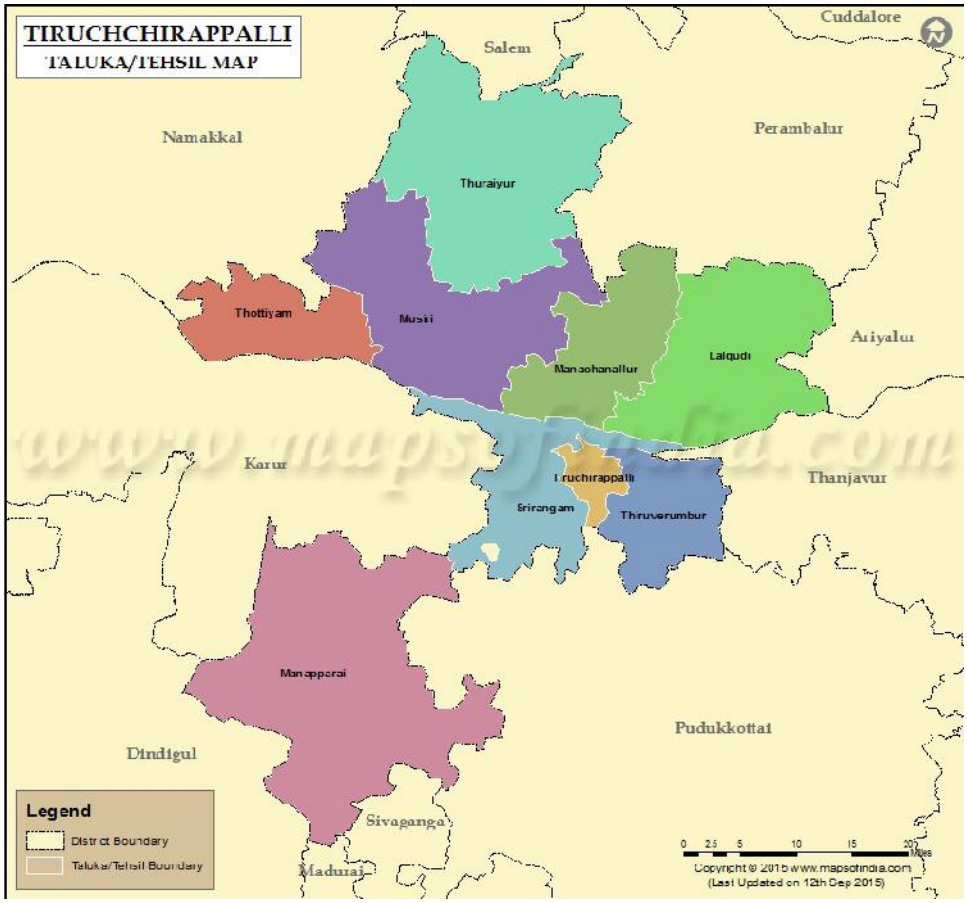
DEPARTMENT OF GEOLOGY AND MINING
TIRUCHIRAPALLI DISTRICT

DISTRICT SURVEY REPORT

FOR GRANITE



MAY 2019

DISTRICT SURVEY REPORT - TIRUCHIRAPALLI DISTRICT

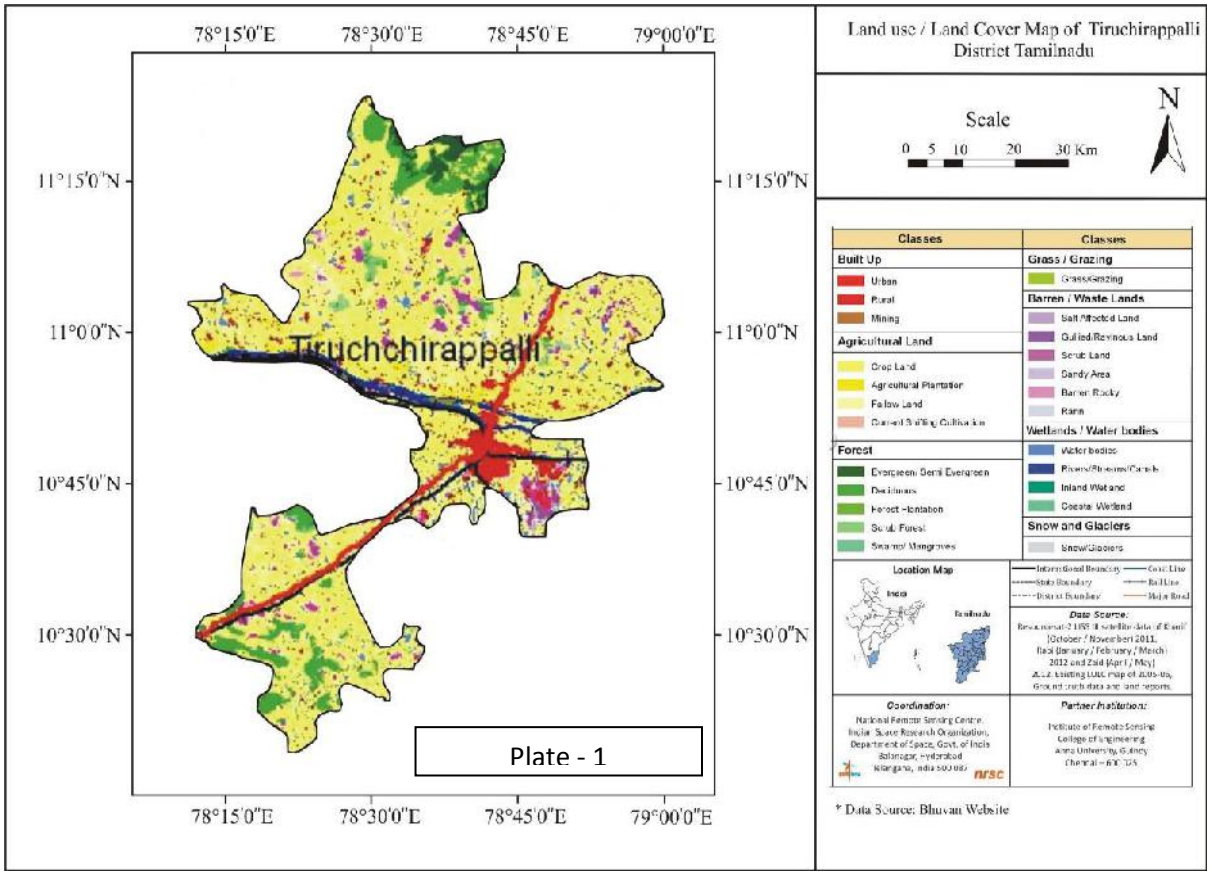
CONTENT

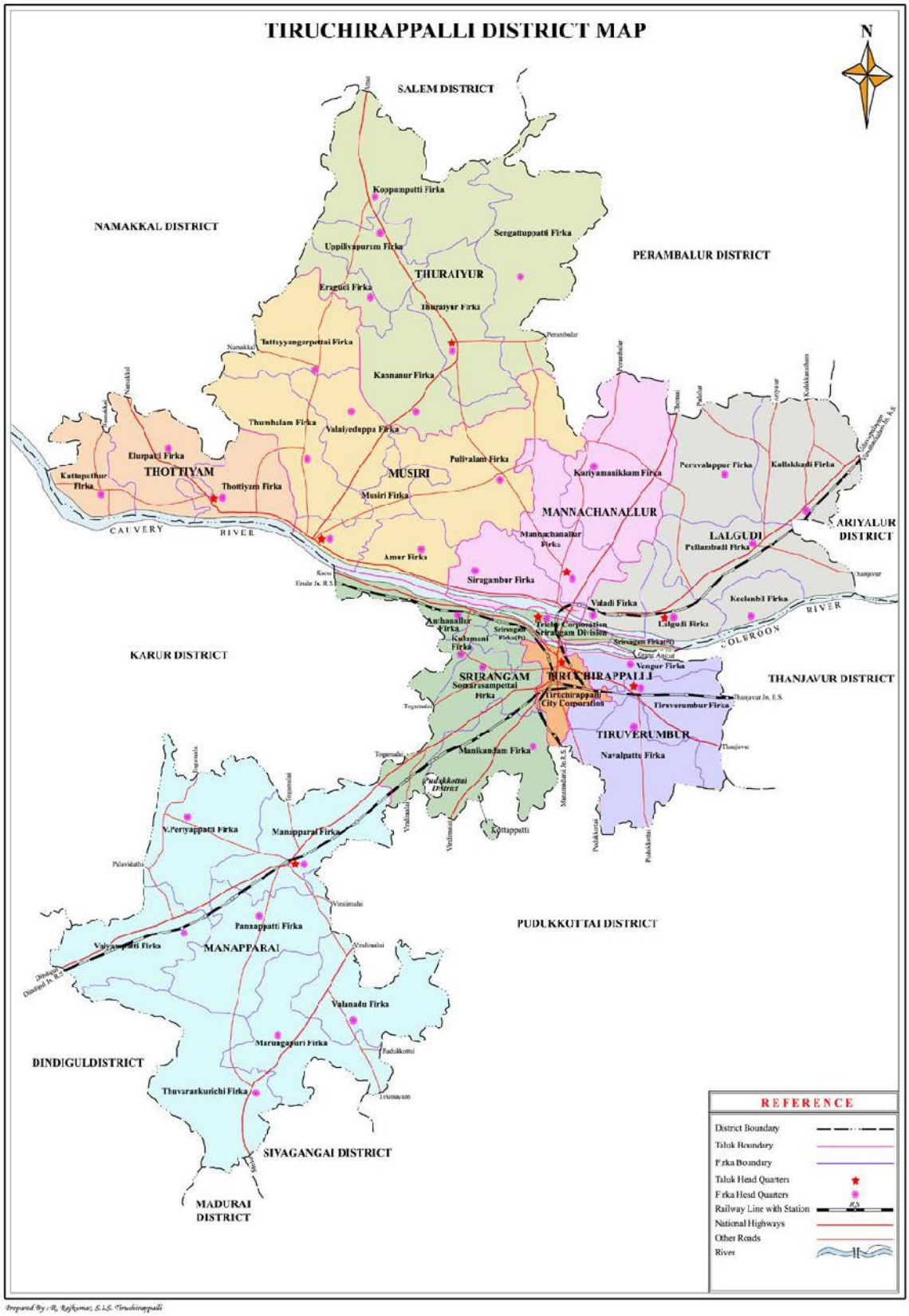
DISTRICT SURVEY REPORT - TIRUCHIRAPALLI DISTRICT

1. INTRODUCTION

With reference to the gazette notification dated 15th January 2016, Ministry of Environment, Forest and Climate Change, the District Environment Impact Assessment Authority (**DEIAA**) and District Environment Assessment Committee (**DEAC**) are to be constituted for prior environmental clearance of quarry for minor minerals. Now The DSR has modified on the basis of MOEF amendment of gazette notification July 2018. The preparation of DSR with help of other Department like prepared with the assistance of irrigation department, Drainage department, Forest department, Mining department and Revenue department in the district.

The main purpose of preparation of District Survey Report is to identify the mineral resources and mining activities along with other relevant data of district. The DEIAA and DEAC will scrutinize and recommend the prior environmental clearance for minor minerals on the basis of district survey report. The district Survey Report is prepared with the assistance of Geological Survey of India, State Unit: Tamilnadu and Puducherry, Chennai.





Prepared By : R. Rajkumar, S.I.S. Tiruchirappalli

Plate - 2

2. Overview of Mining Activity

In Trichirappalli District found variety of rocks and rich deposit of sand material in Cauvery and Kollidam river from west to east. Manapparai region of Trichirappalli district is hard terrain rock like Granite, Charnocknite and gneissic rock. This area is having rich deposits colour granites. The black colour granites had worked as a small pocket deposit Thalugai village of Thuraiyur. The Charnocknite area had worked rough stone quarries with crushers. In other area like Musiri , Thuraiyur and Padaloor area of Lalgudi taluk.

