



For official use

Technical Report Series

**DISTRICT GROUNDWATER BROCHURE
ERODE DISTRICT, TAMIL NADU**

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SCIENTIST-D**

**Government of India
Ministry of Water Resources
Central Ground Water Board
South Eastern Coastal Region
Chennai**

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DISTRICT AT A GLANCE (ERODE DISTRICT)

S.NO	ITEMS	STATISTICS	
1.	GENERAL INFORMATION		
	i. Geographical area (Sq. Km)	8161.91	
	ii. Administrative Divisions AS on (31-3-2007)		
	Number of Tehsils	07	
	Number of Blocks	20	
	Number of Town Panchayats	59	
	Number of Villages	456	
	iii. Population (As on 2001 Censes)		
	Total Population	2581500	
	Male Population	1309278	
	Female Population	1272222	
	iv. Average Annual Rainfall (mm)	789.7 (1901 - 1950)	
2.	GEOMORPHOLOGY		
	i. Major physiographic Units	Upland plateau region with hill ranges, isolated hillocks and undulating plain.	
	ii. Major Drainages	Cauvery, Bhavani, Noyil, Amaravathi and Palar.	
3.	LAND USE (Sq. Km)		
	i. Forest area	2287	
	ii. Net area sown	3010	
	iii. Cultivable area	55.6	
4.	MAJOR SOIL TYPES	Red calcareous soil, Red non calcareous soil, Black Soil, Alluvial and Colluvial soils, Brown soil and Forest soil.	
5.	AREA UNDER PRINCIPAL CROPS IN Ha. (AS ON 31.3.2007)	1.Paddy – 43539 (13.41%) 2.Ground nut- 46990 (14.47%) 3.Sugarcane - 41402 (12.75%) 4.Pulsus- 19233 (05.92%)	
6.	IRIGATION BY DIFFERENT SOURCES	Number	Area irrigated
	i. Dug wells	122543	52474
	ii. Tube wells/ Bore wells	9707	14659
	iii. Tanks/Ponds	847	228
	iv. Canals	28	91904
	v. Other Sources	07	1952
	vi. Net irrigated area	161217	
	vii. Cross irrigated area	184904	

7.	NUMBERS OF GROUND WATER MONITORING STATIONWELLS OF CGWB (AS ON 2007)		
	i. No of dug wells	18	
	ii. No of piezometers under Hydrology Project	15	
8.	PREDOMINANT GEOLOGICAL FORMATIONS	Alluvium, Colluvium, Laterite, Granites, Dolerites, Quartzite, Charnockites and Gneisses.	
9.	HYDROGEOLOGY		
	i. Major water bearing formations	Alluvium, Colluvium and weathered, fractured, fissured Crystalline rocks.	
	ii. Pre- monsoon depth to water level (May -2006)	1.76 – 35.69 M.bgl	
	iii. Post- monsoon depth to water level (Jan-2007)	1.53 – 16.40 M.bgl	
	iv. Long term water level trend in 10 years (1997-2006) in m/yr	Rise (m/year)	Fall (m/year)
		Min.-0.0015	Min.-0.0085
		Max.-1.4880	Max.-1.2040
10.	GROUND WATER EXPLORATION BY CGWB (As on 31-03-2007)		
	i. Number of Exploratory wells drilled	69	
	ii. Number of Observation wells drilled	18	
	iii. Number of Piezometers drilled	05	
	iv. Depth range (m)	25.00– 300.00	
	v. Discharge (Litres per second)	0.078 – 27.00	
	vi. Specific capacity (Lpm/m)	9.33 – 970.60	
	vii. Transmissivity (m ² /day)	0.053– 457.25	
11.	GROUND WATER QUALITY		
	i. Presence of chemical constituents more than permissible limit	TH as Ca Co ₃ , NO ₃	
	ii. Type of water	NaCl, Ca-Cl	
12.	DYNAMIC GROUND WATER RESOURCES (2004) in mcm		
	i. Annual Replenishable Ground Water Resources	769.62	
	ii. Net Annul Ground Water Draft	1268.26	
	iii. Projected demand for Domestic and Industrial Uses upto 2025	40.07	
	iv. Stage of Ground Water Development	135.24	

13.	AWARENESS AND TRAINING ACTIVITY	
	i. Mass Awareness Programmes Organized	NIL
	Date	--
	Place	--
	No of Participants	--
	ii. Water Management Training Organized	NIL
	Date	--
	Place	--
	No of Participants	--
14.	EFFORTS OF ARTIFICIAL RECHARGE & RAINWATER HARVESTING	
	i. Projects completed by CGWB Number of structures	NIL
	ii. Projects under technical guidance of CGWB Number of structures	NIL
15.	GROUND WATER CONTROL AND REGULATION	
	i. Number of OE Blocks	03
	ii. Number of Critical Blocks	04
	iii. Number of Blocks Notified	NII
16.	MAJOR GROUND WATER PROBLEMS AND ISSUS	<p>1)High level of ground water development.</p> <p>2) Declining of ground water level and drying of shallow wells.</p> <p>3) Incidence of fluoride in ground water.</p> <p>4) Local pollution of Surface and ground water by industrial units.</p>

1.0 INTRODUCTION

1.1 Administrative Details

Erode district is divided into 7 taluks. The taluks are further divided into 20 blocks, which further divided into 549 villages.

S. No.	Taluk	Area (Sq.km)	No.of Villages	Block	Area (Ha.)	No.of Villages
1	Erode	743.79	94	Erode	16928	41
				Madakurichi	34888	29
				Kodumudi	22563	24
2	Bhavani	1503.72	57	Bhavani	22036	20
				Ammapet	24448	23
				Anthiyur	103888	14
3	Perundurai	806.21	111	Perundurai	29234	48
				Chennimalai	28495	24
				Uthukuli	22892	49
4	Gobichetti palayam	703.46	76	Gobichettipalayam	26991	32
				T.N.Palayam	18447	21
				Nambiyur	24908	23
5	Sathiyamangalam	2185.70	96	Sathiyamangalam	96320	30
				Bhavani Sagar	28170	26
				Thalavady	94080	30
6	Kangayam	707.84	37	Kangayam	34910	20
				Vellakoil	35874	17
7	Dharapuram	1511.19	78	Dharapuram	47401	28
				Moolanur	46197	20
				Kundadam	57521	30
District Total		8161.91	549		816191	549

1.2 Basin and sub-basin

Major part of the district is falling in part of east flowing Cauvery river basin as per the Irrigation Atlas of India. Palar Maleru, Suvaranvati, Bhavani, R.B.Cauvery, Moyar, Below dam, Kallar, Vanathangarai, Noyil, Vattamalai, Uppar odai, Nangangai, are the sub basins. The district is further sub divided into number of minar basins.

