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Technical Report Series

DISTRICT GROUNDWATER BROCHURE COIMBATORE DISTRICT, TAMIL NADU

By

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Government of India
Ministry of Water Resources

Central Ground Water Board

South Eastern Coastal Region
Chennai

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DISTRICT AT A GLANCE (COIMBATORE DISTRICT)

S.NO	ITEMS	STATISTICS	
1.	**GENERAL INFORMATION**		
	i. Geographical area (Sq.km)	7470.79	
	ii. Administrative Divisions as on 31-3-2007 Number of Tehsils Number of Blocks Number of Villages	 09 19 481	
	iii. Population (as on 2001 Censes) Total Population Male Female	 4271856 2176031 2095825	
	iv. Average Annual Rainfall (mm)	550 - 900	
2.	**GEOMORPHOLOGY**		
	i. Major Physiographic Units	Upland plateau region with hill ranges, hillocks and undulating plain.	
	ii. Major Drainages	Bhavani, Noyil, Amaravthi and Ponnani rivers	
3.	**LAND USE (Sq. km) during 2005-06**		
	i. Forest area ii. Net area sown iii. Cultivable waste	158803 314958 13997	
4.	**MAJOR SOIL TYPES**	Red calcareous soil, Red non-calcareous soil, Black soil, Alluvial and Colluvial soil.	
5.	**AREA UNDER PRINCIPAL CROPS (AS ON 2005-2006)** Ha.	1. Paddy – 7405 (2.22%) 2. Groundnut - 22515 (6.75%) 3. Pulses – 28111 (8.43%) 4. Sugarcane – 8894 (2.67%) 5. Coconut - 101541 (30.46%)	
6.	**IRIGATION BY DIFFERENT SOURCES (During 2005-06)**	**Number**	**Area irrigated (Ha)**
	i. Dug wells	97316	96357
	ii. Tube wells	28973	19608
	iii. Tanks	77	555.43
	iv. Canals	40	53991
	v. Other Sources	NA	0.24
	vi. Net irrigated area Ha.		170511
	vii. Gross irrigated area Ha.		181471

7.	**NUMBERS OF GROUND WATER MONITORING WELLS OF CGWB (AS ON31.03.2007)**		
	i. No of dug wells	29	
	ii. No of piezometers	39	
8.	**PREDOMINANT GEOLOGICAL FORMATIONS**	Archaean crystallines and Recent alluvial and Colluvial formations	
9.	**HYDROGEOLOGY**		
	i. Major water bearing formations	Weathered & Fractured Granite Gneiss, Granites and Charnockites, Colluvium & Recent alluvium along the river courses.	
	ii. Pre- monsoon depth to water level (May 2006)	1.54 – 39.03	
	iii. Pre- monsoon depth to water level (Jan'2007)	0.62 – 36.42	
	iv. Long term water level trend in 10 years (1998-2007) in m/yr	Annual	
		Rise (m/year)	Fall (m/year)
		Min : 0.0752 Max :1.5420	Min : 0.0068 Max :1.0538
10.	**GROUND WATER EXPLORATION BY CGWB (As on 31-03-2007)**		
	i. Number of Exploratory wells ii. Number of Observation wells iii. Number of Piezometers under H.P	53 59 33	
	iv. Depth range (m)	26.5 – 304.00	
	v. Discharge (lps)	0.33 – 10.00	
	vi. Storativity (S)	9.1×10^{-5} - 4.7×10^{-3}	
	vii. Transmissivity (m^2/day)	<1 - 1146	
11.	**GROUND WATER QUALITY AS ON MAY 2006**		
	i. Presence of chemical constituents more than permissible limit	TH as $CaCO_3$, NO_3, F, SO_4	
	ii. Type of water	CaCl, NaCl, Ca-HCO_3	
12.	**DYNAMIC GROUND WATER RESOURCES (as on 31.03.2004) in MCM**		
	i. Annual Replenishable Ground Water Resources	792.87	
	ii. Total Annul Ground Water Draft for all purposes	821.00	
	iii. Projected demand for Domestic and Industrial Uses up to 2025	42.20	
	iv. Stage of Ground Water Development	117%	
13.	**AWARENESS AND TRAINING ACTIVITY**		
	i. Mass Awareness Programmes Organized		
	Year	1999 - 2000	
	Place	V.Kallipalayam	
	No of Participants	300	
	ii. Water Management Training Organized	Nil	
	Year	Nil	
	Place	Nil	
	No of Participants	Nil	

