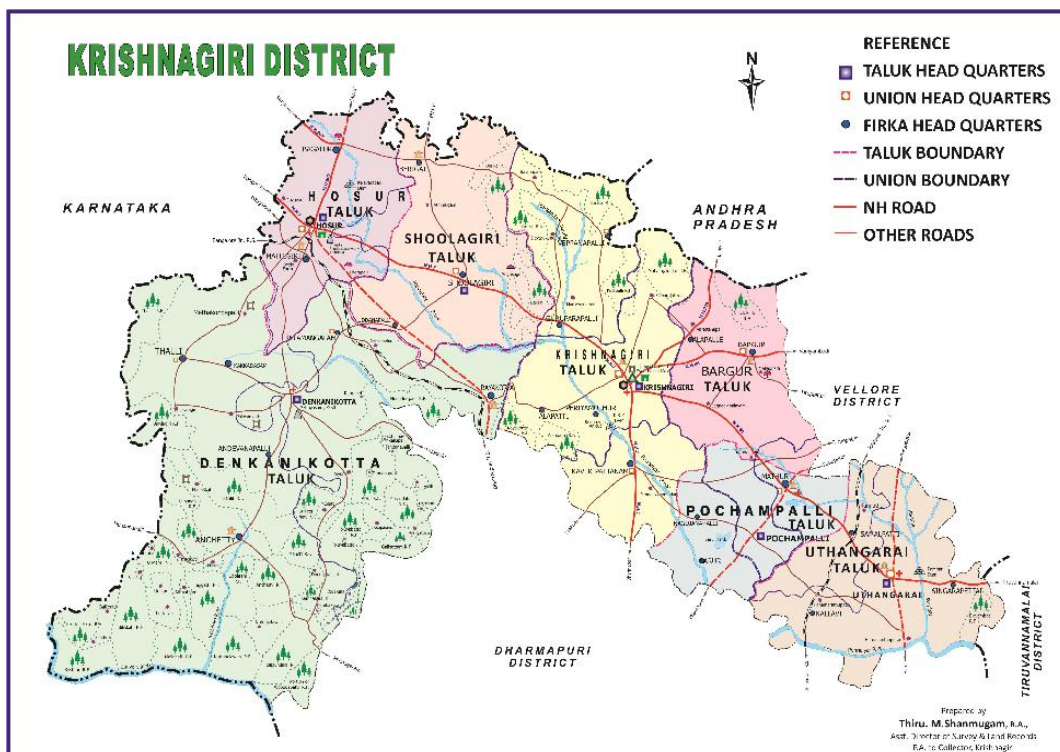


DISTRICT SURVEY REPORT FOR MAJOR MINERALS (LIME STONE)

(Prepared as per Gazette Notification S.O.3611 (E) Dt: 25.07.2018 of
Ministry Environment, Forest.)



DEPARTMENT OF GEOLOGY AND MINING
KRISHNAGIRI DISTRICT

2018-2019

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DISTRICT SURVEY REPORT FOR MAJOR MINERALS

(LIME STONE)

DISTRICT: KRISHNAGIRI

1. INTRODUCTION

In pursuance to the Gazette Notification, Ministry of Environment, Forest and Climate Change, the **Government of India Notification No. S.O.3611 (E) dated 25.07.2018** laid procedure for preparation of District Survey Report of minor minerals other than sand mining or river bed mining. The main purpose of preparation of District Survey Report is to identify the mineral resources and developing the mining activities along with other relevant data of the District.

As per the instructions given in the Government of India Ministry of Environment, Forest and Climate Change Notification S.O.141 (E) dated 15.01.2016, The District Survey report for Krishnagiri district is prepared by DMMG, Krishnagiri, in association with Geological Survey of India, State Unit: Tamil Nadu & Puducherry, Chennai, to form the basis for application for Environmental Clearance, report preparations and appraisal of projects.

2. Over view of mining activity in Krishnagiri district.

A vast range of minerals of Economic importance are reported from the Krishnagiri District. They include Apatite, Corundum Copper, Gold, Iron Ore, Limestone, Kankar, Vermiculite and Dimensional Stones. Of them, the gold occurrence is in the Veppanapalli area. The gold mineralization in Veppanapalli area is studied in detail by the Geological Survey of India. The gold mineralization in Veppanapalli area is confined to the silicified zones showing gold values between 0.3 and 2.6 g/t. For good dimensional stones, this district is unique in possessing both Multi Coloured and black granite occurrences. The Multi Coloured granite named as “Paradiso” is extensively quarried in Chendarapalli - Sulamalai-Modikuppam-Velampatti belt. The Hosur- Denkanikottai belt is endowed with Multi Coloured granite deposits. The black granite deposits of Krishnagiri, Hosur and Denkanikottai taluks contains potential deposits of black granite.

At present the following mining/quarry leases are in existence in

Krishnagiri District.

Sl. No.	Name of the Mineral	Classification of Land	No.of Existing leases
1	Lime stone	Patta	02
2	Colour Granite	Patta land	119
		Patta land(Court order	04
		Government(M/s.TAMIN	08
		Government land (Rule 39 Court order)	28
3	Black granite	Patta Land	52
		Government Land(8-A)	06
		Government Land (M/S.TAMIN)	07
4	Rough Stone	Patta Land	32
		Government Land	90

The Office of the Deputy Director, Department of Geology and Mining is functioning under the control of District Collector, Krishnagiri. The Deputy Director, Geology and Mining is assestining the District Collecotr in the mineral administration works.