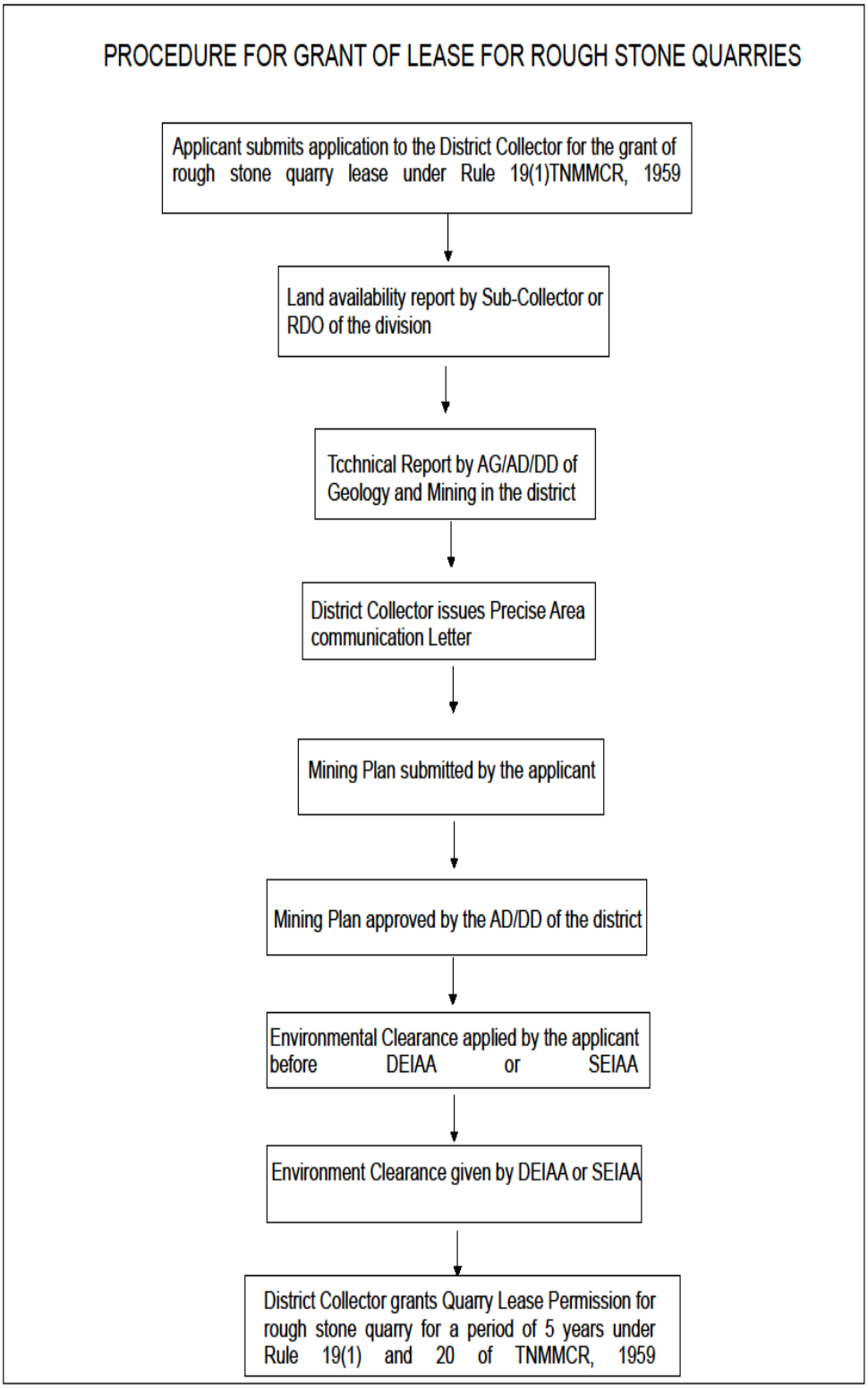
In sedimentary deposits likes lime stone, gypsum, fire clay, steatite, kankar, soap stone and phosphatie nodules are occuring in Dalmiapuram and Pullambadi region. A great Dalmia Cement corporation (Dalmiapuram) and their mines are located in Kallakudi (klk), Kovandakurichi (kvk) and Vengadachalapuram.

A heavy mineral of Garnet sand is also occurying in Musiri , Thuraiyur, Thottiam taluk areas of Tank, Eri, Pond and Odai. The upper region contains only a moderate quantity of valuable minerals of which the magnetic iron beds and garnet sand in Musiri area are the most important.

A brick earth and chamber are running in adjacent area of Cauvery and Kollidam river from west to east.

The Department of Geology and Mining (DGM) is functioning in Tiruchirappalli district under the control of District Collector, Tiruchirappalli. The Assistant Director, Geology and Mining is assisting the District Collector in the Mineral Administration works.

PROCEDURE FOR GRANT OF LEASE FOR ROUGH STONE QUARRIES



3. General Profile of the District

Tiruchirappalli district is located in the Cauvery River in Tamill Nadu, India. The main town in Tiruchirappalli District is the City of Tiruchirappalli, also known as Trichy. During the British Raj, Tiruchirappalli was known as Trichinopoly, and was a district of the Madras Presidency; it was renamed upon India's declaration of independence in 1947.

Tiruchirappalli district lies within Tamil Nadu. The district has an area of 4,404 square kilometers. It is bounded in the north by Salem district, in the northwest by Namakkal district, in the northeast by Perambalur district and Ariyalur district, in the east by Thanjavur District, in the southeast by Pudukkottai district, in the south by Madurai district and Sivagangai district, in the southwest by Dindigul district and, in the west by Karur district. The Kaveri river flows through the length of the district and is the principal source of irrigation and drinking water.

Geographical Position

North Latitude between 10°15'00" to 11°12'00"

East Longitude between 78°10'00" to 79°05'00"

The district is bounded in the North by Perambalur and Salem Districts, west by Karur / Namakkal districts, East by Thanjavur and South by Pudukkottai, Dindigul and Sivaganga Districts. It is situated 326 Kms South of the State Headquarters of Chennai.

The district had experienced cyclone and flood havoc in 1924, 1952, 1954, 1965, 1977, 1979, 1983, 1998 and 1999, and ravaged floods in 2005 The rivers Cauvery, Coleroon and their tributaries, which form a net work of irrigation system, naturally inundate larger areas during floods. Besides, the perennial rivers, there are many jungle streams in this District which carry rain water towards the Bay of Bengal. The North East Monsoon has all along been the main reason for the cyclone, as well as floods in this district. The cyclonic storm takes a heavy toll of human life and cattle besides heavy damage to coconut and other trees resulting in disruption of traffic, pulling-down telephone and electric installations.

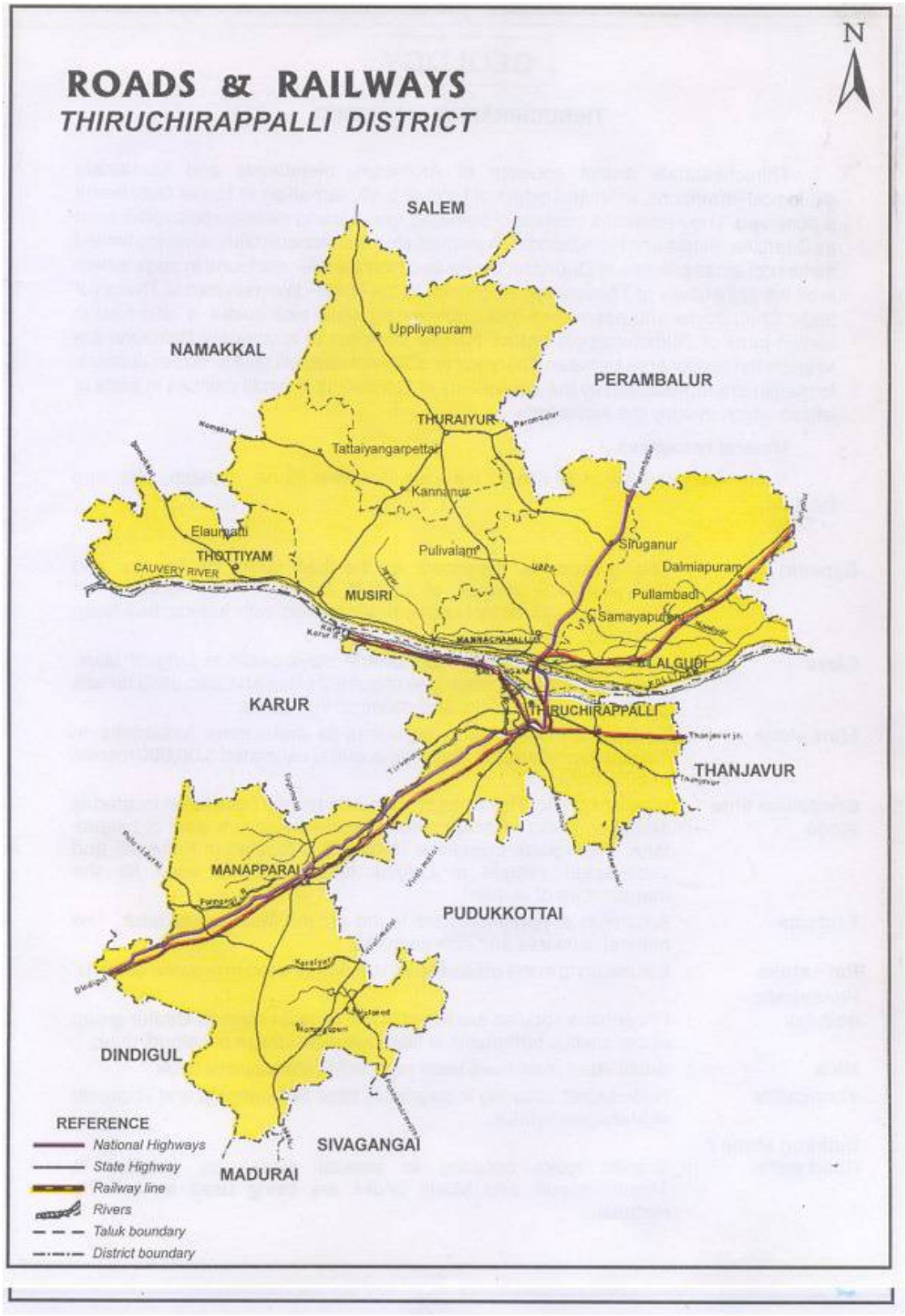

ROADS & RAILWAYS
THIRUCHIRAPPALLI DISTRICT
N
SALEM
NAMAKKAL
PERAMBALUR
Uppliyapuram
THURAIYUR
Tattaiyangarpettai
Kannanur
Elaumalai
THOTTIYAM
CAUVERY RIVER
Pulivalam
MUSIRI
Siruganur
Dalmiapuram
Pullambadi
Samayapuram
LALGUDI
KARUR
THIRUCHIRAPPALLI
THANJAVUR
MANAPPARAI
PUDUKKOTTAI
DINDIGUL
SIVAGANGAI
MADURAI
REFERENCE
National Highways
State Highway
Railway line
Rivers
Taluk boundary
District boundary

Plate - 3

Channels in the left bank are

1) Kattuputhur Channel
2) North Bank Channel
3) Ayyan Channel,
4) Peruvalai Channel
5) Srirangam North Vaikkal
6) Pullampadi Channel in the right bank Kattalai High Level and
7) New Kattalai High Level Channel.

Area and Population

i.	Area (Sq. Km.)		4,403.83
ii.	Population 2011 Census		27,22,290
	a.	Male Population	13,52,284
	b.	Female Population	13,70,006
	c.	Rural Population	13,84,257
	d.	Urban Population	13,38,033
iii.	Density (Sq. Km.)		604
iv.	Literates		20,38,981

Revenue Admin. Divisions

a.	Revenue Divisions	4
b.	Revenue Taluks	11
c.	Revenue Firkas	43
d.	Revenue Villages	507

Local Bodies

a.	Corporations	1
b.	Municipalities	3
c.	Panchayat Unions	14
d.	Town Panchayats	16
e.	Village Panchayats	431

S.No	Name of the Taluk	No Revenue Villages	S.No	Name of CD Blocks	No. of Villages	Inhabited Villages
1	Tiruchirappalli West	13	1	Andanallur	25	25
2	Lalgudi	93	2	Manikandam	24	24
3	Manapparai	51	3	Thiruverumbur	19	19
4	Musiri	64	4	Manapparai	27	27
5	Thuraiyur	64	5	Marungapuri	44	44
6	Mannnachanallur	46	6	Vaiyampatti	24	24
7	Srirangam	59	7	Lalgudi	51	51
8	Thottiyam	30	8	Manachanallur	40	39
9	Thiruverambur	31	9	Pullambadi	36	35
10	Marungapuri	45	10	Musiri	32	32
			11	Thottiam	27	27
			12	Thathayangarpettai	27	27
			13	Thuraiyur	30	30
			14	Uppiliapuram	29	25
11	Tiruchirappalli East	11		Not under any CD Block	36	2
	Total	**507**		**Total**	**507**	**431**

4. Geology of the District

The Tiruchirappalli district exposes crystalline rocks of Archaean and Proterozoic age, Upper Gondwana Formations, sedimentary rocks of Mesozoic age, Miocene and Quaternary sediments.