1.3 Drainage

The river Cauvery flows along the eastern border of the district. Most of the rivers and streams drained the district form the tributaries to the Cauvery river.

The Bhavani river, which has its origin in the Silent Valley range of Kerala State, enters the district about 30 km west of Bhavanisagar and flows more or less in an easterly direction and confluences with the river Cauvery at Bhavani town. Moyar river is a major tributary of the river Bhavani. The river Bhavani is tamed by a reservoir namely the Bhavanisagar.

The Palar river originating in the south Bargur forest flows in north-easterly and easterly directions. Maniyar Halla, Tatta Halla, Kathala Halla, Yemahatti Halla and Dinnepattipaliam are the important minor tributaries of the Palar river.

The Noyil River draining the southern part of the district has its origin in the Boluvampatty valley of the Vellingiri hills of Western Ghats enter the district flowing from Coimbatore district.

The Amaravathi river and its tributaries drain the southern part of the district. It has its origin in Kerala state and passing through the adjoining districts, enters the district at about 5 km south of Salempalayam. The major tributaries to Amaravathi river are the Uppar Odai, Shanmukha Nadi, Nallathangal Odai and Vattamalakkarai.

The important streamlets flowing in the northern side are the Bale Halla and Anaikodu Halla, which form tributaries to Suvaranavati river flowing into Karnataka.

1.4 Irrigation Practices

Nine fold land use classification of the Erode district (2005-2006)

S.No	Classification	Area (Ha)
1	Forests	228749
2	Barren & Uncultivable Lands	7074
3	Land put to non agricultural uses	80708
4	Cultivable Waste	556
5	Permanent Pastures & other grazing lands	187
6	Groves not included in the area sown	1360
7	Current Fallows	90697
8	Other Fallow Lands	105878
9	Net Area sown	300982
	Total	816191

(Source: Department of Economics & Statistics, Govt. of Tamil Nadu)

The data available indicate that an area of about 161217 ha, which is about 19.75 percent of the total geographical area of the district is under irrigated agriculture. Canals are the major source of water for irrigation in the district, accounting for about 57.00 percent of the total area irrigated in the district. Dug wells, and bore wells are the accounting for about 32.55 and 9.09 percent of the total area irrigated respectively. Other sources and tanks accounting for about 1.21, and 0.14 percent respectively. It is observed that the well irrigation is the highest in Dharapuram block followed by block Andhiyur.

The block wise and source wise net area irrigated in Ha is given below (2005-06).

S.No	Block	Net area irrigated by					Total Net Area irrigated
		Canals	Tanks	Tube wells	Ordinary wells	Other Sources	
1	Ammamet	3658.00	0.00	78.00	4133.00	367.00	8236.00
2	Andhiyur	274.00	0.00	259.00	5598.00	440.00	6571.00
3	Bhavani	6983.00	162.00	140.00	3448.00	768.00	11501.00
4	Bhavanisagar	987.00	0.00	1381.00	1087.00	0.00	3455.00
5	Chennimalai	2612.00	0.00	226.00	1896.00	0.00	4734.00
6	Dharapuram	9285.00	46.00	22.00	5930.00	0.00	15283.00
7	Erode	5996.00	0.00	32.00	483.00	101.00	6612.00
8	Gobichettipalayam	10697.00	20.00	1061.00	2630.00	0.00	14408.00
9	Kangeyam	2589.00	0.00	222.00	2162.00	0.00	4973.00
10	Kodumudi	10871.00	0.00	537.00	1628.00	0.00	13036.00
11	Kundadam	3415.00	0.00	243.00	5410.00	0.00	9068.00
12	Modakurichi	15342.00	0.00	85.00	1628.00	26.00	17081.00
13	Mulanur	793.00	0.00	157.00	2800.00	0.00	3750.00
14	Nambiyur	1440.00	0.00	1396.00	2540.00	0.00	5376.00
15	Perundurai	4838.00	0.00	938.00	1500.00	0.00	7276.00
16	Satyamangalam	3362.00	0.00	4088.00	1836.00	250.00	9536.00
17	T.N.Palayam	4234.00	0.00	562.00	3795.00	0.00	8591.00
18	Thalavadi	0.00	0.00	2801.00	525.00	0.00	3326.00
19	Uthukuli	0.00	0.00	187.00	1146.00	0.00	1333.00
20	Vellakottai	4528.00	0.00	244.00	2299.00	0.00	7071.00
		91904	228	14659	52474	1952	161217

1.5 Studies/Activities carried out by CGWB

The erstwhile Ground Water Wing of the Geological Survey of India (GSI) has carried out hydrogeological surveys in the district. With the assistance of Swedish International Development Authority (SIDA), the Central Ground Water Board (CGWB) completed a water balance project covering Noyil, Ponnani and Amaravathi basins forming parts of and Erode district during the period July 1975 to December 1979. Detailed hydrological, hydrogeological, geophysical, Hydrochemical, soil and water use, quantification of ground water recharge, draft, balance and long-term reserves studies were undertaken in the above multi-disciplinary project.

Central Ground Water Board is also carrying out systematic Hydrogeological and Ground Water Management studies and ground water monitoring. Geophysical investigations for assessing the geo-electric characteristics of sub-surface litho-units have also been done by Central Ground Water Board for selection and pin-pointing of sites for exploratory drilling.

Central Ground Water Board took up ground water exploration for delineation of aquifers and for assessing their yield characteristics by drilling of exploratory wells during the period 69 exploratory wells, 18 observation wells and 5 piezometers in the depth range of 25 to 300 m.bgl. Were drilled for this purpose in the district. In the

more recent past, Central Ground Water Board constructed 8 exploratory wells for drought mitigation through out-sourcing. Under the World Bank Aided Hydrology Project, the CGWB has constructed 30 purpose built observation wells (Piezometers) down to depth ranging from 16.50 to 91.05 m bgl.

In additions, Central Ground Water Board has also carried out a number of short – term water supply investigations in the district for various government agencies.

2.0 RAINFALLS AND CLIMATE

The district receives the rain under the influence of both southwest and northeast monsoons. The northeast monsoon chiefly contributes to the rainfall in the district. The southwest monsoon is also reasonable. During the winter and hot seasons, the rainfall is scanty.

