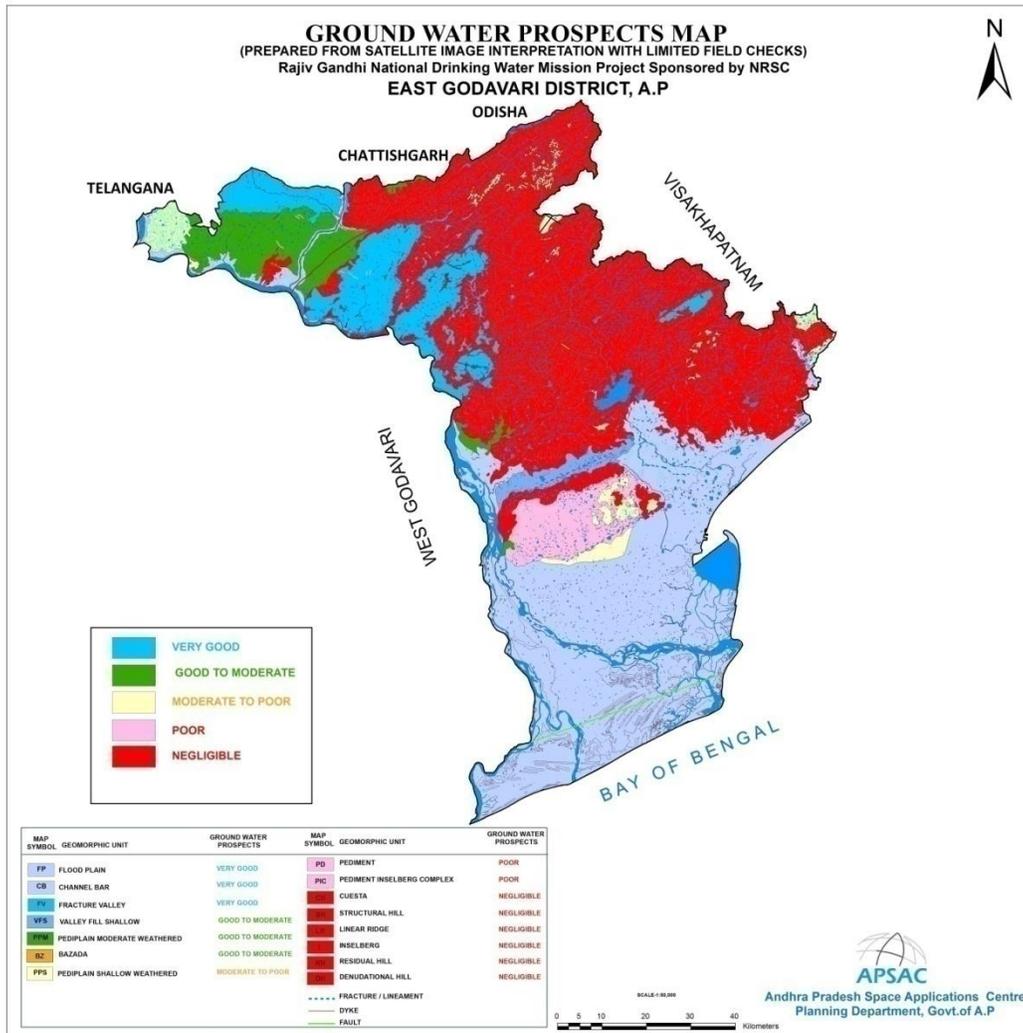


Fig. 19 Ground Water Scenarios in East Godavari District, Andhra Pradesh

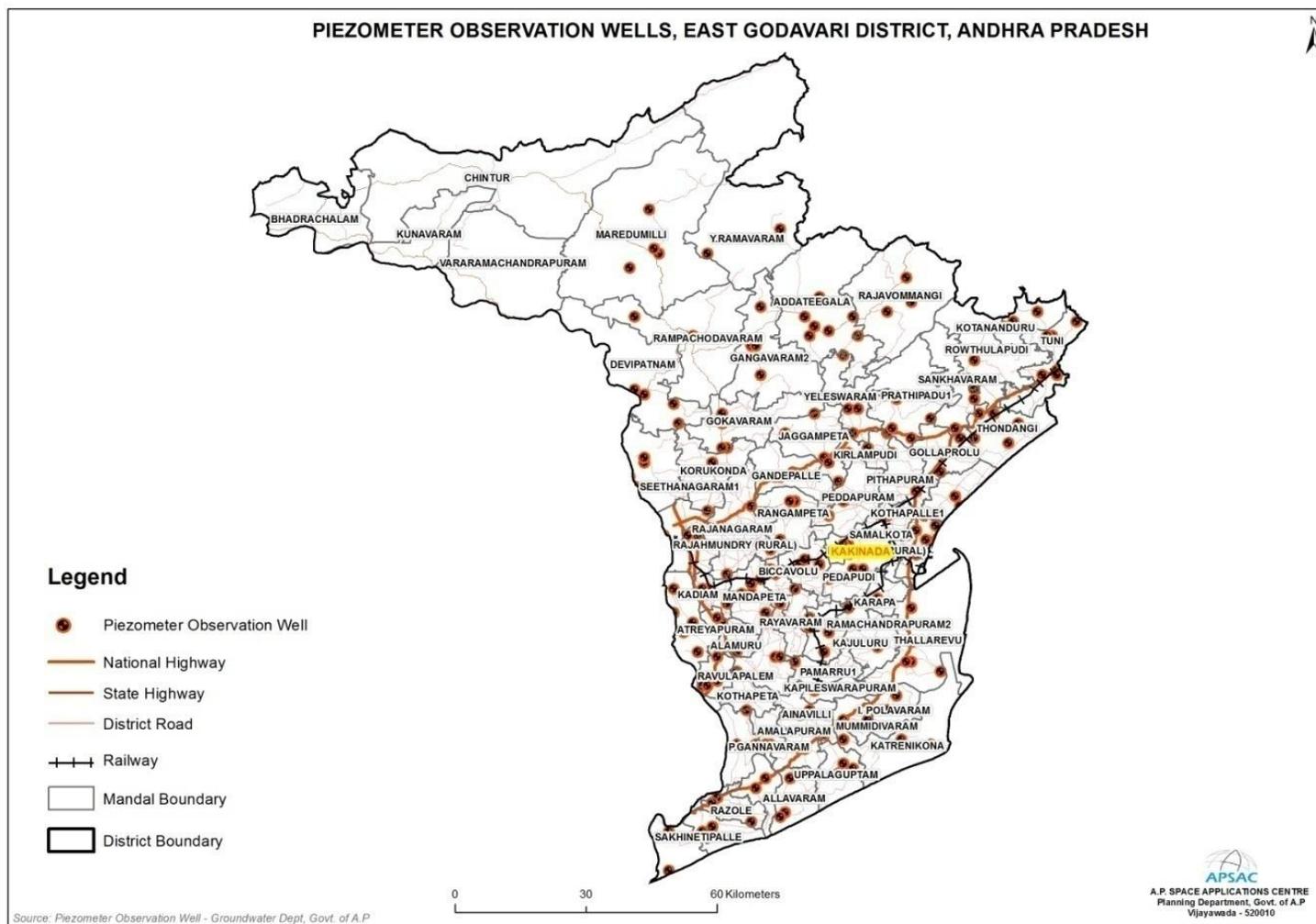


Fig. 20 Distribution of Piezometer Observation wells in East Godavari

## 5.5 Ground Water Quality of the District

The District has been divided into five Revenue Divisions viz., Kakinada, Peddapuram, Rajahmundry, Amalapuram, and Rampachodavaram. There are 1,404 revenue villages of which 1,005 are notified and Panchayats. There are Nine Municipalities in the District. Kakinada is the District headquarters and is on the Coast and also a Port town. The Godavari River is the major river drains in the district, which is perennial and flows along the western boundary of the district. South of Rajahmundry the river bifurcates into two viz., Gautami Godavari in the East and Vasista Godavari in the West. The Godavari River further splits into smaller arms before it debouches into the Bay of Bengal. The other important rivers and tributaries of Godavari flowing in the district are Gondiyeru, Pamuleru, Polavaram vagu, Sileru river, Suddagedda, Yeleru, Madeyeru, and Tandava. The general drainage pattern is dendritic to sub-dendritic. The drainage density varies from less than 0.4 km/sq.km in poorly drained alluvial areas which cover the entire southern parts of the district to 0.6 km/sq.km in the Northern parts occupied by crystalline rocks. The climate of the District is mainly warm. About 90% of rainfall fall is brought by South West Monsoon. The District can be divided into four natural agro climatic zones – Central Delta, Eastern Delta, the Uplands, and the Agency tracts. The delta lands are formed along the lower drainage basins of the major rivers flowing through the District viz., the Godavari, the Yeleru, and the Pampa, where the elevation is usually a few feet above the mean sea level. The elevation reaches up to 1500 feet above the mean sea level in the Agency tract, which is densely covered by the hills of Eastern Ghats interspersed with numerous valleys and drains. The major types of soils in the District are coastal alluvium, clay loams, black cotton, and red soils. Laboratory analyzed for Ground water quality on physicochemical parameters like pH,

**Total Dissolved Solids (TDS)**, Total Hardness (TH), Chloride ( $\text{Cl}^-$ ), **Nitrate** ( $\text{NO}_3^-$ ), Fluoride (F), Iron (Fe), Total Alkalinity (TA) and Sulphate ( $\text{SO}_4^{2-}$ ) using standard techniques, 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 BIS (2015), in terms of desirable, permissible and nonpotable 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 55% of the area is under non potable category due to high concentration of Nitrate and Total Hardness. About 20% of the area is potable category remaining 25% of the area is covered in hills and waterbodies of entire the District. The occurrence and movement of groundwater in an area are governed by several factors such as topography, lithology, geological structure, depth of weathering, extent of fractures, drainage pattern, climate conditions, and inter relationship between these factors. The ground water quality map of East Godavari district is shown in figure 21.

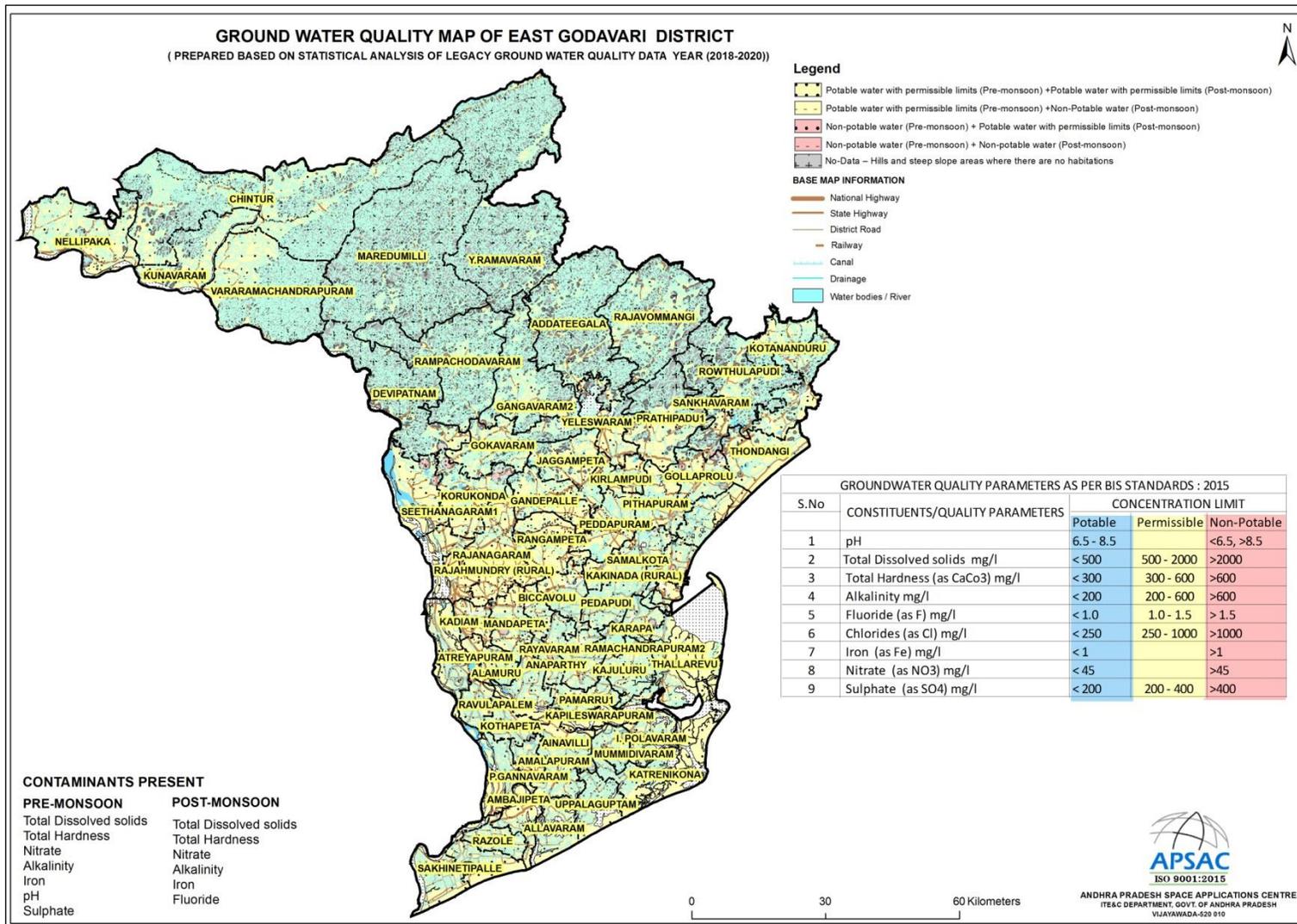


Fig. 21 Ground Water Quality Map of East Godavari District

## 6 Geology and Mineral Resources of the District

### 6.2 Geology of East Godavari District

The northern half of the East Godavari district forms a part of the Eastern Ghats Mobile Belt, exposing all the characteristic lithologies of the Eastern Ghats Supergroup viz., the khondalite, charnockite, and Migmatite groups. The khondalite group is represented by Quartz-garnet-sillimanite: graphite gneiss (khondalite), along with unmappable units of quartzite and calcgranulite/gneiss. Within the khondalite suite itself, varied mineralogical assemblages like graphite schist, cordierite-sillimanite gneiss, and sapphirine-bearing quartzofeldspathic gneiss occur. The charnockite groups consists of acidic, intermediate, and basic varieties. The Migmatite group includes a host of rock types, like porphyroblastic granitoid gneiss, garnetiferous quartzofeldspathic gneiss (leptynite), garnet-biotite-hypersthene gneiss, and quartzofeldspathic migmatites. Unconformably resting over the crystalline rocks of Archaean age occurs, the uppermost member (Tirupathy Sandstone) of the Gondwana Supergroup, deposited in a transitional environment, along the coast. It consists of coarse grained sandstone with conglomerate and clay zones. Pteridophyte flora is recorded in the clay zone. Near Annavaram, the Gondwana rocks have yielded marine fauna (*Trilobites* sp., *Inoceramus* sp., *Pseudomontis* sp., *Pecten* sp. and *Helicoceras* sp.,). The Deccan Traps occur, 2 km north and east of Rajahmundry and extend in ENE-WSW direction. Limestone intertrappeans, rich in Gastropod and Lamellibranch fossils, occur near Kotilingala, Korukonda and Kateru. Rajahmundry Formation, named after the type locality, Rajahmundry, is an ensemble of fine-grained, purple to variegated sandstone, grit, and conglomerate, overlain by current bedded sandstone with clay and shale bands. Intermittently exposed between Rajahmundry, and

Samalkot, it is equivalent to Warkall Beds of Kerala and Cuddalore Formation of Tamil Nadu. The deltaic plain is characterised by fluvial to fluviomarine and marine deposits of Quaternary age, which are described in detail under geomorphology.

The Geological Survey of India (GSI, 2000) gave a detailed account of the geology/lithology of the District with a map on a 1: 2,50,000 scale (Fig. 22) and an elaborate legend with stratigraphic sequence (Fig.23).

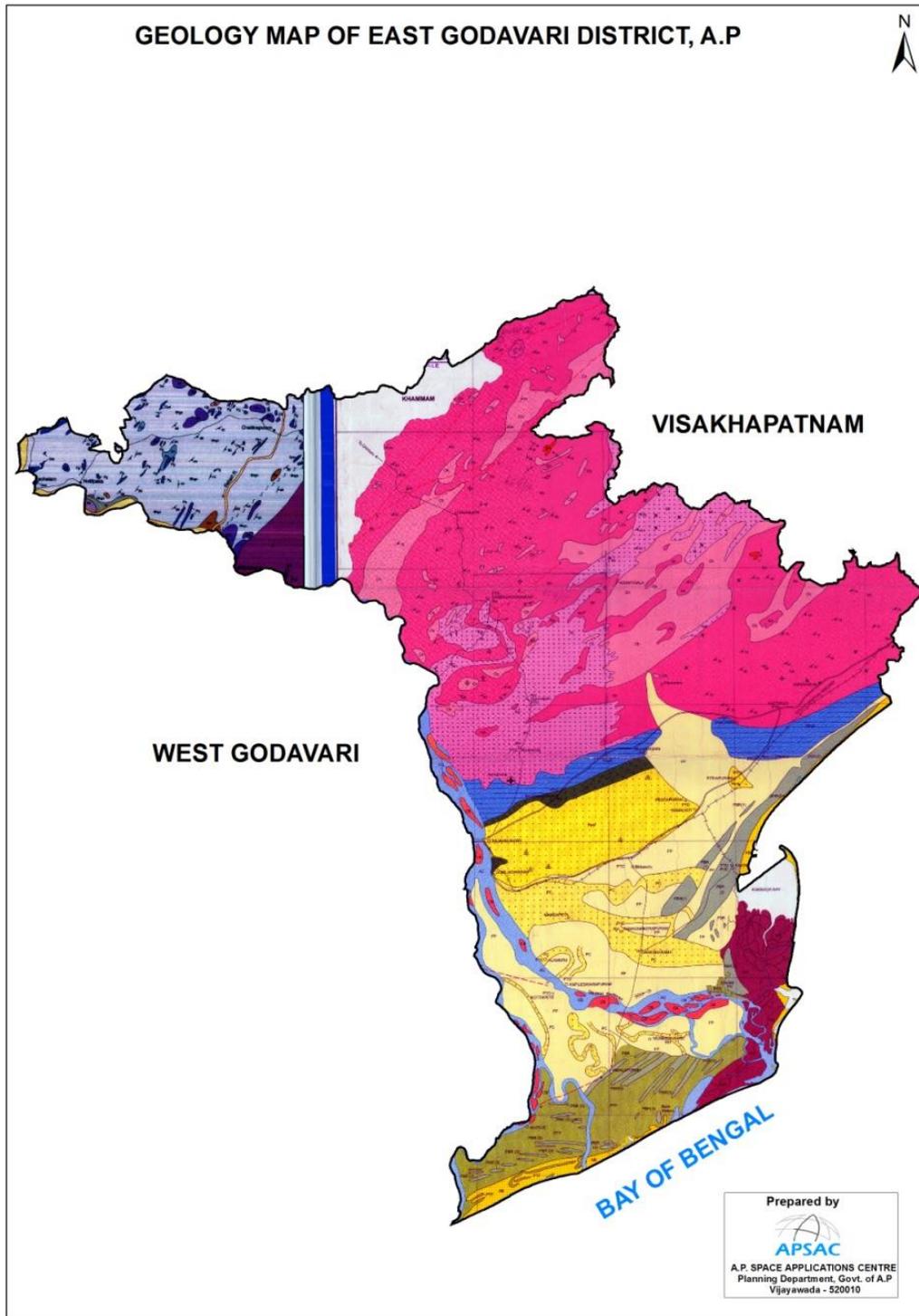


Fig. 22 Geology of East Godavari District, Andhra Pradesh

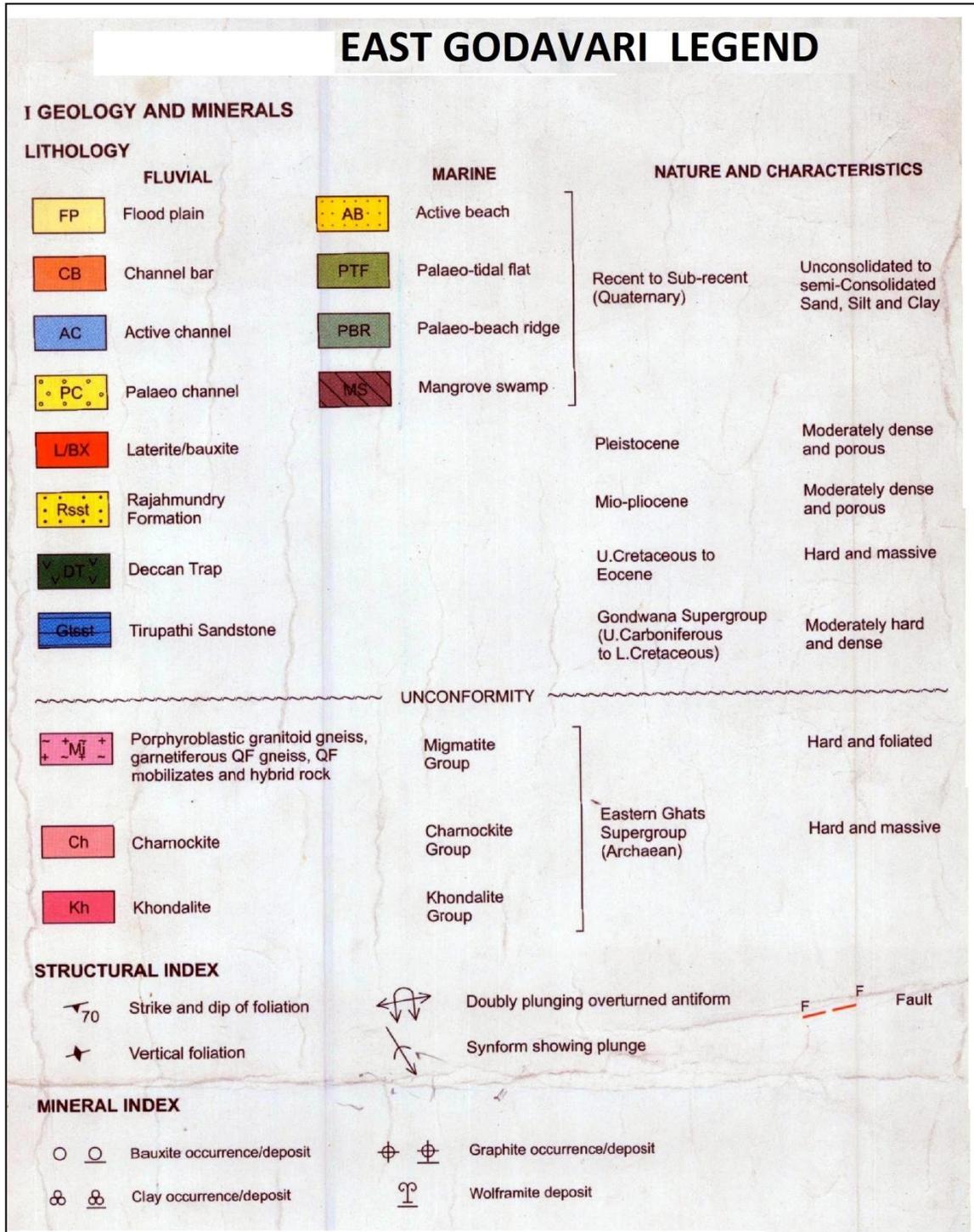


Fig. 23 Detailed Legend with Stratigraphic Sequence of East Godavari District

### 6.3 Mineral Resources of East Godavari District

East Godavari district has very good mineral resources. Graphite, fire clay, china clay, laterite, and bauxite are used extensively in several industries are found in the district. There are several mineral-based industries set up in the district already. Mangalore tiles, bricks, graphite crucibles chemical refractories are some of the industries set up with the help of the mineral resources available in the district. Apart from these, road metal, gravel, and sand are also available in plenty in the district. East Godavari district has a coastline of 114 km as stated already. There are 12500 acres of land on this coastline, particularly on the Kakinada and Yanam road, where salt is manufactured. This provides immense potential for the development of salt industries, washeries, and several salt-based chemical industries in the district. The rich deposits of graphite, clay and fire clay, laterite in the district provide immense scope for setting up pencil grade graphite units; grease, lubricants, electronic goods, and ceramic based industries in the district. Oil and Natural Gas Commission already made substantial efforts in the direction of striking oil in Godavari basin of the district. It has already been established that plenty of gas is available in the district particularly in the Razole region of Godavari basin. The recent finding of availability of huge deposits of oil and gas in Godavari basin has catapulted East Godavari district on the national and international scenario because natural gas is going to be the foremost and abundantly available source for power generation and energizing the industrial sector. When these huge deposits of oil and natural gas are fully exploited the ever-growing problems of power deficiency causing frequent power cuts and load shedding will be solved and the pace of industrial development will be further accelerated.

