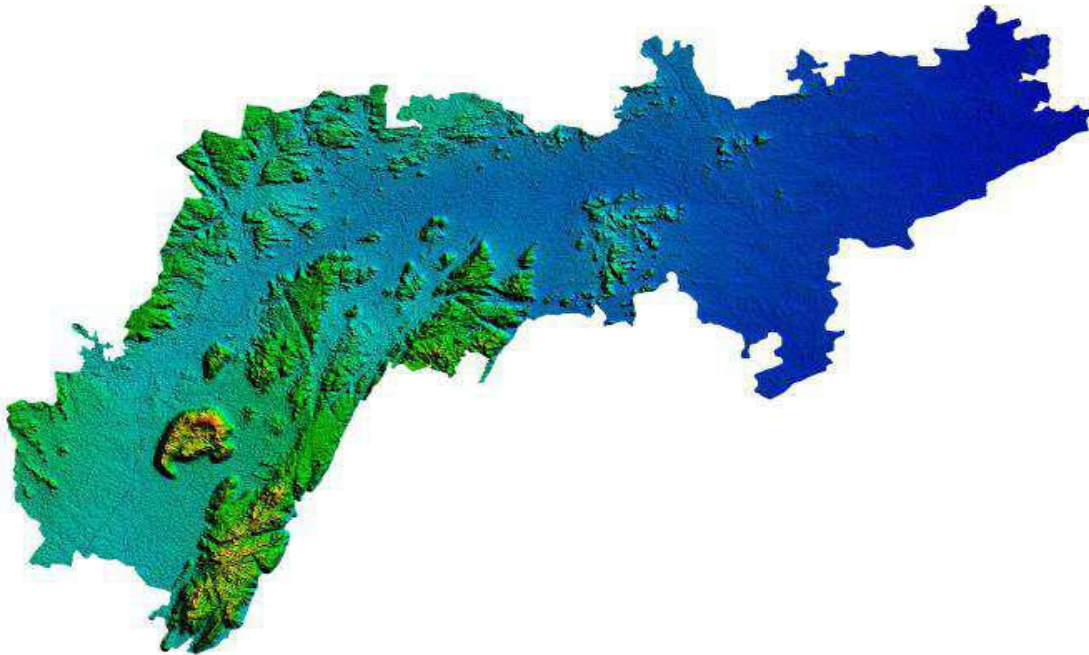




VELLORE DISTRICT TAMILNADU

DISTRICT SURVEY REPORT

SAND



As per notification No. S.O.
3611 (E) New Delhi, The
25th July 2018 of Ministry
of Environment, Forest and
Climate Change, Govt. of
India

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DISTRICT SURVEY REPORT FOR SAND MINING DISTRICT VELLORE

1. PREFACE

In compliance to the Notification issued by the Ministry of Environment and Forest and Climate Change notification No. S.O. 3611 (E) New Delhi dated 25-07-2018, the preparation of District Survey Report of river sand mining in accordance with Appendix X of the Notification. Every effort have been made to cover sand mining locations, areas and overview of mining activity in the district with all its relevant features pertaining to geology and mineral wealth in replenishable and non-replenishable areas of rivers, stream and other sand sources. This report will be a model and guiding document which is a compendium of available mineral resources, geographical set up, environmental and ecological setup of the district and is based on data of various departments, study conducted by renowned institutions, published reports and websites.

SURVEY REPORT OF VELLORE DISTRICT

As per Gazette Notification No. S.O. 3611 (E) New Delhi dated 25-07-2018 of Ministry of Environment, Forest and Climate Change, a survey shall be carried out by the District Environment Impact Assessment Authority (DEIAA) with assistance of Water Resources Department, Forest Department, Geology and Mining Department and Revenue Department in the District for preparation for District Survey Report as per sustainable sand mining guidelines to ensure identification of areas of aggradation or deposition where mining can be allowed and identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited and calculation of annual rate of replenishment and allowing time for replenishment after mining in that area.

The detailed study has been made through IIT, Madras to cover sand mining locations, area and overview of mining activity in the district with all its relevant features pertaining to geology and mineral wealth in replenishable and non-replenishable areas of rivers, stream and other sand sources. The mineral potential is calculated based on field investigation and geology of the catchment area of the river (or) Streams. The area for removal of the mineral in a river or stream is decided depending on geomorphology and other factors. The District

Survey Report shall form the basis for application for Environmental Clearance, preparation of reports and appraisal of projects. The report shall be updated once in five years.

2. INTRODUCTION:

Vellore District is located along the river Palar in Tamil Nadu India. The main town in Vellore district is the city of Vellore. As on 2011, the district had a population of 39,36,311 with 1034 female for every 1000 males. The district has an area of 6062.35 square kilometres. The Vellore is a city in the Indian state of Tamil Nadu and the administrative headquarters of Vellore District. It is the sixth largest municipal corporation in Tamil Nadu. Vellore has a semi-arid climate. It is in Vellore district of the South Indian state, Tamil Nadu, 135 km (84 mi) west of the state capital [Chennai](#). Vellore lies in the [Eastern Ghats](#) region and Palar river basin. The topography is almost plain with slopes from west to east. The Palar river flows through the length of the district and is the principle source of drinking water. The sand deposits across Palar river up to its confluence point in sea at Kancheepuram District. The other rivers are Goddar, Agaram aru, Koundinya nathi, Malattar river and Ponnai river which are seasonal carriers flood water and confluence in to River Palar.

3. OVERVIEW OF MINING ACTIVITIES IN THE DISTRICT.

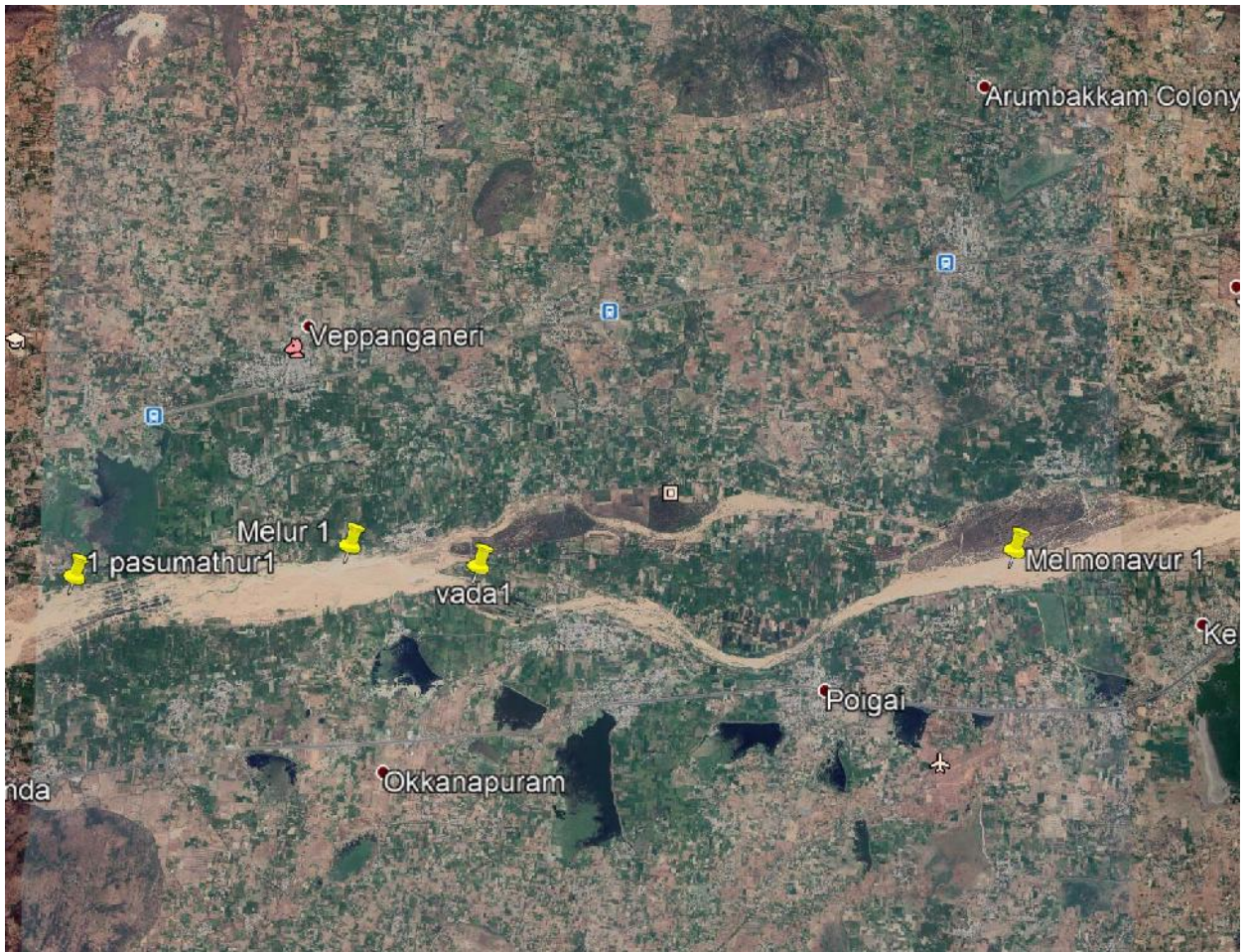
Mainly two types of Minor minerals constituents such as sand and jelly are required for any type of construction apart from other mineral like cement and steel. In earlier times, the houses / buildings were constructed in form of small dwellings with walls made up of mud plaster, stone and interlocking provided with wooden frames and there were negligible commercial as well as developmental activities resulting in less demand of binding materials. However with the percentage of time, new vistas of development activities were started. The quantity of minor mineral consumption in a particular area is thermometer to assess the development of the area. Thus with the pace of development activities, the consumption of minerals also increased. As Tamil Nadu State is highly urbanised state of Indian sub-continent after Maharashtra, the demand of minor minerals in the Vellore District has started increasing trend. Besides that the Vellore District is the Northern part of the State and having potential of sand and rough stone sources, the highly industrialised districts like Chennai,

Kancheepuram, Tiruvallur, Krishnagiri are depending its sand and rough stone need on Vellore Districts.

4. LIST OF MINING LEASES IN THE DISTRICT

In Vellore district there are few new proposals of sand mining were prepared and waiting for the Environmental clearance from DEIAA / SEIAA.

S. No	Name of Quarry	Name of Taluk	Area of Extent (Ha)	River
1	Ekambaranallur – Sripathanallur	Walaja - Katpadi	4.60.0	Ponnai
2	Melur	Katpadi	4.80.0	Palar
3	Kilur – Vadavirinjipuram	Katpadi	4.90.0	Palar
4	Pasumathur - 2	Gudiyattam	15.00.0	Palar
5	Arumparithi - Karnampattu	Katpadi	20.00.0	Palar
6	Melmonavur	Vellore	4.95.0	Palar
7	Poongodu	Arcot	6.00.0	Palar



New Quarries in Palar river



Proposed sand quarry in Sripathanallur – Ekambaranallur in Ponnai river in walajah and katpadi taluk of Vellore District.



Sand quarry in Melur village of Vellore District. Lat – Long N 12°55'47.27"E 79°0'22.88"



**Sand quarry in Kilur – Vadavirinjipuram in Katpadi taluk of Vellore District. Lat – Long
N 12°55'47.27"E 79°0'22.88"**



Sand quarry in Pasumathur in Gudiyattam taluk of Vellore District.



Sand quarry in Arumparithi – Karnampattu in Katpadi taluk of Vellore District.



Sand quarry in Melmonavur in Vellore taluk & District.



Sand quarry in Poongodu In Arcot taluk of Vellore District.

5. DETAILS OF ROYALTY OR REVENUE RECEIVED IN VELLORE DISTRICT.

Sl. No	Name of Quarry / Village	River	Taluk	April 2015	May 2015	June 2015
				Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)
1.	Perungalmedu-II	Palar	Arcot	3.576	----	----
2	Perungalmedu-III	Palar	Arcot	---	3.432	11.368
3	Vannivedu	Palar	Walaja	6.704	6.552	9.648
4	Rangapuram (Bullack Cart)	Palar	Vellore	----	0.9408	5.652
5	Kavanur & Kandaneri	Palar	Katpadi	----	----	----

Sl. No	Name of Quarry / Village	River	July 2015		August 2015	September 2015
			Taluk	Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)
1.	Perungalmedu-II	Palar	Arcot	----	----	----
2	Perungalmedu-III	Palar	Arcot	6.824	10.696	9.136
3	Vannivedu	Palar	Walaja	7.272	2.096	4.0
4	Rangapuram (Bullack Cart)	Palar	Vellore	7.4048	6.6424	7.3128
5	Kavanur & Kandaneri	Palar	Katpadi	----	----	----

From October 2015 to December 2015

Sl. No	Name of Quarry / Village	River	Taluk	October 2015	November 2015	December 2015
				Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)
1.	Perungalmedu-II	Palar	Arcot	----	----	----
2	Perungalmedu-III	Palar	Arcot	3.392	1.672	3.448
3	Vannivedu	Palar	Walaja	13.256	1.704	----
4	Rangapuram (Bullack Cart)	Palar	Vellore	6.8744	3.4608	7.0408
5	Kavanur & Kandaneri	Palar	Katpadi	----	----	----

From January 2016 to March 2016

Sl. No	Name of Quarry / Village	River	Taluk	January 2016	February 2016	March 2016
				Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)
1.	Perungalmedu-III	Palar	Arcot	8.84	6.248	2.16
2	Vannivedu	Palar	Walaja	-----	-----	-----
3	Rangapuram (Bullack Cart)	Palar	Vellore	6.716	6.716	0.7992
4	Kavanur & Kandaneri	Palar	Katpadi	2.384	12.368	12.828
5	Kilambadi	Palar	Arcot	-----	-----	8.744
6	Valavanur	Palar	Arcot	-----	-----	4.16
7	Minnur & Vedakarai	Palar	Ambur	-----	-----	6.688
8	Marapattu (Bullock Cart)	Palar	Gudiyatham	-----	-----	0.7992
9	Vadavirijipuram	Palar	Katpadi	-----	-----	-----

10	Veerankuppam	Palar	Ambur	-----	-----	-----
11	Alinjikuppam & Melmurungai	Palar	Ambur	-----	-----	8.448

From April 2016 to June 2016

Sl. No	Name of Quarry / Village	River	Taluk	April 2016	May 2016	June 2016
				Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)
1	Rangapuram (BullackCart)	Palar	Vellore	4.7008	4.9184	0.248
2	Kavanur & Kandaneri	Palar	Katpadi	12.776	---	---
3	Kilambadi	Palar	Arcot	10.912	7.896	11.128
4	Valavanur	Palar	Arcot	4.392	3.296	4.848
5	Minnur & Vadakarai	Palar	Ambur	9.112	1.104	----
6	Marapattu (Bullock Cart)	Palar	Gudiyatham	1.1168	1.184	1.4768
7	Vadavirinjipuram	Palar	Katpadi	-----	----	----
8	Veerankuppam	Palar	Ambur	-----	----	----
9	Alinjikuppam & Melmurugai	Palar	Ambur	11.256	1.32	----