The normal annual rainfall over the district varies from about 575 mm to about 833 mm. It is the minimum in the southern and southeastern parts of the district around Kodumudi (575.3 mm) Mulanur (581.0 mm) and Dharapuram (593.0 mm). It gradually increases towards north and northwest and reaches a maximum around Talavadi (833 mm).

The western part of the Erode district enjoys a salubrious climate because of the hilly region, whereas the central and eastern parts of the district are hot and humid. The cooler and pleasant climate prevails in the hilly regions. The weather is extremely pleasant during the period from November to February both in the plains and on the hills. Mornings in general are more humid than the afternoons. The relative humidity varies from 65 to 87 percent during the northeast monsoon period between October and November.

The hot weather begins early in March, the highest temperature being reached in April and May. Highest temperatures are recorded during the months of April and May with temperatures reaching 40°C. The weather in the plains during the summer i.e., from April to June is generally dry and hot. Weather cools down progressively from about the middle of June and by December. The night temperatures are the lowest in the hills.

3.0 GEOMORPHYLOGY AND SOIL TYPES

3.1 Geomorphology

The Erode district forms part of the uplands of the state. Physiographically the district can be divided into hilly area, the upland area and plains area. The prominent geomorphic units identified in the district through interpretation of Satellite imagery are 1) Structural hills, 2) Inselberg, 3) Ridges, 4) Valley fill, 5) Pediments, 6) Shallow Pediments,.

The hilly area is represented by the Western Ghats in the northwestern part of the district, the Biligiri Rangan hills in the north, Bodamalai Betta hills in the

northwestern parts and Konbattarayan hills in the north central part of the district. Konbattarayan hill (1699 m above MSL) is the highest peak in the district while Moyar Gorge is a picturesque gorge in the western Ghats through which Moyar river traverses.

The Kongunadu uplands lie south of Bhavani river and the Lower Bhavani canal passes through these uplands. Scattered hillocks and knolls of moderate elevations occur within these uplands. The plains area is characterised by an undulating topography with a general gradient due east and southeast. The plains are limited to the east and southwestern border of the district. The plains west of Cauvery river are known as Lower Cauvery plains.

3.2 Soils

The soils of Erode district can be broadly classified into 6 major soils types viz., Red calcareous soil, Red non calcareous soil, Black Soil, Alluvial and Colluvial soils, Brown soil and Forest soil. Major part of the district covered by red calcareous soils. They are mostly sandy to loamy and characterised by the hard and compact layer of lime. The red non-calcareous soils are seen in Erode, Perunthurai and Gopichettioalayam taluks. The block soils are occurring as patches in four taluks. Brown soil occupies only a small portion of Bhavani, Kangayam and Gopichettipalayam taluks. Alluvial soils are found in small patches along the Noyil and Bhavani rivers and the Colluvial soils are found in the foothills of Western Ghats. Forest soil is confined to the reserve forest area in northwestern part of the district, where a surface layer of organic matter is present.

4.0 GROUND WATER SCENARIO

4.1 Hydrogeology

Erode district is underlain entirely by Archaean Crystalline formations with Recent alluvial deposits occurring along the river and streams courses and colluvium of valley-fills. The important aquifer systems in the district are constituted by weathered, fissured and fractured crystalline rocks and the recent alluvial deposits.

The porous formations in the district are represented by alluvium and colluvium. The alluvial deposits are confined to the major river and stream courses only. Ground water occurs under phreatic conditions. The maximum saturated thickness of these aquifers is upto 5 m depending upon the topographic conditions. The area lying at the foot hill zones which are seen in the northern parts of the district is underlain by the colluvial material derived from the near by hill ranges comprising sands and gravels. The maximum saturated thickness of these aquifers is upto 20 m depending upon the topographic conditions. Ground water occurs under phreatic conditions.

The hard consolidated crystalline rocks of Archaean age represent weathered, fissured and fractured formations of gneisses, granites, charnockites and other associated rocks. Ground water occurs under phreatic conditions in the weathered mantle and under semi-confined conditions in the fractured zones. The thickness of the weathered mantle of the hard rocks is varying from less than a meter to as much as 30 m. It is within the depth of 20 m in major part of the district while in the western

and extreme north-north-eastern parts of the district, they are more than 20 m. The depth of the wells ranged from 7.00 to 45.00 m bgl.

Dug wells have traditionally been the most common ground water abstraction structures. The yields of dug wells used for irrigation ranging from 200 to 400 lpm for drawdown varying from 1 to 3 m for a pumping period of 2 to 4 hours. The yields of dug wells are improved at favorable locations by construction of extension bores, which are 40 to 75m. deep. In recent years, the declining water levels and reduction in yields of wells are being observed due to increased extraction of ground water through large number of bore wells for irrigation purposes.

The Specific capacity of large diameter wells tested in crystalline rocks from 10.04 to 227.5 lpm / m. of draw down. The transmissivity of weathered formations computed from pumping test data using empirical methods range from 11.96 to 420 m²/day.

The yield of bore wells drilled down to a depth of 34 to 104 m, by various state agencies mainly for domestic purposes ranged from 20 to 80 gpm. The yield of successful bore wells drilled down to a depth of 300 m bgl during the ground water exploration programme of Central Ground Water Board ranged from 0.078 to 27.00 lps. The aquifer and well parameters of the wells show wide variation

The depth to water level in the district varied between 1.76 and 35.69 m bgl during pre-monsoon depth to water level (May 2006) and varied between 1.53 and 16.40 m bgl during post monsoon depth to water level (Jan 2007).

The seasonal fluctuation shows a rise in water level, which ranges from 0.04 to 23.37 m bgl. The piezometric head varied between 1.35 to 9.40 m bgl (May 2006) during premonsoon and G.L to 13.00 m bgl during post monsoon.

4.1.1 Long Term Fluctuation (1998-2007)

The long-term water level fluctuation for the period 1998-2007 indicates rise in water level in the area 0.0335 - 0.6159 m/year. The fall in water level ranging between 0.0186 - 0.9738 m/year.

4.1.2 Aquifer Parameters

The Specific Capacity in the fissured formation ranges from 1.07 lpm/m to 970.6 lpm/m The wells recorded transmissivity values ranging from 0.053 to m²/ day to 457.25 m²/ day with low to very low permeability values.

4.2 Ground Water Resources

The ground water resources have been computed jointly by Central Ground Water Board and State Ground & Surface Water Resources and Development Centre (PWD, WRO, Government of Tamil Nadu) as on 31st March 2004. The salient features of the computations are furnished below.