Lithology	Group	Age
Alluvium, Soil and Morrum		Recent
Ferrogeneous sandstone		Tertiary
Marl and Marly Limestone		Upper Cretaceous
Clastic bedded limestone and Marl		
Massive pink coral limestone Grey Shale		Lower Cretaceous
Conglomerate and Sandstone		Upper Gondwana
---------Unconformity---------		
Syenite Complex Ultra-basic complex(s)	Alkali Group	Proterozoic
Mixed gneisses, amphibolites, pyroxenites, calc-gneisses, Charnockite, Garnetiferous Gneiss and Crystalline rocks	Charnockite Group	Archaean

Crystalline rocks of Archaean to late Proterozoic age occupy over 80% of the area of the Tamilnadu, while the rest is covered by Phanerozoic sedimentary rocks mainly along the coastal belt and in a few inland River valleys. The hard rock terrain comprises predominantly of Charnockite and Khondalite groups and their migmatitic derivatives, supracrustal sequences of Sathyamangalam and Kolar groups and Peninsular Gneissic Complex (Bhavani Group), intruded by ultramafic-mafic complexes, basic dykes, granites and syenites. The sedimentary rocks of the coastal belt include fluviatile, fluvio-marine and marine sequences, such as Gondwana Supergroup (Carboniferous to Permian and Upper Jurassic to Lower Cretaceous), marine sediments of Cauvery basin (Lower Cretaceous to Paleogene), Cuddalore /Panambarai Formation (Mio-Pliocene) and sediments of Quaternary and Recent age. Geological map of Tamilnadu and Puducherry is given below:

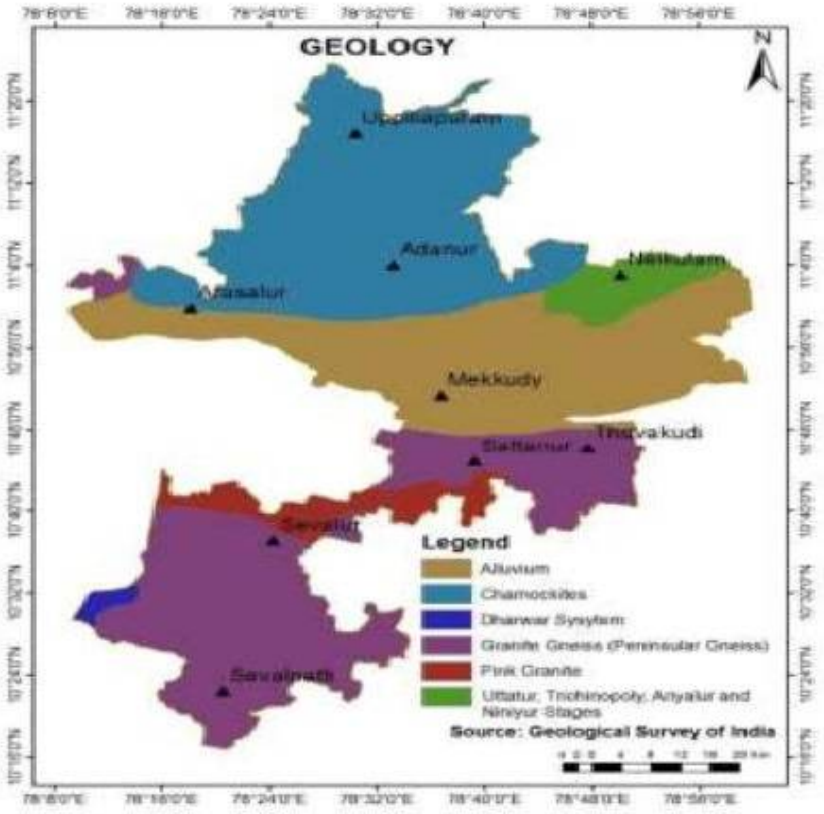


Figure 5, Geology map

Plate - 4

5. Drainage of irrigation pattern

DRAINAGE

The entire district forms part of Cauvery river basin. Cauvery is the major, and the only perennial river in the district. The northern branch of Cauvery, known as 'Coleroon' is mainly a flood carried, while the southern branch retains the name Cauvery. It has numerous tributaries draining the district, the prominen tones of which are Ayyar and Uppar in the north and Koraiyar in the south. Most of the rivers are structurally controlled. The drainage pattern, in general, is dendritic.

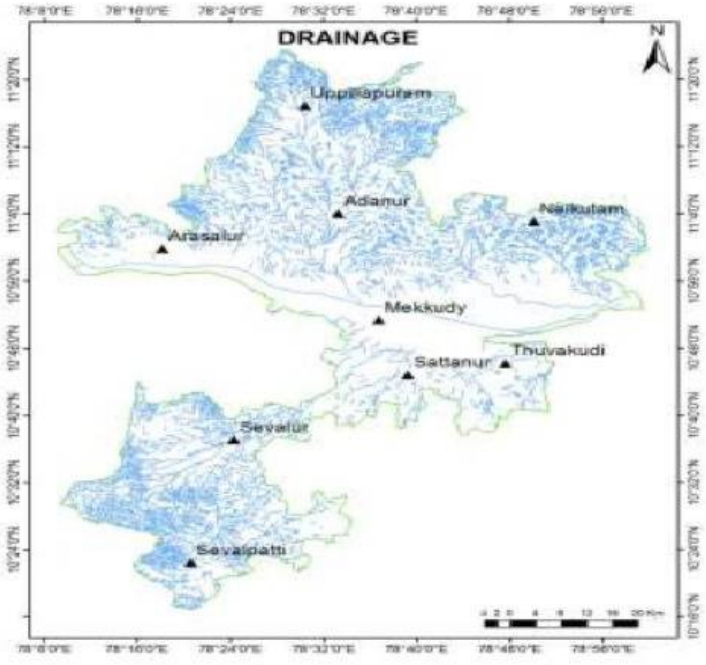


Figure 2, Drainage Map

Plate - 5

IRRIAGATION PATTERN

Irrigations an artificial application of water to the soil usually for assisting in growing crops. In crop production it is mainly used in dry areas and in periods of rainfall shortfalls, but also to protect plants against frost Additionally irrigation

helps to suppress weed growing in rice fields. In contrast, agriculture that relies only on direct rainfall is referred to as rain-fed farming. Irrigation is often studied together with drainage, which is the natural or artificial removal of surface and sub surface water from a given area. Nearly 0.89 hectare of forest land are converted for formation of tank by Public Works Department (PWD) in Sembianatham RF in Tiruchirappalli Division. Laying of pipeline and construction of shed for the water supply project in Mayanur RF by Tamil Nadu Water Supply and Drainage Board (TWAD), Namakal. Laying of pipeline in Evur RF by Tamil Nadu Water Supply and Drainage Board (TWAD), Musiri. In Tiruchirappalli District 1,86,778 ha. (42.41 % to the total geographical area) of land are underirrigated area .The major source of irrigation is through wells and Canals. The presence of canal irrigation is found in all blocks of Tiruchirappalli except Thuraiyur, Marungapuri, and Thathaiyangarenpet.

4. IRRIGATION

4.1 Sources of Water Supply –Blockwise

Year: 2016 -17

Sl. No.	Name of the Block	Number of irrigation sources						
		Govt. nals Nos.	Govt. Canals ngth Km	Res -voirs	Tank	Wells for rigation	Tube Wells	Domestic wells
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Thiruverumbur	26	72	0	161	115	98	755
2	Andanallur	28	78	0	42	682	707	503
3	Manikandam	12	36	0	0	600	541	134
4	Mannapparai	0	0	0	204	6465	1097	673
5	Marungapuri	0	0	0	683	7806	50	537
6	Vaiyampatti	2	11	1	240	6020	88	388
7	Lalgudi	12	84	0	20	2822	2421	518
8	Pullambadi	3	21	0	85	3481	257	669
9	Manachanallur	8	40	0	33	6835	116	102
10	Musiri	3	53	0	42	7061	153	616
11	T.Pet	0	0	0	22	7126	2083	709
12	Thottiam	8	60	0	156	6111	453	548
13	Thuraiyur	9	19	0	74	9529	83	309
14	Uppiliyapuram	24	20	0	15	8098	119	519
	District Total	135	494	1	1767	72751	8266	6980

Source: District 'G' – Return, Trichy District, Fasli1465(2016-17).

4.4 Details of Dams, Tanks, Wells and Bore Wells

Year: 2016-17

Sl. No.	Name of the Block	Number of irrigation sources							
		Govt. Canals Nos.	Govt. Canals ngth Km	Reser voirs	Tank	Tube well & ore well	Dug m Bore well	Filter Point	Dug well
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	Andanallur	28	78	0	0	707	--	25	682
2	Manikandam	12	36	0	42	541	--	--	600
3	Thiruverumbur	26	72	0	161	98	--	--	115
4	Mannapparai	0	0	0	204	1097	--	--	6465
5	Marungapuri	0	0	0	683	50	--	--	7806
6	Vaiyampatti	2	11	1	230	88	--	--	6020
7	Lalgudi	12	84	0	20	2421	--	387	2822
8	Pullambadi	3	21	0	85	257	--	--	3481
9	Manachanallur	8	40	0	33	116	--	38	6835
10	Musiri	3	53	0	42	153	--	--	7061
11	T.Pet	0	0	0	22	2083	--	--	7126
12	Thottiam	8	60	0	156	453	365	--	6111
13	Thuraiyur	9	19	0	74	83	--	--	9529
14	Uppiliyapuram	24	20	0	15	119	--	--	8098
	District Total	135	494	1	1767	8266	365	450	72751

Source: District 'G' – Return, Trichy District,Fas1li 1426(2016-17).

4.2 Actual area irrigated by source

Year: 2016-17

(Area in Hectares)

Source	Number	Area Irrigated	
		Net	Gross
(1)	(2)	(3)	(4)
I.Surface Water:			
1. Canals i) Government Canals ii) Private Canals	135	15273.71	15479.04
2. Tanks i) Large ii) Small Sub-Total	115 1652 1767	**993.72**	**1091.72**
3. Flow Irrigation i) Major & Medium ii) Minor			
5. Ponds i) Lift Irrigation ii) Minor 6. Other Sources: i) Lift Irrigation ii) Flow Irrigation iii) II Ground Water:			
1. Public 2. Private Tube Wells 3. Borewells 4. Dug Wells I) With Masonry ii) Without Masonry	7714 73278	9275.635 28012.62	13521.290 35136.685

Source: 'G' Return2016-17 (Fasli-1426).

6. Land Utilisation Pattern in the District

Land is the basic resources of human society. It is the most significant among the natural resources of the country and most of its inhabitants depend on agriculture for their livelihood. Land is being used by people for various purposes. The basic requirement of human society is food. Farmers produce food from the land. The second important basic need of the people is home. It takes a very higher priority in its demand of land. Land use / Land cover exhibits the physical and economical situation of any region. Land use / Land cover determines the standard of living of the people and the natural resources found in a region. The development of human race started to develop from when man started to convert the land cover region to land use. Land use and land cover changes degrade and have an instant impact on the global carbon cycle. The global cycle can add or remove carbon di-oxide from the atmosphere, contributing to climate changes which lead to global warming. The information on land use/land cover patterns, their spatial distribution and changes over a time scale are prerequisite for making development plans.

Tiruchirappalli district is an important region in the State and had been a Centre of activities for many historical events from the days of the early Cholas. Rock Fort, Thayumana Swamy, Pillaiyar Temple, Teppakulam, the Nawab's palace, the Nadir Shah Mosque, Sri Rangam Temple, Thiruvanai Koil, Subramanyaswami Temple, Upper Anicut and Grand Anicut are some of the important monuments and temples reflecting the history, culture and traditions of the district. Tiruchirappalli district is one of the important districts in Tamil Nadu and had a population of 27 lakhs as per 2011 census. In terms of urbanization level, according to the composition of urban and rural population, Tiruchirappalli district ranked 10th among the other districts in Tamil Nadu.

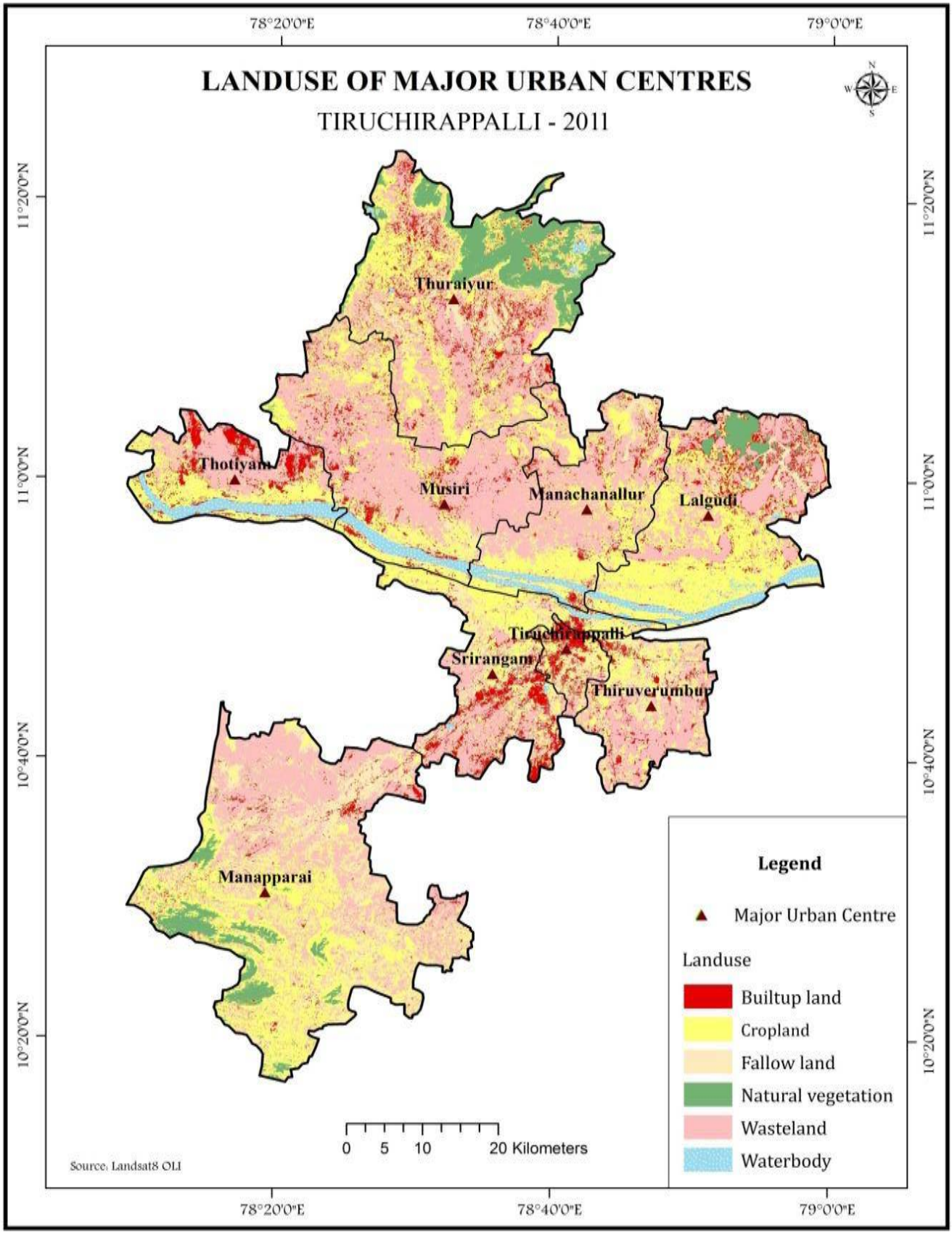

LANDUSE OF MAJOR URBAN CENTRES
TIRUCHIRAPPALLI - 2011
78°20'0"E
78°40'0"E
79°0'0"E
11°20'0"N
11°0'0"N
10°40'0"N
10°20'0"N
Thuraiyur
Thotiyam
Musiri
Manachanallur
Lalgudi
Tiruchirappalli
Srirangam
Thiruverumbur
Manapparai
Legend
Major Urban Centre
Landuse
Builtup land
Cropland
Fallow land
Natural vegetation
Wasteland
Waterbody
0 5 10 20 Kilometers
Source: Landsat8 OLI