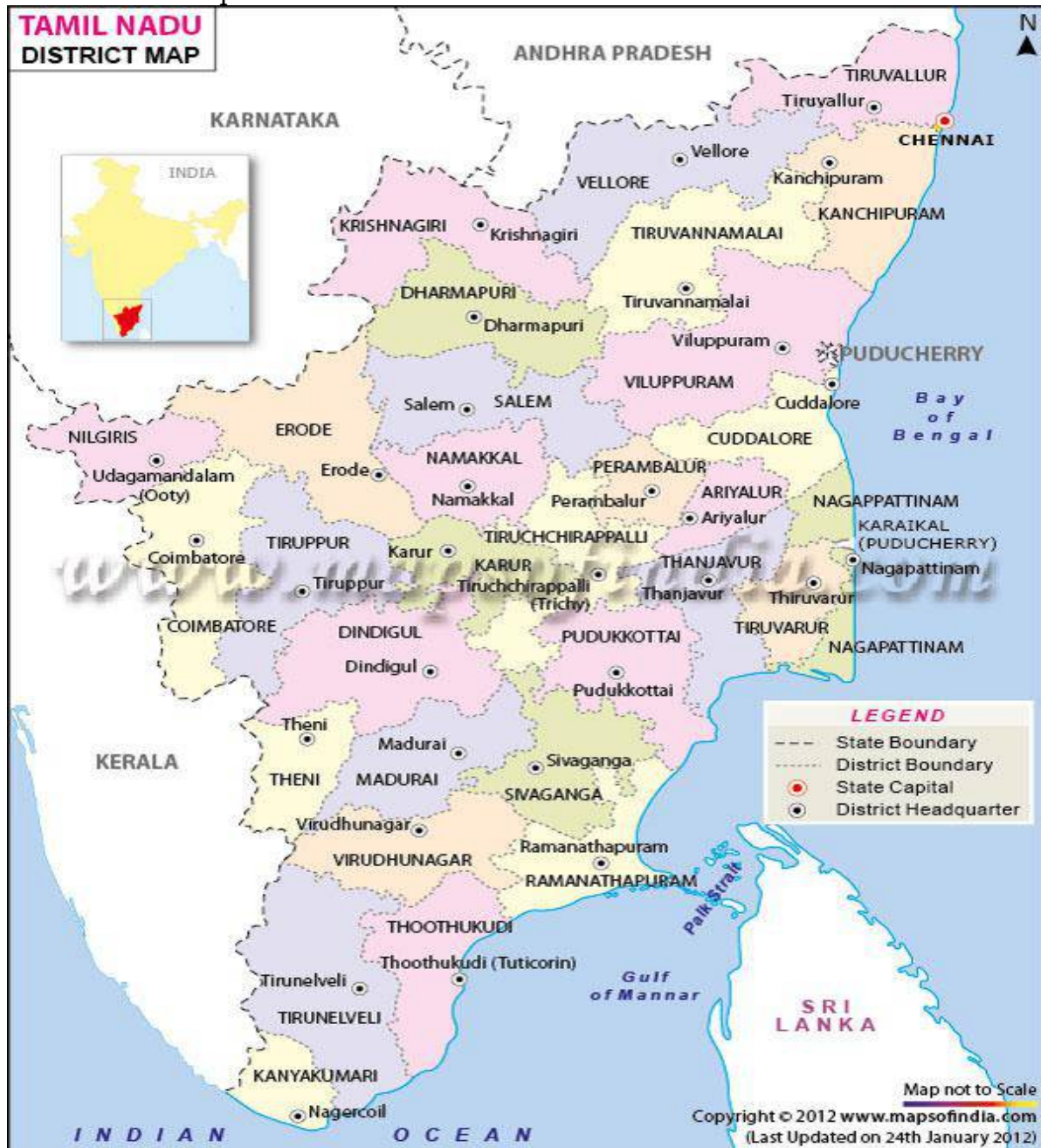
3. General profile of the district

Krishnagiri district had been formed 30th district of the Tamil Nadu by bifurcation of Dharmapuri district on 9th February 2004. It covers an area of 5143Sq.K.M. Krishnagiri district is bounded by Vellore and Thiruvannamalai districts to the east, state of Karnataka to the west, the state of Andhra Pradesh to the north and Dharmapuri district to the south. This district is elevated from 300m to 1400m above the mean sea level. It is located between 11°12' N and 12°49' N latitude, 77°27'E to 78°38'E longitude. The study area (Krishnagiri) is bordered by Andhra Pradesh on the north, Karnataka on the west and Vellore district on the eastern side (**Fig.1**). It is well connected by NH-7 (Kanyakumari-Kashmir), NH-46 (Chennai- Bengaluru), NH-66 (Puducherry-Bengaluru) and NH-219 (Krishnagiri- Kuppam). Apart from this, State Highways and District Highways are linking almost all the towns and villages of the study area. Four National highways are meeting at the Krishnagiri is a unique feature in the study area. The interior villages are well connected from Krishnagiri by fair weathered roads rendering excellent transportation network. The nearest Railway station is Jolarpettai, which located 46 km east of Krishnagiri and accessed through Chennai-Bengaluru broad gauge line. Study area is connected to Air from Bengaluru Airport, which is about 87 km from Krishnagiri. The Syed Pasha Tomb is the major landmark for Krishnagiri town. The Rayakottai Fort a declared National Monument by Archaeological Survey of India, which lies 30kms away from

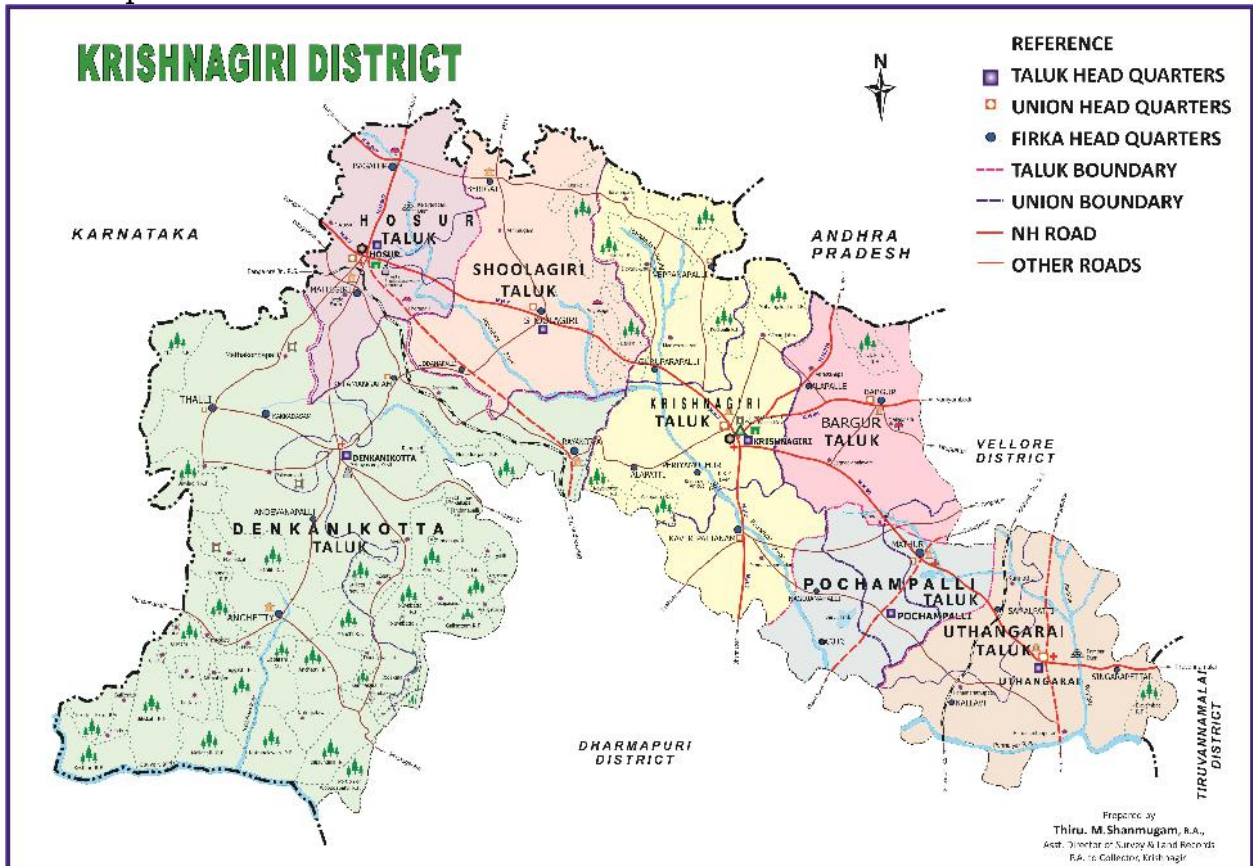
Krishnagiri.

It is basically has a mountainous terrain. The flatlands are irrigated by the South Pennar River. The eastern part of the district experiences a hot climate and the western part contrastingly has a pleasant climate. The average rainfall is 830mm per year. March-June is the summer season. July-November is the rainy season and during December-February winter prevails.

1. state map



2. District Map :



Field image:-

1. VEERAMALAI GREY GRANITE QUARRY



2. Field Image : The lime stone mines at Padavanur village, Uthangarai Tk, Krishnagiri-Dt.



3.1 . Location :-

Krishnagiri District is located in the North western part of Tamil Nadu and is 257.8 kms from the state capital Chennai via NH48. The district is bounded by Vellore and Thiruvannamalai districts in the East, Karnataka state in the west, State of Andhra Pradesh in the North, Dharmapuri District in the south. Its area is 5143 Sq. Kms. This district is elevated from 300m to 1400m above the mean sea level. It is located between 11° 12'N to 12° 49'N Latitude, 77° 27'E to 78° 38'E Longitude. Krishnagiri is also well connected by road ways, also an important junction on the Bangalore-Chennai (NH-48), salem - Bangalore (NH-44), Thiruvannmalai - Bangalore (NH-77 & NH-48), and Thirupathy to Krishnagiri ((NH-716, NH-69 & NH-48) are the major roads via Krishnagiri.

3.2 Area and Population :-

An official Census 2011 detail of Krishnagiri, a district of Tamil Nadu has been released by Directorate of Census Operations in Tamil Nadu. Enumeration of key persons was also done by census officials in Krishnagiri District of Tamil Nadu.

According to the 2011 census, *Krishnagiri district* had a population of 18,79,809 with a sex-ratio of 963 females for every 1,000 males, much above the national average of 929. A total of 217,323 were under the age of six, constituting 112,832 males and 104,491 females. Scheduled Castes and Scheduled Tribes accounted for 14.22% and 1.19% of the population respectively. The average literacy of the district was 63.2%, compared to the national average of 72.99%. The district had a total of 448,053 households. There were a total of 877,779 workers, comprising 218,600 cultivators, 197,369 main agricultural labourers, 15,237 in house hold industries, 310,795 other workers, 135,778 marginal workers, 17,438 marginal cultivators, 65,959 marginal agricultural labourers, 6,681 marginal workers in household industries and 45,700 other marginal workers. **Tamil** is the official and majorly spoken language

while *Telugu* and *Kannada*. *Urdu* is also spoken in parts of the district. Hinduism is the major religion, followed by *Islam* and *Christian* minorities. There was change of 20.41 percent in the population compared to population as per 2001. In the previous census of India 2001, Krishnagiri District recorded increase of 19.62 percent to its population compared to 1991.