Computation of Ground Water Resources of Salem District, Tamil Nadu (2004) (in ha.m) (As per GEC 1997 Methodology)									
S.N	Block	Net Ground Water Availability	Irrigation Draft January-04	Existing Gross ground water draft for Domestic & Industrial Water Supply	Allocation for Domestic and Industrial Requirement for next 25 Years	Existing Ground Water Draft	Balance Ground Water Available for Future Development	stage of Ground water Development	Category (As in Jan 2004)
						Jan-04	Jan-04	Jan-04	
1	Ammapet	5718.46	6400.56	237.66	245.85	6638.23	0.00	116	Over Exploited
2	Andhiyur	6964.60	7316.42	118.91	123.01	7435.33	0.00	107	Over Exploited
3	Bhavani	6210.36	3326.65	269.33	278.60	3595.98	2605.11	58	Safe
4	Bhavanisagar	3069.02	2768.78	123.94	128.20	2892.72	172.03	94	Critical
5	Chennimalai	3392.59	1441.17	172.61	178.55	1613.78	1772.87	48	Safe
6	Dharapuram	6800.80	3931.03	197.18	203.97	4128.21	2665.80	61	Safe
7	Erode	4300.32	494.79	502.48	519.78	997.27	3285.75	23	Safe
8	Gobichettipalayam	9816.75	5681.05	254.17	262.92	5935.22	3872.78	60	Safe
9	Kangeyam	3326.36	1856.48	162.86	168.47	2019.34	1301.41	61	Safe
10	Kodumudi	5943.88	2150.11	230.26	238.19	2380.38	3555.58	40	Safe
11	Kundadam	3836.64	1934.58	171.56	177.46	2106.14	1724.59	55	Safe
12	Modakurichi	8606.76	2013.32	277.39	286.94	2290.71	6306.50	27	Safe
13	Mulanur	3323.95	1965.71	139.77	144.58	2105.48	1213.66	63	Safe
14	Nambiyur	3782.41	3874.70	186.34	192.75	4061.04	0.00	107	Over Exploited
15	Perundurai	4499.07	3920.98	254.76	263.53	4175.74	314.56	93	Critical
16	Satyamangalam	6314.11	6054.83	76.33	78.96	6131.16	180.32	97	Critical
17	T.N.Palayam	5856.17	5090.87	141.19	146.05	5232.06	619.25	89	Semi Critical
18	Thalavadi	2255.30	2154.39	28.54	29.52	2182.93	71.39	97	Critical
19	Uthukuli	1537.62	913.79	158.93	164.41	1072.72	459.43	70	Safe
20	Vellakottai	3911.67	1969.58	186.89	193.32	2156.47	1748.77	55	Safe
District Total		99466.84	65259.78	3891.09	4025.07	69150.87	30181.99		

4.3 Ground Water Quality

Ground water in phreatic aquifers in Erode district in general is colorless, odorless and slightly alkaline in nature. The specific electrical conductance of ground water in phreatic zone (in Micro Seimens at 25 o C) during May 2006 was in the range of 660 to 4080 in the district. It is between 750 and 2250 $\mu\text{S}/\text{cm}$ at 25°C in the major part of the district. Conductance below 750 $\mu\text{S}/\text{cm}$ has been observed in ground water in only one sample is Vellakottai whereas conductance exceeding 2250 $\mu\text{S}/\text{cm}$ has been observed at Pudupalayam, Bhavani and Vijayamangalam.

It is observed that the ground water is suitable for drinking and domestic uses in respect of all the constituents except total Hardness and Nitrate.

Total Hardness as CaCo₃ is observed to be in excess of permissible limits in about 32 percent of samples analysed, whereas Nitrate is found in excess of 45 mg/l in about 66 percent samples. The incidence of high total hardness is attributed to the composition of lithounits constituting the aquifers in the district, whereas the nitrate pollution is most likely due to the use of fertilizers for agriculture and other improper waste disposal.

With regard to irrigation suitability based on specific electrical conductance and sodium Absorption Ratio (SAR), it is observed that ground water in the phreatic zone may cause high to very high salinity hazard and medium to high alkali hazard when used for irrigation. Proper soil management strategies are to be adopted in the major part of the district while ground water for irrigation.

4.4 Status of Ground Water Development

The estimation of groundwater resources for the district has shown that 3 blocks are over exploited and 3 blocks are under “critical” category.

Tamil Nadu Water Supply and Drainage (TWAD) Board is the Government agency responsible for providing drinking water supplies to the urban and rural populace in the district. The water requirements of the habitations are met with either through surface water sources or through various Mini Water Supply Schemes or Integrated water supply schemes utilising the available ground water resources. The status of urban and rural water supply in the district is furnished below

Total Number of Rural Habitants	:	5092
Not Covered	:	26 (0-9 Lpcd)
Partly Covered	:	2489 (10-39 Lpcd)
Fully Covered	:	2577 (40 Lpcd and above)

The habitants of 10 Municipalities of the district are provided with 70 - 90 Lpcd water and the habitants 24 town Panchayats and 30 rural Panchayats are provided with 30 – 70 and 40 – 70 Lpcd water respectively.

Dug wells have traditionally been the most common ground water abstraction structures used for irrigation in the district, with yields ranging from <50 to 200 m³/day in weathered crystalline rocks and up to 400 m³/day in Recent alluvial and colluvial formations along major drainage courses and valleys.

5.0 GROUNDWATER MANAGEMENT STRATEGY

5.1 Groundwater Development

In view of the comparatively high level of ground water development in the major part of the district and the quality problems due to geogenic and anthropogenic

factors, it is necessary to exercise caution while planning further development of available ground water resources in the district.

The development of ground water for irrigation in the district is mainly through dug wells tapping the weathered residuum. The yields of dug wells are improved at favorable locations by construction of extension bores, which are 40 to 75 m deep. Bore wells have also become popular as the source for irrigation in the district in recent years. Dug wells with extension bores wherever necessary is ideal for hard rock areas. The map showing the development prospects for the district is shown in Plate VI.

5.2 Water Conservation and Artificial Recharge

On the basis of experimental studies, it has been found that desilting of existing tanks followed by percolation pond with recharge wells, recharge shafts are economical. Accordingly, computations have been made for Drought Prone Area Programme (DPAP). Over exploited and Critical blocks in the districts warranting immediate attention. A summary giving the availability of surface run off, number of structures feasible and cost estimates for the schemes is provided in the table.

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. Free technical guidance for implementation of rooftop rain water harvesting schemes is also being provided by Central Ground Water Board.