From July 2016 to August 2016

Sl. No	Name of Quarry / Village	River	Taluk	July 2016	August 2016	September 2016
				Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)
1	Rangapuram (Bullock Cart)	Palar	Vellore	---	---	---
2	Kavanur & Kandaneri	Palar	katpadi	15.76	17.16	15.6
3	Kilambadi	Palar	Arcot	11.056	10.872	10.32
4	Valavanur	Palar	Arcot	5.072	4.864	4.424
5	Minnur & Vadakarai	Palar	Ambur	----	----	24.872
6	Marapattu (Bullock Cart)	Palar	Gudiyatham	1.7024	1.7888	1.2032
7	Vadavirinjipuram	Palar	Katpadi	2.6232	6.3056	6.6856
8	Veerankuppam	Palar	Ambur	----	1.4648	1.7304
9	Alinjipkuppam & Melmurungai	Palar	Ambur	----	----	4.832

From October 2016 to December 2016

Sl. No	Name of Quarry / Village	River	Taluk	October 2016	November 2016	December 2016
				Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)
1	Kavanur & Kandaneri	Palar	Katpadi	14.864	12.672	8.184
2	Kilambadi	Palar	Arcot	7.36	5.24	5.304
3	Valavanur	Palar	Arcot	4.976	4.512	11.408
4	Minnur & Vadakarai	Palar	Ambur	29.944	21.448	35.144
5	Marapattu (Bullockcart)	Palar	Gudiuyatham	1.0688	1.1712	1.1456
6	Vadavirinjipuram	Palar	Katpadi	6.1352	6.196	5.7064
7	Veerangkuppam	Palar	Ambur	1.8624	1.988	1.7936
8	Alinjikuppam & Melmurungai	Palar	Ambur	41.448	27.184	11.496

From January 2017 to March 2017

Sl. No	Name of Quarry / Village	River	Taluk	January 2017	February 2017	March 2017
				Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)
1	Kavanur	Palar	Katpadi	---	---	---
2	Kilambadi	Palar	Arcot	---	---	---
3	Valavanur	Palar	Arcot	45.312	8.36	---
4	Minnur & Vadakarai	Palar	Ambur	---	----	---
5	Marapattu (Bullock Cart)	Palar	Gudiyatham	0.9568	0.6352	---
6	Vadavirinjipuram	Palar	Katpadi	5.248	5.5288	7.6344
7	Veerankuppam	Palar	Ambur	1.5504	0.8032	---
8	Alinjikuppam & Melmurungai	Palar	Ambur	71.264	80.104	---

From June 2017 to August-2017

Sl. No	Name of Quarry / Village	River	Taluk	June - 2017	July- 2017	August- 2017
				Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)
1	Sakkaramallur Sathampakkam	Palar	Arcot & Walaja	36.056	54.092	2.584
2	Pasumathur	Palar	Gudiyatham	7.588	45.972	315.44

From September 2017 to November -2017

Sl. No	Name of Quarry / Village	River	Taluk	September-2017	October-2017	November-2017
				Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)
1	Sakkaramallur Sathampakkam	Palar	Arcot & Walaja	1.66	----	6.704
2	Pogai & Kothamangalam	Palar	Katpadi & Gudiyatham	-----	1.296	21.80
3	Pogai & Kothamangalam (Bullock Cart)	Palar	Katpadi & Gudiyatham	-----	-----	2.16

From December 2017 to February -2018

Sl. No	Name of Quarry / Village	River	Taluk	December-2017	January -2018	February-2018
				Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)
1	Sakkaramallur Sathampakkam	Palar	Arcot & Walaja	23.166	11.467	18.413
2	Pogai & Kothamangalam	Palar	Katpadi & Gudiyatham	20.433	14.217	15.798

Sl. No	Name of Quarry / Village	River	Taluk	June-2018	July-2018	August - 2018
				Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)
1	Pattu	Palar	Pernampet	---	---	1.14

From September 2018 to November -2018

Sl. No	Name of Quarry / Village	River	Taluk	September-2018	October-2018	November-2018
				Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)
1	Pattu	Palar	Pernampet	9.62	9.99	13.71
2	Navlak	Palar	Walaja	---	---	2.17

From December 2018 to February -2019

Sl. No	Name of Quarry / Village	River	Taluk	December - 2018	January- 2019	February- 2019
				Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)	Amount (Rs.in Lakhs)
1	Pattu	Palar	Pernampet	16.33	7.10	---
2	Navlak	Palar	Walaja	12.56	10.85	9.40

6. PRODUCTION OF SAND IN THE VELLORE DISTRICT

Sl. No	Name of Quarry / Village	River	Taluk	April 2015	May 2015	June 2015
				Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit
1	Perungalmedu-II	Palar	Arcot	447	---	---
2	Perungalmedu-III	Palar	Arcot	---	429	1421
3	Vannivedu	Palar	Walaja	838	819	1206
4	Rangapuram	Palar	Vellore	---	117.6	706.5
5	Kavanur Kandaneri	Palar	Katpadi	---	---	---

Sl. No	Name of Quarry / Village	River	Taluk	May 2015	June 2015	July 2015
				Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit
1	Perungalmedu-II	Palar	Arcot	--	----	--
2	Perungalmedu-III	Palar	Arcot	429	1421	853
3	Vannivedu	Palar	Walaja	819	1206	909
4	Rangapuram	Palar	Vellore	117.6	706.5	925.6
5	Kavanur Kandaneri	Palar	Katpadi	---	---	---

Sl. No	Name of Quarry / Village	River	Taluk	August 2015	September 2015	October 2015
				Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit
1	Perungalmedu-II	Palar	Arcot	---	---	--
2	Perungalmedu-III	Palar	Arcot	1337	1142	424
3	Vannivedu	Palar	Walaja	262	500	1657
4	Rangapuram	Palar	Vellore	830.3	9141	859.3
5	Kavanur Kandaneri	Palar	Katpadi	---	--	----

Sl. No	Name of Quarry / Village	River	Taluk	November 2015	December 2015
				Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit
1	Perungalmedu-II	Palar	Arcot	--	----
2	Perungalmedu-III	Palar	Arcot	209	431
3	Vannivedu	Palar	Walaja	213	---
4	Rangapuram	Palar	Vellore	432.6	880.1
5	Kavanur Kandaneri	Palar	Katpadi	---	---

Sl. No	Name of Quarry / Village	River	Taluk	January 2016	February 2016	March 2016
				Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit
1	Perungalmedu-III	Palar	Arcot	1105	781	270
2	Vannivedu	Palar	Walaja	---	---	---
3	Rangapuram	Palar	Vellore	839.5	839.5	99.9
4	Kavanur Kandaneri	Palar	Katpadi	298	1546	1603.5
5	Kilambadi	Palar	Arcot	---	---	1093
6	Valavanur	Palar	Arcot	---	---	520
7	Minnur & Vadakarai	Palar	Ambur	---	---	836
8	Marapattu	Palar	Gudiyatham	---	---	99.9

9	Vadavirinjipuram	Palar	Katpadi	---	---	---
10	Veerankuppam	Palar	Ambur	---	---	---
11	Alinjikuppam& Melmurungai	Palar	Ambur	---	---	1056

Sl. No	Name of Quarry / Village	River	Taluk	April 2016	May 2016	June 2016
				Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit
1	Rangapuram	Palar	Vellore	587.6	614.8	31
2	Kavanur Kandaneri	Palar	Katpadi	1597	---	---
3	Kilambadi	Palar	Arcot	1364	987	1391
4	Valavanur	Palar	Arcot	549	412	606
5	Minnur & Vadakarai	Palar	Ambur	1139	138	---
6	Marapattu	Palar	Gudiyatham	139.6	148	184.6
7	Vadavirinjipuram	Palar	Katpadi	---	---	---
8	Veerankuppam	Palar	Ambur	---	---	---
9	Alinjikuppam& Melmurungai	Palar	Ambur	1407	165	---

Sl. No	Name of Quarry / Village	River	Taluk	July 2016	August 2016	September 2016
				Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit
1	Rangapuram	Palar	Vellore	---	---	---
2	Kavanur Kandaneri	Palar	Katpadi	1970	2145	1950
3	Kilambadi	Palar	Arcot	1382	1359	1290
4	Valavanur	Palar	Arcot	634	608	553
5	Minnur & Vadakarai	Palar	Ambur	---	--	3109
6	Marapattu	Palar	Gudiyatham	212.8	223.6	150.4
7	Vadavirinjipuram	Palar	Katpadi	327.9	788.2	835.7
8	Veerankuppam	Palar	Ambur	---	183.1	216.3
9	Alinjikuppam & Melmurungai	Palar	Ambur	---	--	604

Sl. No	Name of Quarry / Village	River	Taluk	October 2016	November 2016	December 2016
				Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit
1	Kavanur Kandaneri	Palar	Katpadi	1858	1584	1023
2	Kilambadi	Palar	Arcot	920	655	663
3	Valavanur	Palar	Arcot	622	564	1426
4	Minnur & Vadakarai	Palar	Ambur	3118	2681	4393
5	Marapattu	Palar	Gudiyatham	133.6	146.4	143.2
6	Vadavirinjipuram	Palar	Katpadi	766.9	774.5	713.3
7	Veerankuppam	Palar	Ambur	232.8	248.5	224.2
8	Alinjikuppam & Melmurungai	Palar	Ambur	5181	3398	1437

Sl. No	Name of Quarry / Village	River	Taluk	January 2016	February 2017	March 2017
				Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit
1	Kavanur Kandaneri	Palar	Katpadi	---	---	---
2	Kilambadi	Palar	Arcot	---	----	---
3	Valavanur	Palar	Arcot	5664	1045	---
4	Minnur & Vadakarai	Palar	Ambur	---	---	---
5	Marapattu	Palar	Gudiyatham	119.6	79.4	---
6	Vadavirinjipuram	Palar	Katpadi	656.0	691.1	7.6344
7	Veerankuppam	Palar	Ambur	193.8	100.4	---
8	Alinjikuppam & Melmurungai	Palar	Ambur	8908	10013	---

Sl. No	Name of Quarry / Village	River	Taluk	June 2017	July 2017	August 2017
				Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit
1	Sakkaramallr	Palar	Arcot & Walaja	4507	6761.50	323.0
2	Pasumathur	Palar	Gudiyatham	948.50	5746.50	3943.0

Sl. No	Name of Quarry / Village	River	Taluk	September 2017	October 2017	November 2017
				Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit
1	Sakkaramallr	Palar	Arcot & Walaja	207.50	---	838.0
2	Pogai & Kothamangalam	Palar	Katpadi & Gudiyatham	---	1.296	2725

Sl. No	Name of Quarry / Village	River	Taluk	December 2017	January 2018	February 2018
				Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit
1	Sakkaramallr	Palar	Arcot & Walaja	2895.80	1433.40	2301.60
2	Pogai & Kothamangalam	Palar	Katpadi & Gudiyatham	2554.10	1777.12	1974.70

Sl. No	Name of Quarry / Village	River	Taluk	March-2018	April 2018	May 2018
				Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit
1	Sakkaramallr	Palar	Arcot & Walaja	2149.90	64.00	---
2	Pogai & Kothamangalam	Palar	Katpadi & Gudiyatham	1644.50	94.00	---

Sl. No	Name of Quarry / Village	River	Taluk	June-2018	July 2018	August 2018
				Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit
1	Pattu	Palar	Pernampet	---	142.24	931.71

Sl. No	Name of Quarry / Village	River	Taluk	September-2018	October 2018	November 2018
				Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit
1	Pattu	Palar	Pernampet	1202.00	1250	1714.00
2	Navlak	Palar	Walaja	---	---	271.00

Sl. No	Name of Quarry / Village	River	Taluk	December-2018	January 2019	February 2019
				Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit	Total Loads in terms of 2 Unit
1	Pattu	Palar	Pernampet	2041.0	887.00	---
2	Navlak	Palar	Walaja	1570.0	1357.00	1175.0

6. PROCESS OF DEPOSITION OF SEDIMENTS IN THE RIVERS OF THE DISTRICT.

Palar is a river of southern India. It rises in the Nandi Hills in Chikkaballapura district of Karnataka state,[1] and flows 93 kilometres (58 mi) in Karnataka, 33 kilometres (21 mi) in Andhra Pradesh and 222 kilometres (138 mi) in Tamil Nadubefore reaching its confluence into the Bay of Bengal at Vayalur about 100 kilometres (62 mi) south of Chennai.[2] It flows as an underground river for a long distance only to emerge near Bethamangala town, from where, gathering water and speed, it flows eastward down the Deccan Plateau. The cities of Ramanaickenpet, Vaniyambadi, Ambur, Melpatti, Gudiyatham, Pallikonda, Melmonavoor, Vellore, Melvisharam, Arcot, Ranipet Walajapet (Anaicut), Kanchipuram and Chengalpattu are located on the banks of the Palar River. Of the seven tributaries, the chief tributary is the Cheyyar River.

Palar river water from Palar anicut is diverted to the Poondi reservoir located in the Kosasthalaiyar River basin and to Chembarambakkam Lake located in the Adayar River basin.[3] These two reservoirs are major water supply points to Chennai city. After

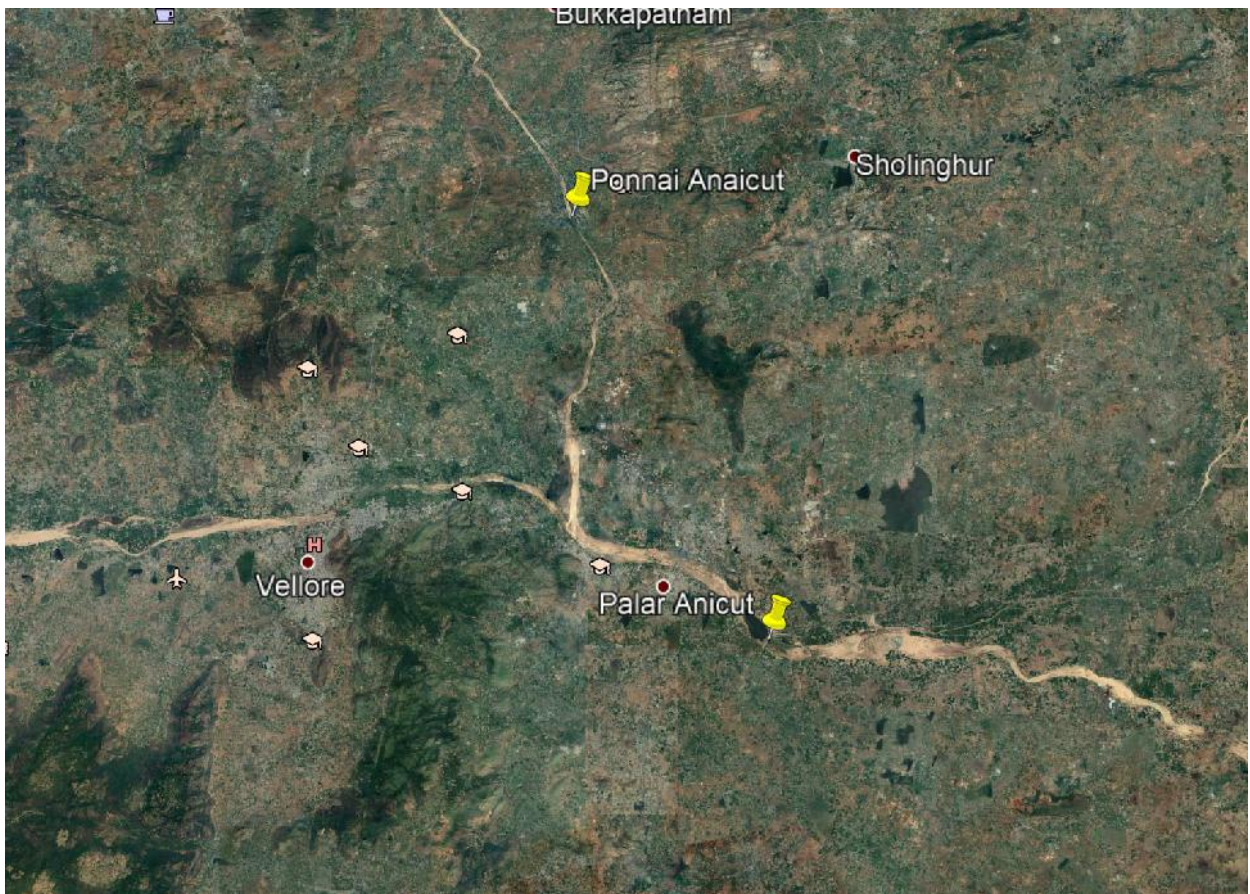
commissioning of the Telugu Ganga project to supply nearly 1000 million litres per day of Krishna Riverwater to the Chennai city, the dependence on Palar river water has reduced drastically.