Plate - 6

3.9 SERICULTURE

Year: 2016-17

Sl. No.	Name of the Taluk/Block	Area under Mulbery in Acre/Farmers	Production of Cocoons in K.gs	Value in Rs.Lakhs
(1)	(2)	(3)	(4)	(5)
1.	THURAIYUR	31.300	7330	146600
2.	UPPILIAPURAM	115.500	43283	865660
3.	THOTTIAM	38.000	6913.5	138270
4.	MANAPPARAI	34.0000	8200.25	164005
5.	MANNACHANALLUR	25.000	5453.5	109070
6.	LALGUDI	32.000	9574	191480
7	T.PET	26.000	6834	136680
8	MUSIRI	20.000	5097	101940
9	VAIYAMPATTI	13.000	4583	91660
10	MANIKANDAM	42.650	8540	170800
11	MARUNGAPURI	28.000	6610	132200
	TOTAL	423.650	15719.25	314385

LAND CLASSIFICATION (IN HECT)

1. Forests	17167.470	3.90 %
2. Barren &Uncultivable land	12598.200	2.86 %
3. Land put to Non Agricultural use	85250.865	19.35%
4. Cultivable Waste	10839.565	2.46%
5. Permanent Pastures & other Grazing Land	667.195	0.15%
5. Land Under Miscellaneous Tree Crops & groves not included in Net Area Sown	3116.080	0.71%
6. Current Fallow Lands	63656.280	14.45%
7. Other Fallow Lands	108046.635	24.53%
8. Net Area Sown	119437.985	27.12%
Un Classified Forests	19605.725	4.47%
Total Geographical Area	440383.00	100.00

7. Surface water and Ground water scenario of the District

since most of the rivers in study area are seasonal, no water was observed during the study period. Hence, in order to assess the surface water quality of the study area six samples from various lakes were and atvarious points around the project site.

It is observed that pH of surface water around the project site is in the range of 6.6 to 7.6 which is neutral. The TDS levels in the surface water at various locations were found to vary from 36 mg/L to 144 mg/L.The Total Hardness of the surface water was found to be ranging from 17mg/l to 53 mg/l. The Fluoride concentration was found to be in the range of 0.11 mg/l to 0.13 mg/l. The microbiological content as total coliform was found to vary from <2 MPN/100mlatInamkulathar Lake to 50 MPL/100mlat Samuthiram Lake. Heavy metal concentrations are below detectable limit however traces of copper, nickel, zinc, manganese and aluminium were found at all six lakes.

To assess the ground water quality of the study area, eight (8) ground water sampling locations were selected. The pH of the ground water at eight locations varied from 7.8 to 8.2 indicating that the water is alkaline. The Total Dissolved Solids (TDS) was found to vary from 324 mg/L at plant site to 2716 at Manaparai Village. The TDS value was higher than the permissible range of 2000 mg/L at Manaparai Village. Similarly the hardness value was found to vary from 154 mg/L at Plant site to 1368 mg/L at Manaparai Village and heavy metals were observed to be below detectable limit.

Tiruchirappalli District - Ground water level from 1991 - 2016

Sl. No	District	Average	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1	Post Monsoon Ground water Level in m (January)	6.8		7.2	5.2	2.5	5.4	10.2	9.6	6.4	2.3	2.8	5.7	8.0	10.3	10.7	7.8	2.6	5.4	5.3	4.5	6.4	4.6	5.1	10.6	11.0	10.7	8.7
2	Pre Monsoon Ground water Level in m (May)	9.7	12.6	10.4	8.5	4.8	9.1	11.2		10.4	6.5	5.8	7.7	10.4	14.0	12.8	9.1	5.4	9.0	8.7	8.3	10.5	7.2	9.6	13.4	13.9	11.9	12.0

Plate - 7

8. Rainfall of the District and Climate condition

RAINFALL

Rainfall is heaviest between October and December because of the north-east monsoon winds, and from December to February the climate is cool and moist. The winter season being cool is pleasant and enjoyable. Period of hot summer prevails till June when South West monsoon sets which brings scanty rains. This monsoon period last till August. The heaviest rainfall occurs during October to December when the North East monsoon sets in. Month wise rainfall data of the district is given below:

Year	Jan		Feb		Mar		Apr		May		June	
	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP
2012	7.9	-68	8.3	-54	35.9	23	28.0	-46	8.9	-71	0.0	-100
2013	0.8	-94	5.7	-37	14.4	22	1.6	-96	42.2	-29	5.4	-83
2014	24.4	-1	7.0	-62	16.7	-43	5.5	-89	137.2	343	7.8	10
2016	0.0	-100	0.0	-100	1.4	-88	0.8	-98	128.6	115	33.8	7

*Source:hydro.imd.gov.in

Year	July		Aug		Sept		Oct		Nov		Dec	
	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP	R/F	%DEP
2012	0.0	-100	0.4	-97	0.0	-100	198.0	31	99.0	-47	33.4	-63
2013	1.3	-98	83.3	13	117.9	-13	85.5	-51	127.1	-9	37.7	-52
2014	2.0	-87	20.0	27	22.1	-39	334.7	121	186.9	1	64.0	-29
2016	114.6	115	37.7	-49	24.9	-82	100.9	-42	4.0	-97	27.8	-64

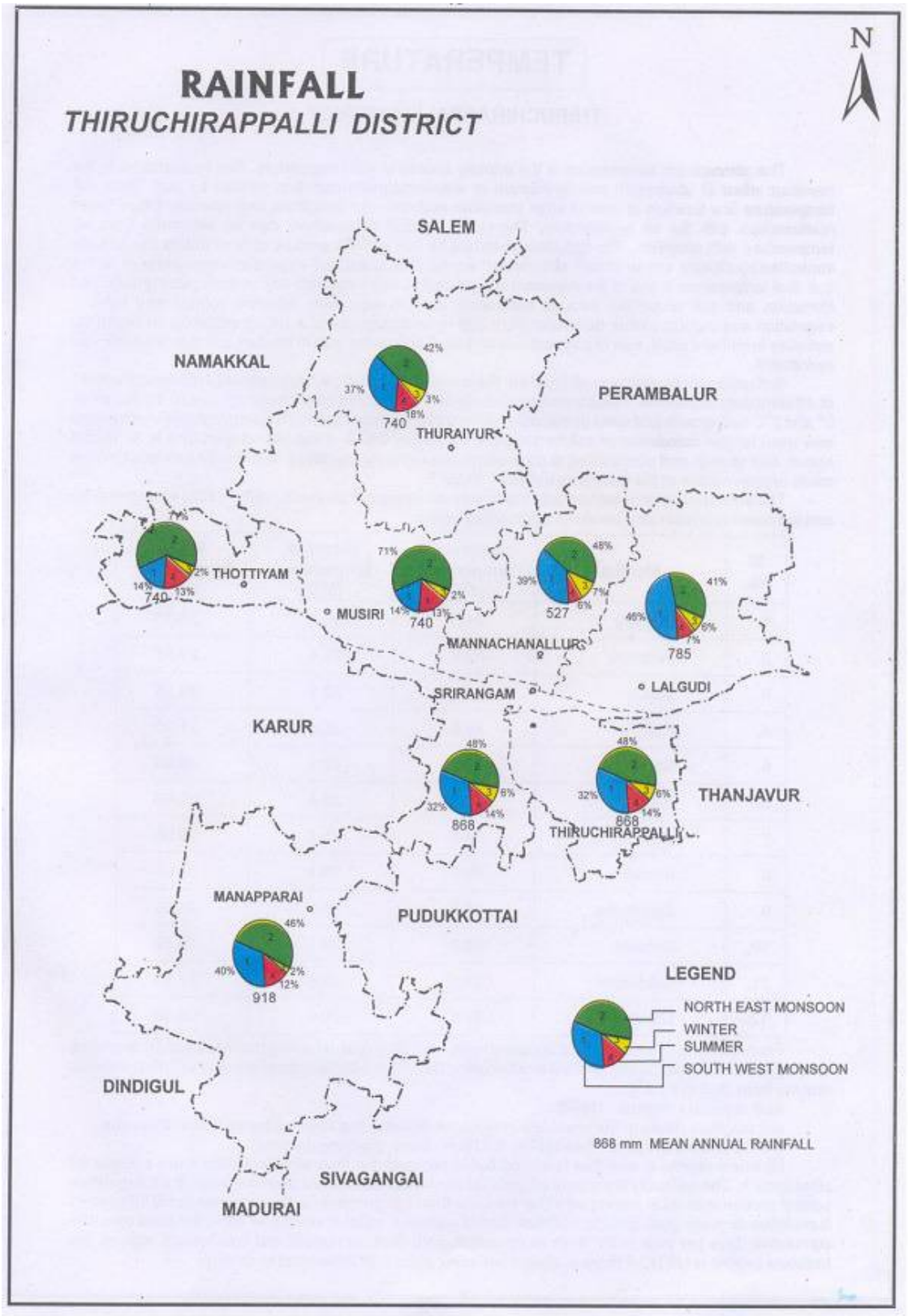

RAINFALL
THIRUCHIRAPPALLI DISTRICT
N
SALEM
NAMAKKAL
PERAMBALUR
THURAIYUR
740
THOTTIYAM
740
MUSIRI
740
527
MANNACHANALLURS
785
LALGUDI
SRIRANGAM
KARUR
868
THANJAVUR
868
THIRUCHIRAPPALLI
MANAPPARAI
PUDUKKOTTAI
918
DINDIGUL
SIVAGANGAI
MADURAI
LEGEND
NORTH EAST MONSOON
WINTER
SUMMER
SOUTH WEST MONSOON
868 mm MEAN ANNUAL RAINFALL

Plate - 8

CLIMATE CONDITION

Tiruchirappalli has a tropical climate. The summers are much rainier than the winters in Tiruchirappalli. This climate is considered to be Aw according to the Köppen-Geiger climate classification. The average temperature in Tiruchirappalli is 28.8 °C. The rainfall here averages 860 mm.

Tiruchirappalli Weather by month // weather averages

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	25.3	27	29	31.2	31.7	31.4	30.6	30.2	29.5	28.1	26.3	25.3
Min. Temperature (°C)	20.6	21.3	23	25.8	26.4	26.5	25.9	25.4	24.9	23.9	22.7	21.3
Max. Temperature (°C)	30.1	32.7	35.1	36.7	37.1	36.4	35.4	35.1	34.2	32.4	30	29.3
Avg. Temperature (°F)	77.5	80.6	84.2	88.2	89.1	88.5	87.1	86.4	85.1	82.6	79.3	77.5
Min. Temperature (°F)	69.1	70.3	73.4	78.4	79.5	79.7	78.6	77.7	76.8	75	72.9	70.3
Max. Temperature (°F)	86.2	90.9	95.2	98.1	98.8	97.5	95.7	95.2	93.6	90.3	86	84.7
Precipitation / Rainfall (mm)	19	11	9	46	58	32	62	90	129	192	132	80

9. DETAILS OF THE MINING LEASES IN THE DISTRICT

BRIEF NOTE ON GRANITE:

At Present, both in domestic and international market, Colour Granite having gang saw size fetches well price and is in good demand. The smaller domestic sales will also bring returns financially to State government and Central government in the forms of taxes, Cesses, duties, etc., As the Colour Granite quarry mining operations in the proposed mine will employ youths indirect basis through allied opportunities in logistics, trading, repairing works etc., good employment potential will arise in this internal rural backward area, which will provide a great fillip for raising income levels and standards of living in the area. Colour Granite one among the most used Granite Dimensional Blocks for building and construction in the form of Rough block, Slabs, Tiles, fancy items and precession plates besides catering monument industries. The requirement of Colour Granite due to its stability and color which always requires a huge demand of every house, Industries, Factories, Colleges, Hospitals and all major infrastructure industries. This specific Colour Granite area has already achieved a considerable place in the domestic and international markets of Granites for the past three decades.

There is no import of Colour Granite at present in India. India especially the peninsular India (southern India) have good resource of Colour Granite and has a great demand in the international supermarket of Granites. Indigenous Colour Granite almost shares more than 30% requirement in the world.

The Colour Granite blocks approved for export market are shipped from Chennai Harbour to various countries and if required blocks may be shifted to Tuticorin Harbour which depend upon the exporters destination.