3.3 Administrative setup

Krishnagiri District is divided into 2 revenue divisions for administrative convenience. The Revenue division is headed by Revenue Divisional Officer in the rank of Sub – Collector in Cadre of I.A.S or a Deputy Collector. He/she is the Sub Divisional Magistrate having jurisdiction over his division. The Revenue divisional Offices are a replica of Collectorate in the matter of number of sections and they act as intermediary in the administrative setup. Each division consists of a few Taluks whose performance is constantly monitored by the concerned Divisional Office.

Revenue Administration :

Name	Total
Revenue Divisions	2
Revenue Taluks	7
Revenue Firkhas	29
Revenue Villages	661
Municipalities	02
Blocks	10
Town Panchyat	06
Village Panchayats	333

3.4 : Agricultural Resources and Irrigation :

Krishnagiri district is one of the potential districts for cultivation of agricultural and horticultural crops. Total cultivated area of 224767 Hectares, out of which 180902 Ha Net cultivated area against the 5,14,325 Ha. of total geographical area. The total normal area cultivated under all crops is 224767 Hectares out of which 73046 Ha is under irrigated and 151720 ha area under rainfed crops. The major agricultural crops in the district are grown Paddy, Ragi, Redgram, Cowpea, Maize, Cumbu, Groundnut, Horsegram and minor millets. The major cultivated area of agricultural crops occupied by rainfed agriculture. The total number of 2,81,733 famers engaged in agriculture out of which 213023 are Marginal farmers (76%), 45970 are Small farmers (16%), remaining 4615 farmers (8%) are medium and large farmers.

The important crops of **Krishnagiri District** are *paddy, maize, ragi, banana, sugarcane, cotton, tamarind, coconut, mango, groundnut, vegetables and flowers*. The district has an excellent scope for agri-business.

The Regional Agricultural Research Center of Tamil Nadu Agricultural University has been functioning efficiently at **Paiyur** in **Kaveripattinam union** since 1973. This center functions in 18.5 hec. of land. It helps the peasants to develop and adopt the modern technique of cultivation. It has developed hybrid seeds by research which yields more tonnage and good quality.

HORTICULTURE

Krishnagiri District is more suitable for cultivation of Horticulture crops. Other Plantation crops, medicinal plants, Fruits, Vegetables, Spices, and flowers are grown well by way of its moderate climate, high altitude and fertility of the soil.

SERICULTURE

5069 acres of land is under mulberry cultivation in Krishnagiri District. This has the employment opportunity for about 24,345 persons at the rate of 5 per acre. Training in Mulberry farming, Rearing Silk Worms is done through a large network of Govt. Departmental Institutions of Sericulture such as Silk quality development farms 75, Govt. Sericulture training center 1, Govt. Sericulture Farm 1 Base seedlings (grain age) development farms 9, Govt. Bi-voltine grain age centers 5, Govt. Cocoon markets 5, Silk Reeling Unit 1, Silk Twisting unit 1, Technical support and service center for rearing silk worm 17, with the above maintained facilities sericulture industry has good scope in this district.

NATURAL RESOURCES

Krishnagiri is one among the districts of Tamil Nadu, which with natural resources having 2,024 Sq. Kms of forest cover is its unique feature. The hill ranges of this district are called by the name 'Melagiri'. The major type of forest seen here are Tropical, Deciduous forests, thorny shrubs and bamboo forest. Dense forest cover Denkanikottai region. The other region contains shrubs, hills and hillocks with bushes.

FLORA AND FAUNA

The major wild animals include Elephants, Sambar, Spotted Deer, Gaur, Wild boar, Panther etc. The forest area of Denkanikottai Taluk forms the prime elephant habitat with lot of bamboos and this area constitutes the Cauvery elephant reserve, which is constituted over an area of about 450 Sq. Kms. The bird population is also attractive with beautiful birds like Paradise flycatcher. Big lakes in Anchetti and Hosur areas also attract large number of migratory birds like Painted storks, Teals etc. Apart from these birds and mammals, there are variety of butterflies, giant spiders etc. that are coming under endangered list. Kodakkarai shoal forest in Denkanikottai Taluk is known for large scale migratory butterflies during a particular season then one can observe thousands of migratory butterflies passing through this forest like a passing cloud.

The district is a paradise for natural lovers. The flora include variety of timber trees like Rose wood, Teak, Sandal etc. Hundreds of medicinal herbs, minor forest plants like nelli, kadukkai, cheekai, pungam etc. The following trees like 'Charakkonnai' ('Cassia histula'). Since pungam trees are found in abundance in this forest pungam oil is extracted from this seeds of this tree which is a non pollutant Bio-fuel.

RAINFALL

The total rainfall received during 2017 is 1130mm against the Normal rainfall of 842mm with average of 59 rainy days.

3.5 TRADE AND COMMERCE :

Internal trade of the district is developing on a large scale. The Mangoes, Rose and Mulberry are the major crops in the District. These products enter into the market in different parts of the country and also exported to many countries. Market Committees are functioning in the district for the purchase and sale of Mangoes, Rose and Mulberry, groundnut, ragi, paddy and vegetables and other edible oil products. The co-operative societies for milk are functioning at all parts of the district. At Hosur, Agricultural primary complex functioning with all facilities to assist the farmers for marketing their agricultural products.

4. GEOLOGY OF THE DISTRICT:

The geological formations of the district belong mainly to Archaean age along with rock of Proterozoic age. The former is represented by Khondalite Group of rocks, Charnockite Group of rocks, Migmatites Complex, Sathyamangalam Group of rocks, while the latter is represented by Alkaline rocks. The Khondalite Group includes garnet sillimanite gneiss and quartzite which occur as small patches. The migmatite complex includes garnetiferous quartzofeldspathic gneiss and hornblends biotite gneiss, the former exposed on the western part of the district. The Sathyamangalam Group includes fuchsite quartzite, sillimanite mica schist and amphibolites. The Bhavani Group in this area includes fissile

hornblende-biotite gneiss, granitoid gneiss and pink migmatite. Amphibolites with barbed ferruginous quartzite and associated quartzofeldspathic rocks (Champion Gneiss) represent the Kolar group and are found west and southwest of Veppanapalli. Following this there are basic intrusions occurring as dykes.

The Charnockite Group occupies a major part of the south-west portion of this district with small bands of Garnetiferous quartzofeldspathic gneiss, Granite gneiss and dolerite dykes. The North-East and Northern part of the District mainly consist of granite gneiss with small patches of Pink Migmatite, hornblende-biotite gneiss and dolerite dykes. The Eastern part of the district consists of Epidote-Hornblende Gneiss, Ultra Mafics, Syenite and Carbonatite.

The Alkaline Complex is represented by epidote-hornblende gneiss, ultramafics, syenite and carbonatite and these are distributed in the eastern part of the district. Innumerable basic dykes and felsites, quartz, barites and pegmatite veins form part of the Alkali Complex.

The crystalline lime stone deposits in the areas of the villages of samalpatti / Padavanur, Uthangarai Taluk of Krishnagiri District is fine grained and are mainly made up of aggregate of calcite with subordinate amount of quartz and silicate minerals. They occur as long, narrow bands and as veins within the gneissic country rocks. The lime stone are generally white, pink and grey in colour. The main impurity in the limestone is silica. As for as the grade of the lime stone is concerned it is of 'Cement and Refractory Grade'. The calcium carbonate is about 85% and the rest is mainly made up of silica in the form of free silica or as silicate minerals such as woolstonite, feldspar.