## 7 Details of Major and Minor Minerals Their Production and Revenue in the District

### 7.2 Administrative Set-Up of DMG in East Godavari District:

The functions of the office of the Asst. Director of Mines and Geology at Rajamahendravaram is promoting Mineral regulatory work and development in East Godavari District with in the purview of APMMC Rules, 1966 in case of Minor Mineral and M.C.Rules, 1960 and MM(D and R) Act, 1957 and other rules.

### 7.3 Overall view of Mining Activity in the District

In East Godavari district, Mandal wise minerals distribution is given in Table 8.

Table-8 Mineral and Place of Distribution Mandal-wise

Sl. No	Mineral	Place of distribution Mandal-wise
1	Oil and Gas	S.Yanam, Mori, Pasarlapudi, Razole I and II, Tatipaka, Manepalli, Eenamuru, Chintalapalli.
2	Laterite	Maredumilli, Prathipadu
3	Fire Clay	Rajanagaram and Rajahmundry
4	China Clay	Jaggampeta, Gandepalli
5	Road Metal	Addateegala, Ganavaram, Gokavaram, Korukonda, Prathipadu, Rampachodavaram, Seetanagaram, Yeleswaram, Rowthulapudi, Tuni, Rajahmundry and Rajanagaram and Sankavaram
6	Building Stone	Kirlampudi, Prathipadu, Tuni
7	Gravel / Earth	Anaparthi, Biccavolu, Kadiyam, Karapa, Thondangi, Rangampeta, Mandapeta, Peddapuram, Samarlakota,

		Gandepalli, Biccavole etc
8	<b>Granite</b>	Rampachodavaram, Addateegala, Yeleswaram, Gangavaram, Rowthulapudi, Sankavaram

Data source: AD, DMG, East Godavari District



Fig.24. Map of Sand reaches of East Godavari District



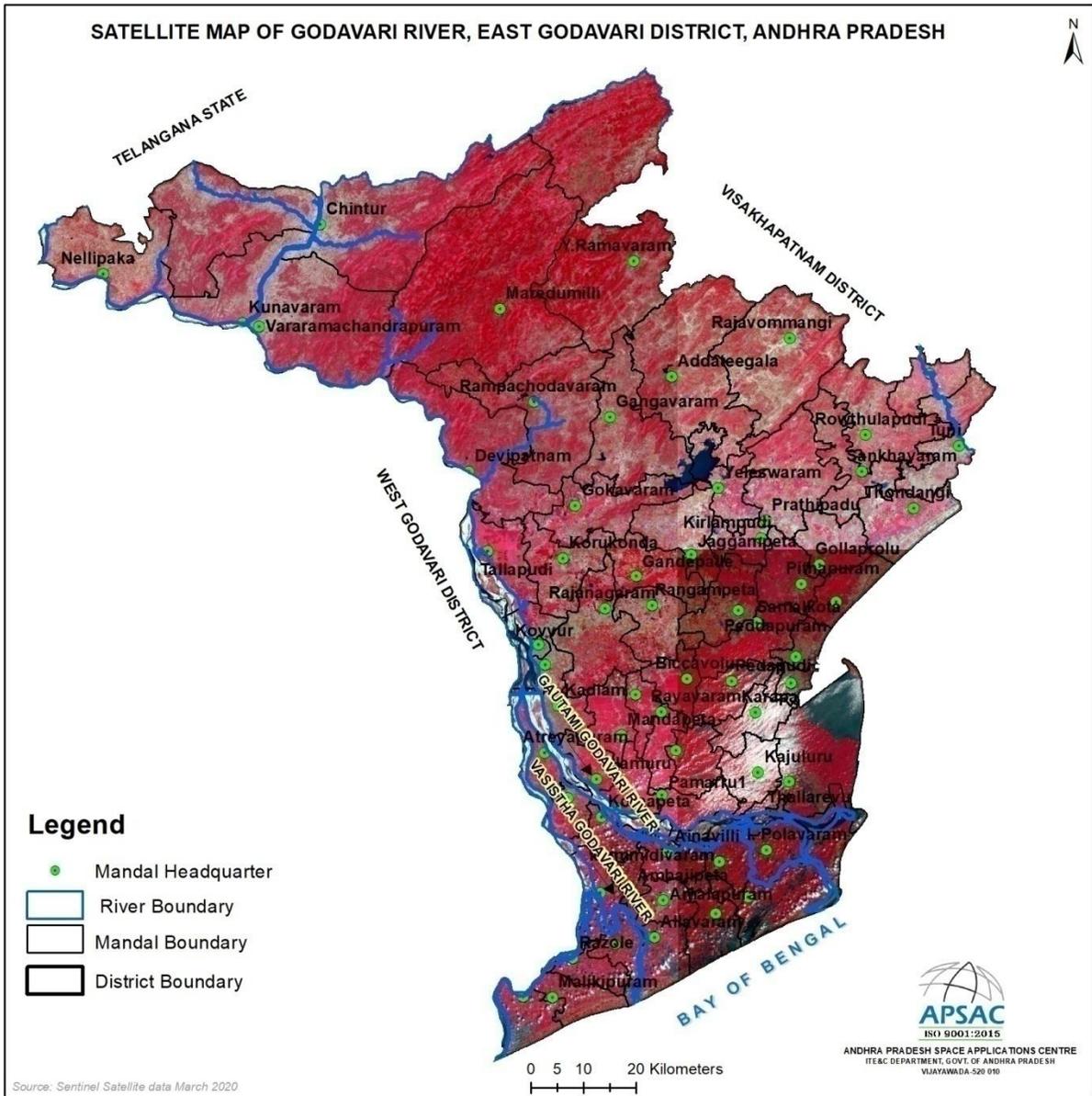


Fig.26. Satellite Map of Godavari River in East Godavari District

## Bauxite

Bauxite is an aluminous rock that contains hydrated aluminium oxide as main constituent and Iron oxide, Silica, and Titania as minor constituents present in varying proportions. Hydrated aluminium oxides present in the bauxite ore are diaspore and boehmite,  $\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$  ( $\text{Al}_2\text{O}_3$ -85%; Al-45%); gibbsite or hydrargillite,  $\text{Al}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$  ( $\text{Al}_2\text{O}_3$ -65.4%; Al-34.6%), and bauxite (containing colloidal alumina hydrogel),  $\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$  ( $\text{Al}_2\text{O}_3$ -73.9%; Al-39.1%). Bauxite is the principal ore of aluminium which is one of the most important non-ferrous metals used in modern industry. It is also an essential ore for Refractory and Chemical industries. In East Godavari District, capping of Laterite which contains at places Bauxite, the raw material for manufacture of Alluminum are found in Dumakonda (V) near Y. Ramavaram. The estimated reserves are about 0.25 million tonnes.

## Laterite

Laterite is a surface formation that is enriched in iron and aluminium. Found mainly in hot, wet tropical areas, it develops by intensive and long-lasting weathering of the underlying parent rock. The mineralogical and chemical composition of Laterite depends on its parent rock. Due to the presence of iron oxides, lateritic soils are red ranging from light bright to brown shades. The term 'laterite' was originally used for highly ferruginous deposits. It is a highly weathered material, rich in secondary oxides of iron, aluminium, or both. It is either hard or capable of hardening on exposure to moisture and drying. Laterite and bauxite show a tendency to occur together. Aluminous laterites and ferruginous bauxites are quite common. The most common impurity in both is silica. Laterite gradually passes into bauxite with a decrease in iron oxide and an increase in aluminium oxide. In East Godavari District, Laterite mineral is formed under process of weathering of Khondalite suit of rocks i.e Aluminium rich rocks of Archean Age. The mineral occurs most of the hill ranges above 300 MT to 900 MT of MSL of Khondalite suit of Rocks and distributed mandals of Y.Ramavaram, Vanthada, Chintaluru, Gajjanapudi of Prathipadu(M) and Avelthi, Anumarthi of Sankavaram (M), Pedduru of Rowthulapudi (M). Low grade Laterite capping found 2 to 4 meters over the Rajahmundry Sand Stone in G.Yerrampalem, Kadiyam, Kesavaram, Biccavolu villages around Rajahmundry. The estimated reserves about 94.84 million tonnes of an extent of 431.11 Hects out of 33 leases.



Fig. 27 Laterite specimen in East Godavari District



Fig. 28 Mining Operations in Vanthada village, East Godavari

### Colour Granite

Colour Granite genetically occurs in Eastern Ghats Mobile Belt of Charnokite suit of Rocs and composed mineral constituents mineral Garnet – Ferrous Gneisses granites of Archean age. These Colour Granites formed Granulite phases of Migmatization. In East Godavari District the

colour granite type is Leptynites. Leptynites are composed of Garnet – Quartzo-Feldspathic gneiss and Megmatized charnokites and the trade name are “Kashmir White”. In East Godavari District the Colour Granite quarries are located in Rowthulapudi, Gangavaram, and Rampachodavaram Mandals.

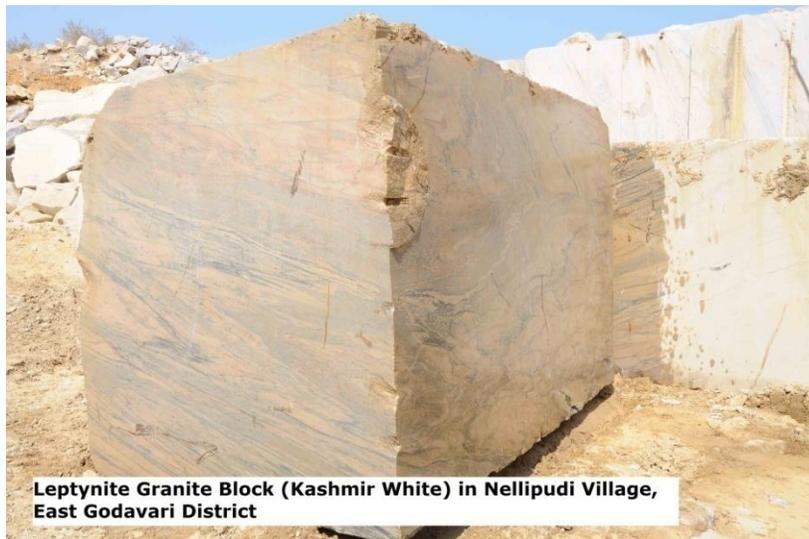


Fig. 29 Leptynite Granite Block in Nellipudi village, East Godavari



Fig. 30 Granite Systematic in Nellipudi village, East Godavari

## Quartz

Geologically the occurrence of Quartz in the district as intrusive belongs to Peninsular Gneissic Complex of Archaean Age. The vein deposit of the quartz in the district observe in association with two litho units viz. (1) Quartz vein with Feldspar as Hanging wall and (2) quartz vein with muscovite schist. The quartz body is generally covered by the soil and Feldspar in the lower altitudes i.e. on either side of the Quartz vein. The Quartz is massive, and glassy. It is colourless to translucent. The general strike of the Quartz vein is NW-SE. Feldspar occurs as a hanging wall over the exposed Quartz Bodies. Quartz, quartzite, and silica sand are used in various industries like glass, refractory, foundry, ceramic, cosmetic, electrical, abrasives, paints, etc. The primary use of silica is in the manufacture of virtually all types of glasswares, ceramics and ceramic glazes. Other major uses are in metallurgy, (where silica is used as a refractory, foundry mould, fluxes, and as a source of silicon for the production of silicon metal and ferro-silicon and other ferro-alloys), silicon carbide manufacture, chemical and construction sectors and as a natural abrasive. Known for its piezoelectric properties, high-quality quartz crystal is used in electronic devices, multiple telephone lines, depth-sounding devices, range finders, chronometers, etc. In East Godavari District, the Quartz quarries are located in Chintoor, Vara Ramachandrapuram and Yetapaka Mandals.



Fig. 31 Quartz at Chintoor village, East Godavari District

## Fire Clay

The name fireclay is given to a group of refractory clays which can withstand temperatures above Pyrometric Cone Equivalent (PCE) - 19. Refractoriness and plasticity are the two main properties needed in fireclay for its suitability in the manufacture of refractory bricks. A good fireclay should have a high fusion point ( $>1580^{\circ}\text{C}$ ) and good plasticity. Fireclay containing high alumina and low iron oxide, lime, magnesia, and alkalis is preferred by refractory manufacturers. The aluminous (kaolinitic) variety of fireclay is more refractory because of its hardness and density and absence of iron, giving it a white burning colour. The absence of alkalis gives it a very high fusion temperature. Fireclays are used in the manufacture of cement, bricks, blocks, retorts, crucibles, mortars, masses, pottery, floor tiles, etc. Low-grade material is used for manufacturing heavy sanitary-ware, such as pipes and bath tubs. Firebricks are used where heat generation is involved. Firebricks are used extensively in furnaces, kilns, and ovens. Firebricks are required chiefly by metallurgical industries. In East Godavari District, the Fire Clay quarries are located in Rajamahendravaram Rural, Rajanagaram, and Kadiyam Mandals.



Fig. 32 Fire Clay Specimen in East Godavari District

### China Clay

The name kaolin (China Clay) is derived from the village of Gaoling in Jiangxi province, China, where the white clay was mined. Kaolin also known as china clay, is a white commercial clay consisting predominantly of the mineral kaolinite, a hydrated aluminosilicate formed by chemical weathering of aluminium silicate minerals like feldspars through a complex sequence of events. It is relatively pure clay predominantly consisting of kaolinite ( $\text{Al}_2\text{Si}_2\text{O}_5(\text{OH})_4$ ), associated with other clay minerals like dickite, halloysite, nacrite, and anauxite, Kaolinite and halloysite is the most commonly found members of the kaolin group whilst nacrite and dickite are considered rare but with the progress made in infrared spectroscopy techniques, nacrite and dickite are now found association with kaolinite in many deposits. The levels of these two minerals are used as a guide by the Oil Industry as an indication of depth of burial of sediments, the levels of the two minerals increases with the higher temperatures and pressures at depth. Crude china clay is normally processed. Almost, all the china clay user industries except cement, insecticide and refractory units consume processed china clay. The natural china clay is processed in the country mostly by the conventional method of levigation/washing. In addition, hi-tech processes, such as, Mozeley hydrocyclone separator, high-intensity magnetic separator, bleaching (chemical de-colorization), spray drying, and calcination are in practice. There is a need to use more sophisticated processing techniques like ultra froth-flotation, cryo-filter, etc. The recovery percentage of processed china clay from raw china clay ranges from as low as 14% to as high as 56%, depending upon the quality of china clay. In East Godavari District, the China Clay quarries are located in Jaggampeta, Gandepalli, and Prathipadu Mandals.



Fig. 33 China Clay Specimen in East Godavari District



Fig. 34 China Clay Mine in Jaggampeta village of East Godavari District

### Oil and Natural Gas

Krishna Godavari Basin is a Peri-Crotonic passive basin on the East Coast of India. The onland part consists of 28000 Sq.Km and is mostly Alluvium covered. Krishna – Godavari are the two major rivers systems which drain the area and discharge in Bay of Bengal. The offshore basinal area covers 24000 Sq. Km to the isobath of 200m. However, the basin

extends into deeper water and covers a much larger area. The basin characteristic feature is its en-echelon horst and graben system which is filled with a thick pile of sediments of Permian to Recent age and emerging as one of Indian's most promising Petroliferous areas commercial accumulation of Hydro Carbons occurs in sediments from the Permian to as young as the Pliocene. ONGC operates 31 Leases to explore Oil and Gas in KrishnaGodavari Basin.

The expected Reservoirs: Permian to Triassic sand stones, Cretaceous to Paleocene sand stones, Eocene lime stones, and Sand Stones Miocene to Pliocene sand stones. Expected Source Rocks, Shales in Permian, Cretaceous and Paleocene – Eocene sequences. Expected Cap Rocks, Intra-formational shales. The average annual production of Crude Oil is 2,74,030.19 MT and Natural Gas is 1,14,28,04,369 SCM. M/s. Oil and Natural Gas Corporation Limited has obtained Petroleum Mining Lease (PML) permissions for Oil and Natural Gas in East Godavari District as detailed below in Table: 9.

Table 9: Permissions for Oil and Natural Gas (PML) in East Godavari District

Sl. No.	Name of PML	Area (Sq.Km)	Area falling under PML	Mandal
1	Mori-1	6.50	Mori	Sakhinetipalli
2	Kesavadasapalem	25.50	Kesavadasapalem	Sakhinetipalli
3	Tatipaka-Pasarlapudi	62.00	Tatipaka	Mamidikuduru
4	Manepalli	10.00	Manepalli	P.Gannavaram
5	Razole – 1 and 2	18.85	Razole	Razole
6	Pasarlapudi – 8 and 9	12.10	Pasarlapudi	Mamidikuduru
7	Mandapeta – 19 and West	26.00	Mandapeta	Mandapeta
8	Srikatpalli–Pasarlapudi (24)-Gopavaram	163.00	Pasarlapudi	Mamidikuduru

9	Kesanapalli(Regrant)	3.70	Kesanapalli	Sakhinetipalli
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Data source: AD, DMG, East Godavari District

### Availability of Sand, Gravel and Aggregate Resources

The River Godavari enters into East Godavari District at Yetapaka Mandal and flows as Akhanda Godavari until Dowlaiswaram Sir Aurthor Cotton Barage. Subsequently, the River Godavari splits into three branches and flows as Gowthami, Vasishta, and Vynateya. The Sand Reaches in this District exists along with Akhanda Godavari Left Bank, Gowthami Left, and Right Banks, Vasishta Left Bank and Vynateya Left and Right Banks. The River Godavari flows through East Godavari approximately to a distance of 250 Km and merge into the Bay of Bengal at Antarvedi. The Yeleru River flows through Yeleswaram, Prathipadu, Kirlampudi, and Peddapuram Mandals in East Godavari District. There is only one identified reach in Yeleswaram Mandal i.e., Marriveedu. The Thandava River flows through Tuni and Kotananduru Mandals in East Godavari District. The sand reaches along Thandava River were not recommended as per AP WALTA Rules by the line departments during Joint Inspection. The Gravel and Aggregate resources, In East Godavari District Khondalite group of rocks are used for Building Stone and Charnokite group of rocks are used for Road Metal for civil constructions. The Deccan traps over lie the Tirupathi Sand Stones and are exposed only in a smaller area of Rajahmundry, Rajanagaram, and Gandepalli mandals. The Traps extended over a distance of 32 Km from Katheru in the west to Katrevulapalli, Jaggampeta Mandal in the East. The traps are basaltic in composition and it is useful for Road Metal for construction of civil works.

### Road Metal/Building Stones

### Charnockites/Khondalites

Road Metal occurred in Charnockite Group of Eastern Ghats Super Group of Archaean age, where the Eastern Ghat Mobile Belt is tapering to less than 20 km width and trending in NNE-SSW in the area and Charnockite zone represented mainly of Charnockite and Basic Granulite. The Charnockite in the area forms dome shaped steeply sloping hills. The rock is medium to coarse grained texture comprises of Greasy quartz, hypersthene, orthoclase and plagioclase with or without Garnet. In East Godavari District, Charnockite Road Metal quarries are located in Seethanagaram, Gokavaram, Korukonda, Rampachodavaram, Yeleswaram, Prathipadu, Rowthulapadu, Tuni, Sankhavaram and Kotananduru Mandals. The available Charnockite rock in the district is in massive nature sustain rock strength for usage of civil works. However, consisting of predominant irregular joints it is not useful for cutting and polishing. As such these are utilizing for breaking and crushing purposes only and the derived aggregate products are using in Civil Construction works, Railway Ballast, and making Railway Sleepers, etc., In East Godavari District, Building Stone occurred in Khondalite Group of Eastern Ghats. The local Villagers of Prathipadu, Kirlampudi, and Sankhavaram Mandals are generally used Khondalite Rocks as Building Stone for foundation and construction of Retaining Walls from the ancient period. Further, the Irrigation Department is using the Building Stone in Revetment along with the Flood Bank and Construction of groins to prevent the erosion of the Flood Banks/Lanka lands.