There are many Granite processing industries inside the district and all over Tamilnadu. There is a huge demand of Colour Granite for construction, infrastructure and Housing Industries as these Granite slabs

are Eco friendly and has less maintenance besides giving an aesthetic appearance in the floor and walls. India is a Global player in the supply of Colour Granite to the international supermarket of Granite for the past three decades. At present there is a huge requirement of this Colour Granite Blocks for the domestic construction industries depends upon the size, Clarity, Purity, rarity the commercial aspects are decided, the applicant proposed to ensure that the Granite is quarried in a scientific and systematic way to attain the maximum recovery of Granite blocks from the area applied for lease. There is a considerable demand of Colour Granite in domestic as well as for export.

The world famous decorative stone of the granites varieties are available in this district. In tiruchirappalli district important granite varieties are mainly multi colour granite in most of the places in the district and small patches of the black granite has noticed in talugai village of the Thuraiyur taluk.

Multi colour granite quarries are occur in and around the Mugavanor, kumaravadi and pudukottai villages in manapparai region. Namely Sivasakthi granites, Farahadeepa quarry and venilla granites. Totally 3 nos of granite leases with extent of 3.32.0 hact. present in Manapparai taluk of tiruchirappalli district. All are colour granite now two quarries operation stopped due to not obtaining environmental clearance. Now only one is running. It is a fresh quarry recently started.

In Manachanallur area one colour granite quarry of Maducon company was running. Now it had stopped. TAMIN multi colour granite quarry is located in sikkathambur village with extent of 14.00.0 hects. in Thuraiyur taluk of tiruchirappalli district. It is a hilly region operation now stopped even though granites blocks are laying down outside of the quarries.

SI.NO	Name of The Mineral	Name of the Lessee	Address & Contact No of Lessee	Mining Lease Grant Order No.& Date	Area of Mining Lease (ha)	Period of Mining lease (initial)		Period Of Mining Lease (1st /2nd ...renewal)	
						From	To	From	To
1	2	3	4	5	6	7	8	9	10
1	Color Granite	Tvl.TAMIN Ltd.	Chennai.	(3D) 114 (MME-1) Dated: 06.09.2005	314 part Poramboke, 15.00.0 Hects., Sikkathambur village, Thuraiyur Taluk	7.12.05	6.12.2025	1st	

Date of Commencement of Mining Operation	Status (Working /Non-Working /Temp-Working for Dispatch etc.)	Captive/ Non-Captive	Obtained Environmental Clearance (Yes/No), if Yes Letter No with Date of grant of EC.	Location of the Mining lease (Latitude & Longitude)	Method of Mining (Opencast/Underground)
11	12	13	14	15	16
7.12.05	Non Working	Captive	No		Opercost

SI.NO	Name of The Mineral	Name of the Lessee	Address & Contact No of Lessee	Mining Lease Grant Order No.& Date	Area of Mining Lease (ha)	Period of Mining lease (initial)		Period Of Mining Lease (1st /2nd ...renewal)	
						From	To	From	To
1	2	3	4	5	6	7	8	9	10
2	Color Granite	Tvl.Sivasakthi Granites	No.147, West Sambandam Rd., R.S.Colony, Coimbatore-2.	(3D) 36 (MMB-1) Dated: 30.5.2005	370/2 Part Patta, 1.00.0 Hects, Kumaravadi village Manapparai Tlauk	29.6.05	28.6.2025	1st	

Date of Commencement of Mining Operation	Status (Working /Non-Working /Temp-Working for Dispatch etc.)	Captive/ Non-Captive	Obtained Environmental Clearance (Yes/No), if Yes Letter No with Date of grant of EC.	Location of the Mining lease (Latitude & Longitude)	Method of Mining (Opencast/Under ground)
11	12	13	14	15	16
29.6.05	Non Working	Captive	No	N10^{0}31'4.83" E78^{0}18'46.32" N10^{0}31'1.60" E78^{0}18'45.12" N10^{0}31'5.82" E78^{0}18'42.82" N10^{0}31'2.06" E78^{0}18'42.89"	Open Cost

SI.NO	Name of The Mineral	Name of the Lessee	Address & Contact No of Lessee	Mining Lease Grant Order No.& Date	Area of Mining Lease (ha)	Period of Mining lease (initial)		Period Of Mining Lease (1st /2nd …renewal)	
						From	To	From	To
1	2	3	4	5	6	7	8	9	10
3	Color Granite	Tmt.Farhadeeba	D/o.A.K.Abdul Samad, No.1.4, Hayes Rd, Rich Mount town, Bangalore-25, Karnataka State.	(3D) 80 (MMB-1) Dated: 07.11.2006	454/3 (part) Patta, 1.19.0 Hects, Pudukkottai village, Manapparai Taluk	4.12.06	3.12.2026	1st	

Date of Commencement of Mining Operation	Status (Working /Non-Working /Temp-Working for Dispatch etc.)	Captive/ Non-Captive	Obtained Environmental Clearance (Yes/No), if Yes Letter No with Date of grant of EC.	Location of the Mining lease (Latitude & Longitude)	Method of Mining (Opencast/Underground)
11	12	13	14	15	16
4.12.06	Non Working	Non Captive	No	N 10^{0}31'3.29" E 78^{0}15'35.18" N 10^{0}31'7.11" E 78^{0}15'39.70"	Opencast

SI.NO	Name of The Mineral	Name of the Lessee	Address & Contact No of Lessee	Mining Lease Grant Order No.& Date	Area of Mining Lease (ha)	Period of Mining lease (initial)		Period Of Mining Lease (1st /2nd ...renewal)	
						From	To	From	To
1	2	3	4	5	6	7	8	9	10
4	Color Granite	Tvl.Madhucon Granites Ltd.,	1-7-70 Madhu Complex, Jublipura Khannan, Andhra Pradesh.	G.O.(3D) No.69 (MMB-1) Dept. Dt: 28.12.2011	210/1B, 118/6B, 118/8B Patta, 1.22.0 Hects. Ayakudi Village Manachanallur Taluk	28.1.2012	27.1.2032	1st	

Date of Commencement of Mining Operation	Status (Working /Non-Working /Temp-Working for Dispatch etc.)	Captive/ Non-Captive	Obtained Environmental Clearance (Yes/No), if Yes Letter No with Date of grant of EC.	Location of the Mining lease (Latitude & Longitude)	Method of Mining (Opencast/Underground)
11	12	13	14	15	16
28.1.2012	Non Working	Captive	No	N 10^0 58' 24" E 78^0 45 ' 05"	Opencast

SI.NO	**Name of The Mineral**	**Name of the Lessee**	**Address & Contact No of Lessee**	**Mining Lease Grant Order No.& Date**	**Area of Mining Lease (ha)**	**Period of Mining lease (initial)**		**Period Of Mining Lease (1st /2nd ...renewal)**	
						From	To	From	To
1	2	3	4	5	6	7	8	9	10
5	Color Granite	Tmt.S.Vennila	W/o.Senthilkumar, No.5/14-A, Meenakshi Sundaram Street, Ayyappa Nagar Tiruchi.	G.O.(3D) No.38 (MMB-1) Dept. Dt: 24.08.2018	314/1A, 314/2A, 315/3B, 315/5B, 315/7A, 315/3D Patta 1.13.0 Hects., Mugavanoor Village, Manapparai Taluk	12.10.2018	11.102038	1st	

Date of Commencement of Mining Operation	**Status (Working /Non-Working /Temp-Working for Dispatch etc.)**	**Captive/ Non-Captive**	**Obtained Environmental Clearance (Yes/No), if Yes Letter No with Date of grant of EC.**	**Location of the Mining lease (Latitude & Longitude)**	**Method of Mining (Opencast/ Underground)**
11	12	13	14	15	16
12.10.2018	Not Working	Non Captive	Yes	N $10^0$36’27.18” E $78^0$16’54.60” N $10^0$36’34.37” E $78^0$16’59.21”	Opencast

SI.NO	Name of The Mineral	Name of the Lessee	Address & Contact No of Lessee	Mining Lease Grant Order No.& Date	Area of Mining Lease (ha)	Period of Mining lease (initial)		Period Of Mining Lease (1st /2nd …renewal)	
						From	To	From	To
1	2	3	4	5	6	7	8	9	10
6	Black Granite	Tmt.C.Dhanalakshmi	W/o.Chelladurai, Kandasamypudur, Athur Taluk, Salem Dt.	(3D) 100 (MMB-1) Dated: 13.12.2000	660/2A2 Patta 1.29.5 Hects. Thalugai village Thuraiyur Taluk	27.1.01	26.1.2021	1st	

Date of Commencement of Mining Operation	Status (Working /Non-Working /Temp-Working for Dispatch etc.)	Captive/ Non-Captive	Obtained Environmental Clearance (Yes/No), if Yes Letter No with Date of grant of EC.	Location of the Mining lease (Latitude & Longitude)	Method of Mining (Opencast/Underground)
11	12	13	14	15	16
27.01.01	Non Working	Non Captive	No	N $11^0$24’15” E $78^0$28’15”	Open Cast

SI.NO	Name of The Mineral	Name of the Lessee	Address & Contact No of Lessee	Mining Lease Grant Order No.& Date	Area of Mining Lease (ha)	Period of Mining lease (initial)		Period Of Mining Lease (1st /2nd ...renewal)	
						From	To	From	To
1	2	3	4	5	6	7	8	9	10
7	Black Granite	S.Thangaraju	Proprietor, T.J.P.Granite, Tharamangalam, Salem District.	(3D) 51 Industries (MMB-1) Department, Dt:14.10.2010	295/1 (part), 295/2 (Part), 295/7 (part), Patta, 1.05.0 Hects Thalugai village Thuraiyur Taluk	10.11.2010	09.11.2030	1st	

Date of Commencement of Mining Operation	Status (Working /Non-Working /Temp-Working for Dispatch etc.)	Captive/ Non-Captive	Obtained Environmental Clearance (Yes/No), if Yes Letter No with Date of grant of EC.	Location of the Mining lease (Latitude & Longitude)	Method of Mining (Opencast/Underground)
11	12	13	14	15	16
10.11.2010	Non Working	Captive	No		Opencast

10.Details of Seniorage fee received in last three years

Granite (Seinorage fee)

S.No	Period	Collected Amount In Rs.
1	2016-2017	8,74,105
2	2017-2018	Nil
3	2018-2019	Nil

11. Details of production of minor mineral

Granite

S.No	Period	Quantity in m^3
1	2016-2017	359.305
2	2017-2018	Nil
3	2018-2019	Nil

12. Mineral Map of the District

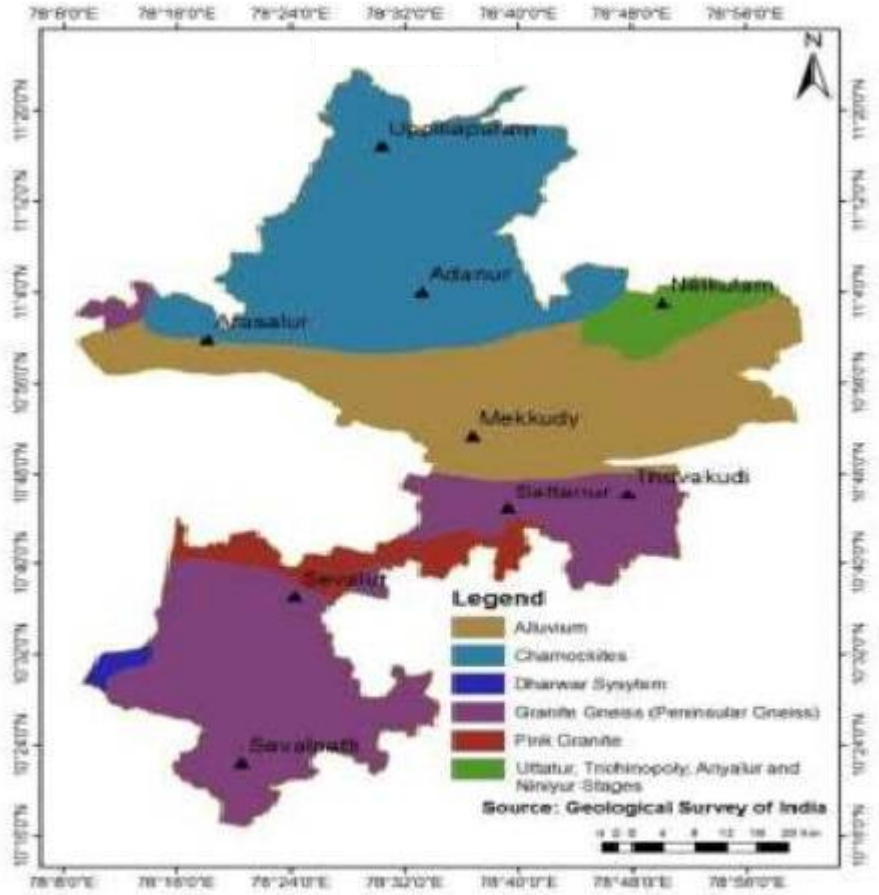


Plate - 9

13. List of Letter of intent (LOI) Holders in the District

SI.NO	Name of the Mineral	Name of the Lessee	Address & Contact No. Of Letter of Intent Holder	Letter Of Intent Grant Order No.& Date
1	2	3	4	5
1	Color Granite	Tvl.TAMIN Ltd.	Chennai	-----
2	Color Granite	Tvl.Sivasakthi Granites	No.147, West Sambandam Rd., R.S.Colony, Coimbatore-2.	3D) 36 (MMB-1) Dated: 30.5.2005
3	Color Granite	Tmt.Farhadeeba	D/o.A.K.Abdul Samad, No.1.4, Hayes Rd, Rich Mount town, Bangalore-25, Karnataka State.	(3D) 80 (MMB-1) Dated: 07.11.2006