6.0 GROUNDWATER RELATED ISSUES & PROBLEMS

The ground water development in the district, in general, is moderate when compared to many other districts in the state. As many as 3 out of 20 blocks in the district have been categorised as either 'OVEREXPLOITED' or 'DARK'. The trend analysis of historical ground water level data also indicates a long-term fall in a part of the district. Based on the factors mentioned, it is inferred that a part of the district could be considered vulnerable to various environmental impacts of water level depletion such as declining ground water levels, drying up of shallow wells, decrease in yield of bore wells and increased expenditure and power consumption for drawing water from progressively greater depths.

The ground water pollution in this district is due to the indiscriminate discharge of untreated effluents from the textiles dyeing, bleaching processing and tanneries units, which are concentrated at Erode, Bhavani, Chennimalai and Vellakoil towns and their environs. This has affected the quality of the formation in the shallow aquifers, thereby rendering unsuitable for drinking purposes.

Excessive use of fertilisers and pesticides in the areas with intensive irrigation practices has also reportedly resulted in localised enrichment of nitrate and other harmful chemicals in the ground water, especially in the phreatic zone.

Incidence of fluoride in ground water in excess of permissible limits for drinking has been reported from parts of the district, especially from the fracture zone. The source of fluoride in ground water is the fluoride-bearing minerals present in the granitic gneisses and granites, which underlie in the area.

7.0 AREA NOTIFIED BY CGWA/SGWA

Central Ground Water Authority has not notified any area in the district. Government of Tamil Nadu vide G.O.No. 53 has banned groundwater development for irrigation in the over exploited blocks of Tamil Nadu. The over exploited blocks in this district are Ammapet – E, Andhiyur, Nambiyur.

8.0 RECOMMENDATIONS

As the development of ground water has already reached an alarming stage in some of the blocks, further development of ground water for creation of additional irrigation potential has to be carried out with extreme caution.

Necessary measures for regulation of ground water abstraction from over-exploited and critical blocks may be initiated without further delay.

Detailed studies on the extent of pollution by industrial units in the district may be taken up to assess the damage to the ground water resources in the area and to understand the migration of pollutants. A network of observation wells may be established in the area to monitor the water quality on a regular basis.

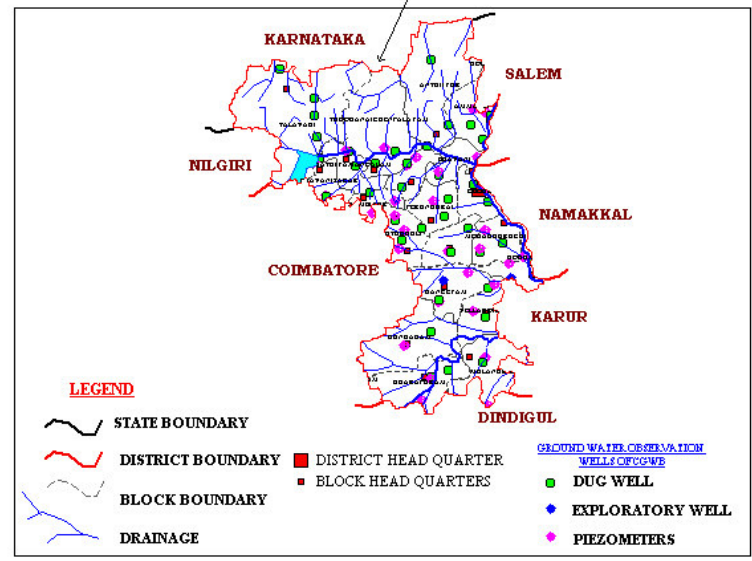
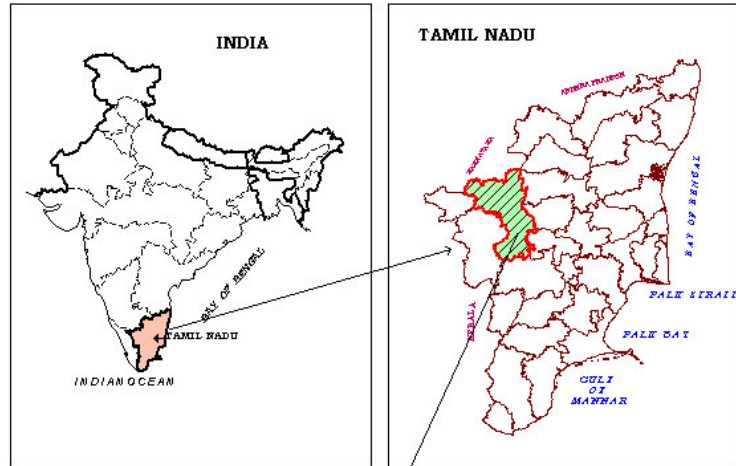
Artificial recharge of ground water through cost-effective rainwater harvesting systems may be popularised in the district by providing incentives to individuals/communities embarking upon such initiatives. A concerted effort involving various Government agencies and NGOs can create the necessary awareness among the rural masses.