LOCATION MAP OF SAND REACHES, EAST GODAVARI DISTRICT, ANDHRA PRADESH

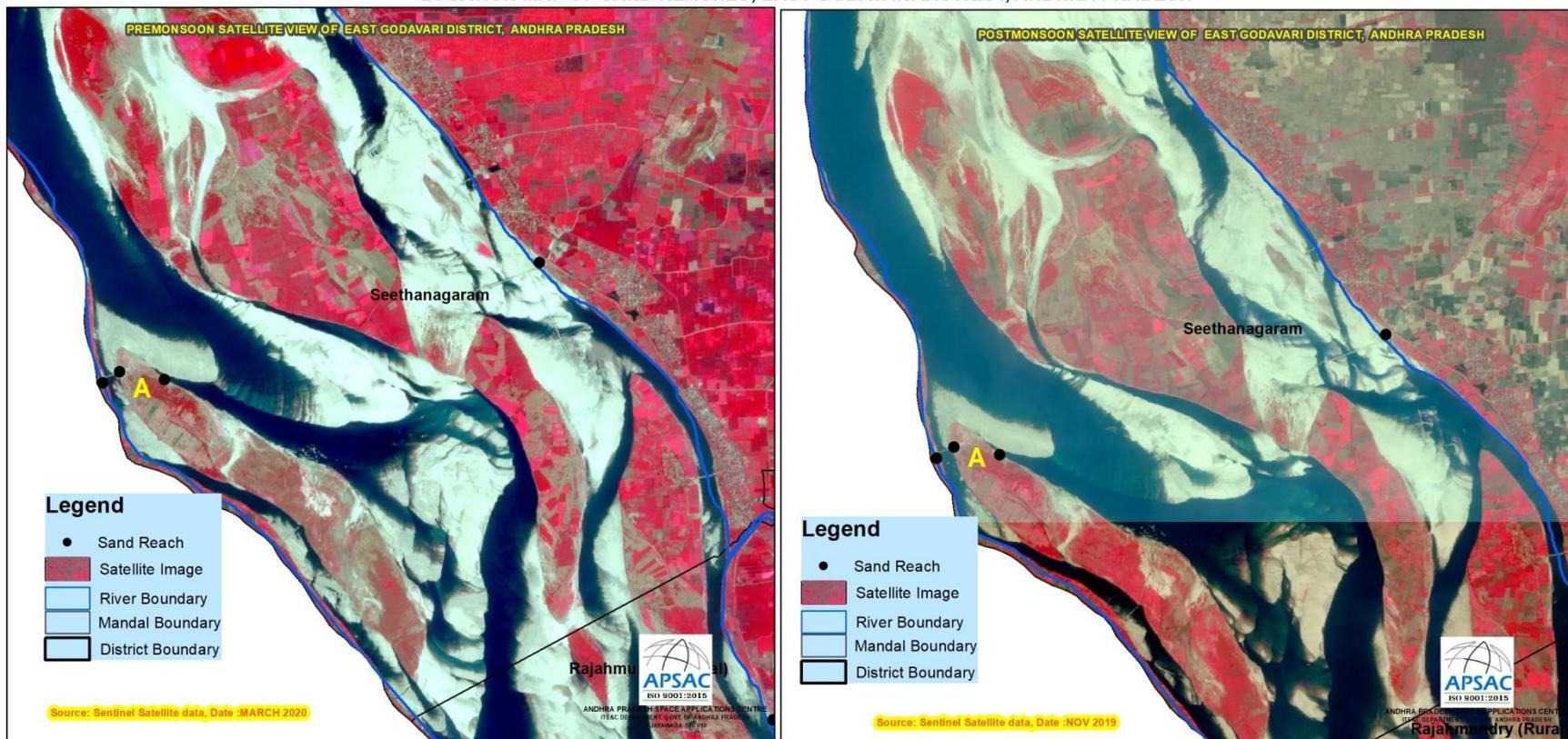


Fig.35. Pre and Post Monsoon Sand Reach Point - A

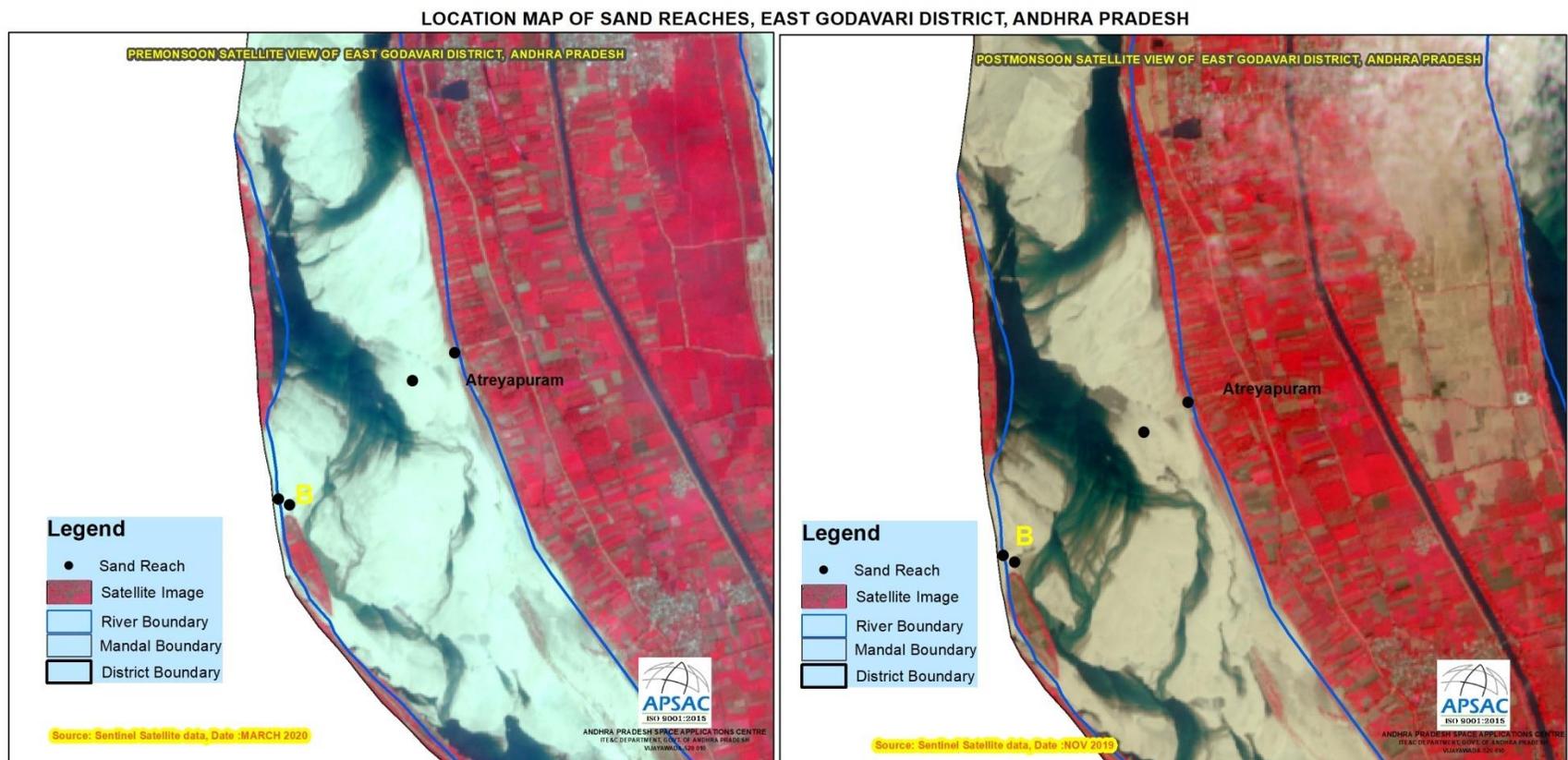


Fig.36. Pre and Post Monsoon Sand Reach Point - B

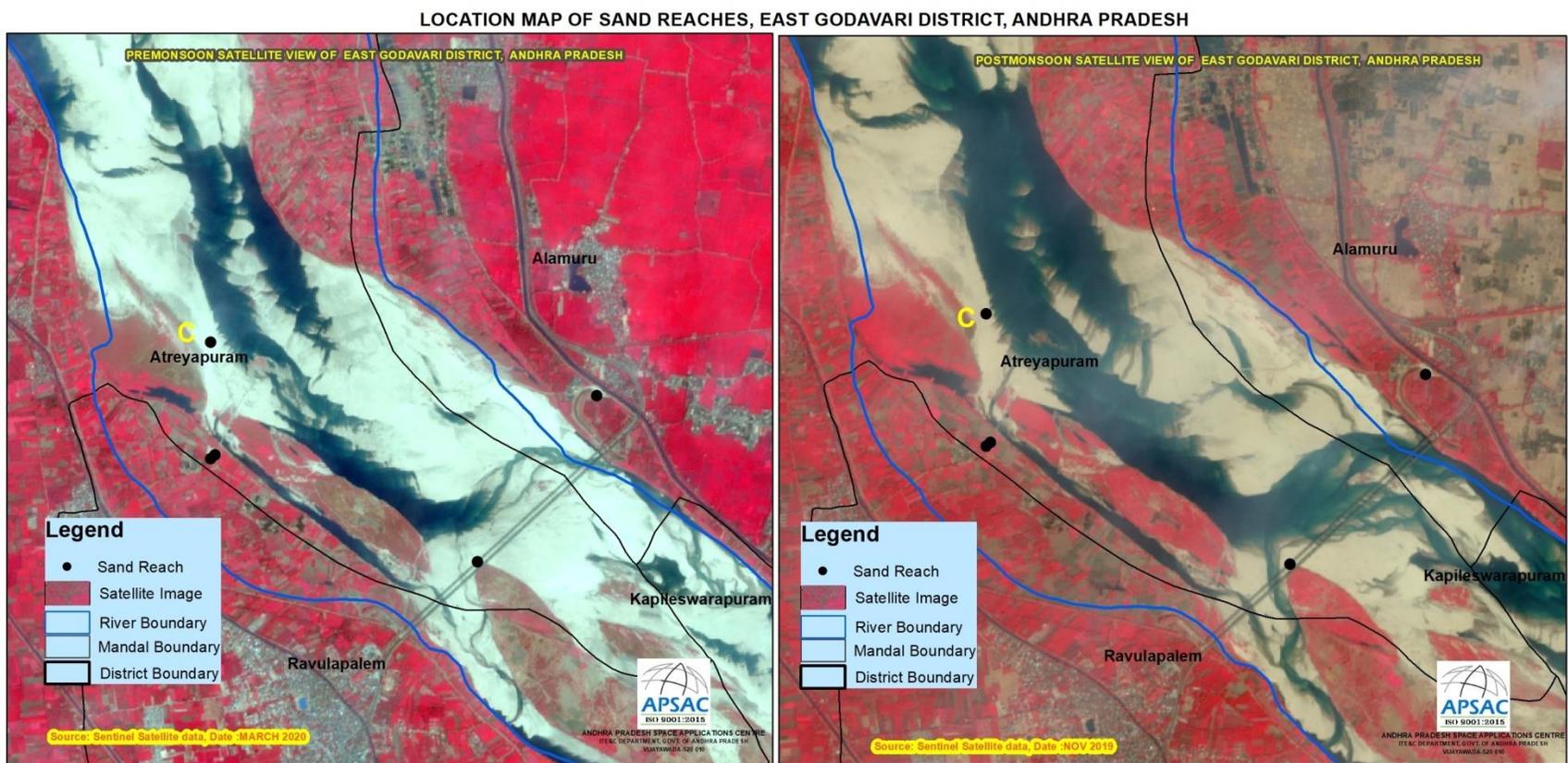


Fig.37. Pre and Post Monsoon Sand Reach Point - C

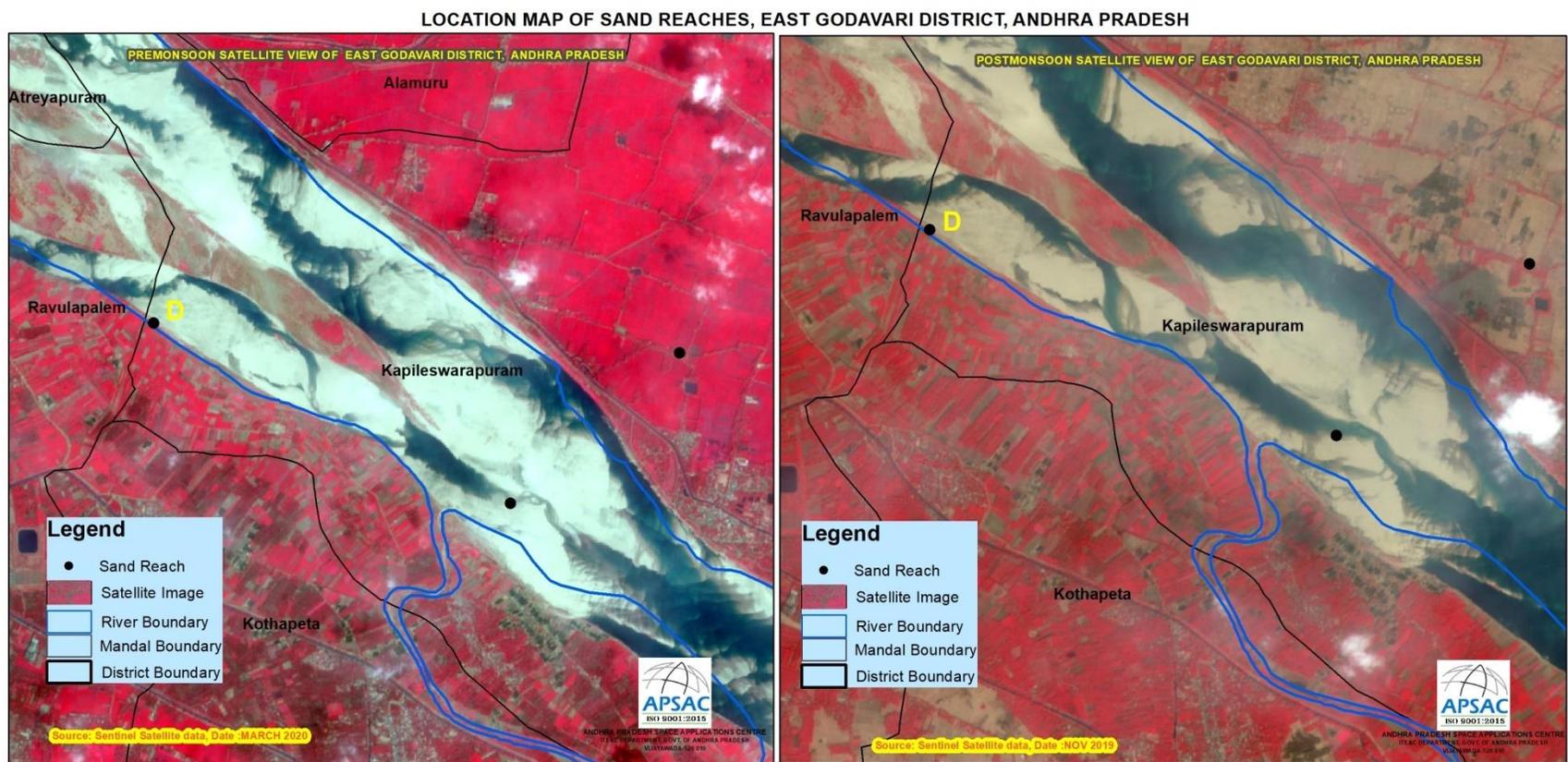


Fig.38. Pre and Post Monsoon Sand Reach Point - D



Fig. 39 Charnockite Specimen East Godavari District



Fig. 40 Charnockite Hill Deposits in East Godavari District

### Deccan Traps (Basaltic Lava)

In East Godavari District, Road Metal has occurred in Deccan Trap formation of upper cretaceous period. The Deccan traps overlie the Tirupathi Sand Stones and are exposed only in a smaller area of Rajahmundry, Rajanagaram, and Gandepalli mandals. Road Metal quarries are located in Kateru, Konthamuru and Kolamuru in Rajamahendravaram Rural, Palacherla, Rajanagaram and Gandepalli Mandals. The Traps extended over a distance of 32 Km from Katheru in the west to Katrevulapalli, Jaggampeta Mandal in the East. The traps are basaltic in composition and it is useful for Road Metal for construction of civil works.



Fig. 41 Basalt Specimen in Rajamahendravaram, East Godavari District



Fig. 42 Basalt Rock in Deccan Trap Formation in Rajamahendravaram, East Godavari

### Gravel

Gravel is formed due to in-situ weathering of Khondalite rocks of Eastern Ghat Super Group of Archaean age due to effect of wind, water and temperature. Large gravel deposits are a common geological feature, being formed as a result of the weathering and erosion of rocks. The action of rivers and waves tends to pile up gravel in large accumulations. This can sometimes result in gravel becoming compacted and lithified into the sedimentary rock called conglomerate. In East Godavari District, Gravel formations are generally occurred in upland i.e table plateau, it consists of formations of Miocene to Mio-Pleistocene period and weathering of Khondalite suit of rocks Mineral constituent namely Gravel. Gravel formations are generally distributed in Peddapuram, Samalkot, Gandepalli, Gollaprolu, Biccavolu, Anaparthi, Mandapeta, Rangampeta, and Rajanagaram Mandals.



Fig. 43 Gravel quarry in East Godavari

### Earth

In East Godavari District, Southern part of the district mostly covering Alluvial Soil formed by the Godavari Delta consisting of Black cotton Soils, Sandy Soils, and Loamy Soils. The Mineral Earth is available in the Revenue Divisions of Rajamahendravaram, Amalapuram, Ramachandrapuram, and Kakinada.

### Beach Sands

In East Godavari District, Beach Sand Minerals like Zircon, Illiminite, Monozite, and Rutile, etc., are deposited along the coastline of Bay Bengal stretching from North Thondangi Mandal to Sakhinetipalli Mandal approximately covering a distance of 150 Km. Beach Sand Minerals usually categorized as Rare Earth Elements (REE) are characterized by high density, high melting point, high conductivity, and high thermal conductance. Several rare earth minerals contain thorium and uranium in variable amounts but thorium and uranium do not constitute essential components in the composition of the minerals. Rare earth materials are utilized in a

wide range of critical products enabling many emerging green energy technologies, high-tech applications, and defense systems such as hybrid cars, plug-in hybrid electric vehicles (PHEVs), the latest generation of efficient windpower turbines, computer disc drives, and missile guidance systems, etc. Monazite contains about 25.28%  $P_2O_5$  which can be recovered as a by-product for the manufacture of fertilizers and production of elemental phosphorus or its salts. Besides, rare earth, thorium is recovered from monazite. It is a source of atomic energy. An important use of thorium is for addition to tungsten in minute quantity (about 0.75%) to increase the ductility of tungsten wire and thus to facilitate its drawing into filaments used in electric lamps. Metallic thorium is also used in photoelectric cells and X-ray tubes and certain alloys. Thorium is used as a catalytic agent for various processes. Amongst thorium salts, and thorium nitrate is used largely in the manufacture of incandescent gas mantles. Mesothorium, the chief radioactive element recovered as a byproduct in the chemical treatment of monazite, is marketed usually in the form of its bromide and used in self-luminous paints or enamels. Mesothorium is also used in the treatment of certain types of cancer and skin diseases. At present, there are no Beach Sand Mining Leases in East Godavari District.



Fig. 44 Beach Sand in Kona village in East Godavari

## Sand

### Godavari River (V Order Stream)

The River Godavari enters into East Godavari District at Yetapaka Mandal and flows as Akhanda Godavari until Dowlaiswaram Sir Aurthor Cotton Barage. Subsequently, the River Godavari splits into three branches and flows as Gowthami, Vasishta, and Vynateya. The Sand Reaches in this District exists along with Akhanda Godavari Left Bank, Gowthami Left, and Right Banks, Vasishta Left Bank, and Vynateya Left, and Right Banks. The River Godavari flows through East Godavari approximately to a distance of 250 Km and merge into the Bay of Bengal at Antarvedi. The Sand Reach details along the Godavari River Banks are as follows:

Table-10 The Sand Reach details along the Godavari river

Sl. No.	Name of the River	Name of the Sand Reach	Chainage (Km)	Type of Reach
1	Akhanda Godavari Left Bank	Vangalapudi	32.000 to 35.00	Open Reach
2		Muggalla	26.000 to 32.000	Open Reach
3		Munikudali	25.000 to 26.000	Open Reach
4		Katavaram	22.000 to 25.000	De-siltation
5		Rajahmundry	3.000 to 8.800	De-siltation
6	Gowthami Left Bank	Vemagiri – Kadiyapulanka	3.000 to 8.000	Open Reach
7		Jonnada	9.000 to 19.400	Open Reach
8		Tatapudi	23.200 to 25.900	Open Reach
9		Kapileswarapuram	29.000 to 29.900	Open Reach
10		Korumilli	30.400 to 32.400	Open Reach
11		Kotipalli	40.000 to 48.000	Open Reach
12		Pillanka	55.000 to 60.400	By Boats
13		Govallanka	59.000 to 60.400	By Boats

14	Gowthami Right Bank	Bobbarlanka – Peravaram	3.00 to 5.00	Open Reach
15		Vaddiparru	7.400 to 10.800	Open Reach
16		Atreyapuram	10.000 to 15.000	Open Reach
17		Ubalanka	19.000 to 22.000	Open Reach
18		Ravulapalem	22.000 to 24.900	Open Reach
19		Mandapalli	27.000 to 29.000	Open Reach
20		Kothapeta – Kedaralanka	27.000 to 31.000	Open Reach
21		Vadapalem – Narayanalanka	31.400 to 34.200	Open Reach
22		Invallilanka – Veeravallipalem	45.000 to 51.000	Open Reach
23		Kondakuduru	51.000 to 55.000	Underwater excavation
24		Kommanapalli – Gedallanka	58.000 to 58.500	Open Reach
25		Muramalla	59.000 to 72.000	By Boats
26		Pallamkurru	75.000 to 79.100	By Boats
27	Vasishta Left	Rajavaram –	3.500 to 7.500	Open Reach

	Bank	Velicheru		
28		Pulidindi	8.800 to 10.500	Open Reach
29		Tadipudi	12.000 to 14.000	Open Reach
30		Ankampalem	19.000 to 30.000	Open Reach
31		Gopalapuram	30.000 to 44.200	Open Reach
32		Y.V.Palem – Bendapudi	44.200 to 48.400	Open Reach
33		Soampalli	48.400 to 63.000	Underwater excavation
34		Dindi	63.000 to 80.000	By Boats
35		Tekisettipalem - Sakhinetipalli	63.000 to 80.000	Underwater excavation
36		D.S.Palem	0.800 to 0.900	Open Reach
37	Vynateya Right	Manepalli	5.000 to 10.000	Open Reach
38	Bank	Pedapatnam – Appanapalli	5.000 to 15.000	Underwater excavation
39		Pasarlupudi	15.000 to 18.000	By Boats
40	Vynateya Left Bank	Bodaskurru	22.000 to 35.000	Underwater excavation

41	PIP Flood Bank	Yedurlanka	0.000 to 12.000	Underwater excavation
42		Guttinadeevi	12.000 to 15.000	
43		Pasuvulanka	35.000 to 40.575	
44		Kesanakurru	22.0 to 35.000	

Data source: AD, DMG, East Godavari District

From the above Sand Reaches, on an average Sand quantities of 25.00 to 30.00 Lakh cum per annum are being excavated to meet the needs of the public in East Godavari District and adjacent Districts.



Fig. 45 Sand deposits in River Godavari

### Yeleru River (III Order Stream)

The Yeleru River originated from Eastern Ghats of Y.Ramavaram Mandals and flows through Addategala (Agency area), Yeleswaram, Prathipadu, Kirlampudi, Peddapuram Mandals in

East Godavari District. There is only one identified reach in Yeleswaram Mandal i.e., Marriveedu. There is a possibility of small Sand shoals at Yeleswaram and Kirlampudi Mandals for utilization of sand for local consumption only.

### **Thandava River (III Order Stream)**

The Thandava River originated at Eastern Ghat hills from Chodavaram Mandal, Visakha District, and flows through Kotananduru and Tuni Mandals of East Godavari District. There is a possibility of small Sand shoals at Kotananduru and Tuni Mandals for utilization of sand for local consumption only.

## 7.4 Process of Deposition of Sediments in the Godavari River of the East Godavari

### District

The East Godavari District is enriched by huge water resources of River Godavari and Major stream Yeluru, Pampa, Suddha Gadda, and Thandava. The Godavari River is covering a total of 250 Kms. The Godavari River is the major contributor to sand deposits. The Godavari River is perennial. It flows continuously throughout the season. There is an existing Sir Arthur Cotton Barrage across the Godavari River.

Table 11: The details of Production of Sand in last three years in the district

Sl.No	Year	Production of Sand in CBM/Tons
1	2017-18	2507868 CBM
2	2018-19	1199208 CBM
3	2019-20	4598895 CBM (As per APMDC Ltd.)

Data source: AD, DMG, East Godavari District

The East Godavari District has consolidated formations, semi-consolidated formations, and unconsolidated formations. The consolidated formations include crystalline (Khondalites, Charnockites, Shales, Phyllites, and Quartzites) of Arachean and Pre-Cambrian periods respectively. The semi-consolidated formations are formed in the tertiary age include Rajahmundry Sand Stones and Gollapalli Sand Stones of Miocene. The un-consolidated formation comprise deltaic, alluvial deposition. Floods:

The River Godavari has been hit by huge floods in the rainy seasons. Due to heavy floods, the river overflows its banks at times of high flood water. It is built of alluvium carried by the River Godavari and deposited in the sluggish water beyond the influence of the swiftest current.

### Delta:

The River Godavari upon reaching the plains begins to widen out until it reaches Rajamahendravaram. After crossing Rajamahendravaram, the Godavari splits into two branches which are called Vriddha Gowthami (Gowthami River) and Vasishta Godavari.

Again the Gowthami branch splits into two branches namely Gowthami and Nilla Revu. Similarly, the Vasistha splits into two branches named Vasishta and Vynateya. These four branches which were joined Bay-Bengal at different places and are forming a delta length of 170 Km (110 Miles) along the Coast of Bay Bengal and is called as Kona-Seema Region. As such, the accumulation in a wider body of water (usually a sea) of sediment supplied by a Godavari River in such quantities that it is not removed by tides, waves, and currents. Eventually, Sand is deposited in the Godavari River due to the heavy floods during the rainy season and formation of deltas at the old stage of the River:

**Valley fill:**

The unconsolidated sediment is deposited by any agent to fill or partly fill a valley.

Details of Patta Lands in the East Godavari District: The details are shown in Table 12.