6.a. Location of Irrigation structures

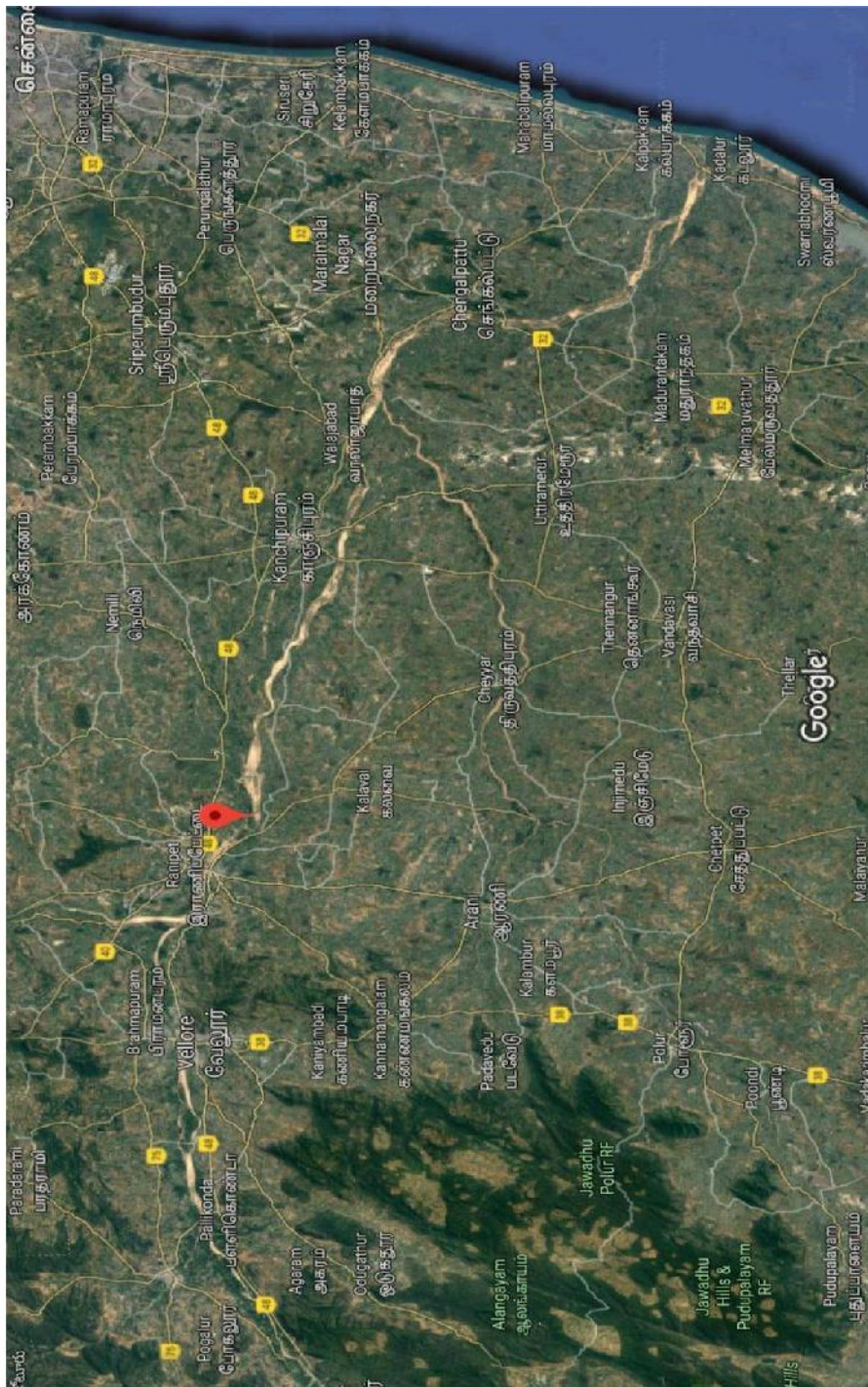
The important irrigation structures located along the study which are used for the regulation of water along the reach are detailed below

Ponnai anicut

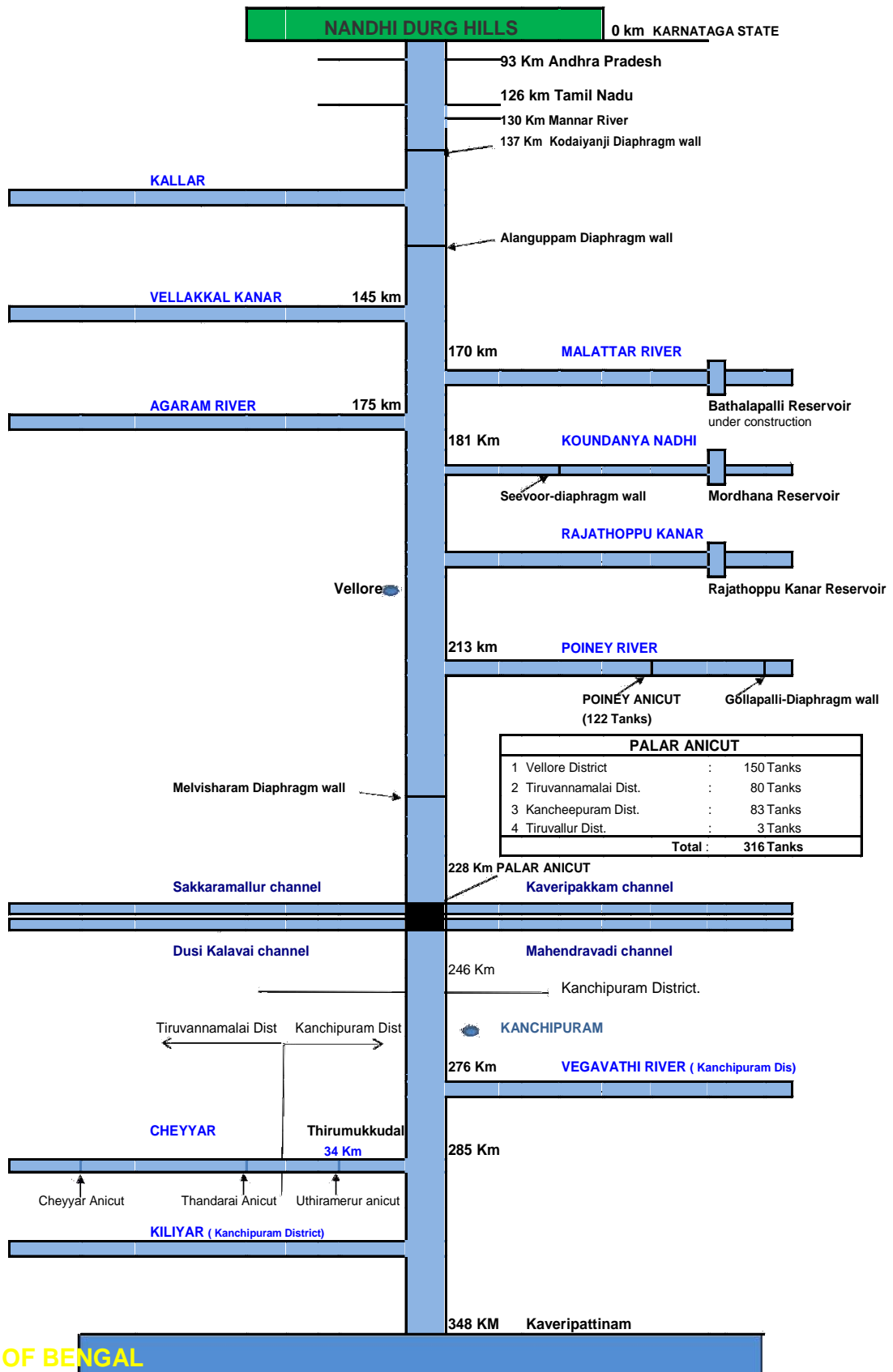
Palar anicut



Important anicuts in Palar river



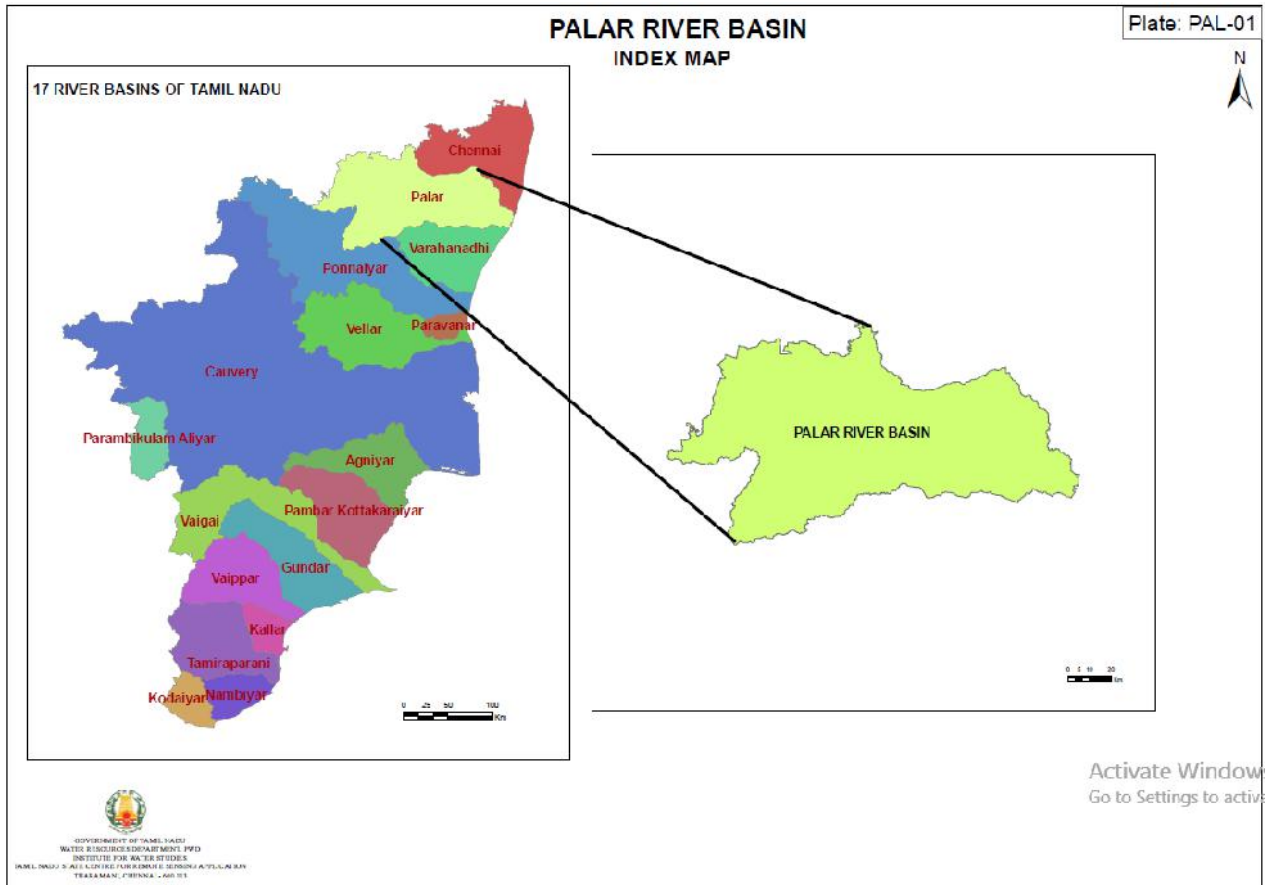
FLOW DIAGRAM OF PALAR RIVER



6.d. PALAR RIVER BASIN

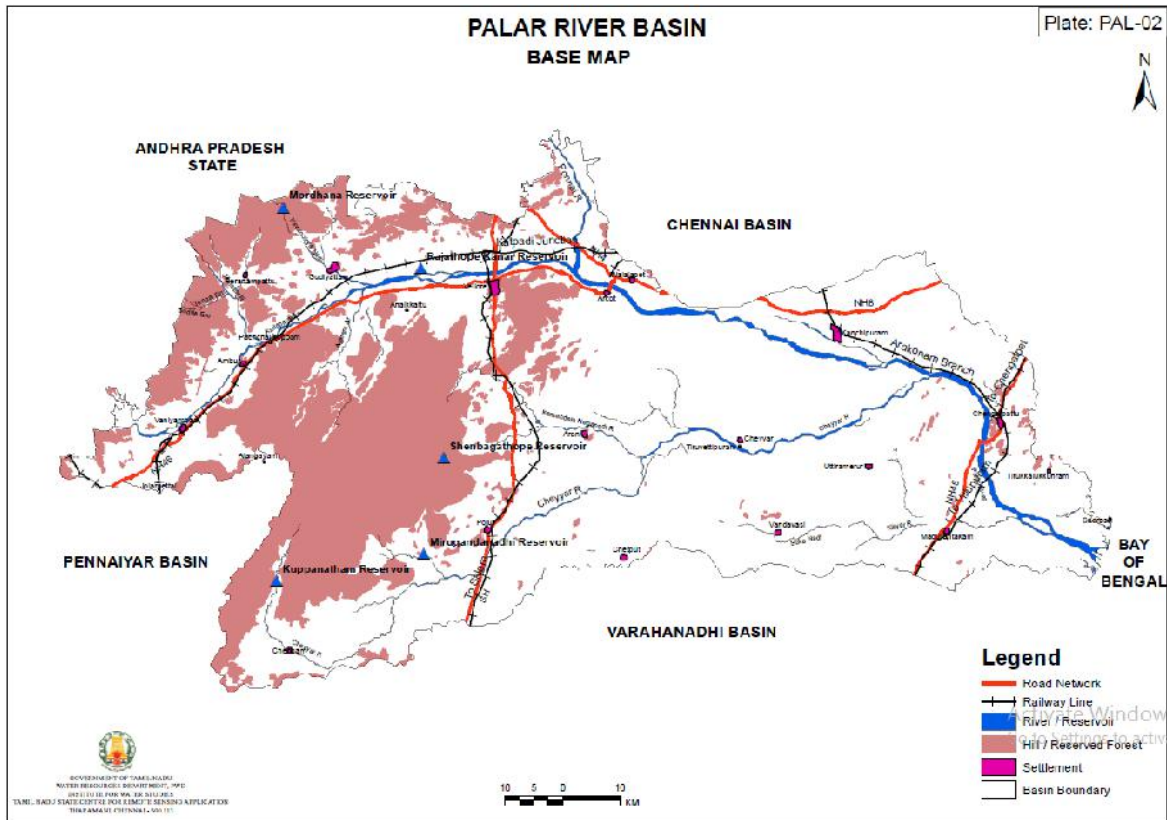
The Palar River Basin is one of the major river basins in Tamilnadu. The main Palar River originates in Nandhi Durg, Kolar district at an elevation of 800 m above MSL in eastern part of Karnataka State, through Kolar and Bangarupet Taluks where it forms the very large Bethamangal tank, which is the main source of water supply to Kolar Gold Field and Bharath Earth Movers Limited. It leaves Karnataka border and flows through Andhra Pradesh for a small distance in Kuppam Taluk in Chittoor District and enters Vellore District of Tamil Nadu and passes through west of Vaniambadi Town and flows into the Bay of Bengal, east of Maduranthagam and south of Mahabalipuram.