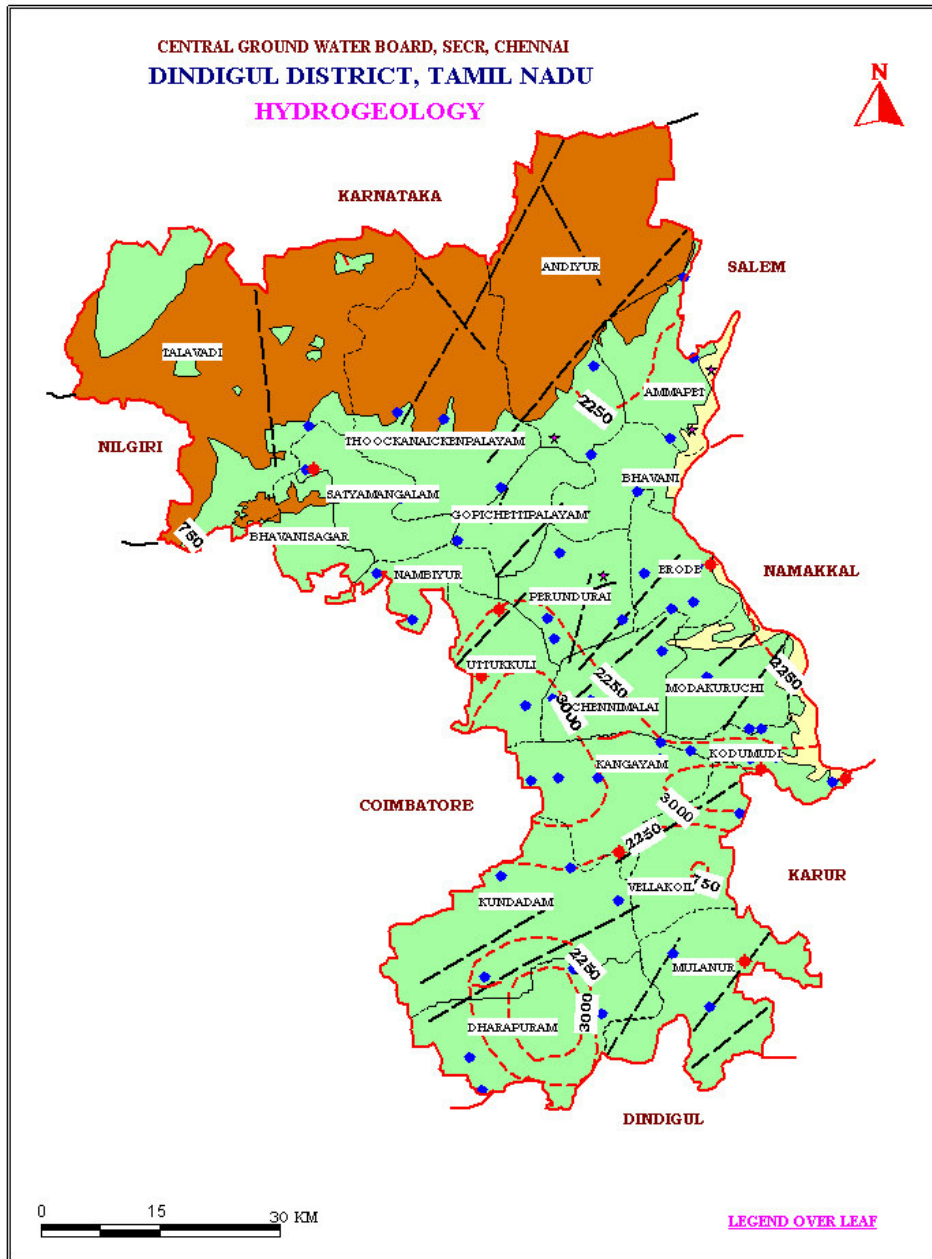
Steps be taken up to evolve suitable measures for desilting the existing irrigation tanks and supply channels to improve their longevity and for augmenting the storage of rain waters which in turn will induce the ground water recharge.

CENTRAL GROUND WATER BOARD, SECR, CHENNAI
ERODE DISTRICT, TAMIL NADU

LOCATION





(NOT TO SCALE)







LEGEND FOR PLATE - II

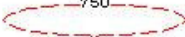

ADMINISTRATIVE SETUP

-  STATE BOUNDARY
-  DISTRICT BOUNDARY
-  BLOCK BOUNDARY
-  HILLY AREA


GROUND WATER HYDROLOGY

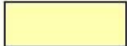
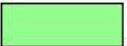
-  EXPLORATORY BORE WELL [CGWB]
- 5.1  HIGH YIELDING BORE WELL [CGWB]