14.	**EFFORTS OF ARTIFICIAL RECHARGE & RAINWATER HARVESTING**	
	i. Projects completed by CGWB Number of structures	04
	ii. Projects under technical guidance of CGWB Number of structures	4 Percolation Ponds constructed by State Agencies through the Technical Guidance of CGWB under Central Sector Scheme for a budget outlay of Rs 42.10 Lakhs during 2001-02
15.	**GROUND WATER CONTROL AND REGULATION**	
	i. Number of OE Blocks	11
	ii. Number of Critical Blocks	04
	iii. Number of Blocks Notified	Nil
16.	**MAJOR GROUND WATER PROBLEMS AND ISSUES.**	1) High level of ground water development. 2) Declining of ground water level and drying of shallow wells. 3) Incidence of fluoride in ground water. 4) Local pollution of Surface and ground water by industrial units. 5) An area of about 202.68 Sq. Km covering Tiruppur and its environ is affected by Industrial pollution.

1.0 INTRODUCTION

1.1 Administrative Details

Coimbatore district is divided into 9 taluks. The taluks are further divided into 19 blocks, which further divided into 481 villages.

Administrative set- up of Coimbatore district

S.No.	Name of taluk	Area in ha.	No. of villages	Name of blocks	Area in ha.	No. of villages
1	Avinashi	66490	55	1. Annur	29060	22
				2. Avinashi	37430	33
2	Coimbatore((N)	59374	34	1. P.N.Palayam	39537	18
				2. S.S.kulam	19837	16
3	Coimbatore (S)	77332	47	1. Madukarai	35882	29
				2. Thondamuthur	41450	18
4	Mettupalayam	64545	19	1. Karamadai	64545	19
5	Palladam	88256	62	1. Palladam	29759	21
				2. Sulur	28922	21
				3. Sulthanpet	29575	20
6	Pollachi	116552	131	1. Anamalai	101748 (including Valparai area)	20 (including Valparai town panchayat)
				2. Pollachi north	28557	48
				3. Pollachi south	20636	29
				4. Kinathukadavu	32575	35
7	Tiruppur	63887	39	1. Pongalur	35023	16
				2. Tiruppur	28864	23
8	Udumalpet	143679	93	1. Gudimangalam	30970	24
				2. Madathukulam	22696	18
				3. Udumalpet	90013	51
9	Valparai (hilly area)	66964	1	-	-	-
	Total	**747079**	**481**		**747079**	**481**
	(Source: Department of Statistics, Coimbatore)					

1.2 Basin and sub-basin

The district is part of the composite east and west flowing river basins and Cauvery basins. Bhavani, Noyyil, Amaravathi, Parambikulam- Aliyar and Valparai are the important sub basins.

1.3 Drainage

The Bhavani river which has its origin in the silent valley ranges in Kerala state and enters in to Coimbatore district about 25 km west of Mettupalayam and flows in a northeast direction. The river drains an area of 1056 Sq.km with in this district.

The Noyil River has its origin in the Boluvampatty valley of the Vellingiri hills and comes to be called the Swami Mudiyar. Further south it is joined by the Periyar and Chinnar.

The Amaravathi River rises in the Anjanad valley in the Kerala state between the Anamalai hills and the plains and flows in the northeastern direction. Amaravathi dam is located on this river.

The Palar, Aliyar and Upar which are the main steams of the river Ponnani are originating from the Anaimalai hills and flows in a north-northwest direction on the southern part of the district, the Aliyar and Thirumoorthy dams are located on Aliyar and Palar respectively.

The Parambikulam and Sholaiyar streams, which are tributaries to the Periyar River has a southwesterly direction on the southwestern part of the district. Five surface reservoirs are located on this river, which form part of the Parambikulam Aliyar project.