SI.NO	Area of Mining Lease to be Allotted	Validity of LOI	Use (Captive/Non-Captive)	Location of the Mining Lease (Latitude & Longitude)
	6	7	8	9
1	314 part Poramboke, 15.00.0 Hects., Sikkathambur village, Thuraiyur Taluk	20 years 7.12.05 to 6.12.2025	Captive	------
2	370/2 Part Patta, 1.00.0 Hects, Kumaravadi village Manapparai Tlauk	20 years 29.6.05 To 28.6.2025	Captive	N10^{0}31'4.83" E78^{0}18'46.32" N10^{0}31'1.60" E78^{0}18'45.12" N10^{0}31'5.82" E78^{0}18'42.82" N10^{0}31'2.06" E78^{0}18'42.89"
3	454/3 (part) Patta, 1.19.0Hects, Pudukkottai village, Manapparai Taluk	20 years 4.12.06 to 3.12.2026	Captive	N 10^{0}31'3.29" E 78^{0}15'35.18" N 10^{0}31'7.11" E 78^{0}15'39.70"

SI.NO	Name of the Mineral	Name of the Lessee	Address & Contact No. Of Letter of Intent Holder	Letter Of Intent Grant Order No.& Date
1	2	3	4	5
4	Color Granite	Tvl.Madhucon Granites Ltd.,	1-7-70 Madhu Complex, Jublipura Khannan, Andhra Pradesh.	G.O.(3D) No.69 (MMB-1) Dept. Dt:28.12.2011
5	Color Granite	Tmt.S.Vennila	W/o.Senthilkumar, No.5/14-A, Meenakshi Sundaram Street, Ayyappa Nagar Tiruchi.	G.O.(3D) No.38 (MMB-1) Dept. Dt:24.08.2018
6	Black Granite	Tmt.C.Dhanalakshmi	W/o.Chelladurai, Kandasamypudur, Athur Taluk, Salem Dt.	(3D) 100 (MMB-1) Dt:13.12.2000

SI.NO	Area of Mining Lease to be Allotted	Validity of LOI	Use (Captive/Non-Captive)	Location of the Mining Lease (Latitude & Longitude)
	6	7	8	9
4	210/1B, 118/6B, 118/8B Patta, 1.22.0 Hects. Ayakudi Village Manachanallur Taluk	20 years 28.1.2012 to 27.1.2032	Captive	N 10^0 58' 24" E 78^0 45 ' 05"
5	314/1A, 314/2A, 315/3B, 315/5B, 315/7A, 315/3D Patta 1.13.0 Hects., Mugavanoor Village, Manapparai Taluk	20 years 12.10.2018 to 11.102038	Non Captive	N $10^0$36'27.18" E $78^0$16'54.60" N $10^0$36'34.37" E $78^0$16'59.21"
6	660/2A2 Patta 1.29.5 Hects. Thalugai village Thuraiyur Taluk	20 years 27.1.01 to 26.1.2021	Non Captive	N $11^0$24'15" E $78^0$28'15"

SI.NO	Name of the Mineral	Name of the Lessee	Address & Contact No. Of Letter of Intent Holder	Letter Of Intent Grant Order No.& Date
1	2	3	4	5
7	Black Granite	S.Thangaraju	Proprietor, T.J.P.Granite, Tharamangalam, Salem District	(3D) 51 Industries (MMB-1) Department, Dt:14.10.2010

SI.NO	Area of Mining Lease to be Allotted	Validity of LOI	Use (Captive/Non-Captive)	Location of the Mining Lease (Latitude & Longitude)
	6	7	8	9
7	295/1 (part), 295/2 (Part), 295/7 (part), Patta, 1.05.0 Hects Thalugai village Thuraiyur Taluk	20 years 10.11.2010 to 09.11.2030	Captive	----

14. Total Mineral Reserve available in the District

SI. NO	Name of the lessee	S.F. Number & Extent	Village and Taluk	Available Geological resources at site (m^3)
1	Tvl.TAMIN Ltd.	314 part Poramboke, 15.00.0 Hects.,	Sikkathambur village/Thuraiyur Taluk	28,27,367
2	Tvl.Sivasakthi Granites	370/2 Part Patta, 1.00.0 Hects,	Kumaravadi village / Manapparai Tlauk	63,750
3	Tmt.Farhadeeba	454/3 (part) Patta, 1.19.0Hects,	Pudukkottai village /Manapparai Taluk	99,165
4	Tvl.Madhucon Granites Ltd.,	210/1B, 118/6B, 118/8B Patta, 1.22.0 Hects.	Ayakudi Village/ Manachanallur Taluk	72,460
5	Tmt.S.Vennila	314/1A, 314/2A, 315/3B, 315/5B, 315/7A, 315/3D Patta 1.13.0 Hects.,	Mugavanoor Village, /Manapparai Taluk	2,92,780
6	Tmt.C.Dhanalakshmi	660/2A2 Patta 1.29.5 Hects.	Thalugai village /Thuraiyur Taluk	21,200
7	S.Thangaraju	295/1 (part), 295/2 (Part), 295/7 (part), Patta, 1.05.0 Hects	Thalugai village /Thuraiyur Taluk	52,500

15. Quality / Grade of Mineral Available in the District

Mineral	Quality/Grade
Colour Granite	Multi colour good quality and good Grade
Rough Stone	Charnockite, Gneiss, good quality
Gravel and Earth	Good quality of filling and road material
Gypsum	Cement grade very good quality
Lime stone	Sedimentary basis, Cement grade very good quality
Garnet sand	Industrial Grade good quality
Quarts & fieldsper	Small varies deposits and low quality
Steatite	Medium Grade

16. Use of Mineral

Granite :

It is world's toughest substance. It has been used since thousands of years. Apart from using it from building monuments it is also used in curling balls and gym walls for training mountain climbing. Below are the **granite uses** in different forms:

- Building monuments
- Granite used in jewellery
- Granite used in fireplace mantle and floor
- Granite used in bathroom skins, shelves, tabletops, basins

Granite used in building monuments:

Long lasting structures like temples, gravestones or monuments are usually made of granite. Before the existence of power tools/equipments

granite carving was time consuming. Also it was laborious. Therefore the stone was used for important projects only

Granite used in jewellery:

Few granites are rare and amazingly beautiful. So they are used as gemstones. They are used in jewellery. Example of gemstone – blue tint found in himalayas named K2 Azurite granite is a rare stone and is known as gemstone

Granite used in fireplace mantle and floor:

If you have a fireplace mantle in your living room, then using granite you can make it more attractive. An ordinary fireplace can turn into centrepiece. An excellent place for get together with friends and family. Also, if you want a perfect flooring, which is smooth and looks good,

Then granite tiles will do. There are different colors of tiles. It is the best choice for people who are prone to allergies because it is bacteria resistant. Very easy easy to clean. Regular sweeping and mopping will keep the flooring in great condition.

Granite used in bathroom skins, shelves, tabletops, basins:

Using granite for kitchen tops, shelves, tabletops etc makes it look elegant. Apart from elegance, it has great strength and is durable. It looks stylish and is easy to clean. Granite sinks like undermount sink, angular basin, modern or pedestals sink are some of the different granite basins available. These are water resistant and maintenance is also easy.

17.Demand and Supply of the mineral in the last three years:-

Among all the minerals, there is a huge demand for Granite in the district due to the sudden increase of Construction activities around the district. Hence, the production of the Granites and revenue realised for the past three years is as follows:-.

Granite (Seinorage fee)

S.No	Period	Collected Amount in Rs
1	2016-2017	8,74,105
2	2017-2018	Nil
3	2018-2019	Nil