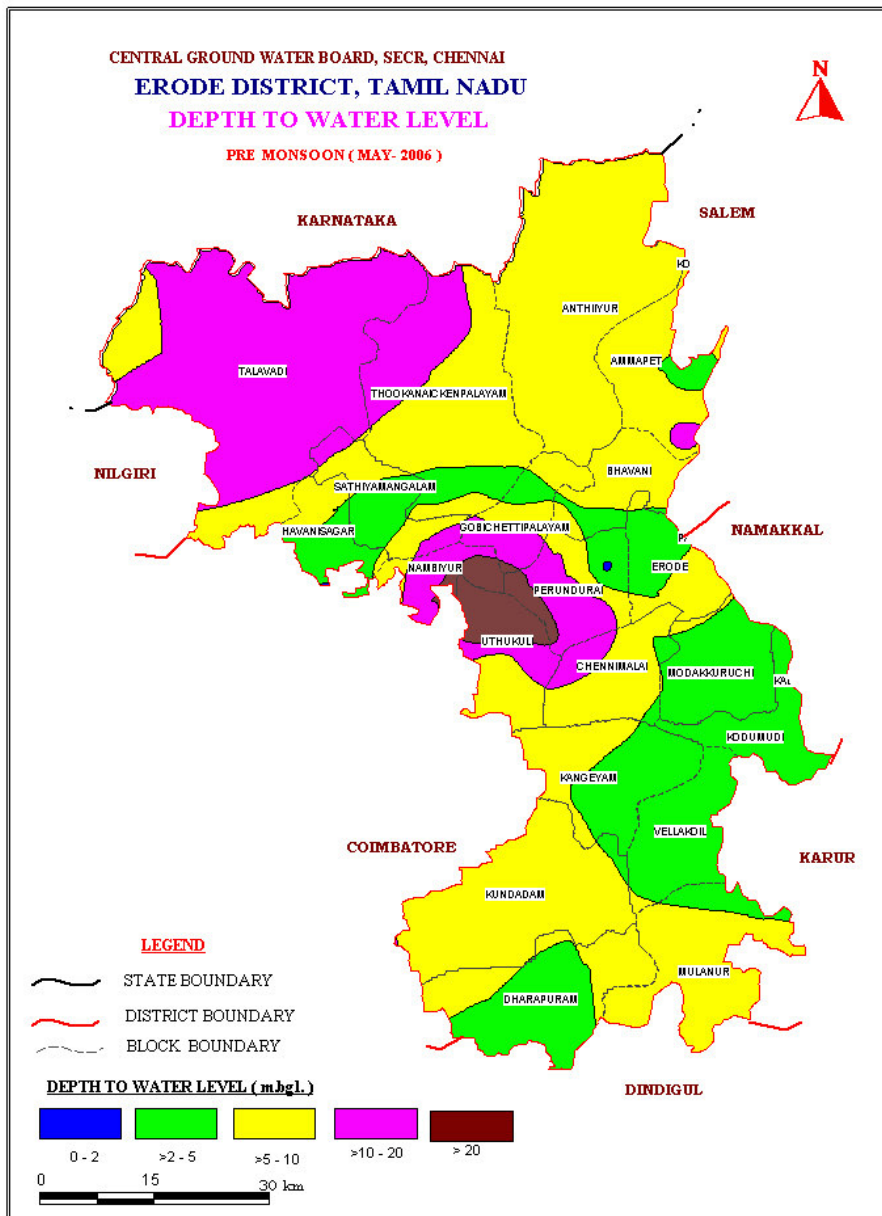
HYDROCHEMISTRY

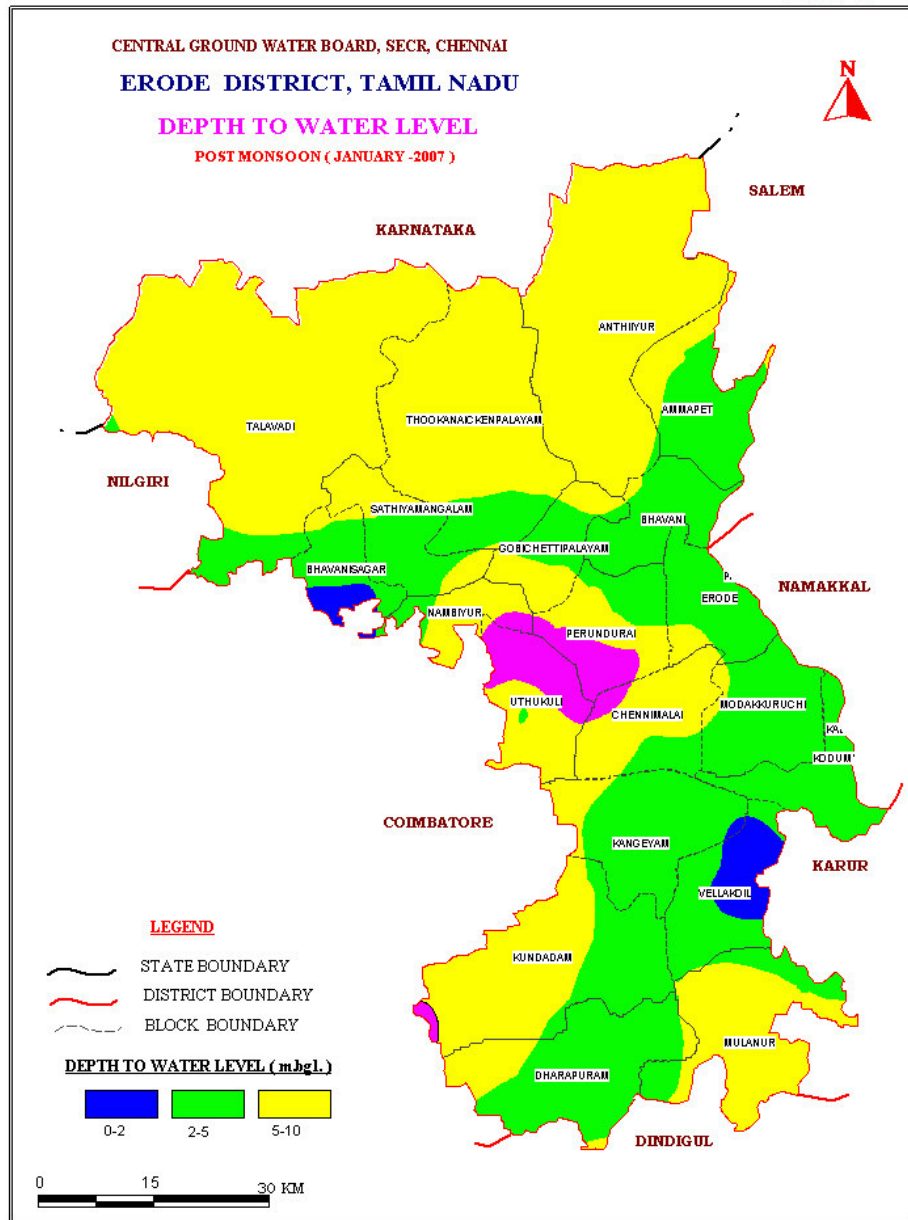
-  ISOCONS [Sp ELECTRICAL CONDUCTANCE [μ s /Cm at 25° C]
-  FLORIDE = 1.5 (mg/l)