The total area of Palar River Basin is 17,633.19 sq.km which includes an area of 3,123 sq.km in Karnataka state, 4,267 sq.km in Andhra Pradesh and 10273.19 Sq Km in Tamil Nadu. It lies between 78°24'43" E, 12°36'26" N and 80°09'54" E, 12°31'26" N from east to west and between 79° 14'23"E, 13°10'21" N and 78°41'51" E, 12°14'05" N in north to south. The Index map is given in Figure.

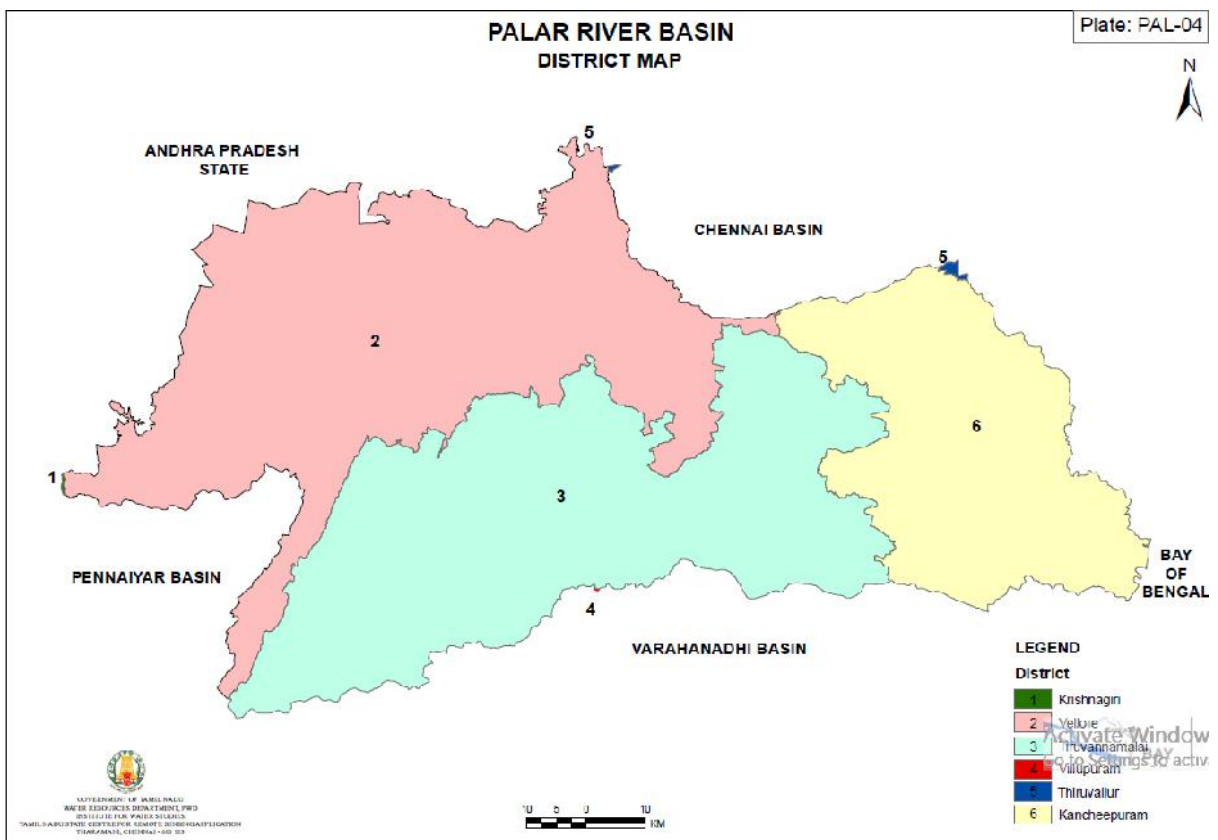


Index Map of Palar River Basin

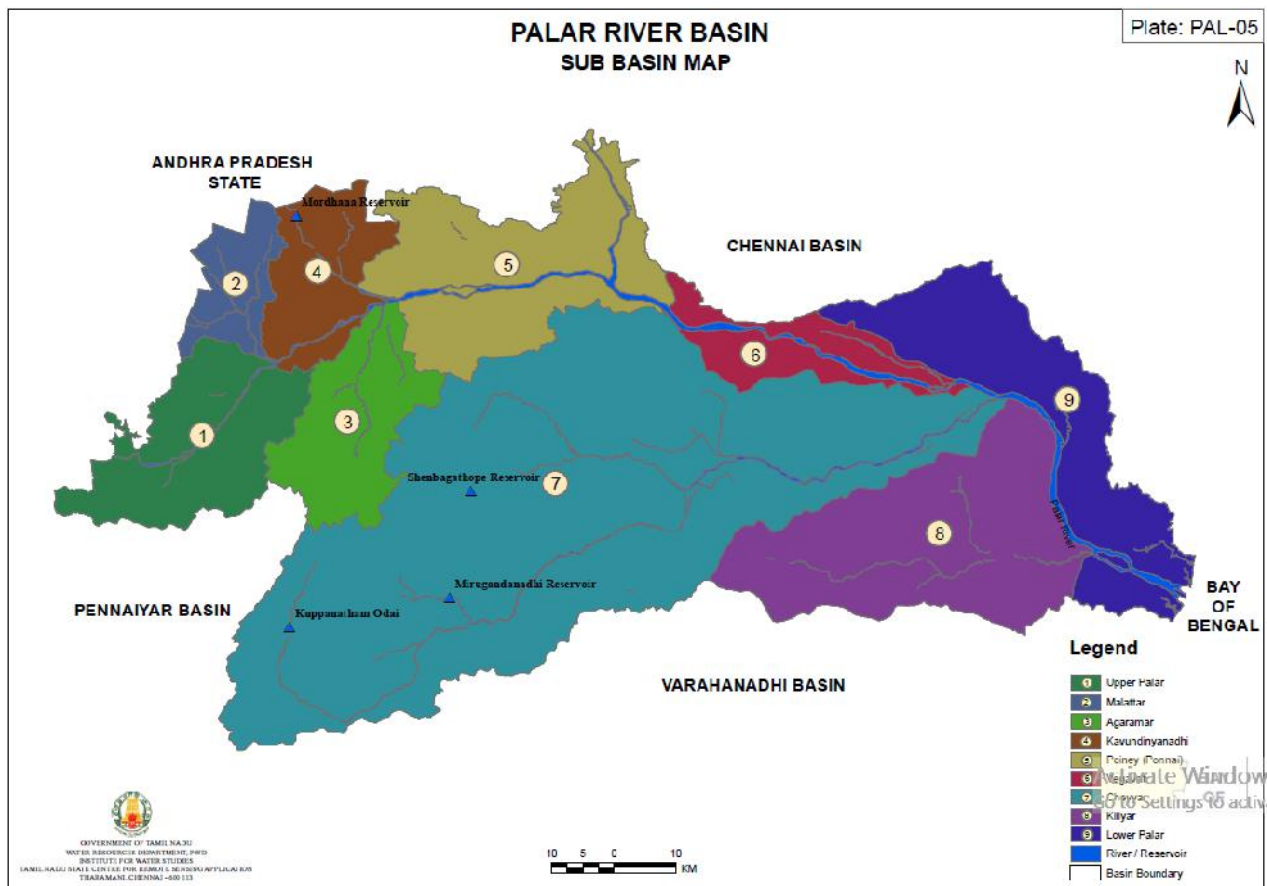
The basin is bordered on the northwest by Andhra Pradesh state, northeast by Chennai River Basin, southwest by Pennaiyar river basin and northeast by Varahanadhi river basin. The base map is given in Figure.



Base Map of Palar River Basin



District Map of Palar River Basin



The basin covers Vellore, Thiruvannamalai, Kancheepuram, Thiruvallur, Villupuram and Krishnagiri districts of Tamilnadu. The important tributaries are

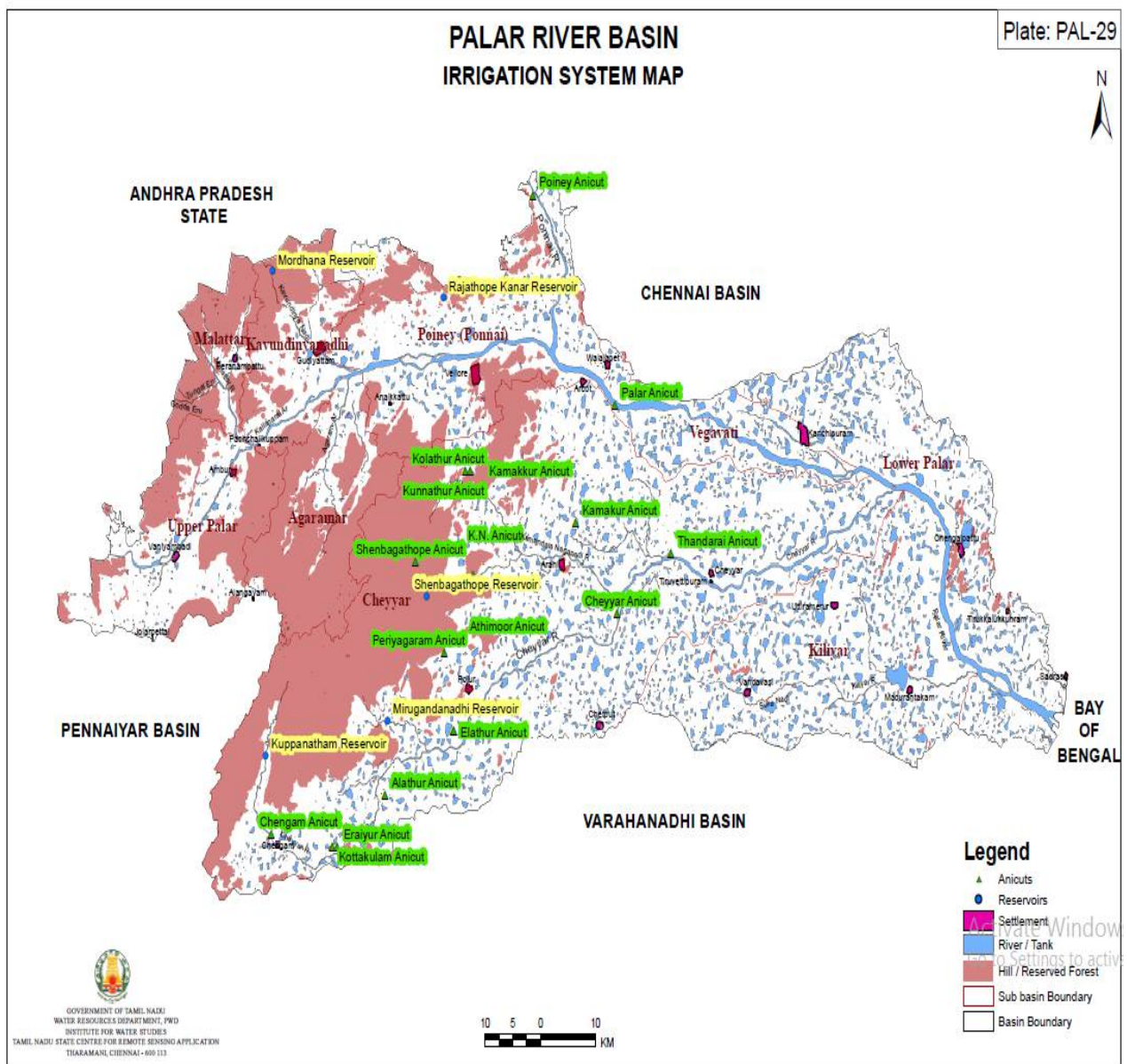
- 1.Ponnai
- 2.Kaudinya Nadhi
- 3.Malattar
4. Cheyyar
- 5.Agaramar
- 6.Kamandalar
- 7.Naganadhiar

8. Killiyar

9. Vegavathiar.

In this basin there are 50 blocks either partly or fully falling in the above districts.

6.e. RESERVOIRS ALONG PALAR RIVER BASIN



There are 5 Reservoirs in the basin having a total ayacut of 11506.02Ha. The details of the reservoirs are given in Table

S. No.	Name of Reservoir	Name of River	Name of Sub Basin	Gross capacity in Mcum	Ayacut in Ha
1	Mordhana Reservoir	Kavundinya Nadhi	Kavundinya Nadhi	7.40	3387.00
2	Rajathope Kanar Reservoir Reservoir	Rajathope Kanar	Kavundinya Nadhi	0.58	219.24
3	Kuppanatham	Cheyvar	Cheyvar	19.82	3971.72
4	Mirugandanadhi Reservoir	Mirugandanadhi	Cheyvar	2.47	1219.37
5	Shenbagathope Reservoir	Kamandalar	Cheyvar	8.13	2708.69
			Total	38.40	11506.02



6.f. Shoaling in river bed



6.g. Reduction of River carrying capacity by shoal formation



6.h. Siltation Problem in U/S of Anicut

6. i. REPLENISHMENT STUDY FOR SAND

Replenishment study was under progress according to the *MoEFCC Gazette Notification No.S.O.3611(E) dated 25.07.2018*. Therefore, replenishment study should be carried out across the state in all districts as per the method prescribed in the *Sustainable Sand Mining Guidelines 2018 of MoEFCC*. Some of the points that should be taken care of while conducting replenishment study are:

- The cross-section survey should cover a minimum distance of 1.0 km upstream and 1.0 km downstream of the potential reach for extraction.
- The sediment sampling should include the bed material and bed material load before, during and after extraction period.
- Development of sediment rating curve at the upstream end of the potential reach using the surveyed cross-section.
- Using the historical or gauged flow rating curve, determination of suitable period of high flow that can replenish the extracted volume.