Table 12: Details of Patta Lands in the East Godavari District

Owner	Sy. No	Area (Ha)	District	Tehsil	Village	Agricultural Land (Yes/No)
<b>Year 2019-2020</b>						
Sri Annabathula Veera Raghava Hanuman	45-1-A-1-A	0.615	East Godavari	P.Gannavaram	L.Gannavaram	Yes
Sri Annabathula Srinivasa Rao	45-1-A-1-B	0.809	East Godavari	P.Gannavaram	L.Gannavaram	Yes
Sri Annabathula Bala Parameswara Rao	45-1-A-2	0.619	East Godavari	P.Gannavaram	L.Gannavaram	Yes
Sri Annabathula Naidu	45-1-B	0.405	East Godavari	P.Gannavaram	L.Gannavaram	Yes
Sri Karnati Adithya Chandra Babu	213-2, 213-3, 213-4A, 215-1C and 215-5	3.804	East Godavari	Seethanagaram	Seethanagaram	Yes
Sri Parimi Rajendraprasad and others	209-2 and 3, 208-1 and 2	7.899	East Godavari	Seethanagaram	Seethanagaram	Yes
Smt. Mutyala Lakshminaryanamma	38-4A and 38-4B	2.792	East Godavari	Seethanagaram	Mulakallanka	Yes
Smt. Jujavarapu Ramaseetha	36-1	0.728	East Godavari	Seethanagaram	Mulakallanka	Yes
Smt. Polina Ananthalakshmi	33-4B	0.546	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Polina Venkanna	30-2	0.700	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Polina Prakasa Rao and 2 others	134 and 132-2	2.270	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Nune Achyutharamayya and others	210, 211, 212-1 and 212-2	7.232	East Godavari	Seethanagaram	Purushothapatnam	Yes
Smt. Polina Vijaya Kumari	34-1 and 33-4D	0.360	East Godavari	Seethanagaram	Mulakallanka	Yes
Smt. Geddam Venkata Satyavathi	34-2B, 36-2 and 36-3	0.397	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Polina Chitti Veerraju and Smt. Polina Vijaya Kumari	33-1A, 33-2A, 33-4A, 30-3, 34-4D, 34-2A	1.396	East Godavari	Seethanagaram	Mulakallanka	Yes
Smt. Geaddam Veankata Satyavati and Sri Polina	33-4E	0.231	East Godavari	Seethanagaram	Mulakallanka	Yes

Srinivasarao						
Sri Polina Govindarajulu, Polina Suryanarayana and Smt. Geddam Venkata Satyavathi	33-3, 34-3 and 34-4A	0.672	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Polina Satyanarayana	26-2, 30-1, 34-4B, 34-4C	1.554	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Polina Srinivasa Rao	33-4C	0.239	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Polina Trimurthulu and Sri Polina Satyanarayana	36-9 and 36-8	0.465	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Grandhi Venkata Ratnam	10	3.452	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Polina Hanumantha Rao and others	157-4A, 157-5A, 157-4B-2, 157-5B, 157-4B1, 157-6	4.043	East Godavari	Seethanagaram	Mulakallanka	Yes
Smt. Appasani Dhana Lakshmi	40	1.214	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Polina Ramachandra Rao and Polina Venkatarayudu	157-7, 157-10, 157-11, 157-15, 132-3 and 129-2	3.869	East Godavari	Seethanagaram	Mulakallanka	Yes
Smt. Polina Nagaratnam	1	3.440	East Godavari	Seethanagaram	Katavaram	Yes
Sri Polina Ramachandra Rao and Polina Venkatarayudu	14/5	0.732	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Kongala Bhaskara Rao and others	9, 13/4, 13/6A, 12/1B, 12/4, 13/1C, 13/2B, 13/3A, 13/6C	4.112	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Garapati Bulli Venkata Rao and others	16/1, 16/2, 17/1B and 17/2	4.217	East Godavari	Seethanagaram	Mulakallanka	Yes
Smt Garapati Suryakantham and others	18/1, 18/2, 19/1A, 19/1B, 19/4	4.791	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Palacherla Venkata Durgam and Palacherla Chowdary	42	2.501	East Godavari	Seethanagaram	Mulakallanka	Yes
B Hari Viswanadham	26-1A, 28/5	0.336	East Godavari	Seethanagaram	Mulakallanka	Yes
Smt. Nekkanti Jhansi Rani	29/1A, 31/1A, 31/2, 32/1	2.501	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Malli Ramakrishna	14/6	0.206	East Godavari	Seethanagaram	Mulakallanka	Yes
U.Gangadhar rao	43-2E-2, 195-13A, 195-2	1.113	East Godavari	Seethanagaram	Mulakkalanka	Yes
Sri Edupuganti Veerraju	12-2A, 12/2C, 12-6A	0.611	East Godavari	Seethanagaram	Mulakallanka	Yes
M.Subrahmanyam	43-2B, 43-2C, 195-2, 195-13D	1.182	East Godavari	Seethanagaram	Mulakkalanka	Yes
Smt. Pendurthi Venkatalakshmi	12-2B, 12-3, 12-6B	0.809	East Godavari	Seethanagaram	Mulakallanka	Yes

Smt. K Satyavathi and others	157/1, 157/2, 157/3, 157/9, 157/13, 157/14, 162/1A, 162/1B	4.480	East Godavari	Seethanagaram	Mulakallanka	Yes
R Negeswara Rao	13-2A, 13-5, 13-6B	0.809	East Godavari	Seethanagaram	Mulakallanka	Yes
Parimi Narayana Rao	43/1A, 43/1B	0.898	East Godavari	Seethanagaram	Mullakalanka	Yes
Reddy Madhuri	14-2, 128	2.950	East Godavari	Seethanagaram	Mullakalanka	Yes
B Jhansi Rani	41-1	1.214	East Godavari	Seethanagaram	Mullakalanka	Yes
Smt. Y Krishna Veni	25/2	0.842	East Godavari	Seethanagaram	Mullakalanka	Yes
Sri P Chalapathi Rao	21/4, 20/7	0.931	East Godavari	Seethanagaram	Mullakalanka	Yes
Smt P.Tripurasundari	8-2	0.579	East Godavari	Seethanagaram	Mullakalanka	Yes
Sri U Balagangadhar	43-2E-2B, 14/1C, 195-13F2, 195-2A1	1.643	East Godavari	Seethanagaram	Mullakalanka	Yes
Sri Undavalli Gangadhar rao	14/1A, 43/2E-1, 195/2, 195/13A	1.105	East Godavari	Seethanagaram	Mullakalanka	Yes
Sri M.Venkata Rama Rao	43-2C, 195-13A, 195-2	0.635	East Godavari	Seethanagaram	Mullakalanka	Yes
Smt N Lakshmi	8-3	0.579	East Godavari	Seethanagaram	Mullakalanka	Yes
Smt Ch Devi	14/3, 22, 28/4	0.834	East Godavari	Seethanagaram	Mullakalanka	Yes
Sri R Subba Rao	13-1A, 13-1B, 13-3B, 6	0.542	East Godavari	Seethanagaram	Mullakalanka	Yes
Sri Vundavalli Srinivasa Rao	43-2E4, 14-1D, 195-13G, 195-2	1.105	East Godavari	Seethanagaram	Mullakalanka	Yes
Sri U Satya Sekhara Vara Prasad	43-2E-2A, 195-13F-1, 195-2A2, 14-1C-1	1.534	East Godavari	Seethanagaram	Mullakalanka	Yes
Smt S.Pushpavathi	10	3.452	East Godavari	Seethanagaram	Mullakalanka	Yes
Sri Hari Babu	14/3, 22, 28/4	0.902	East Godavari	Seethanagaram	Mullakalanka	Yes
Sri S Venkata Rama Rao	11-1	1.578	East Godavari	Seethanagaram	Mullakalanka	Yes
MANSAS Trust	132, 195 etc.,	17.041	East Godavari	K.Gangavaram	Kotipalli	Yes
Sri M.Suryanarayana Murthy	23-1	0.716	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri B.Satyanarayana	28/9	0.571	East Godavari	Seethanagaram	Mulakallanka	Yes

Sri B.Gangadhara Surya Vara Prasad	26/1B	0.393	East Godavari	Seethanagaram	Mulakallanka	Yes
<b>Year 2020-21</b>						
T.Naga Srinivasa Rao	15/3	0.959	East Godavari	Seethanagaram	Mulakallanka	Yes
Mallipudi Ananthalakshmi	15/1	1.866	East Godavari	Seethanagaram	Mulakallanka	Yes
T.Naga Srinivasa Rao	23/2A, 28/3, 28/6, 28/1	1.420	East Godavari	Seethanagaram	Mulakallanka	Yes
K.Meena Kumari	164/1B, 161/1, 164/1A, 164/1A1, 164/1A/1	3.545	East Godavari	Seethanagaram	Mulakallanka	Yes
M.Nageswara Rao and Others	163/2, 160, 163/1,163/1A, 163/1B	4.148	East Godavari	Seethanagaram	Mulakallanka	Yes
R Neelambaram	10	0.809	East Godavari	Seethanagaram	Mulakallanka	Yes
R Venkateswara Rao	8-5	0.518	East Godavari	Seethanagaram	Mulakallanka	Yes
R.Suryanarayana	8-4	0.599	East Godavari	Seethanagaram	Mulakallanka	Yes
S Durgamma	11-2	0.065	East Godavari	Seethanagaram	Mulakallanka	Yes
R Madhuri	195-13A	0.506	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri.K.Pullarao and Smt.P.Ananthalakshmi	155, 156/1	1.242	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri G.Sandeep	9	1.938	East Godavari	Seethanagaram	Mulakallanka	Yes
B.Koteswara Rao	28/5 and 26/1A	0.332	East Godavari	Seethanagaram	Mulakallanka	Yes
B.Chittabai	26/1A	0.073	East Godavari	Seethanagaram	Mulakallanka	Yes
B.Narayana	26/1A and 28/5	0.328	East Godavari	Seethanagaram	Mulakallanka	Yes
Smt Valluripalli Jayanthi and 6 others	195/13B, 195/2, 195/13H, 195/13I, 195/2D, 195/13C, 195/13E	4.399	East Godavari	Seethanagaram	Mulakallanka	Yes
Smt Valluripalli Jayanthi and 5 others	25/1, 43/2A, 44/1, 43/2D, 43/2D, 44/1, 44/1, 44/4, 43/5D	2.436	East Godavari	Seethanagaram	Mulakallanka	Yes

Smt. Appasani Dhana Lakshmi	195/2	1.599	East Godavari	Seethanagaram	Mulakallanka	Yes
BS Murthy Co-operative Collective Farming Society X232, President Sri Yennabathula Bhima Rao	184 and 186/2	4.075	East Godavari	P.Gannavaram	L.Gannavaram	Yes
Pathuri Suryakantham	20-5 and 21-6	0.304	East Godavari	Seethanagaram	Mulakallanka	Yes
Kavala Subba Lakshmi	14/4 and 27/1	0.304	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Malli Venkata Satyanarayana	27/2	0.162	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Bandaru Sahadevudu	21/7	0.425	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Dandamudi Venkateswara Rao	8/6	0.502	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Mallipudi Ganga Rao	23-2C	0.579	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Kavala Nageswara Rao	14/4 and 27/1	0.304	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Malli Satyanarayana	27/2	0.081	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Perugu Nageswara Rao	14/4, 21/2, 21/5, 27/1	0.243	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Perugu Veerabhadra Rao	14/4, 21/2, 21/5, 27/1	0.249	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Ramaseetha	27/2	0.198	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Perugu Venkata Rao	21/2 and 21/5	0.125	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Pathuri Markandeyulu	21/6 and 20/2	0.372	East Godavari	Seethanagaram	Mulakallanka	Yes
MANSAS Trust	82, 84 and 107	2.015	East Godavari	K.Gangavaram	Kotipalli	Yes
Sri Perugu Satyanarayana	21/5 and 21/2	0.129	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri K.Venkateswarlu	24/3 and 28/8A	0.457	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Kottuboyina Krishna	24/3, 24/4C and 28/8A	0.457	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Mallipudi Rama Krishna	23/2B	0.190	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Rachuri Venkateswara Rao	20/1	0.846	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri Mallipudi Venkateswara Rao	23/2B	0.194	East Godavari	Seethanagaram	Mulakallanka	Yes
Sri M Satyanarayana	11/1 to 10	1.125	East Godavari	Seethanagaram	Seethanagaram	Yes

Data source: AD, DMG, East Godavari District

The details of M-Sand Plants in the East Godavari District is shown in Table 13

Table 13: Details of M-Sand Plants in the East Godavari District

Plant Name	Owner	District	Tehsil	Village	Geolocation	Quantity Tonnes/Annum
--Nil--						

**Present Status of Mining:**

The details of mining leases already in operation in the East Godavari District, area, and production in last three years from these leases are detailed below.

Table 14: Statement Showing the List of Leases for Major and Minor Minerals and Details of Lease wise Production and Revenue Collections during the last three years pertaining to O/o the Asst. Director of Mines and Geology, Rajamahendravaram.

Sl. No.	Lessee Name	Mineral Name	Location			Extent (in ha )	Lease Period		Production(Dispatches)			Mineral Revenue Collections			Remarks
			Survey No	Village	Mandal		From	To	2017-18	2018-19	2019-20	2017-18	2018-19	2019-20	
1	Smt K. Anasuya	Road Metal	207/1	GONTUVANIPALE M	Addateegala	2	27-Jan-07	26-Jan-17	0	0	0	0	0	0	Renewal applied
2	P.KANNAYAMMA	Road Metal	207/1	GONTUVANIPALE M	Addateegala	2	27-Jan-07	26-Jan-17	0	0	0	0	0	0	Renewal applied
3	Smt Palla Sanyasamma,	Road Metal	207/1	GONTUVANIPALE M	Addateegala	1	10-Jun-08	9-Jun-18	2050	5438	0	131250	430486	0	Renewal Applied
4	M/s Bhavani Girijana Quarry Workers LC C Society	Road Metal	207/1	GONTUVANIPALE M	Addateegala	0.85	26-Jun-08	25-Jun-18	1266	300	0	52450	42750	0	Renewal Applied
5	Sri Manepalli Chandra Rao,	Road Metal	207/1	GONTUVANIPALE M	Addateegala	9.5	31-Jul-08	30-Jul-18	7855	7750	0	589125	1057552	0	Renewal Applied
6	Sri Manepalli Chandra Rao	Road Metal	207/1	GONTUVANIPALE M	Addateegala	1.4	31-Jul-08	30-Jul-18	8451	1750	0	158825	131442	0	Renewal Applied
7	M/s Gontivanipalem Girijana QW Indl.co Society	Road Metal	207/1	GONTUVANIPALE M	Addateegala	1.507	4-Jul-08	3-Jul-18	1005	1000	0	75350	75557	0	Renewal Applied
8	M/s Vijaya Girijana Q.	Road Metal	207/1	GONTUVANIPALE	Addateegala	3.87	4-Jun-08	3-Jun-18	4950	1800	0	171959	387529	259502	Renewal

	L.C.c. Society			M											Applied
9	Sri Pallala Sanyasamma	Road Metal	207/1	GONTUVANIPALE M	Addateegala	0.125	18-Dec-12	3-Jun-18	1300	0	0	97250	0	0	Renewal Applied
10	Sri P.Krishna	Road Metal	24	Puligogulapadu	Addateegala	1.85	1-Jun-06	31-May-16	0	0	0	0	0	0	Expired/ Determined
11	Sri J. Satya Vara Prasad	Road Metal	24	PULIGOGULAPAD U	Addateegala	2	25-Jun-08	24-Jun-18	1333	600	0	100000	48000	0	Renewal Applied
12	Sri N.Naga Raju	Road Metal	24	PULIGOGULAPAD U	Addateegala	6	4-Jul-08	3-Jul-18	3240	10559	0	300000	794925	0	Renewal Applied
13	Sri Ganesh Sainadha Granites	Colour Granite	37,	Regulapadu	Addateegala	3	10-Feb-06	9-Feb-26	0	0	0	0	0	0	Determined
14	M/s Chaitanya G QUARRY LABOUR CONTRACT CO OPERATIVE SOCIETY LIMITED	Colour Granite	178/2,	THUNGAMADUGU LA	Addateegala	0.9	08-05- 2005	08-04- 2025	0	0	0	0	0	0	Determined
15	Sri karri Sambasiva Reddy	Gravel	8/1DP	DUPPALAPUDI	Anaparthi	3.08	29-Jan-14	28-Jan-17	0	0	0	0	0	0	Expired/ Determined
16	A.SATISH KUMAR	Gravel	8/1CP	Duppalapudi	Anaparthi	0.87	26-Jun-15	4-Apr-20	0	0	0	0	0	0	
17	A.RAMESH	Gravel	8/1C	DUPPALAPUDI	Anaparthi	0.797	13-Apr-16	12-Apr-19	5500	0	0	196500	0	0	
18	S.SIVANNARAYANA REDDY	Gravel	23	DUPPALAPUDI	Anaparthi	1.841	21-Jun-16	2-Sep-19	0	0	0	0	0	0	
19	MALLIDI VEERA RAGHAVA REDDY	Gravel	28	BALABHADRAPUR AM	Biccavolu	4.077	16-Apr-14	15-Apr-19	5430	5436	0	0	163080	0	Expired/ Determined
20	S.VEERA VENKATA SATYANARAYANA REDDY	Gravel	49/P	BALABHADRAPUR AM	Biccavolu	2.4	12-May-14	11-May-17	0	0	0	0	0	0	Expired/ Determined
21	K.V.V.S.SUBRAHMANYAM	Gravel	73	BALABHADRAPUR	Biccavolu	1.012	20-Jan-15	3-Jan-17	0	0	0	0	0	0	Expired/Dete

				AM											rmined
22	Sri K Muni Reddy	Gravel	205	Balabhadrapuram	Biccavolu	1.092	18-Apr-18	17-Apr-23	0	6010	6765	0	180420	159150	
23	S.SRINIVASA REDDY	Gravel	27(P),	BALABHADRAPUR AM	Biccavolu	1.619	08-Aug-14	07-Aug-17	0	0	0	0	0	0	Expired
24	M/s Sainath Minerals	Laterite	212/2,	Balabhadrapuram	Biccavolu	1.62	24-Aug-98	23-Aug-18	0	0	0	0	0	0	Expired
25	Sri T.Nagi Reddy	Fireclay	2/1,	Balabhadrapuram	Biccavolu	5.042	21-Dec-99	20-Dec-19	0	0	0	0	0	0	Expired
26	S.SIVANNARAYANA REDDY	Gravel	152/4B,4C ,4D,4E,4F, 4G	KAPAVARAM	Biccavolu	1.618	9-Oct-15	6-Jul-20	0	0	0	0	0	0	
27	S.SIVANNARAYANA REDDY	Gravel	152/2	KAPAVARAM	Biccavolu	0.745	21-Jun-16	12-Sep-20	0	0	0	0	0	53109	Expired/Dete rmined
28	G.SATYA PRAKASH	Gravel	108/1	THUMMALAPALLE	Biccavolu	0.987	21-Jun-16	30-Jun-21	2450	375	0	27180	79069	0	
29	P.SATYANARAYANA	Quartz	26	KESARAM	Chintur	0.874	25-Mar-09	24-Mar-29	2137	350	0	180500	30310	9086	
30	B.LAKSHMANA	Quartz	19	Kesaram	Chintur	4.046	16-Nov-06	10-Feb-22	0	0	0	0	228377	60857	
31	Anigi Seetha(Seethamma)	Road Metal	36/P	Kanusuluru	Chinturu	2.95	18-Dec-19	17-Dec-29	0	0	0	0	0	0	
32	Sri P.S.V.S Chowdary	Gravel	255/2P,3, 4P,5	Gandepalle	Gandepalle	2.38	#N/A	#N/A	0	0	0	0	0	0	Expired/Dete rmined
33	Sri DVV Ramana Reddy	China Clay (Crude)	23/2P,24/ 2P	GANDEPALLE	Gandepalle	1.033	21-Nov-05	20-Nov-25	5400	6500	4450	260000	325043	232122	
34	M/s Hindustan Sanitaryware and Industries Ltd	China Clay (Crude)	3/P,4/P	Gandepalle	Gandepalle	1.78	27-Dec-10	26-Dec-30	0	0	0	0	0	0	
35	M/s Naga Sai gravel Quarry	Gravel	178/2 178/3P,	NAYAKAMPALLI	Gandepalle	0.971	02-Apr-12	02-Mar-17	0	0	0	0	0	0	Expired
36	SIDHVI INFRASTRUCTURE PROJECTS LIMITED	Gravel	212/1 2 3 AND 213/3	P.nayakampalle	Gandepalle	2.408	8-Sep-14	13-Sep-16	0	0	0	0	0	0	Expired/Dete rmined
37	SIDHVI INRASTRUCTURE	Gravel	212/6	P.nayakampalle	Gandepalle	0.728	8-Sep-14	13-Sep-16	0	0	0	0	0	0	Renewal

	PROJECTS LIMITED														applied
38	JETTY SATYANARAYANA and OTHERS	Ordinary Earth	79/P,2P,3 P 4P	YELLAMILLI	Gandepalle	5.75	3-Feb-15	2-Feb-25	3500	10000	0	1610000	7020788	373750	
39	JETTY SATYANARAYANA and OTHERS	Road Metal	79/P,2P,3 P 4P	YELLAMILLI	Gandepalle	5.75	3-Feb-15	2-Feb-25	29500	105000	0	0	0	0	
40	JETTY SATYANARAYANA and OTHERS	Ballast	79/P,2P,3 P 4P	YELLAMILLI	Gandepalle	5.75	3-Feb-15	2-Feb-25	0	0	0	0	0	0	
41	JETTY SATYANARAYANA and OTHERS	Boulders	79/P,2P,3 P 4P	YELLAMILLI	Gandepalle	5.75	3-Feb-15	2-Feb-25	0	0	0	0	0	0	
42	Sri K.Venkata Rao	China Clay (Crude)	21-Jan	ZAMINDAR RAGAMPETA	Gandepalle	1.01	7-Aug-02	6-Aug-22	8650	12300	12000	432500	715042	540768	
43	Smt K.V.V.S.A.Subba Laxmi	Fire Clay	63/3B	ZAMINDAR RAGAMPETA	Gandepalle	0.729	22-Nov-04	21-Nov-24	2700	9350	13500	130000	467530	698295	
44	K.SRINIVASA RAO	China Clay (Crude)	21/2,22/1 22/2	ZAMINDAR RAGAMPETA	Gandepalle	2.412	8-Dec-04	7-Dec-24	6200	11700	4000	306356	585100	234161	
45	APARNA ENTERPRISES LIMITED	China Clay	17/1,17/1A ,17/1B,17/1C,17/1D,1	Zamindar Ragampeta	Gandepalle	2.55	24-Jul-19	23-Jul-39	0	0	8200	0	0	455400	
46	D.V.V.S.N.MAHESH	Colour Granite	53	Jaderu	Gangavaram	7.5	30-May-18	29-May-38	0	0	287.431	0	0	703821	
47	M/s Mars Granites	Color Granite-Leptinites	486/1,488 /1	NELLIPUDI	Gangavaram	1.52	5-Oct-05	4-Oct-25	1203.551	1199.569	1152.99	3593879	3694535	3301200	
48	RATHOD PREM	Color Granite-Leptinites	487	NELLIPUDI	Gangavaram	1	10-Aug-16	9-Aug-36	725.857	829.513	1977.282	2155294	2482888	5654135	