5. Drainage of Irrigation pattern

Krishnagiri district basically has a mountainous terrain. The General regional slop is towards east. The various land forms occurring in the districts such as structural hills, erosional plains residual hills, rolling uplands of different facies belonging to the denudational and structural land forms. Cauvery River forms the southwestern boundary of the district. Pennaiyar is the major river draining the district and is ephemeral in nature. The major reservoirs are KRP dam, Kelavarapalli Dam and Barur Lake. The prominent dams in the district namely KRP dam has a present water level at 39.05ft as against the full capacity of 52ft with command area of 9012 acre, Kelavarapalli dam water level 41.50ft against the full capacity of 44.28 feet with command area of 9083 acre and Barur Lake 12.900 feet with command area 2400 acre. The other major reservoirs are Pambar and Shoolagiri Chinnar with storage 280 Million Cubic feet and 112 Million cubic feet. It originates from Nandhi hills in Karnataka, enters Tamil Nadu west of Bagalur and flows almost in a southeasterly direction till it reaches Manjamedu from where it flows along the district boundary before entering the district, again near Hanuman Tirtham. After flowing for a short distance in an easterly direction, it again follows the district boundary before entering the neighboring Dharmapuri district. Pambar and Burgur Ar., are among the important tributaries of Pennaiyar draining part of the district.

6. Land utilization pattern in the districts.

Krishnagiri district is one of the potential districts for cultivation of agricultural and horticultural crops. Total cultivated area of 224767 Hectares, out of which 172884 Ha Net cultivated area against the 5,14,325 Ha. of total geographical area. The total normal area cultivated under all crops is 224767 Hectares out of which 73046 Ha is under irrigated and 151720 ha area under rainfed crops. The major cultivated area of agricultural crops occupied by rainfed agriculture.

Total Geographical area 5,14,326 Hects.	
a) Forest --	2,03,964
b) Net Cultivated Area --	1,72,884
c) Land under Non-Agriculture use -	41,986
d) Permanent pastures and Grass Land-	7,855
e) Cultivable waste land -	4,352
f) Land under miscellaneous tree crops and grows	8,344
g) Barren and uncultivable land -	23,937
h) Current follows --	34,063
i) Other follows -	16,941

7. Surface water and Ground Water Scenario of the District:

7.1 Hydro Geology :

Krishnagiri district is underlain by Archaean crystalline formations with Recent alluvial deposits of limited areal extent and thickness along the courses of major rivers. The occurrence and movement of ground water are controlled by various factors such as physiography, climate, geology and structural features. Weathered, and fractured crystalline rocks constitute the important aquifer systems in the district. Ground water generally occurs under phreatic conditions in the weathered mantle and under semi-confined conditions in the fractured zones at deeper levels. The thickness of weathered zones in the district ranges from less than a meter to more than 15m. The yield of large diameter dug wells in the district, tapping the weathered mantle of crystalline rocks ranges from 100 to 500 lpm. These wells normally sustain pumping for 2 to 6 hours per day, depending upon the local topography and characteristics of the weathered mantle. The depth to water level (DTW) during pre monsoon (May 2006) ranged between 0.5 and 9.9 m bgl in the district. In major part of the district the DTW is more than 5.5 mbgl. Whereas it ranged between 2 and 9.9 m bgl during post monsoon, in the district and the DTW is in the range of 5 – 10 m bgl in the entire district except a few isolated pockets. The yield of successful exploratory wells drilled in the district ranged from 0.78 lps to 26 lps. As per the studies the wells drilled in granitic gneiss have higher yields than the wells drilled in charnockites. The specific capacity of the wells ranged

from 1.2 to 118.0 lpm/m/dd. The piezometric head of fracture zones varied between 0.50 and 18.45 m bgl.

Long Term fluctuation (1998-2007) :

The long-term water level fluctuation for the period of 1998-2007 indicates a rise in water level in the range of 0.098-0.414 m/year whereas the fall in water level ranges between 0.0666 and 1.618 m/year.

Aquifer Parameters:

The transmissivity values of fracture zones ranged from 1 to 188 m² /day with low to very low permeability values.

Hydrogeology:

Type of aquifer	Discontinuous unconfined to semi confined aquifers in fissured formations.
Aquifer parameters	--
Well yield lpm:	36 – 1125
Transmissivity (T)(m ² /day)	8 – 73
Transmissivity (T)m ² /day	8 – 73
Permeability (K)m/day:	0.78 - 23
Depth of Water level	8m to 25m

GROUND WATER QUALITY :-

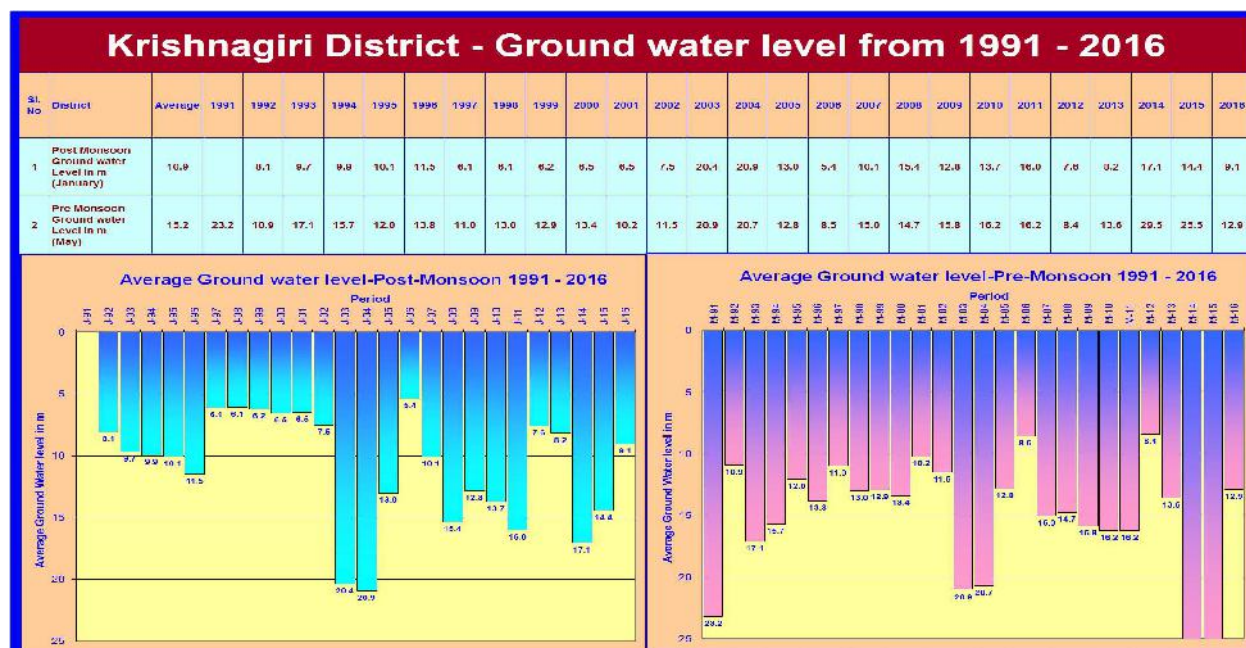
Ground water in phreatic aquifers in Krishnagiri district, in general, is colorless, odorless and predominantly alkaline in nature. The specific electrical conductance (EC) of groundwater in the phreatic zone (Micro Siemens at 25°C) during May 2006 was in the range of 830 to 3030 in the district. In about 67% of the samples analyzed the ground water is of average quality with EC less than 2250. It is observed that the ground water is suitable for drinking and domestic uses in respect of all the constituents except total hardness, fluoride and nitrate in about 67.85 and 50% of the samples. Total hardness as CaCO₃ is observed to be in excess of permissible limits in 33% of the samples analyzed, whereas nitrate is found in excess of 45 mg/l in about 50% of samples. Excess fluoride more than the permissible limit

of 1.5 mg/l is observed 8 at K.Vetrapatti and Karukanchavadi areas. The incidence of high total hardness is attributed to the composition of litho-units constituting the aquifers in the district, whereas nitrate pollution is most likely due to the use of fertilizers and other improper waste disposal.

Ground Water Level::

The Ground Water levels from the 44 number of observation wells of TWAD have been analysed for Post-Monsoon and Pre-Monsoon. Since 1991, average Ground water level in m Below Ground Level for pre and post monsoon is as follows:

Jan 2012	May 2012	Jan 2013	May 2013	Jan 2014	May 2014	Jan 2015	May 2015	Jan 2016	May 2016	5 Years Pre Monsoon Average	5Years Post Monsoon Average
7.60	8.43	8.20	3.58	7.10	1.27	4.43	8.50	9.05	2.85	6.92	1.28



Ground Water Development

The development of ground water for irrigation is mainly through dug wells tapping weathered residuum. However, in view of the comparatively high level of ground water development in 4 blocks of the district and the quality problems due to lithogenic and anthropogenic factors, it is necessary to exercise caution while planning further development of available ground water

resources in the district. Dug wells tapping the weathered mantle with horizontal bores wherever feasible are ideally suited for the terrain. The narrow linear valley fill deposits are also suited for development through shallow tube wells drilled down to 30 m bgl. However the actual number of wells will depend on several factors such as availability of land for construction, nature of weathered formation, their water bearing characteristics, etc.