18. Mining Leases marked on the Map of the District

Manapparai Taluk, Tiruchirappalli District

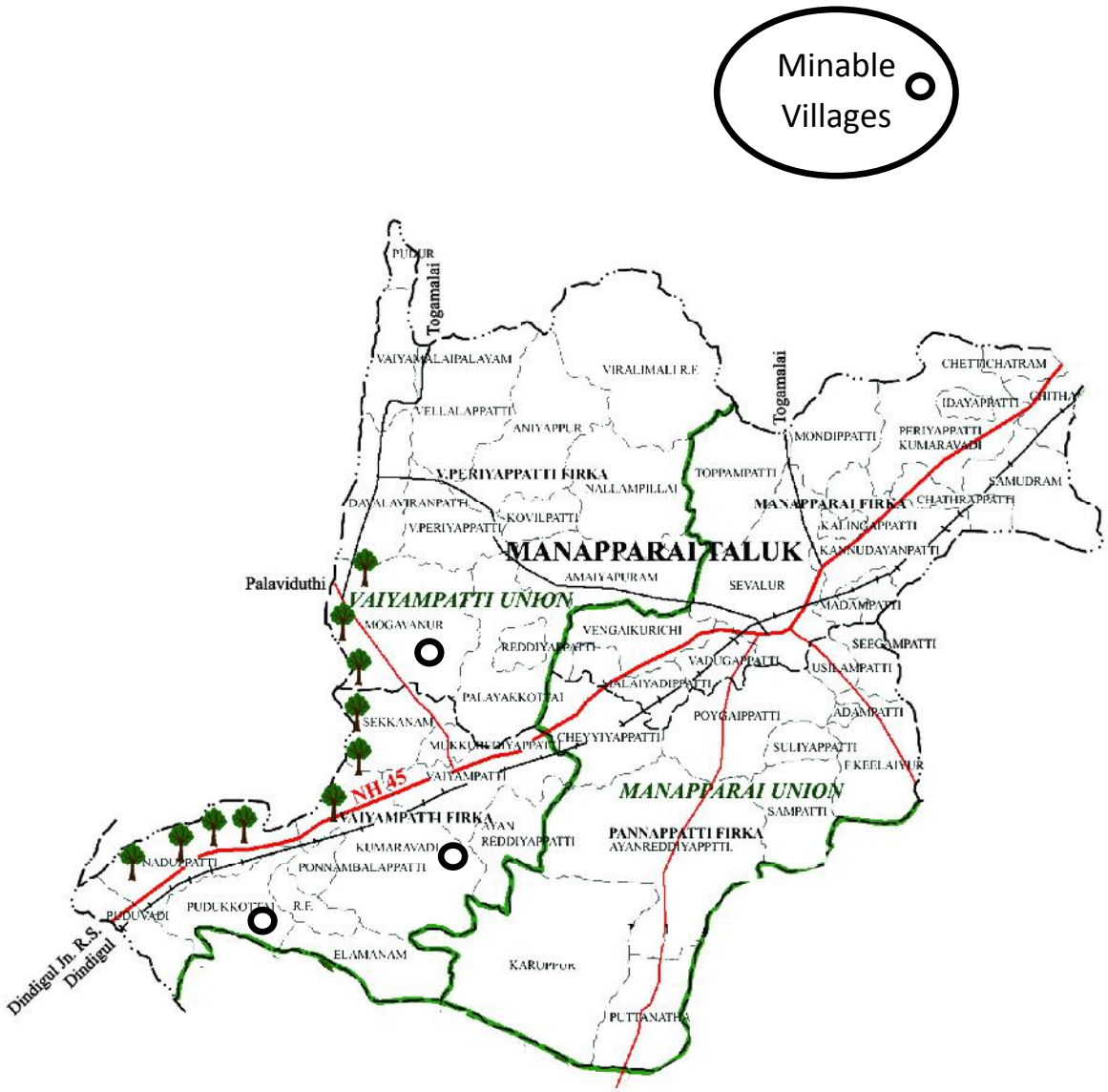


Plate - 10

Mannachanallur Taluk
Tiruchirappalli District

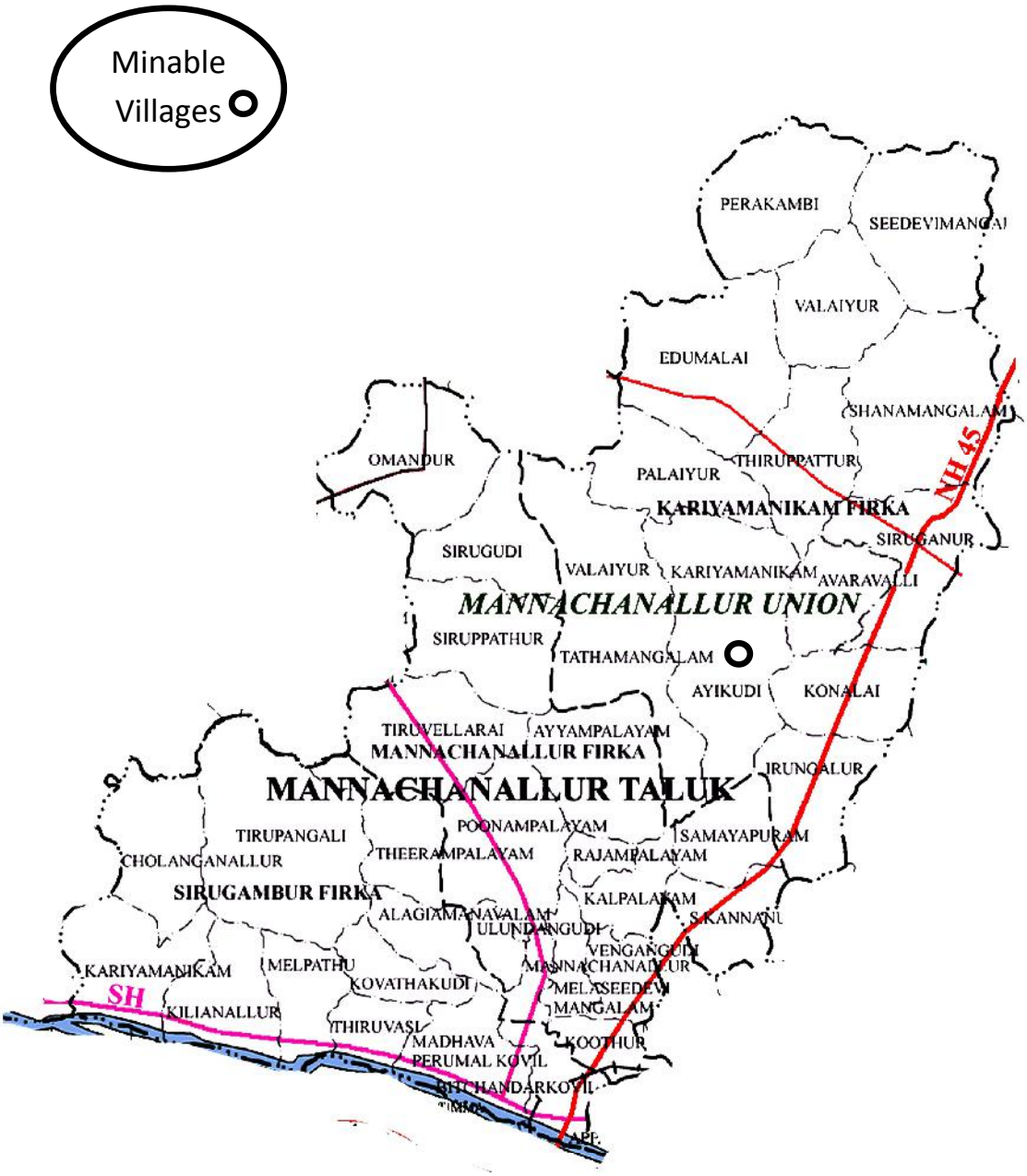


Plate - 11

Thuraiyur Taluk
Tiruchirappalli District

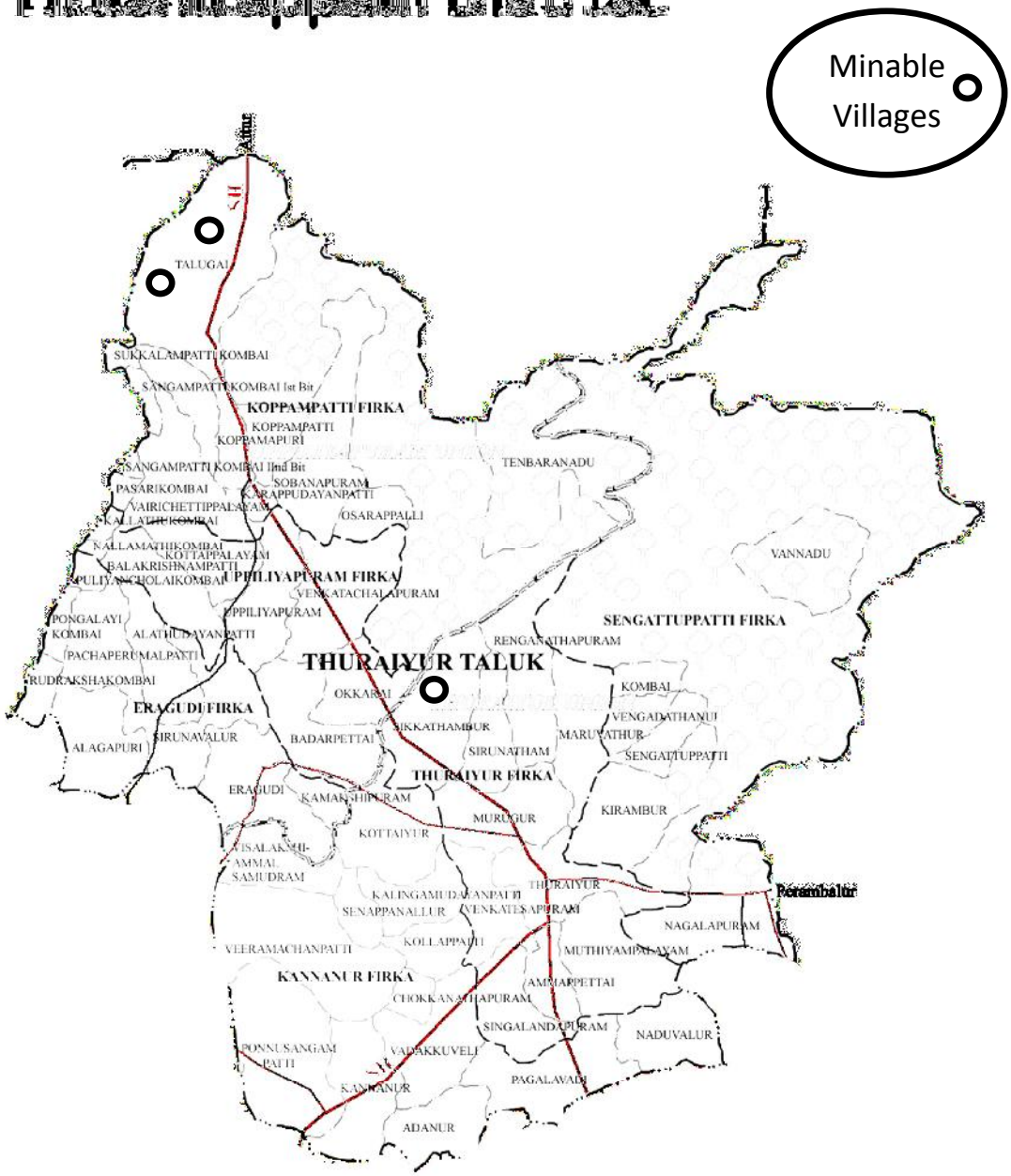
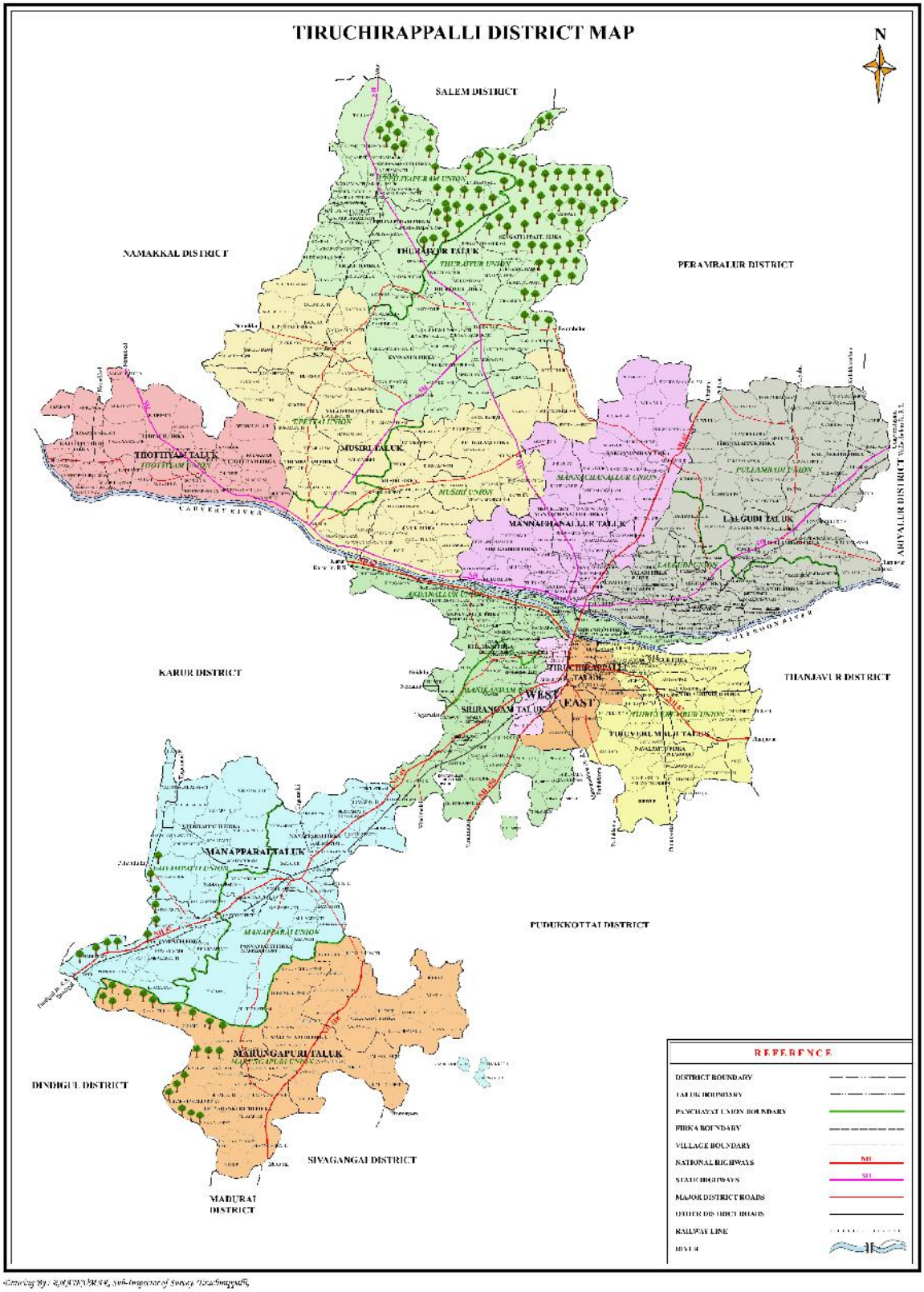


Plate - 12



Drawing By : R.GANESAMURTHI, Sub-Inspector of Survey, Tiruchirappalli.

Plate – 13

19.<u>Details of the area of where there is a cluster of mining viz., number of mining leases, location (latitude and longitude):-</u>

S. No.	Name of the Mineral	Letter of Intent Grant order No. & date	Area of mining lease to be allotted (Ha)	Village	Taluk	District	Geological Reserves (Mill.Tons)	Use (Capitive /Non-capitive)	Location of the Mining lease (Latitude & Longitude)
Not Applicable									

20.Details of Eco – Sensitive area:

National Parks and Wildlife Sanctuaries are notified as a part of the forest management as dedicated areas for harbouring the representative biodiversity of a place and for providing reproductive surplus to the forests providing harvest based sustainable utilization. Therefore such protected areas are extremely important for conservation of biodiversity, and for ensuring the survival of its floral and faunal components, not only for the present but also for future. However, the rising human population and their growing demands for socio economic development have placed tremendous stress on forests including such areas both directly and indirectly. Keeping in view the fact that a balance has to be struck between development and conservation, any activity involving use or diversion of any part of a notified protected area may be considered only under most exceptional circumstances, taking mainly into account inevitability, its impending impact on the management of the Protected Area, and feasibility of mitigation thereof without compromising the objective thereof. Additionally, such activities to be taken up in the identified wildlife habitats also need to be governed by the orders of Hon'ble Supreme Court as well as the statutory requirements as provided in the Wild Life (Protection) Act, 1972. There is no **Eco – Sensitive area in Triruchirappalli district.**