49	Ch Indira Priyadarsi	Colour Granite	1/2	Patharamavaram	Gangavaram	10	6-May-19	5-May-39	0	0	0	0	0	0	
50	Sri K.Srinivas	Road Metal	1	Pothandorapalem	Gangavaram	1.5	12-May-06	10-May-18	1002	1800	0	75150	135206	97500	Renewal applied
51	A.P. Tribal Mines Co. Ltd	Road Metal	1	POTHANDORAPA LEM	Gangavaram	1.5	12-Mar-09	11-Mar-19	1650	1200	0	123750	15000	0	Expired/Determinded
52	Sri P.Ananda Reddy	Road Metal	104	KALIJOLLA	Gokavaram	2.02	7-Nov-07	6-Nov-27	450	450	0	101000	101277	131300	Renewal Applied
53	Sri P.Veera Reddy	Road Metal	104	KALIJOLLA	Gokavaram	2.02	7-Nov-07	6-Nov-27	450	450	0	101000	101277	131300	Renewal Applied
54	Sri K.Seetha Rama Laxmana Reddy	Road Metal	104	KALIJOLLA	Gokavaram	2.19	7-Nov-07	6-Nov-27	450	450	0	109500	109800	142350	Renewal Applied
55	Sri K.Nagi Reddy	Road Metal	104	KALIJOLLA	Gokavaram	1.27	7-Nov-07	6-Nov-27	300	450	0	63077	63674	82550	Renewal Applied
56	M/s Swasthik Metals	Road Metal	359/7	KALIJOLLA	Gokavaram	1.456	20-May-08	19-May-18	0	0	0	145600	0	170632	Renewal Applied
57	Smt K. Atchuta Padma	Road Metal	104/P	KALIJOLLA	Gokavaram	1.32	3-Feb-10	2-Feb-20	0	0	0	0	0	0	
58	Sri M.Srinivas	Road Metal	546	MALLAVARAM	Gokavaram	2.63	27-Nov-07	26-Nov-27	0	900	0	131449	131861	170950	Renewal Applied
59	Sri S.Subash Chandra Bose	Road Metal	359	MALLAVARAM	Gokavaram	3	27-Oct-07	28-Oct-27	2000	0	0	140976	153625	0	Renewal Applied
60	T.NAGESWARA RAO	Road Metal	359	MALLAVARAM	Gokavaram	2	18-Oct-07	17-Oct-27	750	0	0	100000	102417	0	Renewal Applied
61	PRUDHVI GRANITES	Road Metal	546	MALLAVARAM	Gokavaram	2	2-Nov-07	6-Nov-17	0	0	0	0	200274	130000	Renewal Applied

62	M/S SWASTHIK METALS	Road Metal	359/7	MALLAVARAM	Gokavaram	0.575	24-Feb-15	23-Feb-25	0	0	0	0	84076	38557	
63	M/S SWASTHIK METALS	Road Metal	359/10	MALLAVARAM	Gokavaram	0.886	24-Feb-15	23-Feb-25	0	0	0	0	124775	59410	
64	Sri T. Venkata Reddy	Road Metal	1P	Thantikonda	Gokavaram	1	20-May-06	19-May-16	0	0	0	0	0	0	Expired/Determined
65	M/s Bharat Clays	China Clay (Crude)	102/3	JAGGAMPETA	Jaggampeta	2.023	7-Oct-97	10-Jun-37	1950	1500	0	97500	75084	0	
66	Alapati Bose	China Clay	144/A	Jaggampeta	Jaggampeta	1.012	21-May-19	20-May-39	0	0	100	0	0	18895	
67	Sri A.Bose	China Clay	121/2,3,4 and 5,,	JAGGAMPETA	Jaggampeta	0.619	16-Sep-99	15-Sep-19	0	0	0	0	0	0	Expired
68	Sri K.Srinivasa Rao	China Clay (Crude)	26	RAMAVARAM	Jaggampeta	0.882	18-Feb-00	17-Feb-20	4100	0	0	200000	0	0	Expired/Determined
69	M/s Jyothula Industries	China Clay (Crude)	21	RAMAVARAM	Jaggampeta	2.023	20-Nov-01	1-Sep-36	1800	1000	0	75000	50084	40460	
70	Sri D.V.V.Ramana Reddy	China Clay (Crude)	19-Feb	RAMAVARAM	Jaggampeta	0.607	20-Aug-98	19-Aug-18	4500	500	0	225000	28394	0	Expired/Determined
71	M/s Sri Sri Gowri Minerals	China Clay	456/4,458 /5,459/1 and 459/3,	Vengayammapuram	Jaggampeta	4.264	21-Jun-07	20-Jun-27	0	0	0	0	0	0	
72	M/s Gowri Shankar Mines	Fire Clay	536/P	KADIAM	Kadium	1.214	10-Jul-08	9-Jul-28	2170	2170	1730	108500	108550	97620	
73	Sri D. Subba rao	Fire Clay	533/1	KADIAM	Kadium	1.66	6-Jul-10	5-Jul-30	20	500	700	0	44803	10031	
74	Sri S.Sitharama Raju	Fire Clay	536/3	KADIAM	Kadium	2.233	22-Oct-96	21-Oct-18	20422	13201	0	1004595	676654	0	Renewal Applied
75	S.SEETHARAMA RAJU	Fireclay	536/1A	Kadium	Kadium	2.614	15-Dec-18	14-Dec-38	0	3700	21774	0	185108	1102762	
76	M/s Laxmi Ganeswara	Fireclay	531/P and	KADIAM	Kadium	0.809	25-Jun-03	24-Jun-23	0	0	0	0	0	0	Determined

	Clays		2P,												
77	Sri K.V.V.Satyanarayana Murthy	Gravel	135	Vemagiri	Kadium	2.218	25-Mar-13	24-Mar-18	0	0	0	0	0	0	Expired/De rmined
78	N.GANAPATHI RAO	Gravel	86/1	VEMAGIRI	Kadium	0.821	24-Feb-16	23-Feb-21	28500	4000	0	767840	120090	0	
79	PRATHIPADU HARIJANA QUARRY KARMIKA SANGAM	Road Metal	66/1Y	Jagapathinagaram	Kirlampudi	1	4-Dec-06	3-Dec-16	0	0	0	0	0	0	Expired/De rmined
80	PRATHIPADU HARIJANA QUARRY KARMIKA SANGAM	Building Stone	66/1Y	Jagapathinagaram	Kirlampudi	1	4-Dec-06	3-Dec-16	0	0	0	0	0	0	Expired/De rmined
81	Smt P.Santha Kumari	Building Stone	66/1Y	JAGAPATHINAGA RAM	Kirlampudi	0.5	#N/A	#N/A	0	0	0	0	0	0	Expired/De rmined
82	Sri T.Nooka Raju	Building Stone	66/1Y,	JAGAPATHINAGA RAM	Kirlampudi	1	7/19/2007	7/18/2017	0	0	0	0	0	0	Expired
83	M/s Sai Ram Building Stone	Building Stone	1	VELANKA	Kirlampudi	1	1-Mar-12	28-Feb-22	420	0	0	50000	50137	67055	
84	Smt A.Manga Devi	Road Metal	75/3A	BOLLEDDUPALEM	Korukonda	1	29-Mar-06	28-Mar-26	900	600	0	67500	50137	65000	
85	Sri K.P.C.S.Poojitha Rao	Road Metal	75/3A	Bolleddupalem	Korukonda	1	21-Aug-06	30-Mar-18	0	0	0	0	200137	0	Renewal applied
86	Sri Venturi Rama Gopal	Road Metal	75/3A	BOLLEDDUPALEM	Korukonda	1	6-Sep-12	5-Sep-22	0	0	0	0	0	0	
87	N.VEERAMMA	Gravel	75-3A	BOLLEDDUPALEM	Korukonda	0.976	10-Jan-20	9-Jan-30	0	0	2970	0	0	376940	
88	V VENKATA RAO	Road Metal	75-3A	Bolleddupalem	Korukonda	1	6-Mar-20	5-Mar-30	0	0	0	0	0	0	
89	K Veerababu	Gravel	7-2B	DWARAPUDI	Mandapeta	1.756	19-Feb-20	31-Aug-21	0	0	3000	0	0	87376	
90	Sri Vundamatla Narayana Rao	Gravel	80/2P	Kesavaram	Mandapeta	1.308	#N/A	#N/A	0	0	0	0	0	0	Expired/De rmined
91	K.SIVANNARAYANA	Gravel	79/1	KESAVARAM	Mandapeta	0.542	20-Feb-15	19-Feb-18	2200	0	0	47198	0	0	

92	K.MUNESWARA RAO	Gravel	69.P	KESAVARAM	Mandapeta	2.205	4-Nov-15	3-Nov-20	0	0	0	0	0	0	
93	K.LINGA DORAJI	Gravel	64 /2	KESAVARAM	Mandapeta	1.261	6-Nov-18	5-Nov-23	0	8300	9750	0	249139	325493	
94	U GOPI	Gravel	64 /2	Kesavaram	Mandapeta	1.59	11-Feb-20	31-Oct-21	0	0	11280	0	0	444000	
95	N.RAJESWARI	Gravel	103/1A7,1 A8,1A11,1A1 2	VEMULAPALLE at SEETAY	Mandapeta	1.62	13-Jul-15	12-Jul-17	0	0	0	0	0	0	Expired/Dete rmined
96	P.ESWARA REDDY	Gravel	103/A2/C	VEMULAPALLE at SEETAY	Mandapeta	1.619	25-Apr-16	24-Apr-21	0	0	0	0	0	0	
97	Smt. K.Suramma	Gravel	103/1A21 103/1A22 103/1A25	Vemulapalli	Mandapeta	2.023	19-Jul-18	18-Jul-23	0	15000	21000	0	450142	548858	
98	Sri Penmatsa Srinivasa Raju	Gravel	103/A-2C,	VEMULAPALLI	Mandapeta	1.456	11-05-2012	11-04-2017	0	0	0	0	0	0	Expired
99	Sri Rowthula Krishna	Gravel	103/A-2C,	VEMULAPALLI	Mandapeta	1.517	11-05-2012	3/13/2017	0	0	0	0	0	0	Expired
100	L.Ravi Kumar	Laterite	1/B,C,D,E, G,	ARJUNALOVA	Maredumilli	7.02	7-Dec-04	6-Dec-24	0	0	0	0	0	281184	
101	Smt G.Sumitra	Laterite	4/P,5/P and 8/P ,	CHAVIDIKOTA	Maredumilli	4.636	19-Dec-07	18-Dec-27	0	0	0	0	0	0	
102	Rajiv Tribal Quarry Labour Contract Co-Operative Society	Laterite (Metallurgical Grade)	37,38	MADDIVEEDU	Maredumilli	16.39	26-Oct-13	22-Oct-33	0	0	0	0	0	0	
103	Basavayya Minerals	Laterite	22,	VETUKURU	Maredumilli	2.98	10-Mar-03	9-Mar-23	0	0	0	0	0	0	
104	Sri G.Paramananda Rao	Laterite	15/1 16/1 2 and 3,17,	VETUKURU	Maredumilli	7.28	7/30/199 9	7/29/201 9	0	0	0	0	0	0	Determined
105	G.PADMAVATHI	Quartz	17/A 17/VU	Rangapuram	Nellipaka	1.25	27-Sep-05	26-Sep-25	1400	1000	1150	92478	75052	71948	
106	Sri Prathipati Surya Bhaskar	Gravel	897/3AP	PEDDAPURAM	Peddapuram	1.417	9-Jan-14	8-Jan-17	0	0	0	0	0	0	Expired/Dete

	Rao														rmined
107	K.VENKATA KRISHNA REDDY	Gravel	439	Peddapuram	Peddapuram	2.023	22-Jul-11	21-Jul-16	0	0	0	0	0	0	Expired/Determined
108	Sri Gunnam Surya Rao	Gravel	897/3AP	PEDDAPURAM	Peddapuram	2.024	9-Jan-14	8-Jan-17	0	0	0	0	0	0	
109	Sri Kanta Shankar	Gravel	897/3AP	PEDDAPURAM	Peddapuram	1.619	9-Jan-14	8-Jan-17	0	0	0	0	0	0	Expired/Determined
110	GUNNAM.RANGA RAO	Gravel	70/1AP	Peddapuram	Peddapuram	1.619	14-Mar-14	13-Mar-16	0	0	0	0	0	0	Expired/Determined
111	K.SRIMANNARAYANA	Gravel	900	Peddapuram	Peddapuram	1.149	20-Jan-15	10-Nov-16	0	0	0	0	0	0	Expired/Determined
112	CH.TULASIDAS	Gravel	207/3,4,5,6	PEDDAPURAM	Peddapuram	1.821	9-Feb-15	22-Jan-17	0	0	0	0	0	0	Expired/Determined
113	CH.RAMESH	Gravel	207/1,2	PEDDAPURAM	Peddapuram	2.023	9-Feb-15	22-Jan-17	0	0	0	0	0	0	Expired/Determined
114	P.PAPARAO	Gravel	207/7,8	PEDDAPURAM	Peddapuram	4.56	7-Apr-15	31-Mar-18	0	0	0	0	0	0	Expired/Determined
115	K.Seshagiri Rao	Gravel	899/1C	PEDDAPURAM	Peddapuram	0.809	13-Jul-15	3-Mar-18	0	0	0	0	0	0	Expired/Determined
116	M/S. PAVANAPUTHRA PROJECTS	Gravel	898/11	PEDDAPURAM	Peddapuram	1.149	30-Jul-15	29-Jul-20	7500	7500	0	359000	90000	0	
117	N.SATHI BABU	Gravel	901/1C	PEDDAPURAM	Peddapuram	0.607	18-Nov-15	19-May-17	0	0	0	0	0	0	Expired/Determined
118	G.V.V.RAMA RAO	Gravel	212/2F,2G,2H,2I	Peddapuram	Peddapuram	0.712	31-Aug-19	30-Aug-21	0	0	8900	0	0	281244	
119	SRI SATYA MINING AND MULTIPURPOSE	Gravel	1/2,1/3,1/4,1/5,2/3,	RAMESWARAM	Peddapuram	2.99	11-Jun-15	10-Jun-20	3986	0	0	239200	0	0	

	MUTUALLY AIDED CO OPERATIVE SOCIETY LIMIT		2/4												
120	SRI SATYA MINING AND MULTIPURPOSE MUTUALLY AIDED CO OPERATIVE SOCIETY LIMIT	Gravel	2/2,3/2,3 /4,3/5 4/1	RAMESWARAM	Peddapuram	2.15	3-Aug-15	2-Aug-20							
									10066	0	0	301980	86000	0	
121	M/S.SRI SATYA MINING and MULTIPURPOSE MUTUALLY AIDED CO- OPERATIVE SOCIETY LIMITED	Gravel	23/3,23/5 ,23/6,23/ 9,24/2,24 /6,	RAMESWARAM	Peddapuram	4.35	16-Jul-15	15-Jul-20							
									8000	17400	0	66000	522000	0	
122	M/s.SRI SATYA MINING and MULTIPURPOSE MUTUALLY AIDED CO-OP SOCIETY LIMITED	Gravel	6/1,6/2,6 /6,6/8	RAMESWARAM	Peddapuram	2.18	26-Aug-15	25-Aug-20							
									2900	0	0	87200	0	0	
123	SRI SATYA MINING AND MULTIPURPOSE MUTUALLY AIDED CO OPERATIVE SOCIETY LIMIT	Gravel	7/1,8/1,8/ 3	RAMESWARAM	Peddapuram	1.619	26-Aug-15	25-Aug-20							
									2158	0	0	129520	0	0	
124	SRI SATYA MINING AND MULTIPURPOSE MUTUALLY AIDED CO OPERATIVE SOCIETY	Gravel	12-Feb	RAMESWARAM	Peddapuram	0.526	26-Aug-15	25-Aug-20							
									0	0	0	42080	0	0	

	LIMIT														
125	M/s. SRI SATYA MINING and MULTIPURPOSE MUTUALLY AIDED CO-OP SOCIETY LIMITED	Gravel	6/4,6/9	RAMESWARAM	Peddapuram	0.315	26-Aug-15	25-Aug-20	0	0	0	25200	0	0	
126	SRI SATYA MINING AND MULTIPURPOSE MUTUALLY AIDED CO OPERATIVE SOCIETY LIMIT	Gravel	10/1,10/3, 10/4,10/5, 10/6,10/7,	RAMESWARAM	Peddapuram	6.475	26-Aug-15	25-Aug-20	0	0	0	0	517970	0	
127	SRI SATYA MINING AND MULTIPURPOSE MUTUALLY AIDED CO OPERATIVE SOCIETY LIMIT	Gravel	11/1, 12/3	RAMESWARAM	Peddapuram	1.052	26-Aug-15	25-Aug-20	0	0	0	0	84160	0	
128	SRI SATYA MINING AND MULTIPURPOSE MUTUALLY AIDED CO OPERATIVE SOCIETY LIMIT	Gravel	04-Mar	Rameswaram	Peddapuram	0.223	26-Aug-15	25-Aug-20	0	0	0	17840	0	0	
129	SRI SATYA MINING AND MULTIPURPOSE MUTUALLY AIDED CO OPERATIVE SOCIETY LIMIT	Gravel	08-Feb	RAMESWARAM	Peddapuram	0.546	26-Aug-15	20-Aug-20	10828	0	0	346680	0	0	

130	M/S.SRI SAI VENKATA VIGNESH MULTI PURPOSE AND LABOUR CONTRACT MUTUALLY AIDED CO-OPERATIVE SOCIETY LTD	Gravel	15-May	RAMESWARAM	Peddapuram	0.546	26-Nov-15	25-Nov-17								720	0	0	0	0	0	Expired/Determimed
131	M/S.SRI SAI VENKATA VIGNESH MULTI PURPOSE and LABOUR CONTRACT MUTUALLY AIDED CO-OPERATIVE SOCIETY LTD	Gravel	13/3 14/4	RAMESWARAM	Peddapuram	1.093	26-Nov-15	25-Nov-17								0	0	0	0	0	0	Expired/Determimed
132	M/S.SRI SAI VENKATA VIGNESH MULTI PURPOSE and LABOUR CONTRACT MUTUALLY AIDED CO-OPERATIVE SOCIETY LTD	Gravel	14/3,6,21/ 1 AND 22/2,3	RAMESWARAM	Peddapuram	2.566	26-Nov-15	25-Nov-17								3420	0	0	0	0	0	Expired/Determimed
133	M/S.SRI SAI VENKATA VIGNESH MULTI PURPOSE and LABOUR CONTRACT MUTUALLY AIDED CO-OPERATIVE SOCIETY LTD	Gravel	24/3,24/5	RAMESWARAM	Peddapuram	0.985	26-Nov-15	25-Nov-17								1320	0	0	0	0	0	Expired/Determimed
134	SRI SATYA MINING AND MULTIPURPOSE MUTUALLY AIDED CO OPERATIVE SOCIETY LIMIT	Gravel	5/3,8/4 ,8/6	RAMESWARAM	Peddapuram	1.307	21-Dec-15	20-Dec-20								1742	0	0	104560	0	0	

135	M/S.SRI SATYA MINING and MULTIPURPOSE MUTUALLY AIDED CO-OPERATIVE SOCIETY LIMITED	Gravel	13/5, 14/1, 14/2	RAMESWARAM	Peddapuram	1.618	21-Dec-15	20-Dec-20	2160	6657	0	64720	134990	0	
136	SRI SATYA MINING AND MULTIPURPOSE MUTUALLY AIDED CO OPERATIVE SOCIETY LIMIT	Gravel	9/1,9/2,9 /5,9/6,9/7	RAMESWARAM	Peddapuram	2.76	21-Dec-15	20-Dec-20	0	0	0	0	220800	0	
137	M/s.Sri Satya Mining and Multipurpose Mutually Aided Co-Operative Society Limited	Gravel	20/2,	RAMESWARAM	Peddapuram	0.546	26-Aug-15	25-Aug-20	0	728	0	0	45354	0	Determined
138	M/s.Sri Satya Mining and Multipurpose Mutually Aided Co-Operative Society Limited	Gravel	6/1 6/2 6/6 6/8 ,	RAMESWARAM	Peddapuram	5.446	26-Aug-15	25-Aug-20	0	21471	0	0	404990	0	Determined
139	M/s.Sri Satya Mining and Multipurpose Mutually Aided Co-Operative Society Limited	Gravel	1/2 1/3 1/4 etc,10/1 10/3 10/4 etc,	RAMESWARAM	Peddapuram	19.65	11-Jun-15	10-Jun-20	0	27612	0	0	0	0	Expired
140	G.SATYANARAYANA	Gravel	473/3	RAYABHUPALAPA TNAM	Peddapuram	0.4	25-Apr-16	24-Apr-21	3000	0	0	74000	0	0	
141	M/s Murali Krishna Stone	Road Metal	53	CHINA	Prathipadu	0.809	28-Apr-07	27-Apr-22	540	1740	800	0	171061	23939	

	Crusher			SANKARLAPUDI											
142	M/s Murali Krishna Stone Crusher	Road Metal	53	CHINA SANKARLAPUDI	Prathipadu	1.902	28-Apr-07	27-Apr-22	1267	1698	1319	95120	127610	12548	
143	M.SREENIVASA RAO	Road Metal	53	China sankarlapudi	Prathipadu	13.59	20-Nov-09	19-Nov-19	6660	78051	164200	679500	5855687	11633638	
144	M.SREENIVASA RAO	Boulders	53	China sankarlapudi	Prathipadu	13.59	20-Nov-09	19-Nov-19	2400	0	0	0	0	0	
145	PKR PROJECTS AND ENGINEERS	Road Metal	53	CHINA SANKARLAPUDI	Prathipadu	0.95	27-Apr-10	1-Jul-27	1620	3000	0	118303	225130	61749	
146	PKR PROJECTS AND ENGINEERS	Road Metal	53	CHINA SANKARLAPUDI	Prathipadu	2.645	10-Mar-11	9-Mar-21	27636	59580	56724	2072265	4471113	4647837	
147	PKR PROJECTS AND ENGINEERS	Road Metal	53	CHINA SANKARLAPUDI	Prathipadu	1	10-Mar-11	15-Apr-21	5400	24348	27960	403434	1826237	2238529	
148	PKR PROJECTS AND ENGINEERS	Road Metal	53	CHINA SANKARLAPUDI	Prathipadu	6	25-Aug-12	24-Aug-22	50040	50520	0	3748100	3789822	390000	
149	PKR PROJECTS AND ENGINEERS	Road Metal	53	CHINA SANKARLAPUDI	Prathipadu	1.376	18-Jun-12	17-Jun-22	6492	4600	0	480567	435789	89440	
150	M/s Murali Krishna Stone Crusher	Road Metal	53	CHINA SANKARLAPUDI	Prathipadu	0.404	28-Aug-12	27-Aug-27	268	270	0	20268	20306	0	
151	M/s Murali Krishna Stone Crusher	Road Metal	53	CHINA SANKARLAPUDI	Prathipadu	0.09	28-Aug-12	27-Aug-27	60	210	0	4500	15763	0	
152	M/s Murali Krishna Stone Crusher	Road Metal	53	CHINA SANKARLAPUDI	Prathipadu	0.87	28-Aug-12	27-Aug-27	580	565	0	43500	43620	0	
153	Sri Chakkapalli Suryanarayana	Road Metal	53	CHINA SANKARLAPUDI	Prathipadu	0.49	9-Jul-12	8-Jul-22	0	0	0	24495	24568	0	
154	Sri G.Lakshmana Rao	Road Metal	53	CHINA SANKARLAPUDI	Prathipadu	0.809	1-Mar-13	28-Feb-23	938	0	0	59	80996	0	
155	Smt Ch. Annapurna	Road Metal	53	CHINA	Prathipadu	0.75	#N/A	#N/A	0	0	0	0	0	0	Expired/Dete

				SANKARLAPUDI											mined
156	M.SATHI REDDY	Road Metal	61/9 10 11 12 69/1 2 3 4,	CHINA SANKARLAPUDI	Prathipadu	1.693	16-Dec-14	15-Dec-24	0	0	0	0	270226	0	
157	Sri M. China Manga Rao	Road Metal	53,	CHINA SANKARLAPUDI	Prathipadu	14	30-Jun-09	29-Jun-19	0	0	0	0	0	0	Determined
158	M/s Maheswari Minerals	Laterite (Cement)	1	Chintaluru	Prathipadu	24.281	28-Mar-07	27-Mar-27	0	0	0	0	0	0	
159	S.Lakshmana Reddy	Laterite	1,	CHINTALURU	Prathipadu	51.86	3/28/200 7	3/27/202 7	0	0	0	0	0	0	Determined
160	T.Gangadhara Reddy	Laterite	1,	CHINTALURU	Prathipadu	4.795	3/28/200 7	3/27/202 7	0	0	0	0	0	0	Determined
161	M/s Coral Mineral Product Ltd	China Clay (Crude)	419	DHARMAVARAM	Prathipadu	1.597	1-Feb-08	31-Jan-28	600	300	600	9881	24021	38919	
162	M/s Parameswari Minerals	Laterite	262/2,,	GAJJANAPUDI	Prathipadu	7.118	5/24/199 7	5/23/201 7	0	0	0	0	0	0	Determined
163	Sri Andru Srinivas	Laterite (Cement)	703	GIRIJANAPURAM	Prathipadu	10	7-Dec-13	3-Dec-33	85000	100000	10000	3508500 0	3950548	1010000	
164	Sri Andru Srinivas	Laterite (Metallurgical Grade)	703	GIRIJANAPURAM	Prathipadu	10	7-Dec-13	3-Dec-33	175000	20000	0	0	0	0	
165	Smt Manyam Venkata Rajani	Laterite (Cement)	703	GIRIJANAPURAM	Prathipadu	10	7-Dec-13	3-Dec-33	45000	69500	10000	1820000 0	6538048	1010000	
166	Smt Manyam Venkata Rajani	Laterite (Metallurgical Grade)	703	GIRIJANAPURAM	Prathipadu	10	7-Dec-13	3-Dec-33	105000	20000	0	0	0	0	