Status of ground water Development:

The stage of ground water development ranges from 34 to 159%. The minimum is in Thali block and the maximum is in Mattur block. The ground water development is more than 100% in 4 blocks viz., Burgur, Mathur, Uthangarai and Veppanapalli. The estimation of ground water resources for the district has shown that four blocks are over exploited and one block is semi-critical.

Block	Net Ground water availability (M.Cu.m)	Existing Gross Draft for irrigation (M.Cu.m)	Existing Gross Draft for Domestic and Industrial Water supply (M.Cu.m)	Existing gross draft for all uses (M.Cu.m)	Allocation for Domestic and Industrial Requirement supply up to next 25 years (2029) (M.Cu.m)	Net ground water availability for future irrigation development (M.Cu.m)	Stage of Ground Water development (%)	Category of Block
Burgur	45.75	65.71	2.65	68.37	2.78	-22.75	149	Over exploited
Hosur	37.48	25.93	3.84	29.77	4.03	7.51	79	Semi-critical
Kaveripattanam	28.25	21.57	3.22	24.79	3.38	3.29	88	Critical
Kelamangalam	35.24	14.06	1.73	15.80	1.82	19.35	45	Safe
Krishnagiri	43.54	21.70	2.0	23.71	2.10	19.72	54	Safe
Mathur	29.91	45.73	1.72	47.45	1.81	-17.63	159	Over exploited
Shoolagiri	40.92	28.39	2.74	31.14	2.88	9.64	76	Semi-critical
Thali	50.78	15.67	1.56	17.24	1.64	33.46	34	Safe
Uthangarai	45.29	65.60	2.48	68.09	2.61	-22.92	150	Over exploited
Veppanapalli	27.19	31.46	1.10	32.57	1.15	-5.42	120	Over exploited
Total	384.38	335.89	23.09	358.98	24.24	24.25	95.4	

Water Conservation and Artificial Recharge :

CGWB had prepared a master plan to augment groundwater potential by saturating the shallow aquifer taking into consideration the available unsaturated space during post monsoon and available uncommitted surplus run off. Subsequently, computations have been made for Drought Prone Area Program (DPAP) for over exploited and critical blocks in the districts

warranting immediate attention. Institute of Remote Sensing, Anna University had prepared block wise maps demarcating potential zones for artificial recharge for the State of Tamil Nadu. Subsequently, State Government agencies have constructed artificial recharge structures with their own fund or with fund from Central Government, dovetailing various government programs. Ministry of Water Resources, Government of India has initiated Dug Well Recharge Scheme in the State. The scheme is being implemented by the Nodal Department (SG&SWRDC, PWD, WRO, Government of Tamil Nadu) with the technical guidance of CGWB. The subsidy of Rs. 4000/- for small and marginal farmers and Rs. 2000/- for the other farmers is credited to the beneficiaries' bank account through NABARD. The scheme after implementation will prove to be beneficial to the irrigation sector. The available uncommitted surplus run off has to be recomputed, taking into consideration the quantum of recharge effected through existing irrigation dug wells also. The existing structures and uncommitted surplus flow should be considered for further planning of artificial recharge program.

9, On the basis of experimental studies, it has been found that de-silting of existing tanks followed by percolation pond with recharge wells, recharge shafts are economical. There is considerable scope for implementation of roof – top rainwater harvesting in the district. Recharge pits / Shafts / trenches of suitable design are ideal structures for rainwater harvesting in such areas. Central Ground Water Board is also providing free technical guidance for implementation of rooftop rainwater harvesting schemes.

8. Climate and Rain fall of the District:

8.1 Climate :

Eastern part of the district experiences hot climate and Western part has a contrasting cold climate. the average normal rainfall is 850.88 mm per annum. March - June is summer season. July - November is Rainy Season and between December - February winter prevails.

8.2 Rain fall :

The total rainfall received during 2017 is 1130mm against the Normal rainfall of 830mm with average of 59 rainy days.

Rain fall details month wise:

Sl. No.	Name of the month	Normal Rain fall (in mm)
1	April	32.9
2	May	83.0
3	June	50.7
4	July	70.3
5	August	124.5
6	September	41.6
7	October	202.2
8	November	58.6
9	December	23.6
10	January	--
11	February	10.4
12	March	--

9. Details of Mining in the District : Major Minerals -Lime Stones mines

Sl. 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 (1 st /2 nd ...renewal)		Date of Commencement of Mining Operations Status (Working / Non-Working /Temp. Working for dispatch etc.)	Capitive / Non-Capitive	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)	
						From	To	From	To						
1.	Lime stone	Tvl. Shanthi Mines,	No.1/67, Thalavaipatti Post, Salem-636302	CGM Chennai Proc.RC.No.2762/M2/2002 Dt:27.3.03	Padavanur-vill, Uthangarai Taluk	11.06.2003	10.06.2023	-	-	11.06.2003	Non working	-	No	11°27'10.15"N 77°59'12.13"E	Open cast
2.	Lime stone	Tvl. Siva Mines	1/173, Vasantha Nagar, Alagapuram, Salem	DGM, Chennai Proc.Rc.No.16622/MM1/2002 Dt:14.2.06	Padavanur-vill, Uthangarai Taluk	29.3.2005	28.3.2025	-	-	29.3.2005	Non working	-	No	11°27'10.15"N 77°59'12.10"E	Open cast

10. Details of royalty realized in the last three years.

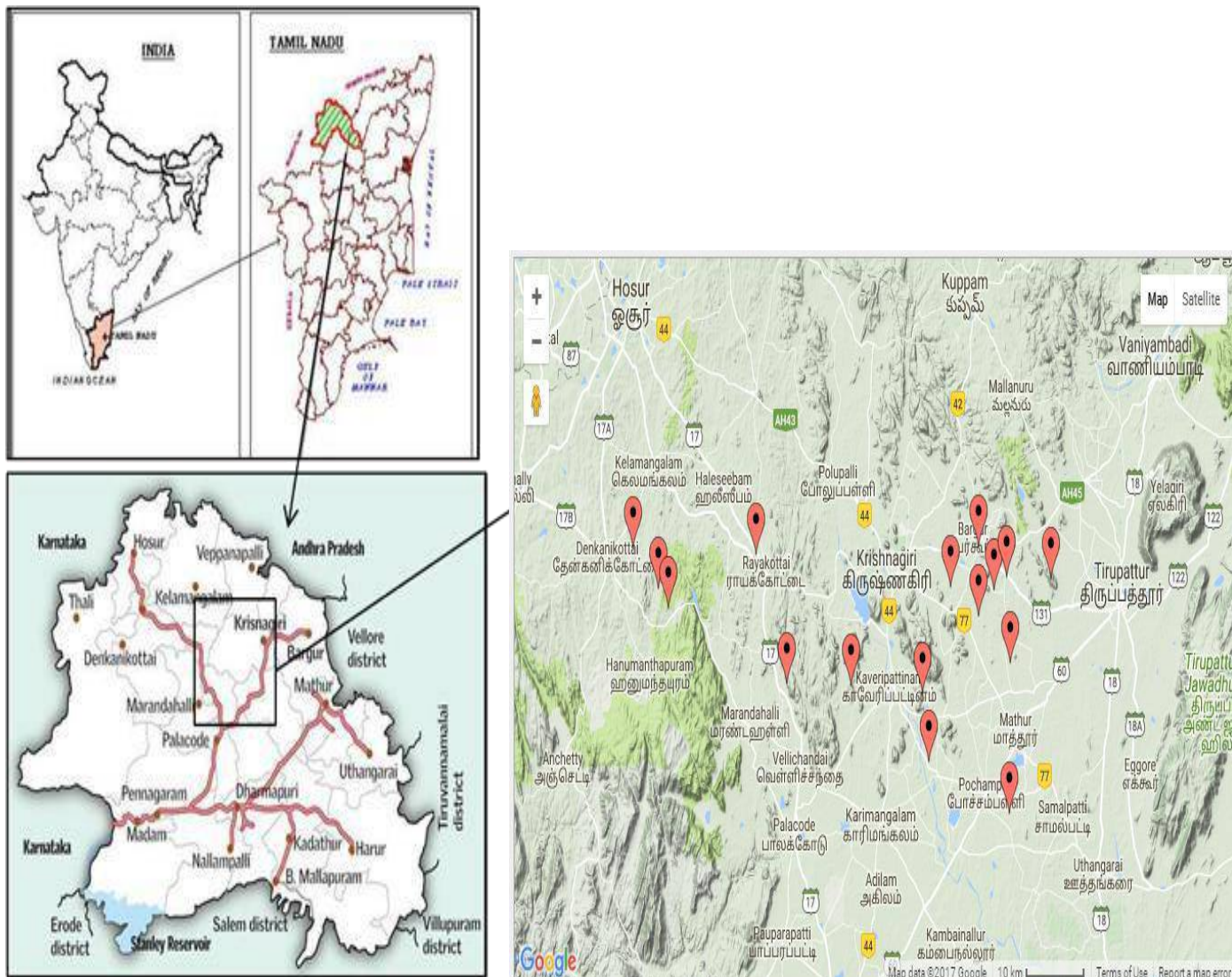
Sl.No.	Name of the mineral	Royalty collected (In Rupees)		
		2016-17	2017-18	2018-19
1	Lime Stone	7,19,678	--	--