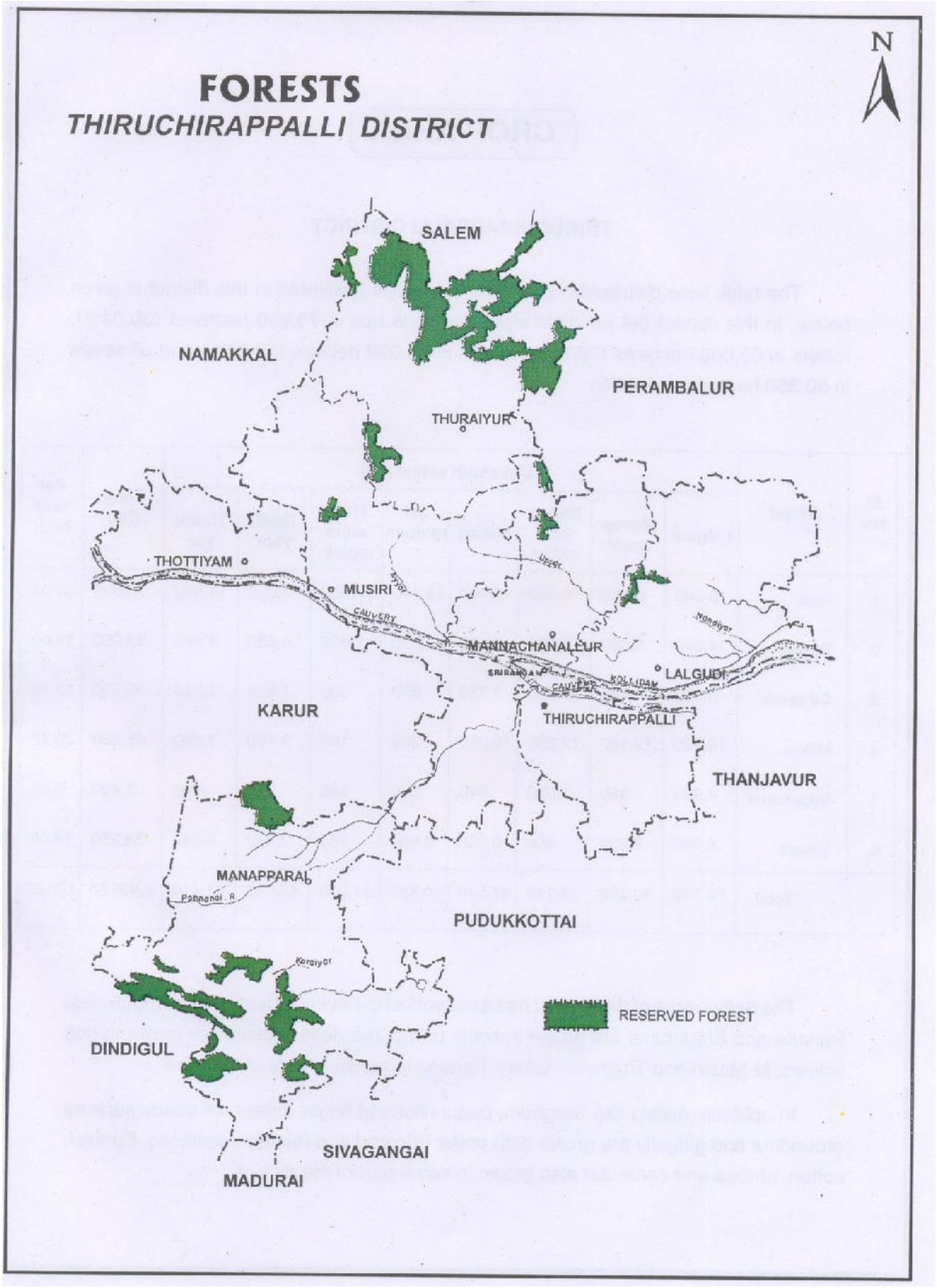

FORESTS
THIRUCHIRAPPALLI DISTRICT
N
SALEM
NAMAKKAL
PERAMBALUR
THURAIYUR
THOTTIYAM
MUSIRI
CAUVERY
MANNACHANALLUR
LALGUDI
KARUR
THIRUCHIRAPPALLI
THANJAVUR
MANAPPARAI
PUDUKKOTTAI
DINDIGUL
SIVAGANGAI
MADURAI
RESERVED FOREST

Plate - 14

21. Impact on the Environment (Air, Water, Noise, Soil Flora & Fauna, Land use, Agriculture, Forest etc.,) due to Mining Activity

Generally, the Environmental impacts can be categorized as either primary or secondary. Primary impacts are those, which are attributed directly by the project, secondary impacts are those, which are indirectly induced and typically include the associated investment and changed pattern of social and economic activities by the proposed action.

The impact has been ascertained for the project assuming that the pollution due to mining activity has been completely spelled out under the baseline environmental status for the entire ROM which is proposed to exploit from the mines.

Air

Mining Operations are carried out by opencast semi mechanized/ Mechanized method, dust particles are generated due to various activities like, Excavation, Loading, handling of mineral and transportation. The air quality in the mining area depends upon the nature and concentration of emissions and meteorological conditions.

The major air pollutants due to mining activity includes:-

- Particulate Matter (Dust) of various sizes.
- Gases, such as, Sulphur Dioxide, Oxides of Nitrogen, Carbon Monoxide etc., from vehicular exhaust.
- Dust is the single Air pollutant observed in the open cast mines. Diesel operating drilling machines, small amount of blasting and movement of machinery/ vehicles produce NOX,SO2and CO emissions, usually at low levels. Dust can be of significant nuisance surrounding land users and potential health risk in some circumstances.

Water Impact

The mining operation leads to intersect the water table cause ground water depletion. Due to the interruption surface water sources like River, Nallah, Odai etc., surface water system, Drainage pattern of the area is altered.

Noise

Noise pollution is mainly due to operation of Machineries and occasional plying of machineries. These activities will create Noise pollution in the surrounding area.

Land Environment

The topography of the area will change, due to the Topographical changes the entire Eco system will be altered.

Flora and Fauna

The impact on biodiversity is difficult to quantify because of its diverse and dynamic characteristics. Mining activities generally result in the deforestation, land degradation, water, air and noise pollution which directly or indirectly affect the faunal and floral status of the project area.

However, occurrence and magnitude of these impacts are entirely dependent upon the project location, mode of operation and technology involved.

22. Remedial Measure to mitigate the impact of Mining on the Environment

Air

Mitigated measures suggested for air pollution controls are based on the baseline ambient air quality of the area.

The following measures are proposed to adopted in the mines such as,

- Dust generation shall be reduced by using sharp teeth of shovels.
- Wet drilling shall be carried out to contain the dust.
- Controlled blasting techniques shall be adopted.
- Water spraying on haul roads, service roads and overburden dumps will help in reducing considerable dust pollution.
- Proper and regular maintenance of mining equipment's have to be considered.
- Transport of material in trucks covered with tarpaulin.
- The mine pit water can be utilized for dust suppression in and around mine areas.
- Information on wind direction and meteorology will be considered while planning, so that pollutants, which cannot be fully suppressed by engineering technique, will be prevented from reaching the nearby agriculture area.
- Comprehensive green belt around overburden dumps has to be carried out to reduce to fugitive dust emissions in order to create clean and healthy environment.

Water

 Construction of garland drains to divert surface run-off into the mining area.

 Construction of check dams / gully plugs at strategic places to arrest silt wash off from broken up area.

 Retaining walls with weep hole will be constructed around the mine boundaries to arrest silt wash off.

 The mined out pits shall be converted into the water reservoir at the end of mine life. This will help in recharging ground water table by acting as a water harvesting structure.

 Periodic analysis of mine pit water and ground water quality in nearby villages.

 Domestic sewage from site office & urinals/latrines provided in ML is discharged in septic tank followed by soak pits.

Noise

Mitigation measures

 Periodic maintenance of machinery, equipment'sshall be ensured to keep the noise generated at minimum.

 Development of thick green belt around mining area and haul roads to reduce the noise.

 Provision of earplugs to workers exposed to high noise generating activities. Workers and operators at work site will be provided with earmuffs.

 Conducting periodical medical checkup of all workers for any noise related health problems.

 Proper training to personnel to create awareness about adverse noise level effects.

 Periodic noise monitoring at suitable locations in the mining area and nearby habitations to assess efficacy of adopted control measures.

 During the blasting, optimum Spacing, Burden and charging of holes will be made under the supervision of competent qualified mines foreman, Mate as approved by Director of Mines safety.

Biological Environment

MITIGATION MEASURES:

 Development of gap filling saplings in the safety barrier left around the quarryarea.

 Carrying out thick greenbelt with local flora species predominantly with long canopy leaves on the inactive mined out upperbenches.

 Development of dense poly-culture plantation using local flora species in the mining area at conceptual stage.

 Adoption of suitable air pollution control measures as suggested above.

 Transport of materials in trucks covered with tarpaulin.

 Construction of garland drains and settling tank to arrest silt wash off from lease area.

 Construction of retention walls around lower boundary of mining area to arrest silt wash off and roll down boulders.

 Retaining walls with weep hole will be constructed around the mine boundaries to arrest silt wash off.

23. Reclamation of Mined out area (Best practice already implemented in the district, requirement as per rules and regulation, proposed reclamation plan):-

Under Rule 23A, Mine Closure Plan: Every mine shall have Mine Closure Plan, which shall be of two types:-

(i) Progressive mine closure plan; and

(ii) Final mine closure plan.

Conceptual Final Landform-

The broad rehabilitation objective for the post-quarry landform is to establish a similar land use on the disturbed areas, with the exception of the final void. The topography of the final landform will consist of a large number of stepped benches formed in an amphitheater configuration, each with a re-vegetated bench as shown in Figure-1. Figure 2 shows plan and sectional views of the final landform. The void will be some approximately 1.88.8 Ha in area. Until such time that extraction has ceased, rehabilitation will occur around the perimeter of the pit only along the benches, and will not involve the pit floor. The primary purpose of rehabilitation during the operational phase is to mitigate any visual impacts.

Once operations have ceased, all buildings and infrastructure will be removed. These areas will be reshaped and ripped where necessary for top-soiling and re-vegetation. The top benches will be vegetated with appropriate native species. The lower benches will be formed as a shallow depression of retention pond/ rain water harvesting structure.

Rehabilitation and Re-vegetation –

Rehabilitation of the site will be undertaken once extraction is complete. As the extraction progresses through the resource, 5 m wide benches will be left every 5 m of depth to provide a horizontal platform on which native flora species will be established.

The plantation in the mine lease area also includes gap filling plantation on the safety barrier zone left around the mine lease area. Gap filling plantation has been carried out in the safety barrier zone left around the mine lease area from the beginning of the mining operations.

Additional plantation will be carried out in the inactive mining area. Grass and bushes will be planted in areas prone to erosion. Other areas will be spread with organic manures and planted with local species.

The characteristics of this vegetation will resemble that of the natural environment except for the early growth, which may be a protective cover crop of non-seeding annuals. Before re-vegetation, the land will be properly prepared by spreading the top soil, which is rich in organic contents along with mulches and organic manure. Vegetation will be self sufficient after planting and require no fertilizers or maintenance.

The re-vegetation program will re-establish native tree / shrub / ground cover and will stabilize reshaped and benched areas. Benches will be deep ripped to actively promote infiltration of water which will enhance soil moisture requirements for direct tree seeding and minimize surface runoff to underlying benches. Re-vegetation will also visually screen disturbed areas and will re-establish habitat for native fauna.

24. Risk Assessment & Disaster Management Plan:-

The Disaster Management Plan (DMP) is supposed to be a dynamic, changing, document focusing on continual improvement of emergency response planning and arrangements.

The disaster management plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. For effective implementation of the disaster management plan, it should be widely circulated and personnel training through rehearsals/induction conducted by the respective department from time to time.

General Responsibilities of Employees during an Emergency:

During an emergency, it becomes more enhanced and pronounced when an emergency warning is raised, the workers in-charge, should adopt safe and emergency shut down and attend any prescribed duty as essential employee. If no such responsibility is assigned, he should adopt a safe course to assembly point and await instructions. He should not resort to spread panic. On the other hand, he must assist emergency personnel towards objectives of DMP.

Co-ordination with Local Authorities:

The mine manager who is responsible for emergency will always keep a jeep ready at site. Incase any eventualities the victim will be taken to the nearby hospitals after carrying out the first aid at site. A certified first aid certificate holder will be responsible to carryout the first aid at site. The mine manager should collect and have adequate information of the nearby hospitals, fire station, police station, village panchayat heads, taxy stands, medical shop, district revenue authorities etc., and use them efficiently during the case of emergency.

25. Details of the Occupation Health issues in the District. (Last fiveyear date of number of patients of Silicosis & Tuberculosis is also needs to be submitted):-

As per the guidelines of the Mine Rules 1955, occupational health safety stipulated by the ILO/WHO. The proponent's will take all necessary precautions. Normal sanitary facilities should be provided within the lease area. The management will carry out periodic health checkup of workers.

Occupational hazards involved in mines are related to dust pollution, Noise pollution, blasting and injuries from moving machineries & equipment and fall from high places.

DGMS has given necessary guidelines for safety against these occupational hazards. The management will strictly follow these guidelines.

All necessary first aid and medical facilities will be provided to the workers. The mine shall be well equipped with Personal Protective Equipment (PPE). Further all the necessary protective equipment's such as helmets, safety goggles, earplugs, earmuffs, etc. will be provided to persons working in mines as per Mines Rules. Alloperators and mechanics will be trained to handle fire-fighting equipment's.

26. Plantation of Green Belt development in respect of leases already granted in the District:-

Green Belt Development

 A well planned Green Belt with multi rows (Three tier) preferably with long canopy leaves shall be developed with dense plantations around the boundary and haul rods to prevent air, dust noise propagation to undesired places. Efforts will be taken for the enhancement of survival rate since the soil is alkaline in nature.

Species Recommended for Plantation

Following points have been considered while recommending the species for plantation:

- Natural growth of existing species and survival rate of various species.
- Suitability of a particular plant species for a particular type of area.
- Creating of bio-diversity.
- Fast growing, thick canopy cover, perennial and evergreen large leaf area,
- Efficient in absorbing pollutants without major effects on natural growth.
- The following species may be considered primarily for plantation best suited for the prevailing climatic condition in the area.

RECOMMENDED SPECIES TO PLANT IN THE GREENBELT

S.No	Name of the plant (Botanical)	Family Name Common Name	Habit
1.	Azadirachta indica	*Meliaceae* Neem, Vembu	Tree
2.	Albizia falcatoria	*Fabaceae* Tamarind, Puliyamaram	Tree
3.	Polyalthia longifolia	*Annonaceae* Kattumaram	Tree
4.	Borassus flabellifer	*Arecaceae* Palmyra Palm	Tree

27. Any other information

The details related to the occurrence of mineral resources and other data of the district are subject to updating from time to time. Before grant of any quarry lease, the parameters related to geosciences and sustainable development are to be considered on the basis of ground reality.

The Tiruchirappalli District is having very large deposits of Charnockite rock which is the raw material for the production of aggregates and M-sand is the need of the hour to replace the utilisation of river sand. The Charnockite / Rough Stone are crushed in the crushing units for the manufacture of aggregates and M-sand which gives direct and indirect employment to the local people preferences and encouragements can be given to the Entrepreneurs for set up of new units for the production of M-sand.

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TIRUCHIRAPPALLI