167	Smt Andru Sujatha	Laterite (Cement)	7,03,589	GIRIJANAPURAM	Prathipadu	10	4-Dec-13	3-Dec-33	130000	190000	0	3395000 0	2025000 0	0	
168	Smt Andru Sujatha	Laterite (Metallurgical Grade)	7,03,589	GIRIJANAPURAM	Prathipadu	10	4-Dec-13	3-Dec-33	90000	110000	0	0	0	0	
169	Sri M.Venkateswara Rao	Laterite (Cement)	7,03,589	GIRIJANAPURAM	Prathipadu	10	4-Dec-13	3-Dec-33	195000	125000	40000	4857500 0	1257554 8	260000	
170	Sri M.Venkateswara Rao	Laterite (Metallurgical Grade)	7,03,589	GIRIJANAPURAM	Prathipadu	10	4-Dec-13	3-Dec-33	235000	40000	0	0	0	0	
171	Sri Vempati Veerraju	Laterite (Cement)	703	GIRIJANAPURAM	Prathipadu	10	4-Dec-13	3-Dec-33	45000	69500	5000	1482500 0	6163048	635000	
172	Sri Vempati Veerraju	Laterite (Metallurgical Grade)	703	GIRIJANAPURAM	Prathipadu	10	4-Dec-13	3-Dec-33	80000	10000	0	0	0	0	
173	Andru Ramesh Babu	Laterite (Cement)	7,03,589	GIRIJANAPURAM	Prathipadu	10	4-Dec-13	3-Dec-33	150000	240000	177500	4370000 0	2832554 8	11510000	
174	Andru Ramesh Babu	Laterite (Metallurgical Grade)	7,03,589	GIRIJANAPURAM	Prathipadu	10	4-Dec-13	3-Dec-33	170000	90000	0	0	0	0	
175	Sri Ch.Suryanarayana	Road Metal	160	PEDA SANKARLAPUDI	Prathipadu	1.25	12-Nov-02	11-Nov-17	0	0	0	0	0	0	Renewal applied
176	Sri Murali Krishna Constructions	Road Metal	160	PEDA SANKARLAPUDI	Prathipadu	0.809	1-Mar-13	27-Apr-23	541	539	0	40507	40560	0	Renewal Applied
177	Sri Chakkapalli Laxman Rao	Road Metal	160/1,	PEDA SANKARLAPUDI	Prathipadu	1	3-Jan-07	2-Jan-17	0	0	0	0	0	0	Renewal Applied

178	Sri G. Laxman Rao	Gravel	80	PRATHIPADU	Prathipadu	3	9-Jan-09	8-Jan-19	5000	0	0	12	150000	150411	Renewal Applied
179	M/s Aurelia Laterite Mining pvt Ltd	Laterite (Cement)	USHP	VANTHADA	Prathipadu	67.599	21-Feb-14	16-Sep-28	0	0	0	0	0	0	
180	Smt Kude Laxmi	Laterite (Metallurgical Grade)	7/1,7/2,10 /P,11/P,12 /P,16,17/P	VANTHADA	Prathipadu	10.417	13-May-14	12-May-34	221300	183588	105600	2019750	1960077	7711163	
181	Smt Kude Laxmi	Laterite (Cement)	7/1,7/2,10 /P,11/P,12 /P,16,17/P	VANTHADA	Prathipadu	10.417	13-May-14	12-May-34	24000	38874	0	0	0	0	
182	Sri Ulli Venkata Ramana	Laterite	9/1,9/3,26 /1,26/2 and 27/2,	VANTHADA	Prathipadu	4.447	4-Dec-08	3-Dec-28	0	0	0	0	0	0	
183	S.SOBHAN BABU	Laterite	10/P, 11/P, 12/P, 13/1 and 2, 14/P, 15/1 and 2P, 17/P, 18/1,2,3B and C,	VANTHADA	Prathipadu	12.399	05-07-2004	05-06-2024	0	0	0	0	0	0	Determined
184	Sri S.Soban Babu	Laterite	19/1,2,3; 22,23/4B, 5 and 24 ,	VANTHADA	Prathipadu	4.434	05-07-2004	05-06-2024	0	0	0	0	0	0	Determined
185	Sri K.Ratna Kumar	Fireclay	40/2,	BOMMURU	Rajahmundry	2.023	22-Aug-99	21-Aug-19	0	0	0	0	0	0	Expired

					Rural										
186	Sri M.V.S.Prasad	Fireclay	167/1P,	BOMMURU	Rajahmundry Rural	0.809	3-Dec-99	2-Dec-19	0	0	0	0	0	0	Determined
187	Sri V.S.N Murthy	Fireclay	251/1,367 /3,379/3,	DOWLESWARAM	Rajahmundry Rural	4.388	14-Aug-98	13-Aug-18	0	0	0	0	0	0	
188	Sri S.Veera Reddy	Gravel	250,	DOWLESWARAM	Rajahmundry Rural	3.634	2-Jun-05	1-Jun-15	0	0	0	0	0	0	Renewal Applied
189	PIDIKITI SRIDEVI	Gravel	98	Morampudi	Rajahmundry Rural	6.791	22-Sep-18	21-Sep-23	0	200	0	0	0	154054	
190	Sri Ch.Suresh	Fire Clay	42	Bommuru(u)	Rajamahendravaram(R)	4.856	30-Jul-99	29-Jul-19	0	0	0	0	0	0	
191	Sri S.Veera Reddy	Fire Clay	250	DOWLESWARAM(U)	Rajamahendravaram(R)	8.672	8-Jan-99	7-Jan-19	0	0	0	0	260160	0	
192	Sri K.Nagaiah	Road Metal	770	KOLAMURU	Rajamahendravaram(R)	0.76	1-Nov-06	31-Oct-16	0	0	0	0	0	0	Renewal applied
193	Sri K.Suresh Kumar	Road Metal	689/3	KOLAMURU	Rajamahendravaram(R)	1.214	19-Jan-17	18-Jan-17	0	0	0	0	0	0	Expired/Determined
194	Sri I. Anil Kumar	Road Metal	771/2P	KOLAMURU	Rajamahendravaram(R)	0.668	19-Nov-08	18-Nov-18	3300	900	0	247400	34100	0	
195	M/s Ch.Veerraju Associates	Road Metal	434,436/1, 2,742/742 /4C1,743/2AP,	KOLAMURU	Rajamahendravaram(R)	10.08	15-Dec-08	14-Dec-23	0	0	0	0	0	0	Surrender is under process
196	M/s Ch. Veerraju and Co.,	Road Metal	689/7A, 690/1C,690/2A,690/	KOLAMURU	Rajamahendravaram(R)	1.842	15-Dec-08	14-Dec-23	1260	25200	118200	94600	1890253	9180377	

			2B,690/2C												
197	M/s SriHari Metal Suppliers	Road Metal	147/1C	RAJAHMUNDRY (PART)	Rajamahendravaram(R)	1.82	16-Sep-05	15-Sep-20	1200	900	0	90850	0	0	
198	Sri B.Satyanarayana	Road Metal	771/1, 791/1A	RAJAHMUNDRY (PART)	Rajamahendravaram(R)	1.14	3-Jul-07	27-Aug-16	0	0	0	0	0	0	Expired/Determined
199	Sri Satyanarayana Granites	Road Metal	270/2,689/6	RAJAHMUNDRY (PART)	Rajamahendravaram(R)	1.942	14-Feb-08	13-Feb-28	0	1110	0	0	194454	0	
200	M.KRISHNA RAO	Gravel	509/3	RAJAHMUNDRY (PART)	Rajamahendravaram(R)	0.506	30-Jul-14	29-Jul-16	0	0	0	0	0	0	Expired/Determined
201	Sri Ch.Suresh	Fire Clay	106/4B,107/3,154/1,2	BHUPALAPATNAM	Rajanagaram	1.04	22-Nov-04	21-Nov-24	250	150	200	0	1243	20800	
202	M/S JSR CLAY MINES	Fire Clay	156/1AP	BHUPALAPATNAM	Rajanagaram	1.612	14-May-10	13-May-30	155	90	250	46820	0	24247	
203	Sri Sairam Clay Mine	Fireclay	105/1,	BHUPALAPATNAM	Rajanagaram	1.089	17-Jul-00	16-Jul-20	0	0	0	0	0	0	Expired
204	Sri Ch.Suresh	Fireclay	167/1,,	BHUPALAPATNAM	Rajanagaram	1.028	14-Aug-00	13-Aug-20	0	0	0	0	0	0	Expired
205	M/s Jetty Brothers	Fireclay	103,104,158,159/1 to 5,160/1TO 5,161,162,163,	BHUPALAPATNAM	Rajanagaram	14.4	30-Mar-05	29-Mar-25	0	0	0	0	0	0	Determined
206	P.ADI CHANDRA SEKHAR	Gravel	330/6G	G. YERRAMPALEM	Rajanagaram	1.469	2-Feb-12	1-Feb-17	0	0	0	0	0	0	
207	Sri T.Gangadhara Reddy	Fireclay	330/1A,1B,	G.Yerrampalem, Pathatungapadu	Rajanagaram	3.443	3-Feb-03	2-Feb-23	0	0	0	0	0	0	
208	M/s Sangham Minerals	Gravel	35/3	KONDA GUNTURU	Rajanagaram	2	12-Jun-05	11-Jun-25	22200	13300	0	666000	399220	0	

209	Sri U.Ganga Raju	Gravel	629/10	KONDA GUNTURU	Rajanagaram	1.477	27-Apr-10	26-Apr-20	3600	0	0	30800	0	0	
210	Sri Challa Siva Subrahmanyam	Gravel	648/1 and 648/2	Konda gunturu	Rajanagaram	3.72	3-Jul-13	2-Jul-18	0	0	0	0	0	0	
211	Sri K.V.V.Satyanarayana Murthy	Gravel	647/P	Konda gunturu	Rajanagaram	1.105	8-Nov-13	7-Nov-18	0	0	0	0	0	0	
212	Sri Allampalli Venkata Kishore	Gravel	647/P	Konda gunturu	Rajanagaram	0.648	8-Nov-13	7-Nov-18	0	0	0	0	0	0	
213	A.VENKATA KISHORE	Gravel	647/2	Konda gunturu	Rajanagaram	2.023	9-Jun-15	16-Jul-18	0	0	0	80920	80920	0	Renewal Applied
214	M/s Sangam Minerals	Fire Clay	35/3	KONDA GUNTURU	Rajanagaram	13.967	12-Jun-05	11-Jun-25	5785	6500	7100	289250	325766	363964	
215	S.VENKATA REDDY	Fireclay	148,	MUKKINADA	Rajanagaram	3.044	6-Jun-02	5-Jun-22	0	0	0	0	0	0	Determined
216	Sri Kusu Muneswar Rao	Gravel	183/4B	Namavaram	Rajanagaram	0.777	20-Dec-13	19-Dec-16	0	600	0	0	61560	0	Renewal applied
217	SREE SAI CHAITANYA and CO	Ordinary Earth	348	PALACHARLA	Rajanagaram	0.81	31-Oct-06	31-May-18	5980	1500	0	179400	108111	30150	Renewal applied
218	SREE SAI CHAITANYA and CO	Gravel	348	PALACHARLA	Rajanagaram	0.81	31-Oct-06	31-May-18	0	1500	0	0	0	30150	Renewal applied
219	Smt M. Lalitha Kumari	Road Metal	424/2P,425/2P	PALACHARLA	Rajanagaram	2.81	6-Jul-09	29-Aug-24	0	0	0	0	0	0	
220	Sri Venkateswara Metals	Road Metal	424/2P and 430	PALACHARLA	Rajanagaram	1.74	28-Apr-10	27-Apr-20	3900	6600	7200	292500	495239	574861	Renewal Applied
221	M/s Ratna Granites	Road Metal	429/2P,3P,49,432	PALACHARLA	Rajanagaram	6.433	11-Feb-10	10-Feb-25	11700	11700	8100	877650	878382	713103	
222	M/s Ratna Granites	Road Metal	429/2P	PALACHARLA	Rajanagaram	1.571	17-Apr-11	16-Apr-26	1500	1200	1500	112550	90216	135849	
223	M/s Ch.Veerraju and Co.,	Road Metal	427/1,2P,3,428/1,2,4	PALACHARLA	Rajanagaram	24.072	10-May-12	9-May-27	16044	46200	16500	1203500	3468298	1662745	

			29/4P,358 /1,2,359,3 6													
224	M/s Ch.Veerraju and Co.,	Road Metal	346,347,3 48/P,419,4 20/P,420/ 1P420/2,3, 42	PALACHARLA	Rajanagaram	19.429	10-Oct-12	9-Oct-27		63000	21000	0	4724950	1577662	0	
225	M/s Ch.Veerraju and Co.,	Road Metal	418,333/1 P,354/1,35 4/2P,355/ P,356/1,35 7/	PALACHARLA	Rajanagaram	24.253	22-May-12	21-May-27		16164	11700	0	1212650	1215973	0	
226	M/s Ch. Veerraju and others	Road Metal	269/3,4,2 70/3,4,5,3 43/1P343 /2P,344,3 45,3	PALACHARLA	Rajanagaram	24.156	22-May-12	21-May-27		16104	13200	0	1207450	1211110	0	
227	Sri Medapati Veera Raghava Reddy	Road Metal	424/2P,42 9/1P	PALACHARLA	Rajanagaram	0.887	30-Oct-12	29-Oct-22		1695	5900	0	126975	442622	57655	
228	CH VEERRAJU and CO	Road Metal	424/2P,42 5/1,2P,426 /1	PALACHARLA	Rajanagaram	3.7	6-Sep-14	5-Sep-29		64200	33000	0	4815000	2475507	0	
229	M.SURESH KUMAR	Fire Clay	534	PATHA THUNGAPADU	Rajanagaram	2.326	7-Aug-13	6-Aug-33		0	0	0	0	0	0	
230	M/s Godavari Mining Corp.	Fireclay	166/1,2,	PUNYAKSHETRA	Rajanagaram	0.728	13-Apr-99	12-Apr-19		0	0	0	0	0	0	Expired

				M											
231	Sri K.Balaramakrishna	Road Metal	125/1, 148	RAJANAGARAM	Rajanagaram	2.748	24-Jul-06	23-Jul-16	0	0	0	0	0	0	Expired/Determined
232	Smt K.Ganga Bhavani	Road Metal	126,146P	RAJANAGARAM	Rajanagaram	3.16	31-May-10	30-May-20	0	0	0	0	0	0	
233	Venkata Krishna Metal Crusher	Road Metal	13/P, 141/P, 144/P, 145/P, 146/P, 150/P	RAJANAGARAM	Rajanagaram	7.294	10-Feb-14	9-Feb-29	1600	61400	0	3985700	5737300	0	
234	Venkata Krishna Metal Crusher	Ordinary Earth	13/P, 141/P, 144/P, 145/P, 146/P, 150/P	RAJANAGARAM	Rajanagaram	7.294	10-Feb-14	9-Feb-29	52500	1150	0	0	0	0	
235	M/s Venkateswara Granites	Road Metal	258/8,9	RAJANAGARAM	Rajanagaram	5.103	22-Jul-14	21-Jul-29	12450	7800	0	995550	747700	331695	
236	M/s Venkateswara Granites	Ordinary Earth	258/8,9	RAJANAGARAM	Rajanagaram	5.103	22-Jul-14	21-Jul-29	2055	5400	0	0	0	0	
237	Sri P.Venkateswara Rao	Fire Clay	130/4A	Rajanagaram	Rajanagaram	0.453	11-Dec-00	10-Dec-20	0	0	0	0	0	0	
238	CHUPPARAPALEM GIRIJANA QUARRY WORKERS LABOUR CONTRACT CO-OPERATIVE SOCIETY LTD	Color Granite-Leptinites	37/1,70/2,72	CHUPPARIPALEM	Rampachoda varam	3.93	15-Sep-11	14-Sep-31	0	0	698.972	393000	335551	1783207	

239	Sri Parada Venkanna Dora	Road Metal	58	K.YERRAMPALEM	Rampachoda varam	0.5	28-Oct-14	27-Oct-24	0	0	0	0	0	0	
240	A.P.TRIBAL MINING COMPANY(P)LTD	Road Metal	105	NARASAPURAM	Rampachoda varam	3	19-Aug-08	18-Aug-18	0	0	0	0	0	0	
241	Ambati Chamundeswara Rao	Gravel	410/1, 410/11	G. donthamuru	Rangampeta	4.451	4-Apr-14	3-Apr-19	0	39000	0	0	1696793	0	
242	K.RAMA CHANDRA REDDY	Gravel	409/1,409 /2,409/3, 409/4P,40 9/5	G. DONTAMURU	Rangampeta	1.255	5-Mar-16	17-Nov-18	0	0	0	0	0	0	
243	T.CHIRANJEEVI RAO	Gravel	259	G. DONTAMURU	Rangampeta	3.035	18-Jun-16	12-Jul-20	22800	4500	0	683800	13600	0	
244	S.SATYANARAYANA REDDY	Gravel	410/7	G. donthamuru	Rangampeta	2.023	25-Jan-18	18-Sep-21	3800	21000	1500	127500	616722	105196	
245	T.SURYA PRAKASHA RAO	Gravel	259	G. donthamuru	Rangampeta	2.984	7-Feb-18	12-Jul-20	0	63150	24420	0	1912160	612912	
246	V.VEERRAJU	Gravel	209/7,209 /8,209/9	G. DONTAMURU	Rangampeta	2.485	31-Aug-19	02-Sep-21	0	0	50355	0	0	1657245	
247	M.SATYA NARESH	Gravel	178/3B	Nallamilli	Rangampeta	1.926	3-Jan-18	2-Jan-23	8100	22064	22064	240040	662132	698755	
248	K.CHAKRAVARTHI	Gravel	178/3A	Nallamilli	Rangampeta	1.926	1-Feb-18	31-Jan-23	2660	25470	21225	85840	755312	685525	
249	K.ANIL SRIKANTH REDDY	Gravel	182	Singampalle	Rangampeta	1.019	1-Feb-18	31-Jan-21	750	7500	18105	0	247612	502278	
250	P.ABBULU	Gravel	167/3	Veerampalem	Rangampeta	1.619	7-Jan-15	13-Aug-17	0	0	0	0	0	0	
251	PRABHU WELFARE SOCIETY	Gravel	137/4,137 /7	Veerampalem	Rangampeta	3.153	26-Feb-18	25-Feb-23	0	59134	61621	11748	1774395	1910809	
252	V S R K S NAGA BUSHANA RAO	Road Metal	1/1D and 1/1C	Anantaram	Rowthulapudi	1.683	15-Dec-18	19-Sep-26	0	1100	1700	0	0	125850	
253	Sri J.Srinivasa Rao	Road Metal	1	China Mallapuram	Rowthulapudi	18	29-Dec-07	28-Dec-17	500000	0	0	2775000 1	1802466	1170000	Renewal applied

254	P.CHINA RAMI REDDY	Road Metal	44	Jaldam	Rowthulapudi	4.5	1-May-15	30-Apr-25	0	0	0	0	450617	0	
255	Surya Stone Crusher	Road Metal	1	Mulagapudi	Rowthulapudi	1	14-Oct-01	13-Oct-27	300	450	0	50000	50137	65000	Renewal Applied
256	Sri M.Murali Krishna	Road Metal	1	Mulagapudi	Rowthulapudi	3	6-May-07	6-Apr-17	1000	0	0	0	0	0	Expired/Determined
257	Sri K. Aruna Kumar	Road Metal	1	Mulagapudi	Rowthulapudi	1.5	31-Oct-11	30-Oct-21	1000	3350	4000	74975	251456	367294	
258	K.SATISH KUMAR	Road Metal	1	Mulagapudi	Rowthulapudi	1	7-Jul-15	6-Jul-25	0	900	0	50000	45137	82500	
259	S.V.PRASADA REDDY	Road Metal	1	Mulagapudi	Rowthulapudi	4	19-Jun-15	18-Jun-25	150	0	0	0	400548	0	
260	AMR INDIA LIMITED	Road Metal	1	Mulagapudi	Rowthulapudi	1	1-Apr-08	4-Jun-17	0	0	0	0	0	0	Expired/Determined
261	KAKINADA SEZ PRIVATE LIMITED	Road Metal	1	Mulagapudi	Rowthulapudi	50	2-Dec-13	1-Dec-23	0	0	0	2500000	2506850	3249999	
262	N.LEELA PRASAD	Road Metal	1,,	Mulagapudi	Rowthulapudi	2	27-Jul-15	18-Jun-25	0	0	0	0	0	0	Determined
263	Sri Y. V Rama Krishna Rao	Road Metal	158	Raghavapatnam	Rowthulapudi	7	7-Jul-09	6-Jul-19	500	0	0	0	0	0	
264	S.V.PRASADA REDDY	Road Metal	158	Raghavapatnam	Rowthulapudi	2	7-Jul-09	6-Jul-19	150	0	0	0	200274	0	Renewal Applied
265	M/s Silicon Rocs	Colour Granite (Others)	135	Raghavapatnam	Rowthulapudi	4.6	30-Dec-11	13-Nov-26							
266	M/s Pioneer Builders	Road Metal	81/2	S. pydipala	Rowthulapudi	1	24-Oct-15	23-Oct-25	0	0	0	0	0	0	
267	M/s Sidhvi Infrastructures Project Ltd	Road Metal	15	S. Pydipala	Rowthulapudi	2.12	24-Apr-07	27-Apr-22	10140	12924	21420	760350	969591	1678329	
268	M/s Sidhvi Infrastructures Project Ltd	Road Metal	15	S. Pydipala	Rowthulapudi	1.2	28-Apr-07	27-Apr-22	7670	7992	17508	573750	599565	1344075	
269	M/s Sidhvi Infrastructures Project Ltd	Road Metal	15	S. Pydipala	Rowthulapudi	0.85	28-Apr-07	27-Apr-22	6864	5844	10356	514017	438417	816408	