11. Details of production of Minerals in last three years.

Sl. No.	Name of the mineral	Quantity produced (in MT)		
		2016-17	2017-18	2018-19
1	Lime Stone	7,270	--	--

12. Mineral map of the District:-

Map showing the Location of Granite, Rough stone quarries and limestone mines in Krishnagiri District.



13. List of letter of Indent (LOI) holders for Lime stone quarrying in Krishnagiri District.

S. No.	Name of the Mineral	Name of the Lease	Details of Precise Area Communication	Extent (In Hect.)	Taluk / Village	SF.No.	Location of the Mining Lease
----- Nil -----							

14. Total reserve available in the District:

14.1 Major Mineral - Lime Stone occurrence in Krishnagiri District:

The Geological formation consists of Biotite Hornblende gneisses, calc gneisses and crystalline limestone intruded by younger granites. The granite gneiss and crystalline limestone represent ancient calcareous sediments which have suffered repeated metamorphism, inclusions by granites and folding during Archaean age.

The crystalline lime stone deposits in the areas of the villages of samalpatti / Padavanur, Uthangarai Taluk of Krishnagiri District is fine grained and are mainly made up of aggregate of calcite with subordinate amount of quartz and silicate minerals. They occur as long, narrow bands and as veins within the gneissic country rocks. The lime stone are generally white, pink and grey in colour. The main impurity in the limestone is silica. As for as the grade of the lime stone is concerned it is of 'Cement and Refractory Grade'. The calcium carbonate is about 85% and the rest is mainly made up of silica in the form of free silica or as silicate minerals such as woolstonite, feldspar.

The total available estimated reserves are calculated at 310718 tons.

14.2 Major Mineral - Lime Stone -

Details of Limestone mining leases in Krishnagiri District :

Sl. No	Name of the Mineral	Name of the Lessee	Address & Contact No. of Lessee	Area of Mining Lease (Ha.)	Geological Reserves (in Metric Tons)
1.	Lime stone	Tvl.Shanthi Mines,	No.1/67, Thalavaipatti Post, Salem-636302	Padavanur-vill, Uthangarai Taluk	42193
2.	Lime stone	Tvl.Siva Mines	1/173, Vasantha Nagar, lagapuram, Salem	Padavanur-vill, Uthangarai Taluk	268525

**15. Quality /Grade of Mineral availability in the district:
Lime Stone :**

The general chemical composition of the lime stone available in the district is as follows.

CaO	47.5%
SiO ₂	5.5%
MgO	5.5%
Al ₂ O ₃	0 %
Fe ₂ O ₃	0%
Loss on ignition	41.5%

16. Use of Mineral :

Low grade “Limestone” available in this district is mainly used as a raw material for manufacturing of cement and refractory manufacturing and allied industries.

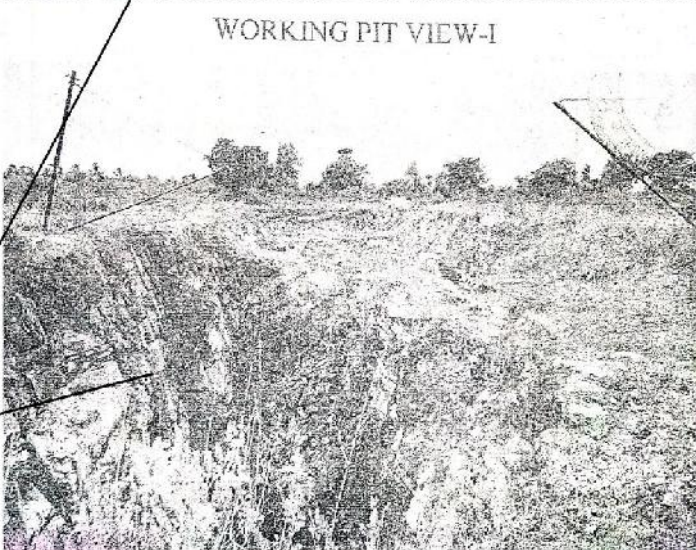
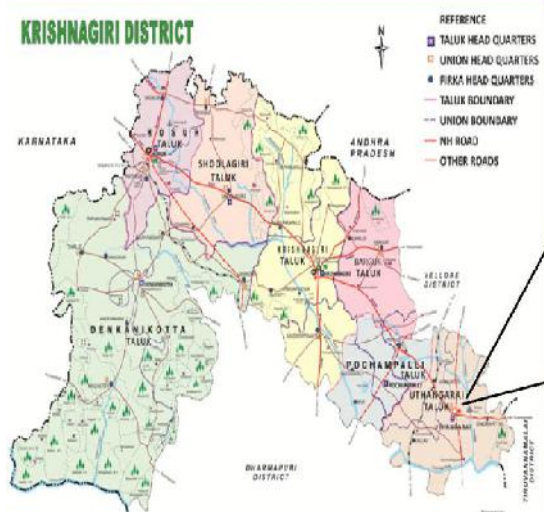
17. Demand and supply of Mineral in the last three years - Lime Stone:-

Due to poor quality of Cao content in lime stone, the mining operation is poor in nature. Besides this due to non obtaining of environmental clearance the mining activities are not permitted from 10.01.2017 as per the supreme court orders.

Year	2016-17	2017-18	2018-19
Demand (MT)	-	-	-
Supply (MT)	7270	-	-

18. Mining leases marked on the map of the district:-

The Map showing the location of lime stone mines in Krishnagiri District .



19. Details of the area of where there is a cluster of mining leases Viz. Number of mining leases, location (Latitude and Longitude):-