1.4 Irrigation practices

The nine - fold land use classification for the district is given below (2005 - 2006)

S.No	Classification	Area (Ha)
1	Forests	158803.00
2	Barren & Uncultivable Lands	7463.53
3	Land put to non agricultural uses	106025.24
4	Cultivable Waste	13996.74
5	Permanent Pastures & other grazing lands	85.03
6	Groves not included in the area sown	3383.10
7	Current Fallows	84524.14
8	Other Fallow Lands	57840.60
9	Net Area sown	314957.62
	Total	**747079.00**

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

The data available indicate that an area of about 170511 ha, which is about 23% of the total geographical area of the district is under irrigated agriculture. Dug wells are the major source of water for irrigation in the district, accounting for about 87% of the total area irrigated in the district. Tube wells accounting for about 5% of the total area irrigated in the district.

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	Anamalai	9907.13	121.00	0.00	9925.72	0.00	19953.85
2	Annur	0.00	0.00	2487.73	1925.43	0.00	4413.16
3	Avinashi	0.00	0.00	2215.77	2061.97	0.00	4277.74
4	Gudimangalam	5432.94	60.76	813.61	9353.08	0.00	15660.39
5	Karamadai	1642.54	24.51	1340.61	5531.72	0.00	8539.38
6	Kinathukadavu	2787.61	0.00	0.00	8831.10	0.00	11618.71
7	Madathukulam	8108.90	256.70	5.00	4038.46	0.00	12409.06
8	Madukarai	0.00	0.00	2396.69	4505.98	0.00	6902.67
9	P_N_Palayam	0.00	0.00	694.10	2716.04	0.00	3410.14
10	Palladam	331.81	0.00	387.20	3094.64	0.00	3813.65
11	Pollachi_N	5391.11	0.00	0.00	9069.56	0.00	14460.67
12	Pollachi_S	4008.19	83.95	0.00	6135.98	0.00	10228.12
13	Pongalur	2630.09	0.00	2937.09	2426.44	0.00	7993.62
14	Sarkarsamakulam	0.00	0.00	499.80	1733.86	0.00	2233.66
15	Sultanpet	2112.05	0.00	496.08	6591.82	0.00	9199.95
16	Sulur	0.00	0.00	751.98	3269.35	0.24	4021.57
17	Thondamuthur	921.73	8.510	4582.28	2740.64	0.00	8253.16
18	Tiruppur	7.03	0.00	0.00	1720.13	0.00	1727.16
19	Udumalpet	10710.30	0.00	0.00	10684.62	0.00	21394.92
		53991.43	555.43	19607.94	96356.54	0.24	170511.58

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

1.5 Studies/Activities carried out by CGWB

Central Ground Water Board has completed a water balance project covering Noyil, Ponnani and Amaravathi basins with the assistance of Swedish International Development Authority (SIDA) during the period between 1975 and 1979. An area of 4880 sq.km in Coimbatore district was covered under the SIDA project. 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. District Ground Water Management Studies were carried out during 1991-92, 1999-2000, 2001-02.

Central Ground Water Board also carried out the exploration in Coimbatore district during the period between 1976 and 1979 in SIDA Project and during 1998-99 and 2004. 19 exploratory wells, 4 observation wells and 2 piezometers ranging in the depth from 46.00 to 302.40 m. were drilled during that period.

In additions, Short-term investigations are being carried out by this office for defence establishments for planning and development of ground water for water supply to meet their demands.

CGWB is monitoring the groundwater regime for the changes in water level and water quality through 29 dug wells and 39 piezometers. The monitoring of water levels are carried out during May (Pre monsoon), August (Middle of south west monsoon), November (post south west monsoon & initial stage of north east monsoon) & January (Post North east monsoon) to study the impact of rainfall on groundwater regime. Water samples are collected during May for determining the changes in chemical quality of groundwater.