270	Ms Srinivasa Stone Crushers	Road Metal	15	S. pydipala	Rowthulapudi	1	2-Jul-09	1-Jul-24	0	0	0	0	9270	0	
271	Sri K.Sridhar Naidu	Road Metal	15	S. pydipala	Rowthulapudi	5	7-Jul-11	6-Jul-21	0	0	0	0	0	0	
272	Sri P. Sri Rama Krishna	Road Metal	15	S. Pydipala	Rowthulapudi	1	3-Jan-12	2-Jan-22	600	0	0	50000	50000	0	
273	Smt G. Vara Laxmi	Road Metal	15	S. Pydipala	Rowthulapudi	1.5	21-Mar-12	20-Mar-22	1000	600	1400	75000	75206	74794	
274	MADDUKURI SIVARAMA KRISHNA	Road Metal	15	S. Pydipala	Rowthulapudi	2.5	16-Jul-15	15-Jul-25	0	0	0	0	0	0	
275	Ravi Babu VS Peddireddi	Road Metal	15	S. pydipala	Rowthulapudi	0.7	28-Apr-07	27-Apr-22	4552	6216	10896	341400	466296	849204	
276	Smt A. Sailaja	Road Metal	15,	S. Pydipala	Rowthulapudi	0.5	27-Jun-09	26-Jun-19	0	300	0	0	53929	0	Renewal Applied
277	Sri G.Laxmana Murthy	Road Metal	90	Tirupatammmapeta	Rowthulapudi	1	19-Jul-05	18-Jul-15	0	0	0	0	0	0	Expired/Determined
278	Sri R. Kondala Rao	Road Metal	90	Tirupatammmapeta	Rowthulapudi	0.5	16-Nov-06	15-Nov-16	0	0	0	0	0	0	Expired/Determined
279	Smt K.Padmavathi	Road Metal	90	Tirupatammmapeta	Rowthulapudi	0.5	25-May-07	24-May-27	420	300	0	31500	25069	0	Renewal Applied
280	Sri G. Papa Rao	Road Metal	90	Tirupatammmapeta	Rowthulapudi	0.4	8-Jul-09	7-Jul-19	0	0	0	20000	20055	0	Renewal Applied
281	Sri G. China Rama Reddy	Road Metal	90	Tirupatammmapeta	Rowthulapudi	0.8	8-Mar-10	7-Mar-20	600	0	500	45000	40110	390	Renewal Applied (Condonation delay applied)
282	Sri K.Aruna Kumar	Road Metal	90	Tirupatammmapeta	Rowthulapudi	0.5	31-Oct-11	30-Oct-21	300	2730	7120	24925	204819	561381	
283	Sri R. Rama Krishna Rao	Road Metal	90	Tirupatammmapeta	Rowthulapudi	0.4	5-Dec-11	4-Dec-21	0	0	0	19780	20055	26000	
284	Sri G. Laxmana Murthy	Road Metal	90	Tirupatammmapeta	Rowthulapudi	1.5	21-Mar-12	20-Mar-22	1000	1000	1799	74963	75205	59793	
285	KARUTURI.VISWATEJA	Road Metal	90	Tirupatammmapeta	Rowthulapudi	1	19-Jan-15	25-May-25	1982	5500	9895	148650	412637	793663	

286	P.ANANTHA LAKSHMI	Road Metal	90	Tirupatammapeta	Rowthulapudi	1	19-Mar-15	20-Mar-22	670	300	625	50250	50387	70863	
287	SAI RAMA STONE CRUSHER	Road Metal	90	Tirupatammapeta	Rowthulapudi	2.5	15-Jun-15	9-Apr-27	1663	800	0	125000	125343	0	
288	M/S S.S.N.R.PROJECTS	Road Metal	90	Tirupatammapeta	Rowthulapudi	3	9-Jun-15	6-Jul-27	300	0	0	150000	150411	195000	Renewal Applied
289	I.SURESH RAJU	Road Metal	90	Tirupatammapeta	Rowthulapudi	1	22-Oct-99	21-Oct-24	455	350	0	49907	50136	64999	
290	M/s Anjani Metal Crushers	Road Metal	261	Uppampalem	Rowthulapudi	4	19-Nov-09	18-Nov-24	14625	45115	70970	1096875	3834173	5012077	
291	A.RAJA BABU	Road Metal	261	Uppampalem	Rowthulapudi	6	23-Dec-09	22-Dec-22	96	0	8875	300000	300372	754803	
292	M.ANTHARVEDI REDDY	Road Metal	261	Uppampalem	Rowthulapudi	4	25-Jan-12	24-Jan-22	0	2666	1200	400000	200548	260000	
293	N.PALLAPU RAJU	Gravel	24-Jan	JAGGAMMAGARIP ETA	Samalkota	1.618	15-Oct-15	19-Aug-20	0	0	0	0	0	0	
294	G.SATYANARAYANA	Gravel	07-Jan	VETLAPALEM	Samalkota	0.648	25-Apr-16	24-Apr-21	7500	0	0	199000	0	0	
295	M/s Maheswari Minerals	Laterite	USHP,	ANUMARTHI	Sankhavaram	17.49	11-02- 2009	11-01-2029	0	0	0	0	0	0	Determined
296	Sri S. Soban Babu	Laterite	USHP,	AVELTHI	Sankhavaram	54.23	9/29/200 9	9/28/202 9	0	0	0	0	0	0	Determined
297	Sri M. Dora Babu	Laterite	USHP,	AVELTHI	Sankhavaram	4.61	11-02- 2009	11-01-2029	0	0	0	0	0	0	Determined
298	S.Venkata Ramana	Gravel	60	Konthangi	Sankhavaram	0.809	2-Jan-15	1-Jan-20	0	0	0	0	0	0	
299	K.SRIDHAR NAIDU	Road Metal	73,	PEDAMALLAPURA M	Sankhavaram	10	4-Jan-11	31-Mar-21	0	0	0	0	0	0	
300	M/S V.V.R Enter Prises	Road Metal	73,	PEDAMALLAPURA M	Sankhavaram	9.295	11-Jan-11	10-Jan-21	0	0	0	0	0	0	
301	VVR Enterprises	Colour Granite	73	Pedamallapuram	Sankhavaram	0.875	13-Feb-16	12-Feb-36	0	0	0	0	113630	0	
302	M/s Pokarna Limited	Colour	66	Polavaram	Sankhavaram	4.421	30-May-13	29-May-33	0	0	0	545733	443312	0	

		Granite (Others)													
303	SILICON ROCS	Color Granite- Leptinites	61/4	Polavaram	Sankhavaram	1.983	8-May-17	7-May-37	0	231.248	67.445	178199	660621	269429	
304	NOBEL STONES and MARBLES PVT LTD	Colour Granite	66,	POLAVARAM	Sankhavaram	3.762	11-Jun-14	26-May-33	0	0	0	0	0	0	Determined
305	M/s SRS Granites	Colour Granite	66,	POLAVARAM	Sankhavaram	1.409	27-May-13	26-May-33	0	0	0	0	0	0	Determined
306	S.NARAYANA REDDY	Road Metal	39	SIDDIVARIPALEM	Sankhavaram	15	31-Jul-07	30-Jul-27	10000	2100	0	0	750000	752055	Renewal Applied
307	CH.BAPI REDDY	Road Metal	1	Siddivaripalem	Sankhavaram	9.238	8-Aug-08	7-Aug-18	0	0	0	0	0	0	
308	Sri M.V.V.Satyanarayana	Road Metal	122	CHINAKONDEPUD I	Seethanagara m	1.21	10-Apr-06	10-Apr-26	805	0	0	120919	60665	0	Renewal Applied
309	Sri M.V.V.Satyanarayana	Road Metal	67	CHINAKONDEPUD I	Seethanagara m	2.821	10-Apr-06	8-Apr-26	1880	0	0	282071	141436	0	Renewal Applied
310	M/s Balatripura Sundari Metal Suppliers	Road Metal	241	Nagampalle	Seethanagara m	1	28-Nov-05	26-Nov-17	0	0	0	0	0	0	Renewal applied
311	Sri M.Ramakrishna	Road Metal	241	NAGAMPALLE	Seethanagara m	1	17-Mar-06	14-Mar-18	0	0	0	0	100137	0	Renewal applied
312	Sri P.Eswara Reddy	Road Metal	241	NAGAMPALLE	Seethanagara m	0.55	18-Sep-06	17-Sep-16	0	0	0	0	0	0	Expired/Dete rmined
313	Sri P.Eswara Reddy	Road Metal	241	NAGAMPALLE	Seethanagara m	1	18-Sep-06	17-Sep-16	0	0	0	0	0	0	Expired/Dete rmined
314	Sri Sathi Rama Chandra Reddy	Road Metal	241	NAGAMPALLE	Seethanagara m	1	9-Apr-08	8-Apr-18	0	0	0	0	0	0	Expired/Dete rmined

315	Sri P. Eswar Reddy	Road Metal	209	NAGAMPALLE	Seethanagara m	3.1	9-Feb-09	8-Feb-19	0	0	0	0	0	0	
316	Smt M. Girisha	Road Metal	209	NAGAMPALLE	Seethanagara m	1	9-Feb-09	8-Feb-19	600	0	0	0	0	0	
317	Sri Gowri Sankara Metals	Road Metal	241	Nagampalle	Seethanagara m	1	22-Oct-10	21-Oct-20	0	0	0	0	0	0	
318	M.SRHARI REDDY	Road Metal	241	NAGAMPALLE	Seethanagara m	1	11-Mar-14	29-Jun-23	1200	1200	0	90000	90137	65000	
319	M.SURYAKANTHAM	Road Metal	241	NAGAMPALLE	Seethanagara m	0.5	23-Jul-14	21-Mar-24	1050	1200	0	78750	90069	32500	
320	M/S CHAMUNDESWARI MINERALS	Road Metal	241	NAGAMPALLE	Seethanagara m	1.619	28-Jan-15	20-Dec-23	150	0	0	80950	81172	105235	
321	Smt N.Kasi Annapurna	Road Metal	241,	NAGAMPALLE	Seethanagara m	1.214	11-May-07	10-Apr-15	0	0	0	0	131459	0	Renewal Applied
322	Smt.N.Jeevendra	Road Metal	241,	NAGAMPALLE	Seethanagara m	0.785	5-Nov-07	4-Oct-15	0	0	0	0	0	104397	Renewal Applied
323	Smt D.Padma	Road Metal	327	PURUSHOTHAPA TNAM	Seethanagara m	2	12-Apr-06	12-Apr-26	1332	0	0	100000	100274	0	Renewal Applied
324	R.Nageswara Rao	Gravel	94/p	CHAMAVARAM	Tuni	6.07	23-Jun-15	22-Jun-25	3500	15000	0	485600	267200	0	
325	Sri S. Gopi Rama Krishna Reddy	Road Metal	29/15	D. POLAVARAM	Tuni	6.5	16-Sep-08	15-Sep-18	4333	900	0	325000	325891	0	Renewal Applied
326	S.GOPI RAMAKRISHNA REDDY	Road Metal	122	D. POLAVARAM	Tuni	2.5	10-Apr-15	26-Apr-25	1666	1200	0	125000	125343	162500	
327	P.Varahalaraju	Gravel	40/2P	HAMSAVARAM	Tuni	6.07	23-Jun-15	22-Jun-25	0	0	0	242800	242800	0	
328	Sri K.C.Chandra Sekhar	China Clay	48/3,49/4 ,	N. SURAVARAM	Tuni	3.465	30-Dec-98	29-Dec-18	0	0	0	0	0	0	Expired

329	Sri S.Gopi Ramakrishna Reddy	Road Metal	17	NANDIVAMPU	Tuni	3.84	21-Jun-08	20-Jun-18	2560	300	0	192000	192527	0	Renewal Applied
330	Sri T.Vijaya Babu	Building Stone	128,	VEERAVARAPU PETA	Tuni	0.2	06-11-2007	06-10-2017	0	0	0	0	0	0	Expired
331	Sri Balaji Stone Crusher	Road Metal	297	J. ANNAVARAM	Yeleswaram	2	7-May-03	6-May-18	1420	300	0	106500	50000	0	Renewal Applied
332	Sri Balaji Stone Crusher	Road Metal	297	J. ANNAVARAM	Yeleswaram	0.5	14-Oct-07	13-Oct-27	336	324	0	25000	70061	0	Renewal Applied
333	Sri S.Ramalingeswara Rao	Road Metal	297	J. ANNAVARAM	Yeleswaram	1	12-Apr-07	11-Apr-27	666	600	0	49975	99400	2055	Renewal Applied
334	M/s Seetharamanjanya Granite Metal Corp	Road Metal	297	J. ANNAVARAM	Yeleswaram	0.5	5-Jun-07	4-Jun-27	300	300	0	25000	25069	32500	Renewal Applied
335	Sri K.Srinivasa Reddy	Road Metal	297	J. ANNAVARAM	Yeleswaram	2	12-Jun-07	11-Jun-27	1330	1600	0	0	200274	130000	Renewal Applied
336	M/s Ramalinga Granite Corp.	Road Metal	297	J. ANNAVARAM	Yeleswaram	1.214	12-Jun-07	11-Jun-27	805	900	0	0	121552	78910	Renewal Applied
337	Sri P. Anantha Subba Raju	Road Metal	297	J. ANNAVARAM	Yeleswaram	4	31-Jul-07	30-Jul-27	11666	16800	0	874950	1260548	268220	Renewal Applied
338	Sri S.Phani Kumar	Road Metal	297	J. ANNAVARAM	Yeleswaram	0.25	1-Nov-07	31-Oct-27	6250	15000	0	468750	1170035	16250	Renewal Applied
339	M/s Ramalinga Granite Corp.	Road Metal	297	J. ANNAVARAM	Yeleswaram	0.81	14-Jul-08	13-Jul-18	2100	300	0	157492	0	93261	Renewal Applied
340	Sri M. Appa Rao	Road Metal	313	J. ANNAVARAM	Yeleswaram	5	10-Mar-08	9-Mar-28	10300	4250	0	522189	318750	250685	Renewal Applied
341	Smt K. Vara Lakshmi	Road Metal	297	J. ANNAVARAM	Yeleswaram	0.64	21-Feb-08	20-Feb-28	1516	2100	0	106000	157588	32000	Renewal Applied

342	Sri P.Srinivas	Road Metal	297	J. ANNAVARAM	Yeleswaram	1	7-Sep-10	6-Sep-20	1800	33300	17400	135000	2497637	1364863	Renewal Applied
343	Sri R. Eswar Rao	Road Metal	297	J. ANNAVARAM	Yeleswaram	1	2-May-11	2-Mar-20	666	1200	56277	0	139318	4245638	Renewal Applied
344	SRI SEETHARAMANJANEYA GRANITE METAL CORPORATION	Road Metal	297	J. ANNAVARAM	Yeleswaram	1	1-Apr-14	21-Jun-27	1200	600	0	90000	50137	65000	Renewal Applied
345	M/S.SRI DURGA BHAVANI and CO	Road Metal	297	J. annavaram	Yeleswaram	0.6	27-Jul-15	21-Jun-27	0	600	0	0	75083	0	Renewal Applied
346	R.SURYANARAYANA	Road Metal	297	J. ANNAVARAM	Yeleswaram	3	23-Jun-15	24-Jul-27	2250	7140	0	318750	535911	6165	Renewal Applied
347	M/s Sidhvi infrastructures Project Ltd	Road Metal	54	J. ANNAVARAM	Yeleswaram	0.5	7-May-09	6-May-24	0	0	0	25000	25069	32500	
348	SURYA STONE CRUSHER	Road Metal	297	J. annavaram	Yeleswaram	4.164	18-Dec-19	17-Dec-34	0	0	30500	0	0	2522460	
349	SURYA STONE CRUSHER	Road Metal	297	J. annavaram	Yeleswaram	1.629	21-Mar-20	20-Mar-35	0	0	0	0	0	0	
350	M/s Mallikarjuna Granites,	Colour Granite	164,	J. ANNAVARAM	Yeleswaram	6	1-Jul-04	30-Jun-24	0	0	0	0	0	0	Determined
351	M/s Kanakamahalaxmi Granites and Vayuputhra Exports	Colour Granite	297,	J. ANNAVARAM	Yeleswaram	3.8	10-Jul-06	09-Jul-26	0	0	0	0	0	0	Determined
352	Sri Peketi Srinivasa Rao	Colour Granite	297,	J. ANNAVARAM	Yeleswaram	2	11/26/2009	9/19/2026	0	0	0	0	0	0	Determined
353	M/s Vadivelu Granites	Colour Granite	297,	J. ANNAVARAM	Yeleswaram	5	12-Nov-09	11-Nov-29	0	0	0	0	0	0	Determined
354	M/s S.B.V.Reddy	Road Metal	1	LINGAMPARTHI	Yeleswaram	4	5-Aug-12	4-Aug-22	3800	0	0	84991	400548	260000	

355	Sri SBV Reddy	Road Metal	1	LINGAMPARTHI	Yeleswaram	1.4	6-Jun-14	20-May-24	900	0	0	0	140192	91000	
356	Smt Andru Usha Rani	Laterite (Cement)	589	LINGAMPARTHI	Yeleswaram	10	7-Dec-13	3-Dec-33	310000	173000	105000	5345000 0	2367554 8	2885000	
357	Smt Andru Usha Rani	Laterite (Metallurgical Grade)	589	LINGAMPARTHI	Yeleswaram	10	7-Dec-13	3-Dec-33	170000	105000	0	0	0	0	
358	Smt. A.A.P.K.Satyavathi	Laterite (Cement)	589	LINGAMPARTHI	Yeleswaram	10	4-Dec-13	3-Dec-33	240000	388000	105000	5495000 0	4205054 8	2885000	
359	Smt. A.A.P.K.Satyavathi	Laterite (Metallurgical Grade)	589	LINGAMPARTHI	Yeleswaram	10	4-Dec-13	3-Dec-33	245000	90000	0	0	0	0	
360	M/s Surya Prakash Minerals	Color Granite- Leptinites	229	MARRIVEEDU	Yeleswaram	5	11-Apr-05	10-Apr-25	46.829	9.623	0	0	500009	501359	
361	Sri R.Ram Babu	Road Metal	78	MARRIVEEDU	Yeleswaram	4	24-Oct-06	23-Oct-16	0	0	0	0	0	0	Expired/Dete rmined
362	Smt S.Surya Kumari	Road Metal	78	MARRIVEEDU	Yeleswaram	7	3-May-07	2-May-17	0	0	0	0	0	0	Expired/Dete rmined
363	Sri M.Prasada Reddy	Road Metal	297	MARRIVEEDU	Yeleswaram	4	27-Jul-07	26-Jul-27	2666	1500	0	0	199997	200548	Renewal Applied
364	Sri I.Srinivas	Road Metal	297	Yeleswaram	Yeleswaram	3	25-Jul-07	24-Jul-27	2000	900	0	506219.1 8	75000	0	Renewal Applied
365	Sri K.V.V.Prasada Reddy	Road Metal	06-Feb	YELESWARAM	Yeleswaram	0.397	4-Dec-10	28-Oct-25	0	7050	6604	19850	528805	501200	
366	Sri P. Karunakar	Road Metal	43/2,3	YELESWARAM	Yeleswaram	8	19-Mar-10	18-Mar-25	9000	0	0	275000	0	0	
367	M/S. SRI RAMAKRISHNA STONE CRUSHER	Road Metal	43/2A	YELESWARAM	Yeleswaram	1	22-Feb-11	23-May-25	150	0	0	50000	0	0	

368	M/s Venkatadri Stone crusher	Road Metal	06-Feb	YELESWARAM	Yeleswaram	1	5-Nov-99	3-Nov-24	2418	2700	0	181350	202637	65000	
369	M/s Sidhvi infrastructures Project Ltd	Road Metal	54	YELESWARAM	Yeleswaram	2.359	24-Aug-09	14-Apr-24	0	0	0	117900	118274	153335	
370	M/s Sidhvi infrastructures Project Ltd	Road Metal	54	YELESWARAM	Yeleswaram	1	4-Apr-07	21-Dec-20	0	0	0	28244	50137	65000	
371	M/S Sri Rama Krishna Stone Crusher	Road Metal	54	YELESWARAM	Yeleswaram	0.5	6-Feb-11	5-Feb-26	0	0	0	18437	0	25069	
372	M/S Sri Rama Krishna Stone Crusher	Road Metal		YELESWARAM	Yeleswaram	0.283	8-Dec-10	9-Nov-25	0	0	0	13300	0	0	
373	M/s Annapurna Suppliers	Road Metal	54	YELESWARAM	Yeleswaram	0.688	26-May-05	25-May-20	0	0	0	0	24017	0	
374	M/s Padmavathi Stone Crusher	Road Metal	54	YELESWARAM	Yeleswaram	1	9-Jan-09	25-Oct-23	0	0	0	50000	0	115137	
375	Sri Padmavathi Stone Crusher	Road Metal	54	YELESWARAM	Yeleswaram	0.7	6-Mar-12	23-Feb-27	0	0	0	35000	0	80596	
376	K.SATYANARAYANA REDDY	Road Metal	54	YELESWARAM	Yeleswaram	0.3	2-Jul-09	11-Sep-17	0	0	0	0	0	0	Renewal applied
377	Sri K.Satyanarayana Reddy	Road Metal	54	YELESWARAM	Yeleswaram	0.49	22-Mar-06	21-Mar-16	0	0	0	0	0	0	Renewal applied
378	SRI SEETHARAMANJANEYA GRANITE METAL CORPORATION	Road Metal	54	YELESWARAM	Yeleswaram	0.607	22-Jun-09	21-Jun-24	0	0	0	22835	30434	39455	
379	M/s Durga Bhavani and co.,	Road Metal	54	YELESWARAM	Yeleswaram	0.404	9-Mar-09	8-Mar-24	0	0	0	0	0	0	Expired/Determimed
380	Smt S.Venu Kumari	Road Metal	54	YELESWARAM	Yeleswaram	1	4-May-05	2-May-17	0	0	0	0	0	0	Renewal

															applied
381	M/s Sidhvi infrastructures Project Ltd	Road Metal	54	Yeleswaram	Yeleswaram	0.849	27-Sep-11	26-Sep-26	0	0	0	50219	42567	55185	
382	Sri G.Kanakayya	Road Metal	54,,	YELESWARAM	Yeleswaram	0.5	4-Dec-05	3-Dec-15	0	0	0	0	0	0	Renewal Applied
383	SMT. S.VENU KUMARI	Road Metal	54,	YELESWARAM	Yeleswaram	0.3	12-Sep-07	11-Sep-17	0	0	0	0	0	0	Renewal Applied
384	Sri K. Satyanarayana Reddy	Road Metal	54	YELESWARAM	Yeleswaram	0.49	13-Jun-08	11-Sep-17	0	0	0	0	0	0	
385	M/s Laxmi Crushing Metal Suppliers	Road Metal	54,	YELESWARAM	Yeleswaram	1	9-Feb-09	8-Feb-24	0	0	0	0	0	0	
386	M/S.SRI DURGA BHAVANI and CO	Road Metal	54,,	YELESWARAM	Yeleswaram	0.404	9-Mar-09	8-Mar-24	0	0	0	0	0	0	
387	Sri K.V.V.Prasada Reddy	Road Metal	54,	YELESWARAM	Yeleswaram	0.3	13-Apr-09	12-Apr-19	0	0	0	0	0	0	Renewal Applied
388	Sri Srinivasa Crusher Metal Company	Road Metal	54,	YELESWARAM	Yeleswaram	0.154	27-Apr-09	24-Jan-22	0	0	0	0	0	0	
389	M/S.SRINIVASA CRUSHER METAL COMPANY	Road Metal	54,	YELESWARAM	Yeleswaram	1	19-Jun-09	18-Jun-24	0	0	0	0	0	0	
390	Sri M.Brahmananda Reddy	Road Metal	54,	YELESWARAM	Yeleswaram	0.404	30-Oct-10	29-Oct-20	0	0	0	0	0	0	Renewal Applied
391	Sri P.Satya Narayana Reddy	Road Metal	54,	YELESWARAM	Yeleswaram	0.424	17-Jan-11	9-Nov-20	0	0	0	0	0	0	
392	Surya Metal Suppliers	Road Metal	54,	YELESWARAM	Yeleswaram	2.428	27-Sep-11	26-Sep-26	0	0	0	0	0	0	
393	Yeleswaram QKLCC Society	Road Metal	54,	YELESWARAM	Yeleswaram	0.5	23-Nov-06	22-Nov-16	0	0	0	0	0	0	Expired
394	M/s Lalitha Stone Crusher	Road Metal	54,	YELESWARAM	Yeleswaram	1.214	25-Jan-07	24-Jan-22	0	0	0	0	0	0	Determined
395	Sri M. Sree Hari Reddy	Road Metal	54,	YELESWARAM	Yeleswaram	1	8-Sep-09	7-Sep-24	0	0	0	0	0	0	Determined
396	Sri Dokka Appa Rao	Road Metal	54,	YELESWARAM	Yeleswaram	0.8	18-May-11	17-May-21	0	0	0	0	0	0	Determined

Data source: AD, DMG, East Godavari District

The list of mineable mineral potentials are shown in Table.15.