STRUCTURE

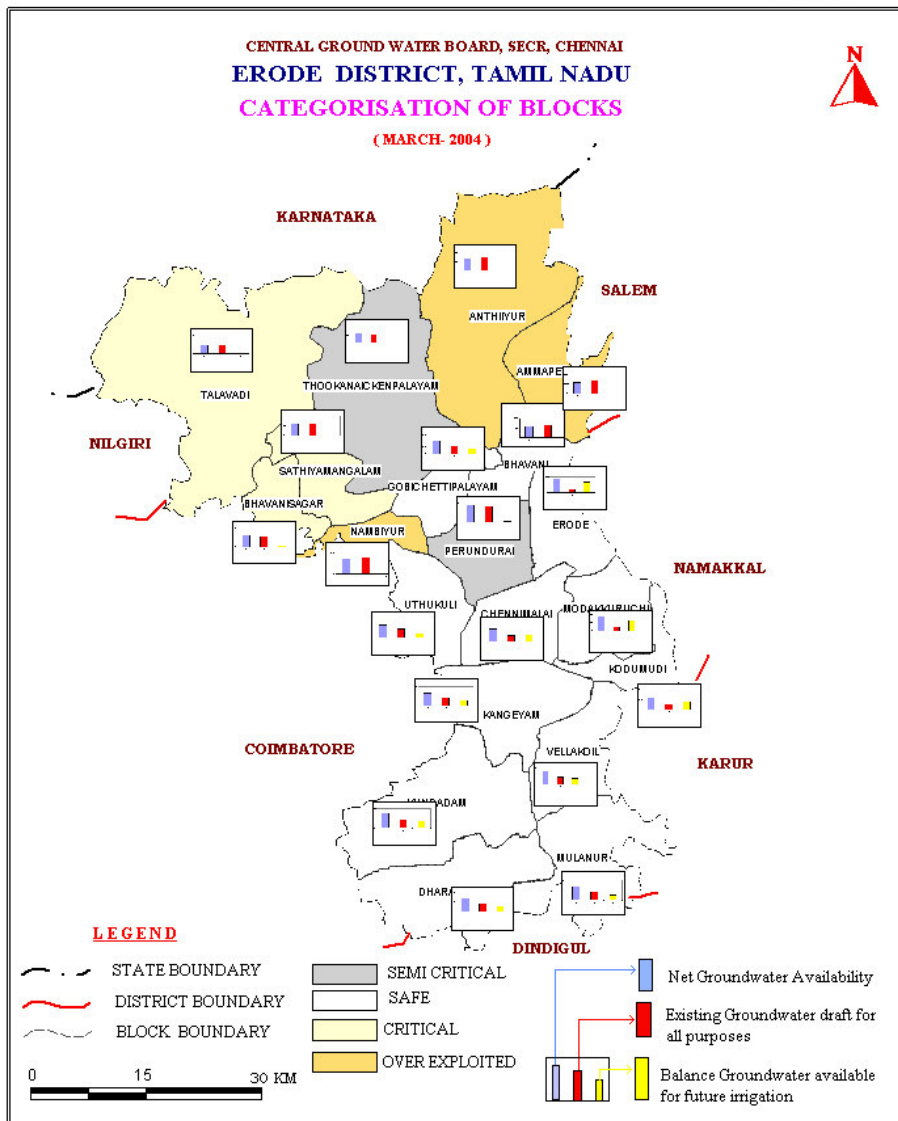
-  TRACE OF LINEAMENT

<u>AQUIFER</u>	<u>AGE</u>	<u>LITHOLOGY</u>	<u>GROUND WATER CONDITIONS</u>	<u>YIELD PROSPECTS (CU.M/D)</u>	<u>GROUND WATER DEVELOPMENT STRATEGIES</u>	
	UNCONSOLIDATED	RECENT	RIVER ALLUVIUM, FLOOD PLAIN-DEPOSITS	DISCONTINUOUS, THIN, UNCONFINED TO SEMI CONFINED	= 200	DEVELOPMENT THROUGH LARGE DIAMETER DUG WELLS AND SHALLOW TUBE WELLS.
	CONSOLIDATED	ARCHAIC	GRANITES, GNEISSES, CHARNOKITE	DISCONTINUOUS, UNCONFINED TO SEMI CONFINED AQUIFERS, RESTRICTED TO WEATHERED RESIDUUM AND FRACTURES	= 50 NEAR WATERSHED DIVIDES & HIGH GROUNDS. 50 - 200 NEAR THIRD ORDER STREAMS AND LOW GROUNDS.	SUITABLE FOR DEVELOPMENT THROUGH DUG WELLS, BOREWELLS FEASIBLE IN FRACTURE ZONES, BEST LOCATIONS BEING INTERSECTION OF FRACTURES

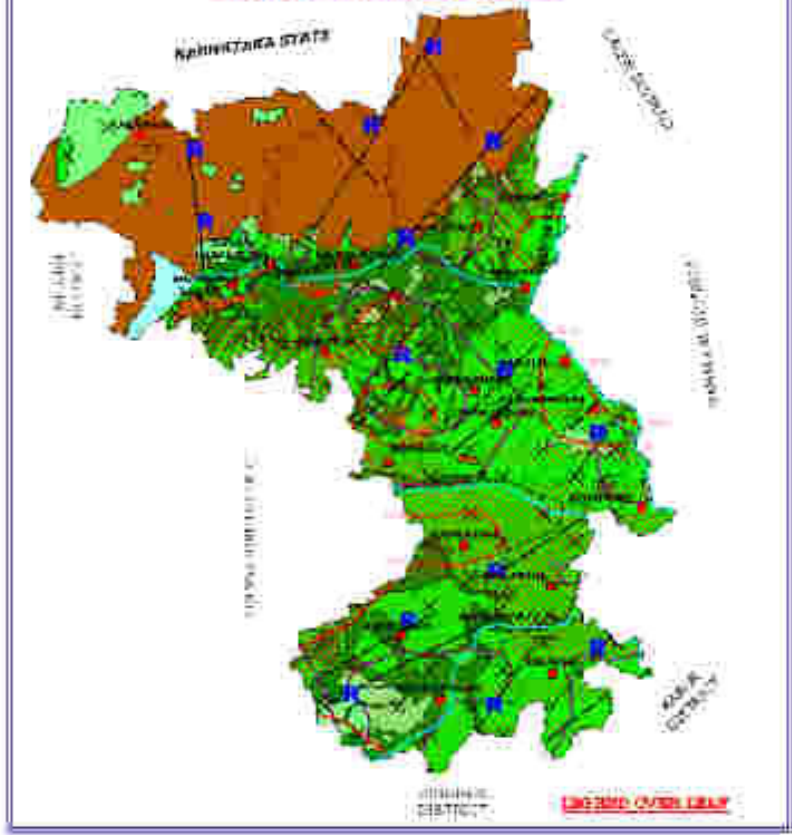




CENTRAL GROUND WATER BOARD, SECR, CHENNAI
ERODE DISTRICT, TAMIL NADU
CATEGORISATION OF BLOCKS
 (MARCH-2004)



















CENTRAL GROUND WATER BOARD, IN CE CENTRAL
GROUND WATER DEVELOPMENT POTENTIAL AND
ARTIFICIAL RECHARGE PROJECTS
KROODI DISTRICT, TAMIL NADU



LEGEND PLATE FOR -VI

DISTRICT – ERODE

	Wells Feasible	Rigs Suitable	Depth of Well (M)	Discharge (LPM)	Suitable Artificial Recharge Structures
 Hard Rock Aquifer	Dug Well Bore Well	Manual DTH	15 - 20 60 – 150	10 - 60 20 – 100	Check Dams/ Gully Plug
 Hard Rock Aquifer	Dug Well Bore Well	Manual Dth	15 - 20 75 - 180	60 – 100 80 – 120	Check Dams/ Farm Pond /Gully Plug
 Hard Rock Aquifer	Dug Well Bore Well	Manual Dth	15 - 20 75 - 180	100 – 200 100 - 250	Check Dams/ Farm Pond /Gully Plug
	State Boundary			District Boundary	
	Hilly Area			Block Boundary	
	District Headquarter			Block Headquarters	
	Water Level-Pre-Monsoon (Decadal Mean 1993-2002) Mbgl			EC In Microsiemens / Cm At 25°C	
	River			Lineament	
	Fluoride Greater Than Maximum Permissible Limit (1.5 mg/L)			Nitrate Greater Than Maximum Permissible Limit (45 mg/L)	
	Recommended Site For Artificial Recharge Structure				

OTHER INFORMATION

Geographical Area	8162 Sq. Km.
No. of Blocks	20
Major Drainage	Cauvery, Bhavani, Noyil, Vattamalai Karai, Uppar Odai & Nangangi
Population (2001)	25,74,067
Average Annual Rainfall	666 Mm
Annual Range Of Temperature	26 –37°C
Regional Geology	Hard Rocks: Charnockite, Hornblend Biotite Gneiss & Granite
Net Ground Water Availability for Future Irrigation	313 MCM/Yr
Stage of Ground Water Development(As On march 2004)	69 %
Name of Blocks showing Intensive Ground Water Development	☆ v. Over-Exploited: Ammapet, Andhiyur & Nambiyur ☆ Critical: Bhavanisagar, Sathiyamangalam & Talavadi ,

SAVE WATER
AND
CONSERVE WATER