7. GENERAL PROFILE OF THE DISTRICT

7.a. PHYSICAL FEATURES AND GEOGRAPHICAL AREA:

Vellore district lies between 12° 15' to 13° 15' North latitudes and 78° 20' to 79° 50' East longitudes in Tamilnadu State. The geographical area of this district is 6077 sq. k.m. The total population as per 2011 Census is 39,36,331. Vellore district is located along the river Palar. The district is bounded in the north by Andhra Pradesh state, in the west by Krishnagiri District, in the East by Kancheepuram District and in the South by Thiruvannamalai District,.

The District has 3 divisions and 13 Taluks as follows:

DIVISIONS

1. Vellore
2. Tirupathur
3. Ranipet

TALUKS

1. Vellore
2. Katpadi
3. Gudiyattam
4. Anaicut
5. Pernambut
6. Arakonam

7. Walaja
8. Arcot
9. Nemili
10. Tirupattur
11. Vaniyambadi
12. Ambur
13. Natrampalli

S.No	Division Name	Taluk Name	Revenue Villages Count
1.	Vellore	Vellore	51
2.	Vellore	Katpadi	85
3.	Vellore	Gudiyattam	45
4.	Vellore	Anaicut	61
5.	Vellore	Pernambut	52
6.	Ranipet	Arakonam	68
7.	Ranipet	Walaja	83
8.	Ranipet	Arcot	102
9.	Ranipet	Nemili	77
10.	Tirupattur	Tirupattur	63
11.	Tirupattur	Vaniyambadi	48
12.	Tirupattur	Ambur	77
13.	Tirupattur	Natrampalli	30

Vellore experiences a tropical savanna climate (Köppen climate classification *Aw*). The temperature ranges from a maximum of 39.4 °C (102.9 °F) to a minimum of 13 °C (55 °F). The

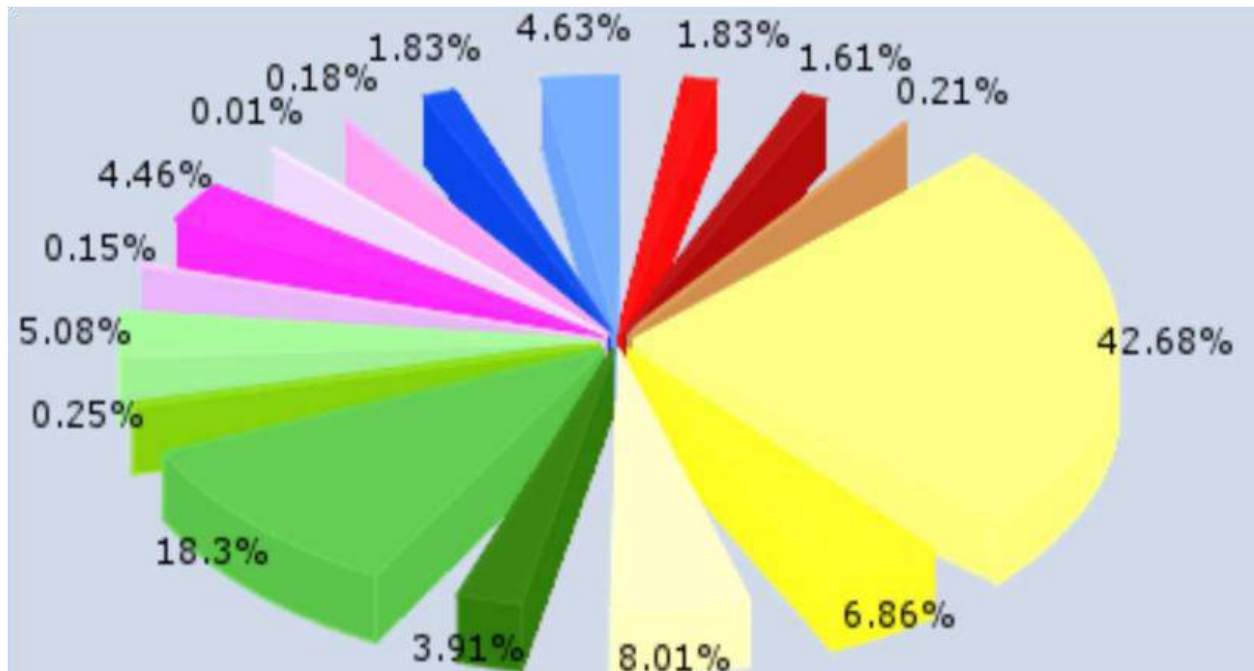
northeast monsoon which lasts from October to December brings rainfall of 388.4mm. The humidity ranges from 40%–63% during summer and 67%–86% during winter.

Climate data for Vellore													
Month	Jan	Feb	Mar	Apr	Ma y	Jun	Jul	Aug	Sep	Oct	No v	De c	Yea r
Record high °C (°F)	35.3 (95.5)	39.8 (103.6)	42.8 (109.0)	44.4 (111.9)	45.0 (113.0)	44.3 (111.7)	40.9 (105.6)	39.4 (102.9)	39.6 (103.3)	39.2 (102.6)	35.8 (96.4)	35.0 (95.0)	45.0 (113.0)
Average high °C (°F)	29.8 (85.6)	32.8 (91.0)	36.1 (97.0)	39.9 (103.8)	41.1 (106.0)	40.6 (105.1)	35.1 (95.2)	34.3 (93.7)	34.0 (93.2)	32.3 (90.1)	29.8 (85.6)	28.7 (83.7)	34.5 (94.2)
Average low °C (°F)	14.8 (58.6)	18.9 (66.0)	21.6 (70.9)	24.6 (76.3)	25.7 (78.3)	25.2 (77.4)	24.5 (76.1)	24.0 (75.2)	23.4 (74.1)	22.4 (72.3)	20.6 (69.1)	13.2 (55.8)	21.6 (70.8)
Record low °C (°F)	7.4 (45.3)	12.0 (53.6)	12.1 (53.8)	17.8 (64.0)	18.1 (64.6)	19.6 (67.3)	18.8 (65.8)	18.7 (65.7)	18.7 (65.7)	15.6 (60.1)	12.1 (53.8)	11.0 (51.8)	8 (46)
Average precipi tation mm (inches)	11.5 (0.45)	1.7 (0.07)	16.7 (0.66)	28.2 (1.11)	69.7 (2.74)	78.2 (3.08)	110.4 (4.35)	134.1 (5.28)	195.2 (7.69)	158.1 (6.22)	15.6 (0.615)	74.0 (2.91)	1,034.1 (40.71)
Average precipitation days	0.9	0.2	1.1	1.5	4.5	5.0	6.2	7.8	8.8	8.6	7.6	3.6	55.8

The district is well connected by road and rail. The district has good educational institutional frame work.

8. LAND UTILISATION PATTERN:-

Out of the total area of 6077 sq. km., the Vellore District hosts the major land use as the Agriculture with Crop land and Plantation type land covers, followed by the forest cover and so on.



LULC Class	Area (Sq.Km)	LULC Class	Area (Sq.Km)
Builtup,Urban	110.98	Builtup,Rural	97.8
Builtup,Mining	13.03	Agriculture,Crop land	2593.47
Agriculture,Plantation	416.87	Agriculture,Fallow	486.59
Forest,Evergreen/ Semi evergreen	237.63	Forest,Deciduous	1111.98
Forest,Forest Plantation	15.3	Forest,Scrub Forest	309
Barren/unculturable/ Wastelands, Salt Affected land	9.38	Barren/unculturable/ Wastelands, Scrub land	271.01
Barren/unculturable/ Wastelands, Sandy area	0.81	Barren/unculturable/ Wastelands, Barren rocky	10.77
Wetlands/Water Bodies, River/Stream/canals	111.16	Wetlands/Water Bodies, Reservoir/Lakes/Ponds	281.2
Total			6077.00

Land utilisation Pattern

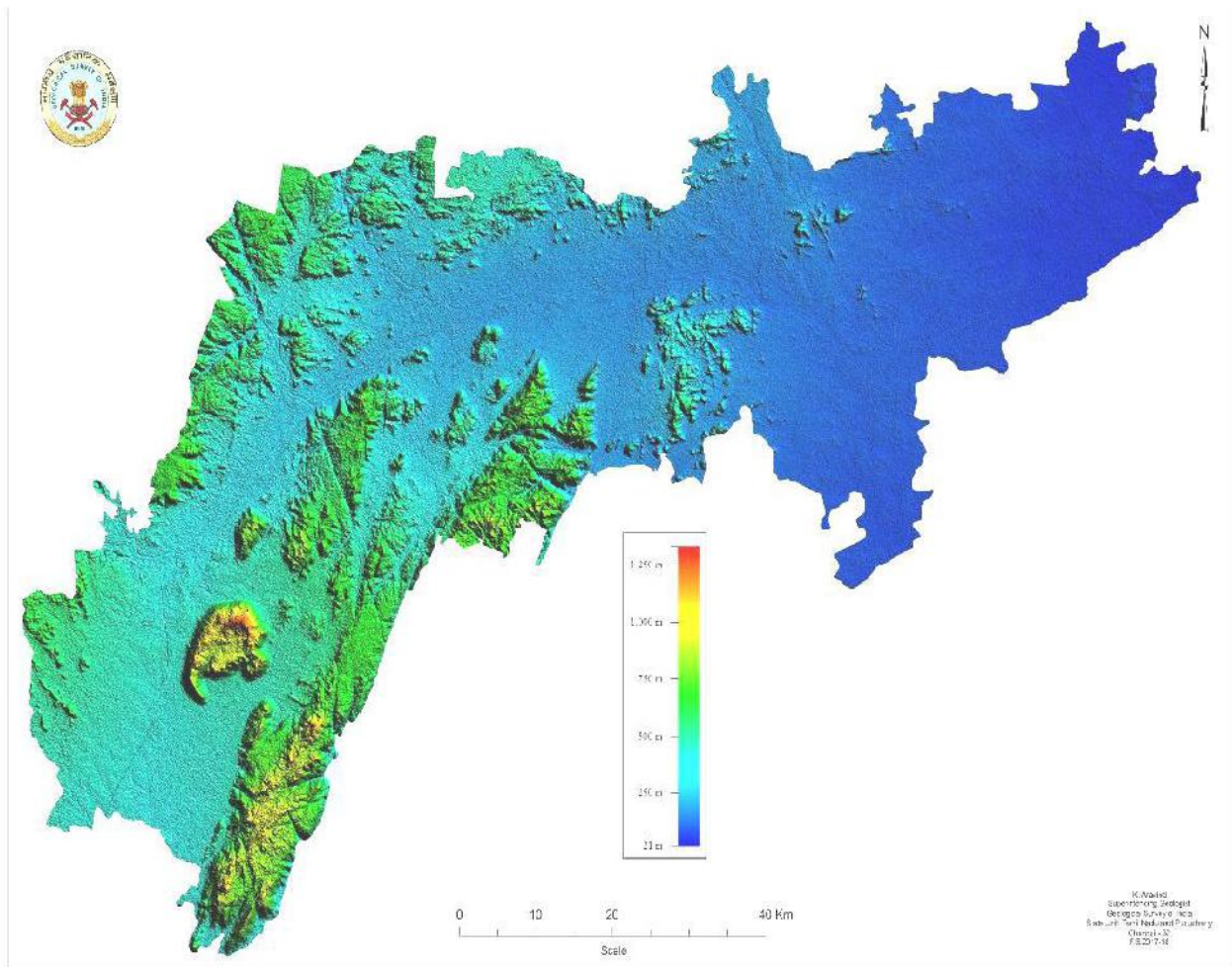
Sl.No.	Land Use Classification	Area in Hectares
1	Forest	5648
2	Barren and Uncultivable uses	20443
3	Land put to Non-Agricultural uses	80725
4	Cultivable Waste	5673
5	Permanent Pastures and Other Grazing Land	3922
6	Land Under Miscellaneous Tree Crops and Groves not included in	2937
7	Current Fallows	77453
8	Other Fallows Land	74369
9	Net Area Sown	164210
10	Reserve Forest	156638
11	Geographical Area According to Village Papers	592018
12	Total Cropped Area	202453
13	Area sown more than once	38244

9. PHYSIOGRAPHY AND REGIONAL GEOLOGY:

This part of South India experiences semi-arid climatic conditions with moderate rainfall averaging about 630mm per year. The river Palar runs parallel to the hill ranges of the Eastern Ghats for a major part of its course and has a vast flood plain in the lower reaches, but is dry for major part of the year and it is ephemeral in nature.

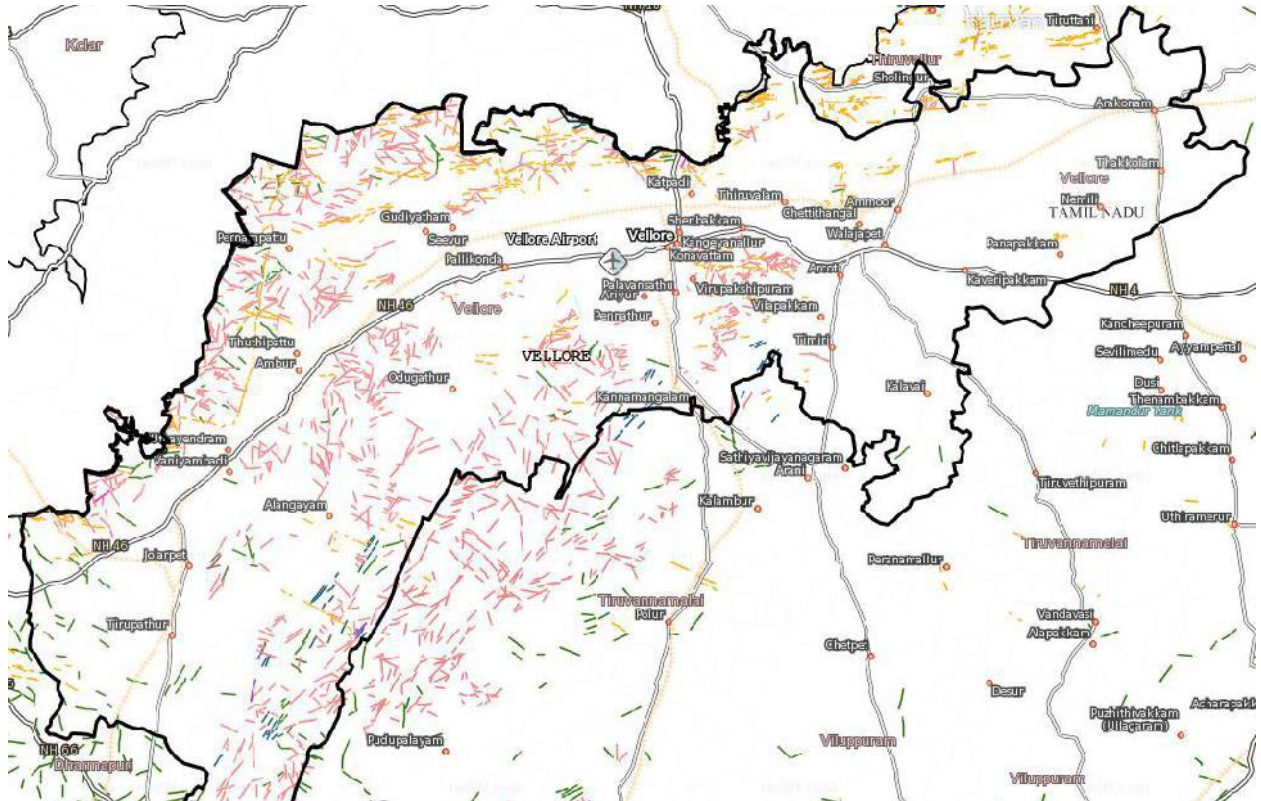
Vellore is the Head-Quarters of Vellore District which is well connected by Rail and bus routes to major towns of the neighbouring states like Andhra Pradesh, Karnataka and Kerala. The history of the District assumes a great significance and relevance, as we unfold the glorious past. The Monuments found in the district give a vivid picture of the town through the ages. In the 18th Century Vellore District was the scene of some of the decisive battles fought in Ambur 1749 A.D., Arcot 1751 A.D. and Vandavasi 1768 A.D. as a result of the long – drawn struggle between the English and the French for Supremacy.