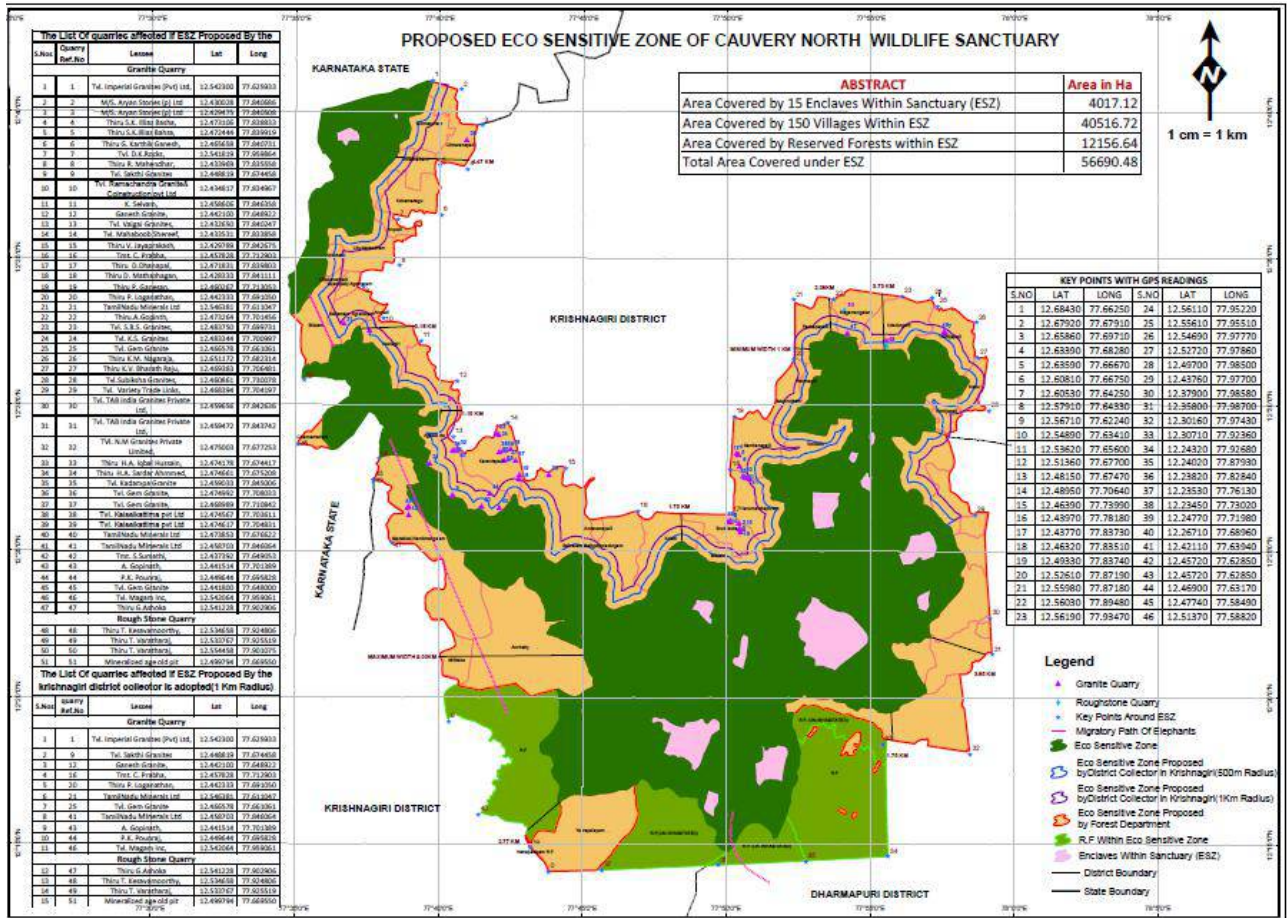
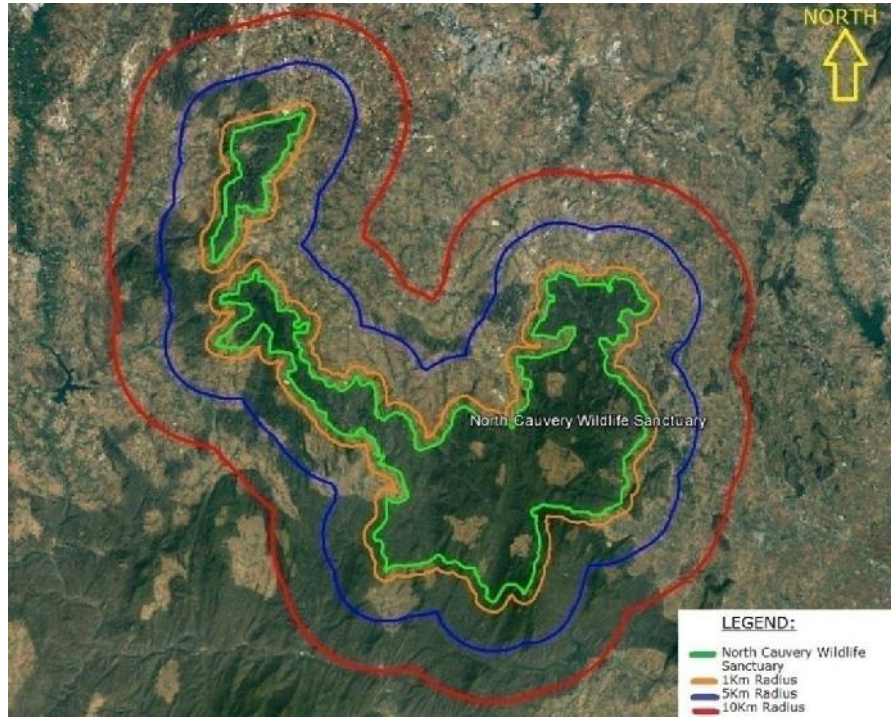
----- NIL -----

20. Details of Eco-Sensitive area, if any in the district:-

The Cauvery North Wild Life sanctuary located in Krishnagiri District measuring between 12.23450 N and 12.68430N Latitude and 77.63410E and 77.98700 E Longitude over an extent of 566.90 Sq.km covering 150 villages and reserve forests, has been carved out and from the forest of Hosur Division and published in Govt. of Tamilnadu Gazeet No.10 (Part-2) -section-2 Dt:12.03.2014. based on the direction of the Hon'ble supreme court of India, Ministry of Forest Environment and Climate change Division the Eco Sensitive zone proposal on the Cauvery North Wild Life sanctuary has been prepared in consultation with the District Administration of Krishnagiri District and the local people and the Eco-sensitive zone proposal has been submitted to the Principal Chief conservator of Forest and Chief Wild life warden for publication under the column 'Activity proposed to be permitted, regulated and prohibited within the Eco sensitive zone', No Mining activity has been proposed within 500mts from the boundary of the wild life sanctuary.

Government of India, Ministry of Environment Forest office Memorandum No.L-11011/ 47/2011-1A-11 (M) Dt:18.05.2012. and as per the guidelines issued in office memorandum F.No.J-11013/41/2006-1A-II (I) (Part) Dt:20.08.2014 by the ministry of Forest and Environment climate change, Govt. of India, New Delhi, if the site of quarrying is located within **10kms** from the boundary of protected areas such as national parks and sanctuaries, wildlife clearance from the standing committee of national board for wildlife (NBWL) has to be obtained. According to the guidelines issued by the GOI the clearance under the national board for wildlife is mandatory.

The map showing the proposed Eco sensitive zone of the Cauvery North Wild Life sanctuary.



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

Mining and allied operations may affect the existing environmental setup in the area unless proper mitigation measures are not taken. Hence it is essential to assess the impacts of mining on various environmental parameters so that abatement measures could be planned in advance for systematic, sustainable and eco-friendly mining in the area.

21.1 Air Environment

The mining and allied operations may cause deterioration of air quality due to pollution if prompt care is not taken. The principal sources of air pollution in general due to mining and allied activities will be the dust generation in the mine due to:

- Excavation of lime stone.
- Movement of HEMM such as excavators, tippers etc.,
- Loading and unloading operation
- Overburden & lime stone mineral transportation

Beside the above mentioned fugitive dust emissions, atmospheric fugitive dust emissions, atmospheric pollution can occur as a result of emission of SO₂, Nox, CO etc., from diesel driven mining equipment, compressors, generators etc., Larger suspended particles are generally filtered in the nose and throat and do not cause problems.

Particulate matter smaller than 10 microns, referred to as PM₁₀, can settle in the bronchi and lungs and cause health problems like Bronchitis, Emphysema, Bronchi Asthma, Irritation of mucus membranes of eyes etc. Particles smaller than 2.5 micrometers (PM 2.5), tend to penetrate into the lungs and very small particles (<100 nanometers) may pass through the lungs to affect other programs.

21.2 Water Environment

The major sources of water pollution normally associated due to mining and allied operations are:

- Generation of Industrial effluent water from workshop, service building.
- Disturbance to drainage course or water bodies in the project area, if any.
- Washouts from waste dumps/embankment, if any.
- Domestic effluent
- Mine discharge water pumped out from opencast mines, if any and effect on ground water table.

Direct impact on human beings due to poor water quality consequent to mining operation can lead to various water borne diseases like diarrhoea, jaundice, dysentery, typhoid etc. Besides, the polluted water may not be useful for animal or human consumption, vegetation and may affect aquatic life, if effluents are not properly treated to remove the harmful pollutants.