2.0 RAINFALL 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 and summer rains are negligible.

Rainfall data from six stations over the period 1901-2000 were utilized and a perusal of the analysis shows that the normal annual rainfall over the district varies from about 550mm to 900mm. It is the minimum around Sulur (550 mm) in the eastern part of the district. It gradually increases towards south and attains a maximum around Anamalai hills.

The district enjoys a tropical climate. The weather is pleasant during the period from November to January. Mornings in general are more humid than the afternoons, with the humidity exceeding 78% on an average. In the period June to November the afternoon humidity exceeds 66% on an average. In the rest of the year the afternoons are drier, the summer afternoons being the driest.

The period from April to June is generally hot and dry. The temperature recorded varies from 11.7°C to 42.6°C.

3.0 GEOMORPHYLOGY AND SOIL TYPES

3.1 Geomorphology

Coimbatore district forms part of the upland plateau region of Tamil Nadu with many hill ranges, hillocks and undulating topography with a gentle slope towards east except for the hilly terrain in the west. The undulating topography with innumerable depressions, are used as tanks for storage of rainwater for agriculture.

The prominent geomorphic units identified in the district through interpretation of Satellite imagery are 1) Structural hills, 2) Ridges, 3) Inselbergs, 4) Bazada, 5) Valley fill, 6) Pediment, 7) Shallow Pediments and 8) Deep Pediments.

The Nilgiris on the northwest and Anamalai on the south are the important ranges, which attain a heights of over 2513m above mean sea level (MSL) and the highest elevation in the valleys adjoining the hills is 600 M above MSL. The ‘Palghat Gap’,

which is an east-west trending mountain pass, is an important physiographic feature is located in the western part of the district.

3.2 Soils

The soils of Coimbatore district can be broadly classified into 6 major soils types viz., Red calcareous Soil, Black Soil, Red non-calcareous, Alluvial and Colluvial Soil, Brown Soil, and Forest Soil.

About 60 per cent of the district is covered by red soils, of which red calcareous soil is predominant. They occupy most parts of Palladam, Coimbatore, Mettupalayam and Udumalpet taluks. Medium to deep red calcareous soils are found mainly in Pollachi and Udumalpet taluks. Parts of Palladam, Avinashi and Udumalpet taluks are occupied by red non-calcareous soils.

The highlands in Coimbatore, Palladam and Avinashi taluks are mostly occupied by the black soils, which are dark gray to grayish brown in co lour.

The Alluvial soils are found in small patches along the Noyil river mainly in the upper reaches. The Colluvial soils are found mainly in Chinnathadagam and Chitrachavadi sub-basins and as scattered patches at the foothills of the Anaimalai.

The Forest soils are confined to the reserve forest area and have a surface layer of organic matter.

4.0 GROUND WATER SCENARIO

4.1 Hydrogeology

The district is underlain by both porous and fissured formations. The important aquifer systems in the district are constituted by i) unconsolidated formations and ii) weathered and fractured crystalline rocks.

The porous formations in the district are represented by alluvium and colluvium. The Colluvial formations are occurring in the western boarder of Coimbatore district especially in Chinnathadagam and Chitrachavadi sub-basins of Noyil river basin. Studies carried out in this area indicate that the sand and gravel beds constitute more than 60 to 70 percent of the colluvium in the western part of Chinnathadagam basin. The Colluvial material in Chitrachavadi basin is mostly composed of silt and kantar with admixtures of sands and gravels. Ground water is occurring under phreatic conditions in the colluviums and is developed by means of dug wells and bore wells. The depth range of these shallow aquifers ranges from 34 to 56 m. The saturated thickness of these aquifers ranges from a few meters in Chitrachavadi basin to as much as 56 m at the center of Chinnathadagam sub-basin. The river alluvium is occurring along the major river courses.

The hard consolidated crystalline rocks are represented by weathered and fractured Granite 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 shallow aquifers in the major part of the district occur within the depth of 30 m while in the western most part of Coimbatore; they are more than 30 m. The depth of the wells ranged from 7 to 45 m bgl.