Vellore district can be classified into two major physiographic divisions i) Hilly terrain in the eastern and southwestern parts ii) Plain regions in the eastern part. The western part of the district is occupied by the Javadi and Elagiri hills. In the Elagiri hills, a few peaks 1121 m, 942 m, 841 m raise above, are prominent. In Javadi hills, the peaks 1076 m, 975 m and 99 m are prominent. The eastern areas of Vellore are undulating rugged plains with isolated hillocks of 120 m and 140 m above msl. The area is drained by Palar, Cheyyar and smaller distributary streams. The drainage is subdendritic and most of the streams are ephemeral . The Palar Flood Plain becomes broader on entering into the Kancheepuram district whereas in the west, it is restricted to the river bed only.



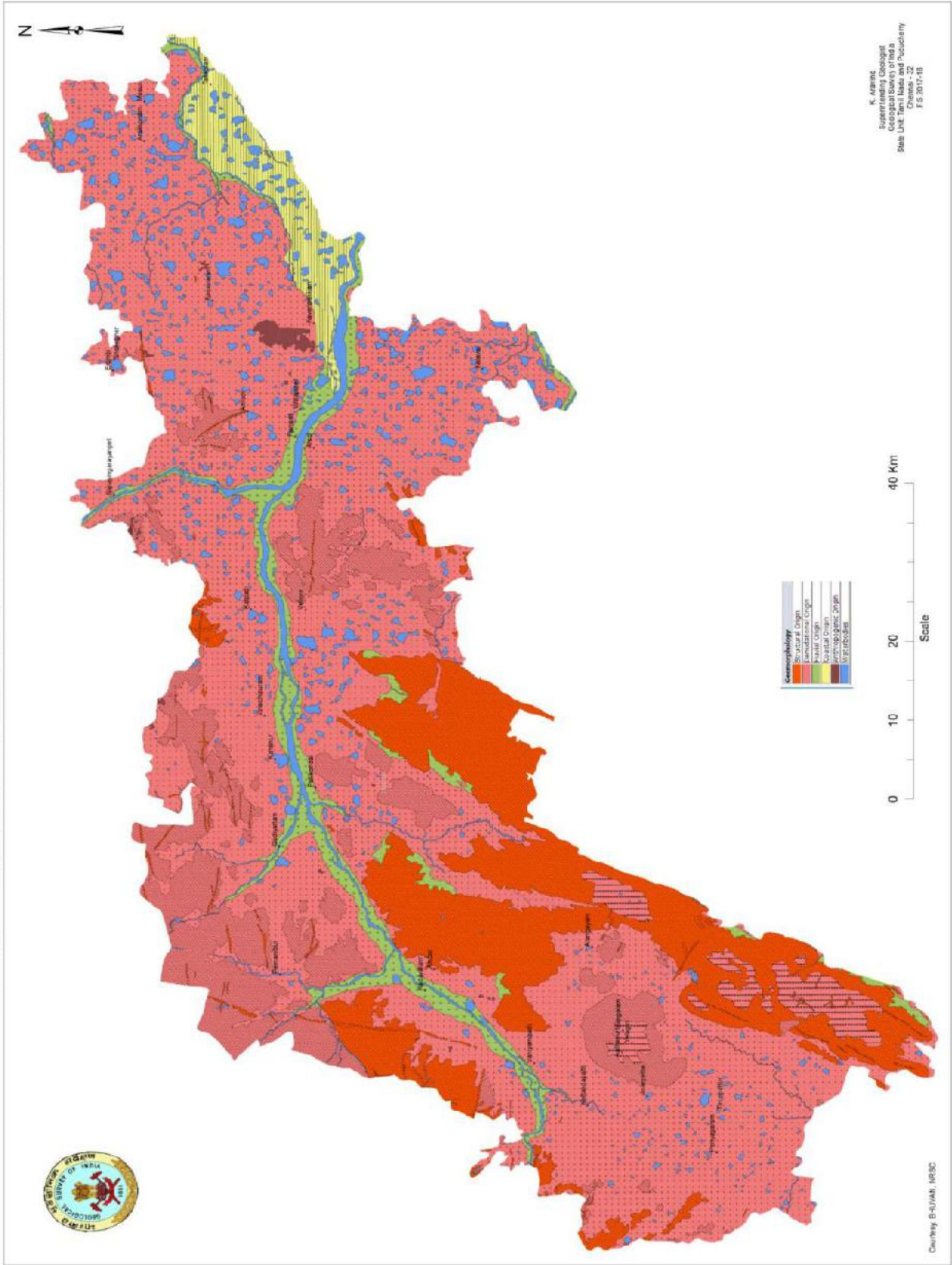
Shaded Relief Map of Vellore District

The Figure represents the shaded relief map of the Vellore District representing the relative elevation differences in the district marked by hillocks in the south western part of the district viz., Elagiri hills ranging upto 1330 m above mean sea level. The lowest of 21 m at the eastern margin of the district in the alluvial plains of Palar River. The geomorphic unit identified in the district are broadly classified as Structural Origin, Denudational Origin, Fluvial Origin, Coastal Origin and Antropogenic origin including the water bodies. It is further classified as given in Table 40 and shown in Fig. 21 in the Geomorphological Map retrieved from NRSC prepared in 1:50,000 scale in collaboration with GSI.



Lineament Map of Vellore District and surrounding area

GEOMORPHOLOGICAL MAP OF VELLORE DISTRICT



10. RAINFALL PATTERN ALONG PALAR RIVER BASIN

Hydrometeorology

Twenty three rain gauge stations in Palar basin are considered for analysis. Three weather stations (full climate stations) are there in this basin. All the rain gauge stations and climate stations are maintained by Public Works Department.

Palar river basin lies within the tropical monsoon zone.

Raingauge stations considered for Run-off analysis

S. No	Name of sub basin	Sub Basin area (sq.km)	Raingauge stations
1	Upper Palar	738.16	Ambur, Jolarpettai, Vaniyambadi
2	Malattar	265.61	Ambur
3	Agaramar	581.29	Alangayam
4	Kavundinyanadhi	466.85	Gudiyatham
5	Ponnai	1090.1	Ponnai anicut, Aliyabad, Ranipet, Vellore
6	Vegavathi	411.16	Kancheepuram, Kaveripakkam
7	Cheyvar	4362.69	Arni, Cheyyar anicut, Chengam, Dusiyankulam, Elathur anicut, Kovilur anicut, Polur, Palar anicut

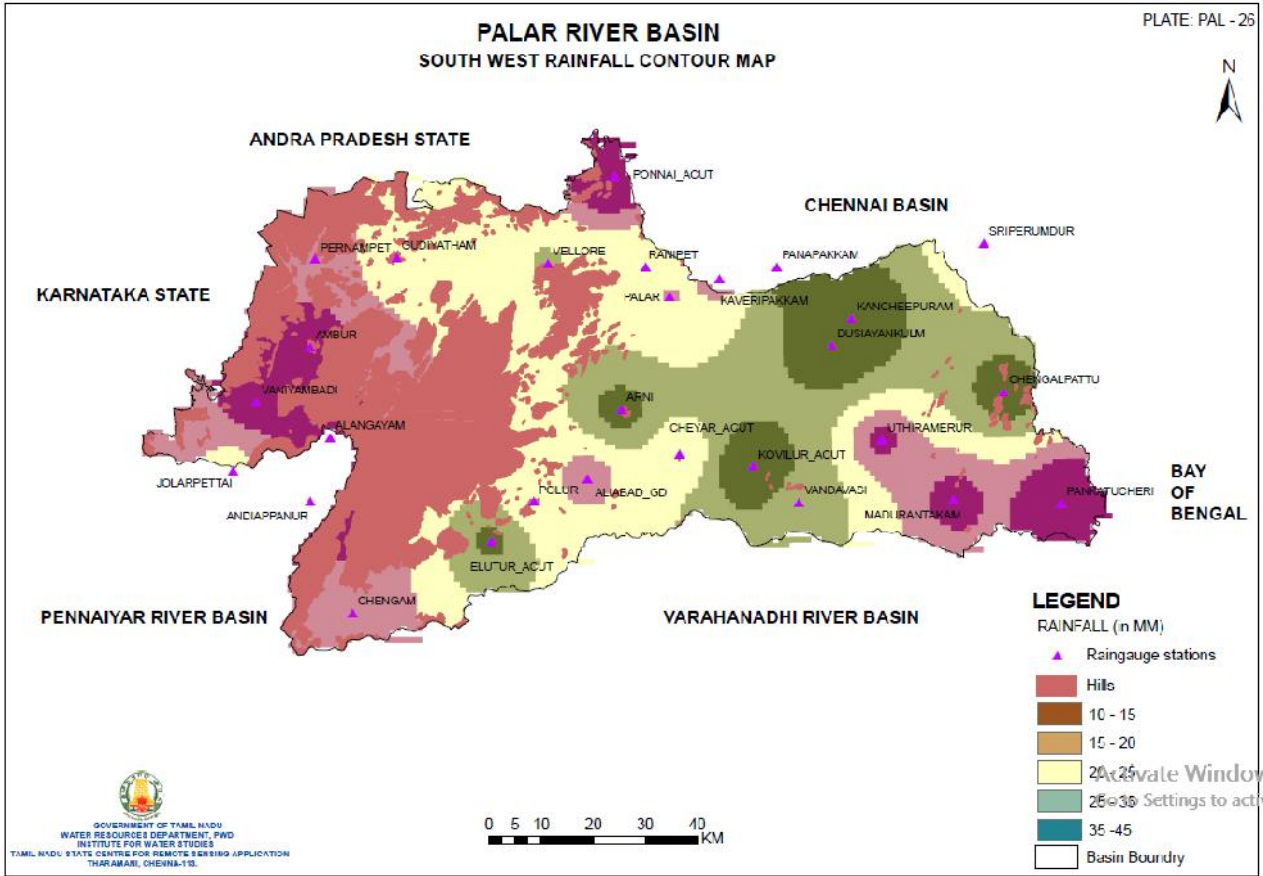
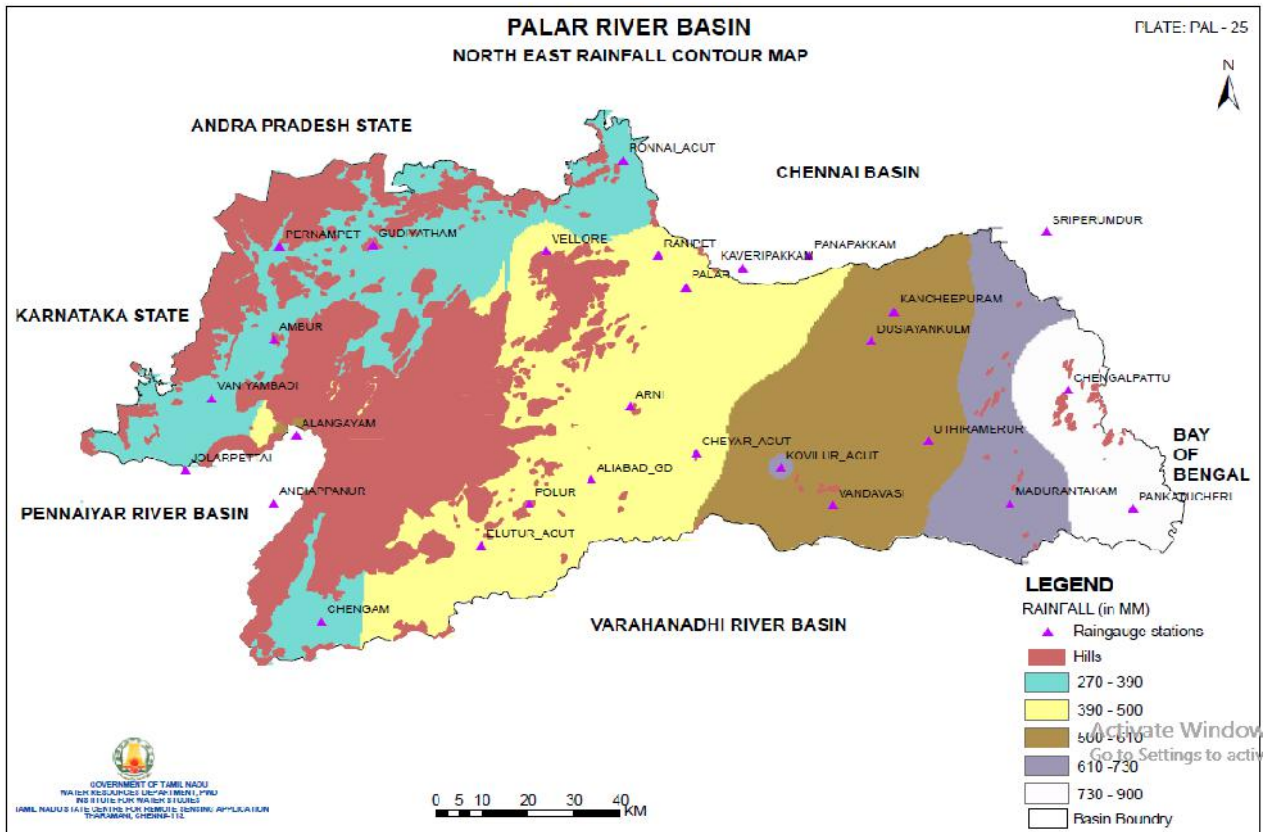
8	Kiliyar	1322.08	Maduranthagam, Vandavasi.
9	Lower Palar	1035.24	Chengalpattu, Panankattucheri, Panapakkam, Sriperumbudur
	Total	10273.18	

The 25%, 50%, 75% and 90% dependable rainfall for Palar basin are tabulated below in Table

5. Table 5 Sub basin wise Dependable Rainfall (in mm) in Palar River Basin

Sl. No	Sub basin	25%	50%	75%	90%
1	Upper Palar	139.51	107.30	86.78	52.12
2	Malattar	52.17	38.97	31.68	19.47
3	Agaramar	182.86	104.03	62.20	35.51
4	Kavundinyanadhi	92.55	76.72	64.14	46.53
5	Ponnai	245.29	197.81	156.64	122.54
6	Vegavathi	106.98	82.18	82.18	54.49
7	Cheyyar	1048.35	867.82	867.82	553.91
8	Kiliyar	382.34	274.89	274.89	161.86
9	Lower Palar	325.45	250.39	250.39	145.61

The Annual Rainfall contour map, North East rainfall and South East Rainfall contour maps are given in Figure



The maximum, minimum and average annual rainfall for the nine sub basins have been given below.