21.3 Noise & Vibration:-

The impact prediction and control measure for noise environment due to mining and allied activities are described below:

Noise is one of the inevitable causes of pollution in mining operations largely due to the extensive mechanization adopted. Since, the lime stone in the district is of metamorphic in nature drilling and blasting is required for excavation. Hence the major source of noise will be from by blasting activity and by the equipment's used such as Excavation, loading & unloading & movement of vehicles etc., will produce noise of considerable magnitude in mining operations. Prolonged exposure to a high noise level is harmful to the human auditory system and can create mental fatigue, rebellious attitude, annoyance and carelessness, which may lead to neglect of work and also results in accidents.

Since, the rock formations in this district belongs mainly to Archaean age and are hard in nature, quarrying activity requires drilling and blasting makes vibrations.

21.4 Impact on Land Environment:

Mining can cause physical disturbances to the landscape, creating eyesores such as waste-rock piles and open pits. Such disturbances may contribute to the decline of wildlife and plant species in an area. In addition, it is possible that many of the premining surface features cannot be replaced after mining ceases. Mine subsidence (ground movements of the earth's surface due to the collapse of overlying strata and sliding of quarry side portions) can cause damage to buildings and roads.

21.5 Impact on Biological Environment:

The major possible impact on biological environment due to mining is given below:

- Clearance of vegetation due to mining and allied activities
- Retardation of tree growth, tip burning etc., due to deposition of dust and the particulate matter generated from the mining operation.
- Presence of Schedule-I fauna in the mining area.
- Proposed impact on surface water quality that also provides water to wildlife
- Risk of fall/slip or cause death to wild animals due to project activities
- The project releases effluents into water bodies that also supplies water to wildlife
- Diversion of Agricultural and forest lands for mining

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

The following remedial measures to be taken during mining.

22.1 Remedial Measures to mitigate Air Pollution

- The emission of contaminants to the atmosphere by proper planning and zoning of quarrying areas.
- Water sprinkling on mineral transport road from the mines to the main road
- Black topping of the main transportation roads to the possible extent.

- Avoiding crowding of trucks by properly spacing them to avoid the concentration of dust emission at any time
- Covering the trucks by tarpaulin sheets during ore transportation
- Proper maintenance of HEMM to minimize gaseous emission
- Imparting sufficient training to operators on safety and environmental parameters
- Development of green belt / plantation around mine, along the roads, backfilled area in various undisturbed areas within the mine lease areas etc.,

22.2 Remedial Measures to mitigate water Pollution

- Industrial effluent treatment systems wherever necessary to be introduced and maintained properly.
- Safety barriers to be provided for all water bodies and no mining activities should be carried out in the safety barrier area.
- Mitigative measures like construction of garland drains formation of earth bunds to be followed in the waste dumping areas to avoid wash off.
- Domestic effluents to be treated in scientific manner
- Required statutory clearances to be obtained and all precautionary measures to be adopted wherever pumping of ground water is involved.
- Recycling of water used in crusher units and prevention measures of polluted water into water bodies by proper storage within the unit so as to avoid water contamination.

22.3 Remedial Measures to reduce Noise & Vibration

- Planting rows of native trees around mine, along the roads, other noise generating centres to act as acoustic barriers.
- Sound proof operator's cabin for equipment may lead to less noise generation.
- Proper and regular maintenance of equipment may lead to less noise generation
- Air silencers of suitable type that can modulate the noise of the engines of machinery to be utilized and will be maintained effectively.
- Providing in-built mechanism for reducing sound emissions.

- Providing ear muffs to workers exposed to higher noise level and to those persons operating or working close to any machine.
- Conducting regular health check-up of workers including Audiometric test for the workers engaged in noise prone area.

22.4 Remedial measures to reduce Impact on Land Environment:

Scientific reclamation measures to be adopted to reduce the impact of land environment due to mining. The lime stone being in shallow depth, back filling of mined out areas may be practiced to avoid land degradation.

22.5 Remedial measures to reduce Impact on Biological environment:

- The quarrying areas in the district are mostly of dry areas, afforestation to be carried out in the quarrying areas.
- Necessary mitigative measures like dust suppression, proper maintenance of equipments, black topping of roads etc., to be carried out to prevent dust generation & any further impact on the vegetation.
- Conservation plan for schedule –I species if any to be prepared in consultation with the Forest Department and the proposals given in the conservation plan to be strictly implemented.
- Effluents generated in the mining areas to be treated properly.

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

Regarding land reclamation, in the mined out pits after back filling and development of plantation/afforestation in the back filled areas will be the best practice of reclamation. The unfilled pits may be used as ground water recharge pits.

24. Risk Assessment & Disaster Management Plan

Risk Assessment and Disaster Management plan in connection with mining and allied operations should be spelt out in detail to cover possible dangers /risks/explosions/accidents etc., likely to arise from the project operations including onsite and off-site emergency plans to meet the disastrous situations if any.

The management is able to deal with the situation efficiently to reduce confusion keeping in view of the likely sources of danger in the mine.

1) Outline of Disaster management plan :-

The purpose of disaster management plan is to restore the normalcy for early resumption of mining operation due to an unexpected, sudden occurrence resulting to abnormality in the course of mining activity leading to a serious danger to workers or any machinery or the environment.

2) System of communication:-

An internal communication system should be provided. Telephone nos. and addresses of adjoining mines, rescue station, police station, Fire service station, local hospital, electricity supply agency and standing consultative committee members should be properly updated and displayed.

3) Consultative committee:-

A standing consultative committee will be formed under the head of Mines. The members consists of Mines manager /safety officer / medical officer / public relation officer/Foreman/ and environmental engineer.

4) Facilities & Accommodation:-

Accommodation and facilities for medical centre, rescue room and for various working groups shall be provided. Regular checking of these facilities shall be undertaken.

5) First Aid & medical facilities:-

The mine management should be having first aid / medical centre for use in emergency situation. All casualties should be registered and should be given first aid. The centre should have facilities for first aid & minor treatment, resuscitation, ambulance and transport. Proper telephone / wireless should be provided for quick communication with hospitals where the complicated cases are to be referred. Regular checking of these facilities shall be undertaken by the doctor and the in charge of the first aid room.

6) Stores and equipment :-

A detailed list of equipment available, its type & capacity and items reserved for emergency should be maintained.

7) Transport services:-

A well defined transport control system should be provided to deal with the situation.

8) Functions of public relations group:-

Liaison with representatives of the mine workers is required to ameliorate the situation of panic, tension, sentiments, grievances and misgivings created by any disaster. Management is required to ameliorate the injured, survivors and family members of affected persons by providing material, finance, moral support and establishing contact with relatives of victims. The consultative committee formed, especially the nominated public relation officer shall look into these aspects.

9) Security :-

Manning of security posts is very essential during the disaster management.

10) Catering & Refreshment:-

Arrangement will be made for the victims, rescue teams and others.

25. Details of Occupational health issue in the District (last five –year data of number of patients of silicosis & Tuberculosis is also needs to be submitted).

The details of number of patients treated for silicosis and Tuberculosis for the last five years in the district is given below:

Sl. No	Year	Number of patients treated for silicosis	Number of patients treated for Tuberculosis
1	2018	Nil	Nil
2	2017	Nil	Nil
3	2016	Nil	Nil
4	2015	Nil	Nil
5	2014	Nil	Nil

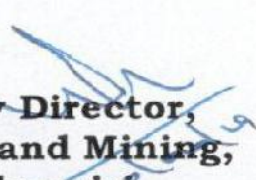
26. Plantation and Green belt development in respect of leases already granted in the district.


The project proponents during the quarry operations, it is necessary to develop Green belt in and around the polluted site with suitable species to reduce the air pollution effectively. Implementation of afforestation program by planting 250 to 500 Neem and Pungan trees is paramount importance. In addition to augmenting existing vegetation, it also checks soil erosion, make the ecosystem more complex and functionally more stable and make the climate more conductive.

The lime stone deposits being shallow in depth, mining simultaneous back filling method will be followed in most of the mining areas. During mining operations, the plantation will be proposed and will be carried out on the safety barrier areas and also on the mined out and back filled areas.

27. Any other Information.

----- Nil -----


**Deputy Director,
Geology and Mining,
Krishnagiri.**


**District Collector,
Krishnagiri.**