Table 15: Mineable mineral potential

Sl. No	River/ Stream	Portion of the Godavari River recommended for mineral concession	Length of the recommended area for mineral concession (in km)	Average width of the recommended area for mineral concession (in meters)	Area recommended for mineral concession (in sq.mtrs.)	Mineable mineral potential (in metric tonne) (60% of total mineral potential)
1	Godavari River	Upstream and low streams	0.261	150	2.4318	21,88,620

Data source: AD, DMG, East Godavari District

### 7.5 Recommendation:

From the above, it is clear that about 36,47,700 Metric Tonnes of Sand is available up to a depth of one meter in the River bed of the Godavari in the East Godavari District. The annual deposition is 03.00 to 04.50 Metric Tonnes . The average annual production is 41,52,985 Metric Tonnes . So, 36,47,700 Metric Tonnes of mineral can be safely removed.

The list of Potential Sand Mining Leases (existing and proposed) Rivers are shown in Table 16.

Table 16: List of Potential Sand Mining Leases (existing and proposed) Rivers

River Details	Lease Details	Area (in Ha)	Distance (in Km) from PA/ BR/ WC/	Distance from Forest Area (in Km)	Mining leases within 500 meters (if yes cluster area)	Total excavation in Tonnes / Annum considering digging depth max as 3 mts	Mineral to be mined (Sand/ Bajri/ RBM etc.)	Ex Pro
Godavari	Korumilli	1.880	--	--	No	18,800	Sand	Ex
Godavari	Tatapudi	3.850	--	--	No	38,500	Sand	Ex
Godavari	Ankampalem	3.140	--	--	No	31,400	Sand	Ex
Godavari	Ubalanka	2.160	--	--	No	21,600	Sand	Ex
Godavari	Jonnada	4.9	--	--	No	49000	Sand	Ex
Godavari	Pulidindi	1.330	--	--	No	13,300	Sand	Ex
Godavari	Tadipudi	4.380	--	--	No	43,800	Sand	Ex
Godavari	Gopalapuram	2.580	--	--	No	25,800	Sand	Ex
Godavari	Vemagiri	3.160	--	--	No	31,600	Sand	Ex
Godavari	Sanapallilanka	3.620	--	--	No	36,200	Sand	Ex
Godavari	Sompalli-Razole	1.100	--	--	No	11,000	Sand	Ex
Godavari	Doddavaram	1.100	--	--	No	11,000	Sand	Ex

Godavari	Vedullapalli	1.680	--	--	No	16,800	Sand	Ex
Godavari	Vakalagaruvu	2.130	--	--	No	21,300	Sand	Ex
Godavari	Purushothapatnam	4.550	--	--	No	45,500	Sand	Ex
Godavari	Atreyapuram-I	4.74	--	--	No	47400	Sand	Pro
Godavari	Atreyapuram-II	4.7	--	--	No	47000	Sand	Pro
Godavari	Atreyapuram-III	4.8	--	--	No	48000	Sand	Pro
Godavari	Vaddiparru-I	4.85	--	--	No	48500	Sand	Pro
Godavari	Vaddiparru-II	4.82	--	--	No	48200	Sand	Pro
Godavari	Rajavaram	4.71	--	--	No	47100	Sand	Pro
Godavari	Velicheru-I	4.56	--	--	No	45600	Sand	Pro
Godavari	Velicheru-III	4.83	--	--	No	48300	Sand	Pro
Godavari	Ankampalem-I	3.23	--	--	No	32300	Sand	Pro
Godavari	Ankampalem-II	4.81	--	--	No	48100	Sand	Pro
Godavari	Ankampalem-III	4.88	--	--	No	48800	Sand	Pro
Godavari	Tadipudi	4.76	--	--	No	47600	Sand	Pro
Godavari	Atreyapuram-IV	4.86	--	--	No	48600	Sand	Pro
Godavari	Atreyapuram-V	4.91	--	--	No	49100	Sand	Pro
Godavari	Korumilli	4.33	--	--	No	43300	Sand	Pro
Godavari	Kedarlanka-II	4.69	--	--	No	46900	Sand	Pro
Godavari	Kapileswarapuram	4	--	--	No	40000	Sand	Pro

Godavari	Gopalapuram-1	4.91	--	--	No	49100	Sand	Pro
Godavari	Gopalapuram-2	4.9	--	--	No	49000	Sand	Pro
Godavari	Jonnada-II	4.66	--	--	No	46600	Sand	Pro
Godavari	Jonnada-III	4.83	--	--	No	48300	Sand	Pro
Godavari	Vemagiri- Kadiyapulanka-I	4.61	--	--	No	46100	Sand	Pro
Godavari	Vemagiri- Kadiyapulanka-III	4.65	--	--	No	46500	Sand	Pro
Godavari	Vaddiparru	4.22	--	--	No	42200	Sand	Pro
Godavari	Atreyapuram-VI	4.64	--	--	No	46400	Sand	Pro
Godavari	Vadapalli-1	4.86	--	--	No	48600	Sand	Pro
Godavari	Vadapalli-3	4.84	--	--	No	48400	Sand	Pro
Godavari	Tatapudi-II	3	--	--	No	30000	Sand	Pro
Godavari	Ubalanka	4.88	--	--	No	48800	Sand	Pro
Godavari	Vemagiri- Kadiyapulanka	4.52	--	--	No	45200	Sand	Pro
Godavari	Velicheru	3.19	--	--	No	31900	Sand	Pro
Godavari	Narkedmilli	4.44	--	--	No	44400	Sand	Pro
Godavari	Vadapalli-2	4.87	--	--	No	48700	Sand	Pro
Godavari	Kanayagudem-I	4.57	--	--	No	45,700	Sand	Pro
Godavari	Kanayigudem-II	4.42	--	--	No	44,200	Sand	Pro
Godavari	Kanayagudem-III	4	--	--	No	40,000	Sand	Pro

Godavari	Yetapaka-I	4.5	--	--	No	45,000	Sand	Pro
Godavari	Yetapaka-II	4.63	--	--	No	46,300	Sand	Pro
Godavari	Purushothapatnam-II	2.8	--	--	No	28,000	Sand	Pro
Godavari	Gundala-I	4	--	--	No	40,000	Sand	Pro
Godavari	Gundala-III	4.92	--	--	No	49,200	Sand	Pro
Godavari	Gommu-Koyagudem-I	4.2	--	--	No	42,000	Sand	Pro
Godavari	Gommu-Koyagudem-II	4.4	--	--	No	44,000	Sand	Pro
Godavari	Gommu-Koyagudem-III	4.17	--	--	No	41,700	Sand	Pro
Godavari	Gommu-Koyagudem-V	4.43	--	--	No	44,300	Sand	Pro
Godavari	Rayanapeta-I	4.27	--	--	No	42,700	Sand	Pro
Godavari	Rayanapeta-II	4.5	--	--	No	45,000	Sand	Pro
Godavari	Rayanapeta-III	3.68	--	--	No	36,800	Sand	Pro
Godavari	Sompalli	2	--	--	No	20,000	Sand	Pro
Godavari	Sivakodu	1.97	--	--	No	19,700	Sand	Pro
Godavari	Razole	2	--	--	No	20,000	Sand	Pro
Godavari	Vangalapudi-I	4.87	--	--	No	48,700	Sand	Pro
Godavari	Vangalapudi-II	4.69	--	--	No	46,900	Sand	Pro
Godavari	Katavaram	4.78	--	--	No	47,800	Sand	Pro
Godavari	Alamuru- I	4.32	--	--	No	43,200	Sand	Pro

Godavari	Alamuru- II	4.56	--	--	No	45,600	Sand	Pro
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Data source: AD, DMG, East Godavari District

The list of Potential Patta Lands/Khatedari Land: (existing and proposed) are shown in Table 17.

Table 17: List of Potential Patta Lands/Khatedari Land

Owner	Sy No	Area (Ac)	District	Tehsil	Village	Total Reserve (MT)	Total Mineral to be mined (MT)	Existing /Proposed
Sri Polina Hanumantha Rao and others	157-4A, 157-5A, 157-4B-2, 157-5B, 157-4B1, 157-6	9.99 Ac	East Godavari	Seethanagaram	Mulakallanka	181933	181933	Existing
Smt. Polina Nagaratnam	1	8.50 Ac	East Godavari	Seethanagaram	Katavaram	120398	120398	Existing
Sri Kongala Bhaskara Rao and others	9, 13/4, 13/6A, 12/1B, 12/4, 13/1C, 13/2B, 13/3A, 13/6C	10.16 Ac	East Godavari	Seethanagaram	Mulakallanka	185029	185029	Existing
MANSAS Trust , Kotipalli	132, 195 etc.,	42.11 Ac	East Godavari	K.Gangavaram	Kotipalli	596467	596467	Existing
MANSAS Trust , Kotipalli	82, 84 and 107	2.01 Ac	East Godavari	K.Gangavaram	Kotipalli	49800	49800	Existing
S Kishore, Seethanagaram	204/1, 203/4, 203/5,	1.78 Ac	East Godavari	Seethanagaram	Seethanagaram	88306	88306	Proposed

	203/2, 204/2							
Sri S Kishore, Seethanagaram	210/2, 213/1, 214/1, 210/3, 215/4	1.69 ac	East Godavari	Seethanagara m	Seethanagara m	80212	80212	Proposed
Sri N.N.V.V.Ganesh Raju, Gopalapuram	493/2, 494/2, 494/7, 494/9	1.21 Ac	East Godavari	Ravulapalem	Gopalapuram	30100	30100	Proposed

Data source: AD, DMG, East Godavari District

The list of Potential De-Siltation Location: (Lakes/Ponds/Dams etc.) (Existing and proposed) are shown in Table 18.

Table 18: List of Potential De-Siltation Location

Name of Reservoir /Dams	Maintain /Controlled by State Govt./PSU etc.	Location	District	Tehsil	Village	Size (Ha)	Quantity MT / Year	Existing /Proposed
Sir Arthur Cotton Barrage	State Govt.	Upstream of Dam	East Godavari	Rajamahendravaram	Dowlaiswaram	--	900000 up to June, 2021	Existing

Data source: AD, DMG, East Godavari District

The list of Potential M-Sand Plants :( existing and proposed) are shown in Table 19.

Table 19: List of Potential M-Sand Plants

Plant Name	Owner	District	Tehsil	Village	Geolocation	Quantity Tonnes/Annum	Existing/Proposed
--Nil--							

The details of the cluster is shown in Table 19.

Table 19: Cluster details

River Name	Cluster No.	Lease No	Location (Riverbed /Patta Land)	Village	Area (in Ha)	Total Excavation (Ton)	Total Mineral Excavation (Ton)
--NIL --							

The list of contiguous Clusters are shown in Table 20.

Table 20: Contiguous Clusters

River Name	Contiguous Cluster No.	Cluster No	Number of leases in the cluster	Location (Riverbed / Patta Land)	Distance between clusters	Village	Area of Cluster ( Ha)	Total Mineral Excavation (Ton)
--NIL--								

## 7.6 Transportation Routes for individual leases

Ramps are declared by the River Conservator from time to time. List is shown in Table 21.

Table 21: Transportation Routes for individual leases

S.No	Name of the River	Name of the Ramp	Village	Mandal	Remarks
1	Godavari	Atreyapuram-I	Atreyapuram	Atreyapuram	
2	Godavari	Atreyapuram-II	Atreyapuram	Atreyapuram	
3	Godavari	Atreyapuram-III	Atreyapuram	Atreyapuram	
4	Godavari	Vaddiparru-I	Vaddiparru	Atreyapuram	
5	Godavari	Vaddiparru-II	Vaddiparru	Atreyapuram	
6	Godavari	Rajavaram	Rajavaram	Atreyapuram	
7	Godavari	Velicheru-I	Velicheru	Atreyapuram	
8	Godavari	Velicheru-III	Velicheru	Atreyapuram	
9	Godavari	Ankampalem-I	Ankampalem	Atreyapuram	
10	Godavari	Ankampalem-II	Ankampalem	Atreyapuram	
11	Godavari	Ankampalem-III	Ankampalem	Atreyapuram	
12	Godavari	Tadipudi	Tadipudi	Atreyapuram	
13	Godavari	Atreyapuram-IV	Atreyapuram	Atreyapuram	
14	Godavari	Atreyapuram-V	Atreyapuram	Atreyapuram	
15	Godavari	Korumilli	Korumilli	Kapileswarapuram	
16	Godavari	Kedarlanka-II	Kedarlanka	Kapileswarapuram	
17	Godavari	Kapileswarapuram	Kapileswarapuram	Kapileswarapuram	
18	Godavari	Gopalapuram-1	Gopalapuram	Ravulapalem	
19	Godavari	Gopalapuram-2	Gopalapuram	Ravulapalem	
20	Godavari	Jonnada-II	Jonnada	Alamuru	
21	Godavari	Jonnada-III	Jonnada	Alamuru	
22	Godavari	Vemagiri-Kadiyapulanka-I	Vemagiri	Kadiyam	
23	Godavari	Vemagiri-Kadiyapulanka-III	Vemagiri	Kadiyam	
24	Godavari	Vaddiparru	Vaddiparru	Atreyapuram	
25	Godavari	Atreyapuram-VI	Atreyapuram	Atreyapuram	
26	Godavari	Vadapalli-1	Vadapalli	Atreyapuram	

27	Godavari	Vadapalli-3	Vadapalli	Atreyapuram	
28	Godavari	Tatapudi-II	Tatapudi	Kapileswarapuram	
29	Godavari	Ubalanka	Ubalanka	Ravulapalem	
30	Godavari	Vemagiri-Kadiyapulanka	Vemagiri	Kadiyam	
31	Godavari	Velicheru	Velicheru	Atreyapuram	
32	Godavari	Narkedmilli	Narkedmilli	Atreyapuram	
33	Godavari	Vadapalli-2	Vadapalli	Atreyapuram	
34	Godavari	Kanayagudem-I	Kanayagudem	Yetapaka	
35	Godavari	Kanayigudem-II	Kanayigudem	Yetapaka	
36	Godavari	Kanayagudem-III	Kanayagudem	Yetapaka	
37	Godavari	Yetapaka-I	Yetapaka	Yetapaka	
38	Godavari	Yetapaka-II	Yetapaka	Yetapaka	
39	Godavari	Purushothapatnam-II	Purushothapatnam	Yetapaka	
40	Godavari	Gundala-I	Gundala	Yetapaka	
41	Godavari	Gundala-III	Gundala	Yetapaka	
42	Godavari	Gommu-Koyagudem-I	Gommu	Yetapaka	
43	Godavari	Gommu-Koyagudem-II	Gommu	Yetapaka	
44	Godavari	Gommu-Koyagudem-III	Gommu	Yetapaka	
45	Godavari	Gommu-Koyagudem-V	Gommu	Yetapaka	
46	Godavari	Rayanapeta-I	Rayanapeta	Yetapaka	
47	Godavari	Rayanapeta-II	Rayanapeta	Yetapaka	
48	Godavari	Rayanapeta-III	Rayanapeta	Yetapaka	
49	Godavari	Sompalli	Sompalli	Razole	
50	Godavari	Sivakodu	Sivakodu	Razole	
51	Godavari	Razole	Razole	Razole	
52	Godavari	Vangalapudi-I	Vangalapudi	Seethanagaram	
53	Godavari	Vangalapudi-II	Vangalapudi	Seethanagaram	
54	Godavari	Katavaram	Katavaram	Seethanagaram	

55	Godavari	Alamuru- I	Alamuru	Alamuru	
56	Godavari	Alamuru- II	Alamuru	Alamuru	

Data source: AD, DMG, East Godavari District

The transportation of Sand is done using the approach roads formed bund of the river and then public roads are used for transportation purposes to the end consumers.

## 8 Conclusion:

The deposition of Sand is a continuous process and gets replenished every year. The State of Andhra Pradesh is endowed with various Rivers/streams majorly Godavari, 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 favorable 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.

### 8.1 AP State-Sand policy and process analysis

1. Through the G.O.Ms.No.70, I.I.I and C (M-II) Dept, Dt. 04.09.2019., Government has introduced the New Sand Mining Policy-2019 for the State of Andhra Pradesh.
2. Based on the detailed review of the implementation of the New Sand Mining Policy 2019 over the last one (1) year, it was found that in order to serve the customers better, certain upgradations are required in the existing policy.
3. Accordingly, Government, vide. Memo No.MGOSAND/63/2020/M.III, Dt:17.07.2020, has constituted a committee with the Group of Ministers to study and analyse all the relevant parameters with reference to existing Sand Policy and suggest

required modifications/amendments, etc. The Group of Ministers, after detailed deliberations and consultations with the general public, made certain recommendations to the Government for the up gradation of the existing sand policy vide their report.

4. Government, vide G.O.Ms.No.78, Ind. and Com. (M-III) Dept, Dt. 12.11.2020 has issued orders to upgrade of New Sand Policy, 2019. Key provisions of the Upgraded Sand Policy are as follows:

- (i) Sand excavation, storage, and sale operations shall be undertaken by the Central Government Agencies / Central Govt. PSUs (CPSUs) are appointed on a nomination basis on terms and conditions as prescribed by the State Government.
- (ii) The Central Govt. Agencies / CPSUs shall be appointed with a premium amount as fixed by the State Government, which is payable to GoAP, in addition to Seigniorage fee and other applicable levies.
- (iii) In case, no response is received from Central Govt. agencies / Central Govt. PSUs, Sand operations shall be entrusted to a technically experienced, competent, and financially strong agency(ies) selected through two (2) bid system i.e., Technical and Commercial bids, with a minimum auction premium fixed by the GoAP, in addition to Seigniorage fee and other applicable levies.
- (iv) Detailed RFP conditions shall be worked out with due legal vetting to achieve the stated objectives.
- (v) All the Reaches across the State shall be classified into 3 packages. The details are as follows:

- (i) Package 1: Srikakulam, Vizianagaram, Visakhapatnam, and East Godavari districts

- (ii) Package 2: West Godavari, Krishna, Guntur, and Prakasam districts
- (iii) Package 3: Nellore, Anantapur, Chittoor, Kurnool, and YSR Kadapa districts
- (vi) 1<sup>st</sup> to 3<sup>rd</sup> order streams shall also be granted, along with higher order streams, to the appointed agency for excavation, storage and sale etc. The relevant Rules (WALTA Rules, APMMC Rules etc.) shall be suitably amended.
- (vii) Sand Reaches in Scheduled areas will continue to be granted and operated by Tribal Societies following Panchayats Extension to Scheduled Areas (PESA) Rules, 2011.
- (viii) Appointed agency may explore to employ “Boatsmen Societies” for sand excavation from specific notified Reaches through desiltation, as per the procedure in vogue.
- (ix) To ensure the quality of sand, production from Patta lands shall be discontinued. Sand production shall be allowed only from Open Reaches. Further availability of sand will be ensured by dredging of Irrigation barrages, such as Prakasam Barrage, Dowaleswaram Barrage etc. Dredging operations will be undertaken by the Mines and Geology and Irrigation Departments in consultation with each other and following the due procedures.
- (x) Agency (ies) shall be required to comply with the Sale price of Sand as fixed by GoAP at all the stockyards and specific cities in the state.

- (xi) Further, the agency (ies) shall also be required to meet the prescribed minimum production, storage, and sale obligations, as well as comply with all other conditions, as may be prescribed by the State Government.
- (xii) The appointed agency (ies) shall be required to comply with all statutory provisions and shall indemnify the State Government against all liabilities, costs, expenses, damages and losses (including but not limited to any interest, penalties and legal costs) arising out of or in connection with breach or non-compliance with applicable laws.
- (xiii) Consumers shall make own transportation arrangements from Stockyard/Reach. However, agency (ies) shall also engage and keep standby vehicles (~20 vehicles per Stockyard/Reach) for transportation of sand to consumers as and when required.
- (xiv) Agency (ies) shall be required to deposit prescribed Performance Security Deposit (PSD) which will be liable to be forfeited in case of any default in timely payments or non-compliance with its obligations.
- (xv) Sand booking shall be permitted through offline mode. Any consumer can go to the Stockyard/Reaches of their choice directly and after verifying the quality of sand and making necessary payments there they can procure the sand in offline mode.
- (xvi) "Free of Cost" sand shall be permitted through bullock carts as per existing mechanism.
- (xvii) Sand shall be supplied "Free of Cost" for self-consumption of villages abutting the Reaches, Government-sponsored Weaker Section Housing

schemes and Government R and R packages Housing, through a coupon system. The subsidy towards the same shall be borne by the State Government.

(xviii) Special Enforcement Bureau (SEB) shall be authorized to file cases related to Sand as per APMMC Rules, 1966 to curb illegal mining, storage, and transportation of sand.

(xix) It shall be ensured that all sand operations, including appointment of agencies, excavation and storage activities, sale of sand, transportation etc. are done duly ensuring transparency and accountability at all stages.

DSR Status

District Survey Report is not being prepared in Andhra Pradesh State prepare their reports which are similar to DSR reports as per the department.

Demand-Supply Assessment

No proper demand-supply assessment has been carried out by Andhra Pradesh. However, since the State is a sand deficit, it ensures through proper monitoring mechanism that no sand from Andhra Pradesh is transported across the border to other States. However, there is no restriction on the import of sand from other States. Further, to take care of the sand deficit, Andhra Pradesh has given industry status to M-sand producing units in the State and has granted certain incentives for production of M-sand to encourage the manufacturers of M-sand.

Online Portal

Andhra Pradesh maintains an online portal, namely [pushkrishna.sps.ap.gov.in/sandapp/dashboard.aspx](http://pushkrishna.sps.ap.gov.in/sandapp/dashboard.aspx)

The portal is an important part of the monitoring mechanism of the State. The portal helps in real time governance of the active sand reaches.

A summary of other key aspects of sand policy of the State is tabulated below:

Table 22- Summary of sand mining policy in Andhra Pradesh

Activity	Responsibility	Sub-Activity	Timelines	IT Usage
Identification of sand	<ul style="list-style-type: none"> <li>District Level Committee</li> </ul>	Joint inspection to fix the boundaries	1 month	Offline

reaches		Assess the sand in terms of quantity Study the environmental aspects		
<b>Clearances and Approvals (Mining Plan, Environment clearance, Consent to operate)</b>	<ul style="list-style-type: none"> <li>District Level Committee</li> </ul>	Preparation of feasibility report Obtain clearance from Ground Water Department as per WALT Act and Rules Clearance from River Conservator in case of underwater extraction Preparation of mining plan, mine closure plan, environment plan (EIA/EMP)	2-3 months	Offline
	<ul style="list-style-type: none"> <li></li> </ul>	Submission of approved mining and environmental study (EIA/EMP) to authority for issue of environmental clearance		
<b>Notification of sand reaches</b>	<ul style="list-style-type: none"> <li>Department of Mines and Geology,</li> <li>Andhra Pradesh</li> </ul>	The department notifies the sand reaches for public after getting all the required clearances	1 month	Online
<b>Operations and Monitoring</b>	<ul style="list-style-type: none"> <li>(Operations) SHGs/ Consumers</li> </ul>	After DGM notifies the area, anyone can excavate and load sand from the notified reaches At some of the reaches, Self Help Groups are working to load sand on vehicles in lieu of the loading charges to be	Continuous	Offline

		borne by the consumer		
	<ul style="list-style-type: none"> <li>(Monitoring) Monitoring</li> <li>Committee</li> </ul>	Overall monitoring responsibility lies with Monitoring Committee	Continuous	Offline and Online
<b>Transportation</b>	Transporters	Delivering sand to the consumer after paying loading charges Collecting money from consumer after delivery of Sand	Continuous	Offline
	Department of Mines and Geology, Andhra Pradesh	Getting all the transportation vehicles registered Issuance of "Weighment Slip" by the department. Mandatory installation of GPS in all sand carrying Vehicles	Continuous	Online
<b>Sales</b>	Department of Mines and	Ordering is offline only and platform for booking of sand is being developed	Continuous	Offline
	Geology, Andhra Pradesh			

Data source: AD, DMG, East Godavari District

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