- Maximum Annual Rainfall of this basin is 2854.10 mm in Agaramar (1985-86)
- Minimum Annual Rainfall of this basin is 203.5 mm in Kavundhiyanadhi (1971-72)
- Average annual rainfall of the Palar basin is 1042.60 mm

11. GEOLOGY AND MINERAL WEALTH

The trace of each and every river/ stream was covered and studied on the following principles of Geology/River bed mining:

- The general geology of the area;
- The presence of any major geological structure;
- Origin of river;
- Pattern of primary / secondary/ tertiary streams;
- Total catchments;
- General profile of river/streams;
- Meandering Pattern;
- Bank stability;
- Total potential of river bed in reference to minor mineral;
- General slope of the river / stream;
- Morphogenetic regions.

In Addition to above, presence of the following objects were also studied:- $\frac{3}{4}$ The presence of any WSS Schemes

- Bridges
- Agriculture fields
- Bank protection works
- Plantation etc.

Following are the important guiding principles considered while recommending the river / stream bed or part of the river / stream bed for collection for minor minerals:-

- The production of aggregate area is a function of the availability of natural resources, the size of population, the economy of the area and various developmental and infrastructural works being undertaken in the area like road construction, hydro-electric projects etc. Further, being a low- value, high-volume mineral commodity, the prices are dramatically affected by transportation distances. If the distance increases, the transportation cost may increase much more than the cost of the aggregates. x A stable river is able to consistently transport the flow of sediments produced by watershed such that its dimension (width and depth) pattern and vertical profile are maintained without aggrading (building up) or degrading (scouring down)
- The amount of boulders, cobbles, pebbles and sand deposited in river bed equals to the amount delivered to the river from watershed and from bank erosion minus amount transported downstream each year.
- It is compulsive nature for river to meander in their belts and therefore they will have to be provided with adequate corridor for meandering without hindrance. Any attempt to diminish the width of this corridor (floodway) and curb their freedom to meander would prove counterproductive. x Erosion and deposition is law of nature. The river/stream has to complete its geomorphological cycle from youth, mature to old age.
- River capturing is unavoidable.
- Erosion in upstream and deposition in downstream.
- Tendency of the river / stream toward grade.
- Fundamentally, the lowest point of any stream is fixed by Sea Level.
- The ratio between the width of meander belt and width of the stream decreases as the width of the stream increases.
- Formation, Bank erosion and Replenishment of any specific riverbed depends
Primarily upon:
 - The Geology of the area;
 - River Profile;

- Nature of source;
- Rainfall in catchments;
- Morphogenetic region;
- Catchments geomorphology;
- Efficiency of River / Stream (i.e erosive power);
- The competency of the river / Stream (i.e transport heaviest stone);
- The capacity of the River/Stream (i.e volume of transportation);
- Hydraulic radius of the River / Stream (ratio between cross sectional area and length of wetted perimeter)

Secondarily upon:

- Geological structures;
- Porosity of formation;
- Run off in the catchments;
- Forest cover;

In addition to the above following man made factors are also involved.

- Type of agriculture;
- Encroachment on flood plain leaving least space for meandering;
- Any barrier on river / stream bed i.e banks , dams and bridge foundations etc;
- Throwing of debris into the river/stream course;
- Drying up of river courses due to construction of dams, thereby reducing the efficiency and capacity of the river / stream.

The total potential of the river / stream bed is calculated up to the depth of one meter and in the workable span. Total potential or annual replenishment is not necessarily mineable. Mine ability depends upon the availability of approachable roads, distance from the general conditions of policy viz distances from WSS Schemes, bridges etc and overall on the

market demand etc. Thus keeping these factors into consideration 60% of the total potential has been taken for the purpose of exploitation of minor minerals.

11. a. Method For calculation of Reserves: For the calculation of total reserves of minor minerals available in the river bed, length, average width and depth of the river bed for which the exploitation is to be carried out / allowed under rule / prevailing instructions of the Govt. was taken into consideration. The volume thus obtained is multiplied with the bulk density which has been assumed as 1.65 for all types of minor minerals. Thus reserves up to particular datum line i.e one meter below the surface have been calculated.

Total reserves of minor minerals (M.T.)= Length x Width x Height i.e Depth x Density. For the annual replenishment of minor mineral reserves, the average annual mean depth up to which the replenishment of minor mineral takes place annually, has been taken into consideration which depends upon the annual rainfall factor and geology of the catchments area.

12. RIVER SYSTEM

12.a. PALAR RIVER

Major part of the district falls in Palar river basin. Palar River is the major river draining the district, flowing towards east for a distance of about 295 km. It runs parallel to the hill ranges of the Eastern Ghats for a major part of its course. It has a vast flood plain in the lower reaches, but is dry for major part of the year. Ponnaiyar, Cheyyar, Pambar and Malattar are some of the major tributaries of Palar draining the district. Almost all the streams are ephemeral in nature and are mostly structurally controlled.

The Palar is the longest of the rivers in the districts bordering Chennai and has been a major source of drinking water for the State capital and its suburbs. The Palar and its tributaries irrigate about 300,000 hectares of agricultural land in Kancheepuram, Thiruvallur, Chennai and Vellore districts. Analysis of surface water samples from Palar River by IAMWARM project shows pH, Electrical Conductivity, Total Hardness, Chloride and Coliform values are

within the limits. Dissolved Oxygen falls below 5 mg/lit at places such as Koudanaya river, Nandhiyalam village, Rajakal head sluice, Mottur village and at stretches between Ranipet to walajah due to mixing of Tannery effluent with water. This affects the aquaculture in the area. The river water is contaminated with domestic sewage. It is also found that Total Dissolved Solids is beyond the tolerable limit in tannery-polluted areas. Chloride is above the acceptable limit but below permissible limit. Total hardness fluctuates above and below tolerable limits and Biological Oxygen Demand is found to be very high in some head works.

12.b. Catchment:

Each basin has been delineated into Catchment, which are constituted by a single major river, by a group of small rivers or a major tributary of the major rivers like Vellar. The catchment in Vellore District is as follows:

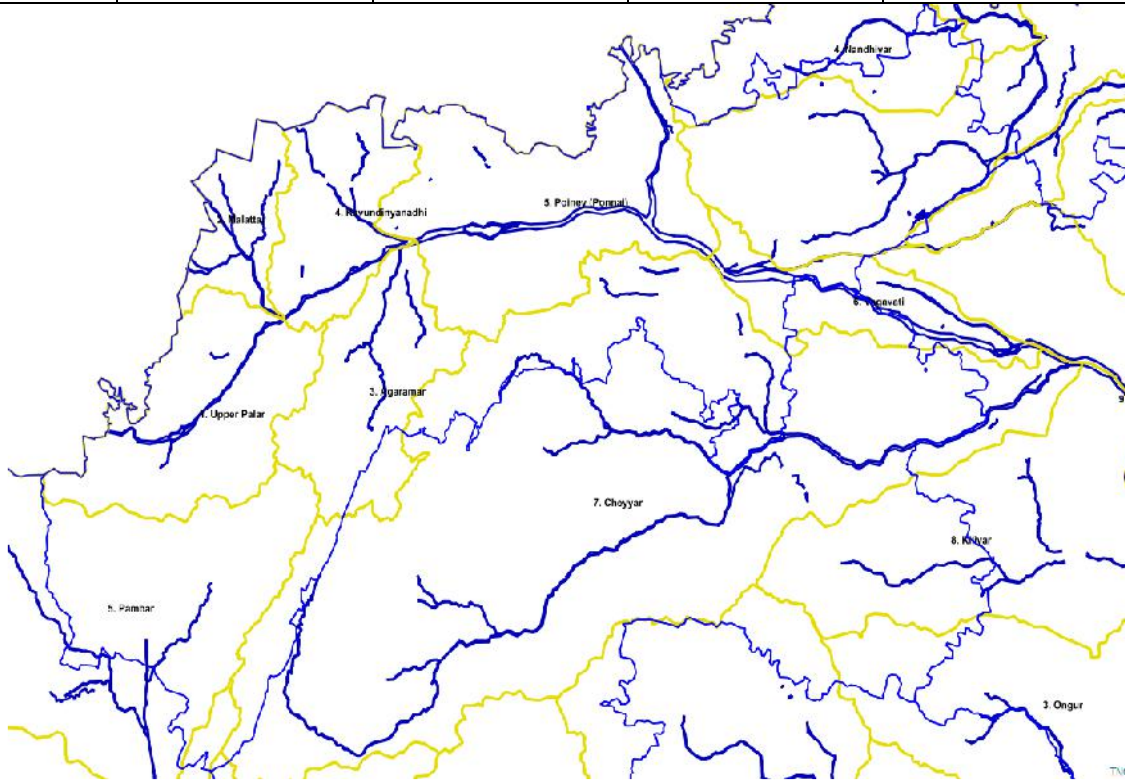
S. No	Basin code No	Rivers covered by the basin	Area Sq. km	States covered
1	4C1	Between Cauvery and Palar	20517.575	Cuddalore, Villupuram, Salem, Tiruvannamalai, Vellore.
2	4C2	Between Pennaiyar and Palar	15997.551	Chenglepet, Vellore, Kancheepuram, Chittur (A.P.)

12.c. Sub Catchment:

Each catchment has been delineated into Sub-Catchment which are constituted by a single river, by a group of small rivers or a major tributary of the major rivers. The Sub Catchment in Vellore District is as follows:

Details of Sub-catchment in Vellore District and adjacent areas

No.	Sub Catchment Code No.	Rivers covered by the Sub Catchment	Area Sq.Km.	Districts covered
1	4C1C	Upper Pannaiyar Beyond Sathanur Dam	6778.020	Salem, Vellore, Tiruvannamalai, Karnataka State
2	4C2A	Lower Palar upto Vellore	7444.570	Chenglepet, Vellore, Tiruvannamalai
3	4C2B	Upper Palar	2471.180	Vellore, Tiruvannamalai, Andhra Pradesh and Karnataka Districts
4	4C2C	Miscellaneous watershed around Chennai	5582.321	Chenglepet, Vellore, Tiruvallur, Chennai.

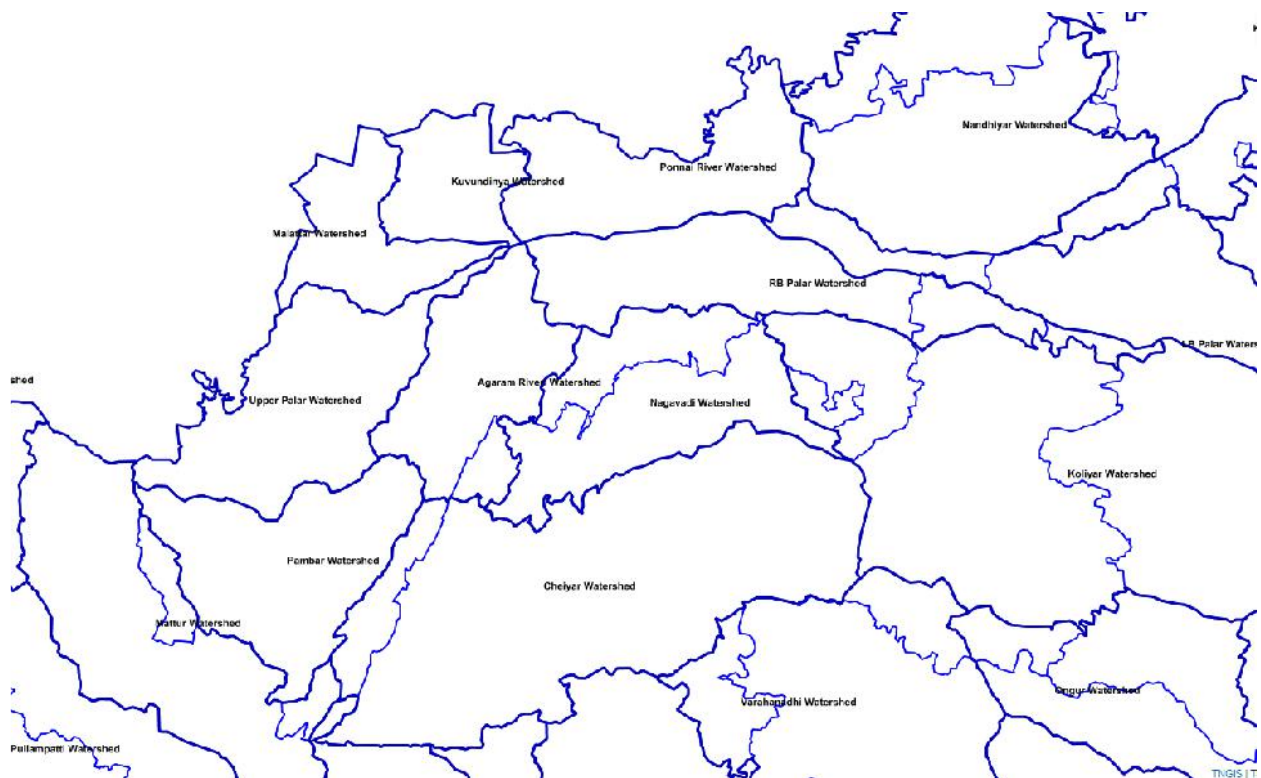


Sub-basin Map of Vellore district and adjacent areas

12.d. Watershed: Each sub catchment has been delineated into watersheds, which are constituted by a single river by a group of small rivers or a tributary of the major rivers like Vellar. The Watersheds in Vellore District are as follows:

Details of Watershed in parts of Vellore District and adjoining areas

No.	Watershed Code No.	Rivers covered by the Watershed	Area Sq.Km.	Parts of Taluks covered
1	4C1C1	Kallar	759.590	Tiruppattur
2	4C1C3	Mattur	1107.180	Tiruppattur
3	4C1C4	Pambar	725.230	Tiruppattur
4	4C2A3	Cheyvar Nagavadi	891.320	Arcot, Vellore
5	4C2A4	Cheyvar Nagavadi	1677.540	Tiruppattur
6	4C2A5	Cheyvar Nagavadi	1141.950	Vellore Arcot
7	4C2A6	R.B.Palar/Lower Palar	1075.920	Gudiyattam, Vellore, Arcot, Walajapet
8	4C2A7	Ponnai	549.160	Gudiyattam, Vellore, Walajapet
9	4C2B1	Agaram	572.340	Vellore, Gudiyattam, Vaniyambadi
10	4C2B2	Malattar	360.650	Vellore, Vaniyambadi, Tiruppattur
11	4C2B3	Upper Palar	1199.000	Vaniyambadi, Tiruppattur
12	4C2B6	Kuvudinya	304.150	Gudiyattam
13	4C2C3	Cooum	1876.641	Walajapet, Arkonam
14	4C2C4	Kosasthalaiyar	1235.250	Arkonam
15	4C2C5	Nandiar	630.210	Arkonam

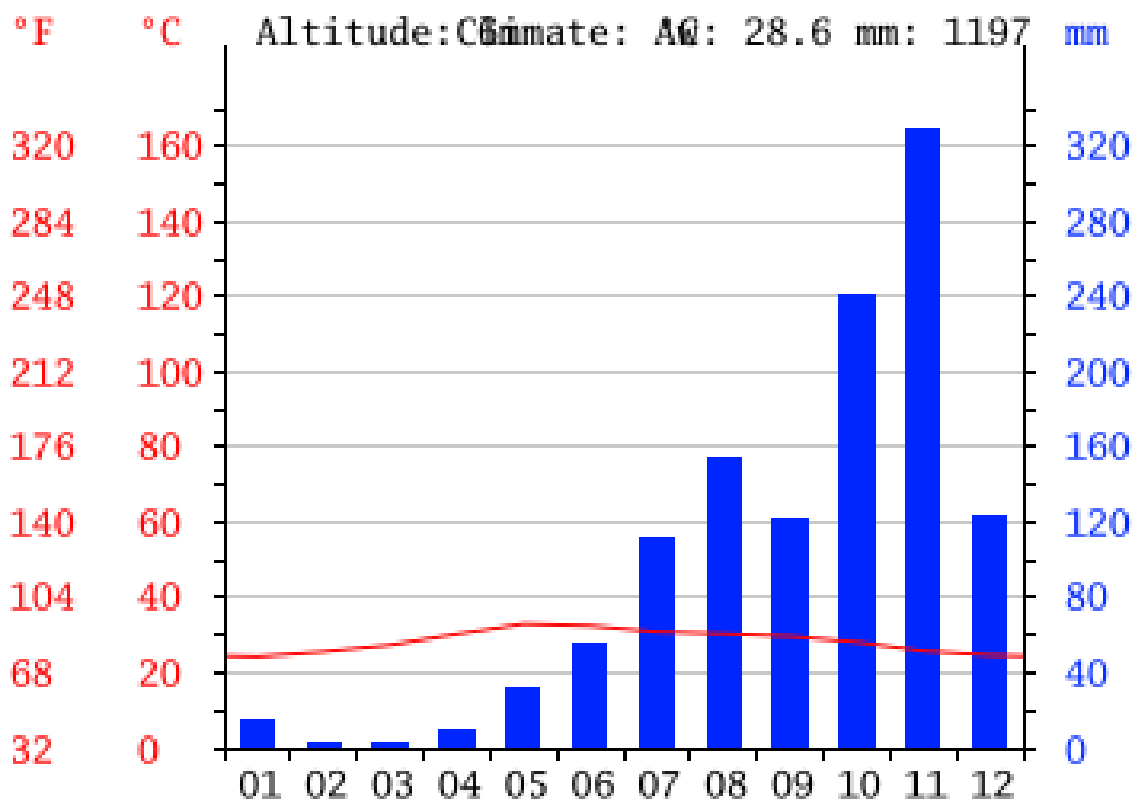


Watershed Map of Vellore district and adjacent areas

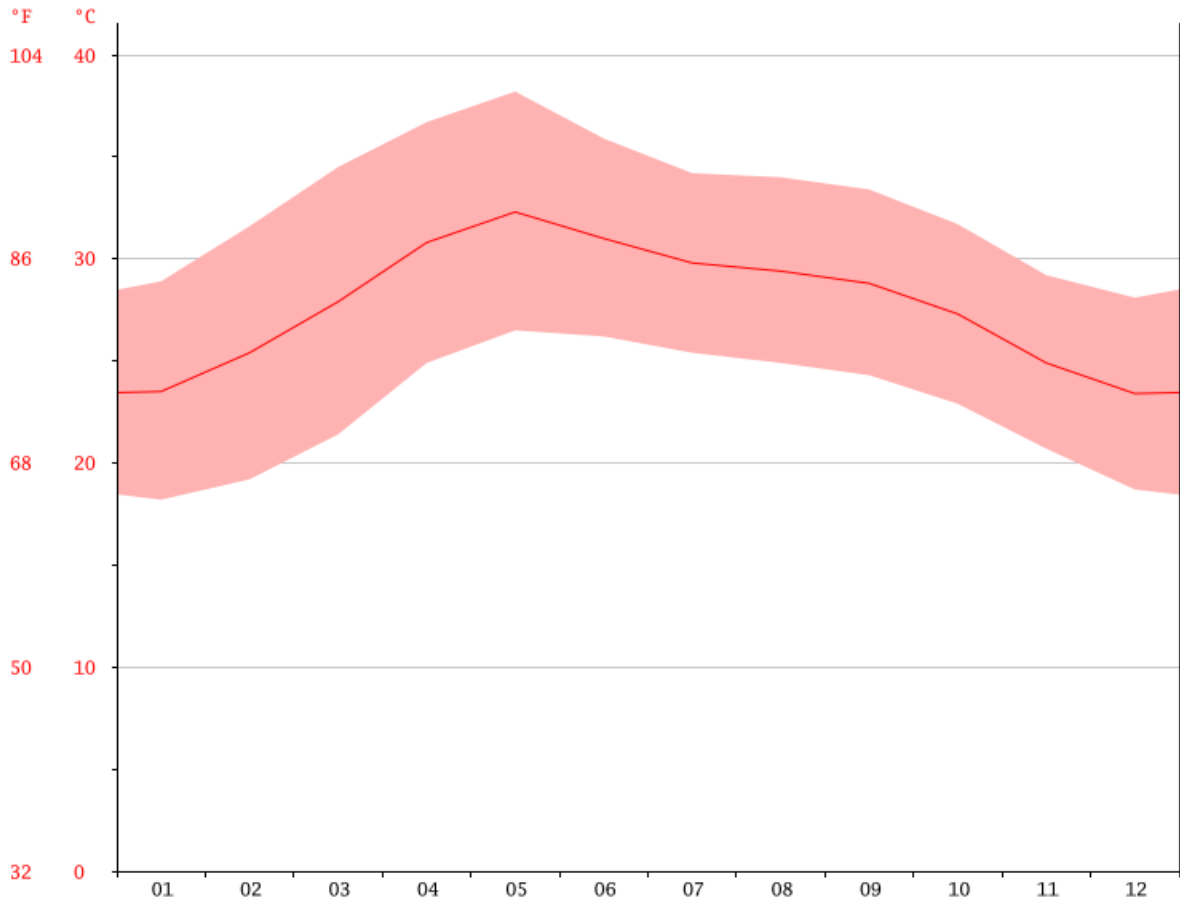
CLIMATIC CHARACTERISTICS: HUMIDITY AND WIND

Vellore experiences a [tropical savanna climate \(Köppen climate classification Aw\)](#). The temperature ranges from a maximum of 39.4 °C (102.9 °F) to a minimum of 13 °C (55 °F). Like the rest of the state, April to June are the hottest months and December to January are the coldest. Vellore receives 1,034.1 mm (40.71 in) of rainfall every year. The southwest monsoon, with an onset in June and lasting up to September, brings rainfall of 517.1 mm, with September being the rainiest month. The northeast monsoon which lasts from October to December brings rainfall of 388.4mm. The humidity ranges from 40%–63% during summer and 67%–86% during winter

CLIMOGRAPH OF VELLORE DISTRICT



AVERAGE TEMPERATURE VELLORE



VELLORE WEATHER BY MONTH // WEATHER AVERAGES

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	23.5	25.4	27.9	30.8	32.3	31	29.8	29.4	28.8	27.3	24.9	23.4
Min. Temperature (°C)	18.2	19.2	21.4	24.9	26.5	26.2	25.4	24.9	24.3	22.9	20.7	18.7
Max. Temperature (°C)	28.9	31.6	34.5	36.7	38.2	35.9	34.2	34	33.4	31.7	29.2	28.1
Avg. Temperature (°F)	74.3	77.7	82.2	87.4	90.1	87.8	85.6	84.9	83.8	81.1	76.8	74.1
Min. Temperature (°F)	64.8	66.6	70.5	76.8	79.7	79.2	77.7	76.8	75.7	73.2	69.3	65.7
Max. Temperature (°F)	84.0	88.9	94.1	98.1	100.8	96.6	93.6	93.2	92.1	89.1	84.6	82.6
Precipitation / Rainfall (mm)	9	6	7	24	67	70	117	124	158	179	144	66

The variation in the precipitation between the driest and wettest months is 173 mm. The average temperatures vary during the year by 8.9 °C.

Humidity

The temperature ranges from a maximum of 39.4 °C (102.9 °F) to a minimum of 13 °C (55 °F). Like the rest of the state, April to June are the hottest months and December to January are the coldest. Vellore receives 1,034.1 mm (40.71 in) of rainfall every year. The southwest

monsoon, with an onset in June and lasting up to September, brings rainfall of 517.1 mm, with September being the rainiest month. The northeast monsoon which lasts from October to December brings rainfall of 388.4mm. The humidity ranges from 40%–63% during summer and 67%–86% during winter.

Humidity Graph

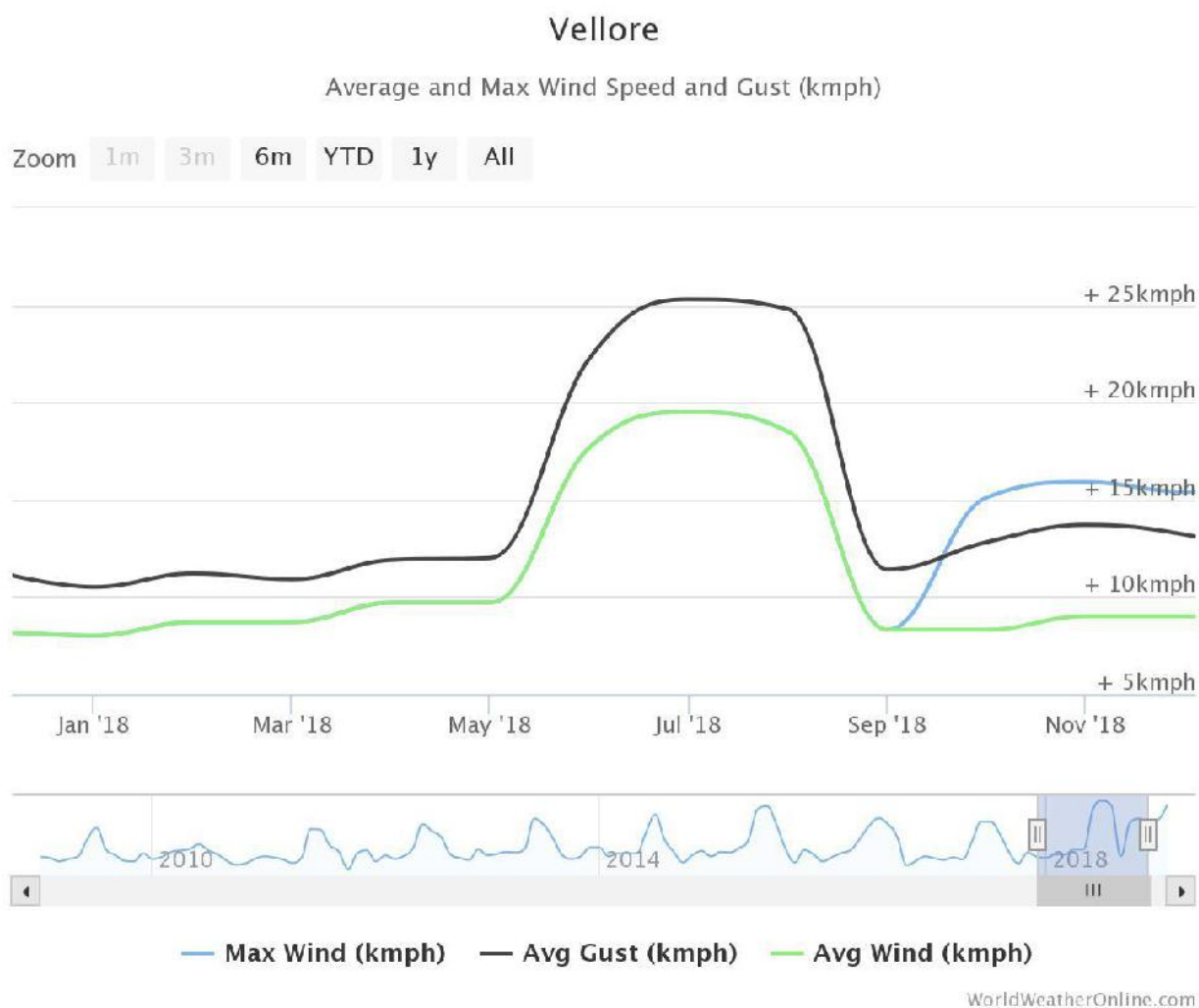


Wind:-

The windier part of the year lasts for 3.2 months, from May 26 to September 02 with average wind speed of more than 10.1 km / hour. The windiest day of the year is June 30th , with an average hourly wind speed of 18.4 km / hour.

The calmer time of year lasts for 8.7 months, from September 2 to May 26th . The calmest day of the year in November 21st with an average hourly wind speed of 4.8 km / hour.

Average wind speed diagram



13. DRAINAGE SYSTEM WITH DESCRIPTION OF MAIN RIVERS

S.NO	Name of the River	Area drained (Sq. km)	% Area drained in the District
1.	PALAR	435.85	7.36

14. SALIENT FEATURES OF IMPORTANT RIVERS AND STREAMS

S.NO	Name of the River or Stream	Total Length in the District (in Km)	Place of Origin	Altitude at Origin (m)
1.	PALAR	122	Nandhi Hills, Karnataka	761
2.	MALATTAR	22	Bathalapalli dam	359
3.	AGARAM	75	Alangayam RF	434
4.	KOUNDANYA RIVER	48	Mordhana dam	331
5.	PONNAI	36	Andhar Pradesh	412

15. MINERAL POTENTIAL OF THE DISTRICT :

SL. No	River or stream	Length of area recommended for mineral concession (in km)	Average width of area recommended for mineral concession (in m)	Area recommended for mineral concession (in square meter)	Mineable Mineral Potential (in Metric Tonne) (60% of total mineral potential)
1.	PALAR	60.00	800	48.00x10 ⁶	28.80X10 ⁶
2.	PONNAI	36.00	400	14.40x10 ⁶	8.64X10 ⁶

16. ECONOMIC IMPACT OF MINING

The mining will generate direct and indirect employment during mining operations. In general, there will be no adverse effect on human health as no blasting or handling of toxic material involved in sand mining. All the safety measures will be strictly followed to prevent occupational risk during excavation, loading and transportation.

The State is highly urbanised State after Maharashtra, the sand mining operation in the district will be the backbone for infrastructural development besides generate the revenue to the Government. Since the operation is carrying out by the Public Works Department they properly identify the aggradation area over the river bed in the district It will be useful to maintain the hydro geological cross section of the river to carry the maximum flood discharge.

17. CONCLUSION/RECOMMENDATION:

Vellore district of the South Indian state, Tamil Nadu, 135 km (84 mi) west of the state capital Chennai. Vellore lies in the Eastern Ghats region and Palar river basin. The topography is almost plain with slopes from west to east. The detailed scientific study reveals that the Palar River carrying sand sediments whenever there is sufficient flows along its entire length in the district. This cumulative sediments have resulted in shoal formation and reduce the carrying capacity of flood. The properly managed sand mining activities are recommended in Palar and Ponnai. Hence, it is concluded that, the permission of sand quarries in the potential areas of river in the district will be beneficial for infrastructural development of the state of Tamil Nadu.

ASSISTANT DIRECTOR, (MINES)
VELLORE DISTRICT

Sd//xxxxxxx(31.05.2019)
DISTRICT COLLECTOR
VELLORE