The yield of large diameter wells in the district, tapping the weathered mantle of crystalline rocks ranges from 50 to 300 lpm and are able to sustain pumping for 2 to 4 hours per day. The Specific capacity of large diameter wells tested in crystalline rocks from 6.28 to 200.00 lpm / m. of drawdown.

The yield of bore wells drilled down to a depth of 50 to 100 m, by various state agencies mainly for domestic purposes ranged from 1 to 5 lps. The yield of successful bore wells drilled down to a depth of 304 m bgl during the ground water exploration programme of Central Ground Water Board ranged from <1 to 10 lps. The aquifer and well parameters of the wells show wide variation.

The depth to water level in the district varied between 1.54 and 39.03 m bgl during pre-monsoon (May 2006) and varied between 0.62 and 36.42 m bgl during post monsoon (Jan 2007). The seasonal fluctuation shows a rise in water level, which ranges from 0.34 to 10.88 m bgl. The piezometric head varied between 1.47 to 50.66 m bgl (May 2006) during pre monsoon and 0.34 to 51.02 m bgl during post monsoon (Jan 2007).

4.1.1 Long Term Fluctuation (1998-2007)

The long-term water level fluctuation for the period 1998-2007 indicates both rise and fall in different part of the district. The rise in water level is of the order of 0.0564 to 0.0984 m/year, while the fall in water level varies between 0.0277 - 0.2748 m/year.

4.1.2 Aquifer Parameters

Aquifer Parameters	Weathered Residuum	Fractured Aquifer
Transmissivity (m^2/day)	4 - 105	<1 -1146
Storativity	-	9.1×10^{-5} - 4.7×10^{-3}
Specific yield	0.015	-

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.

Stage of Groundwater Development of Coimbatore District as on 31st March 2004 (in Ha.m.)								
S.No	**Block**	**Net Groundwater Availability**	**Existing Gross Draft for Irrigation**	**Existing Gross Draft for Domestic and industrial water supply**	**Existing Gross Draft for all uses**	**Allocation for Domestic and Industrial Requirement supply up to next 25 years (2029)**	**Net groundwater Availability for future Irrigation Development**	**Stage of Groundwater Development**
1	Anamalai	12330.05	6154.38	172.15	6326.53	178.88	5996.79	51
2	Annur	3413.10	5689.58	220.04	5909.62	228.64	-2505.13	173
3	Avinashi	3489.59	4187.25	270.34	4457.60	280.92	-978.58	128
4	Gudimangalam	4965.37	4420.97	155.04	4576.01	161.10	383.30	92
5	Karamadai	4136.26	3678.61	301.31	3979.92	313.10	144.55	96
6	Kinathukadavu	4283.47	4726.31	208.39	4934.70	216.54	-659.38	115
7	Madathukulam	6307.51	3365.50	194.88	3560.38	202.50	2739.51	56
8	Madukarai	2294.21	3850.11	210.36	4060.47	218.58	-1774.49	177
9	P_N_Palayam	2311.71	3250.31	231.69	3482.00	240.76	-1179.35	151
10	Palladam	2745.61	2450.08	231.69	2681.78	240.76	54.77	98
11	Pollachi_N	5818.92	6841.70	218.23	7059.93	226.77	-1249.54	121
12	Pollachi_S	2868.52	5270.62	222.12	5492.74	230.81	-2632.91	191
13	Pongalur	3636.10	2774.16	150.98	2925.15	156.89	705.05	80
14	Sarkarsamakulam	1444.73	1847.70	183.39	2031.09	190.57	-593.54	141
15	Sultanpet	3078.74	3140.09	154.90	3294.99	160.96	-222.31	107
16	Sulur	2463.77	2412.00	329.98	2741.98	342.89	-291.12	111
17	Thondamuthur	2820.59	4651.92	131.06	4782.98	136.19	-1967.51	170
18	Tiruppur	1825.09	914.37	316.27	1230.64	328.64	582.08	67
19	Udumalpet	9054.08	8423.26	158.45	8581.71	164.65	466.17	95
	District Total	**79287.42**	**78048.91**	**4061.27**	**82110.19**	**4220.14**	**-2981.63**	**104**

4.3 Ground Water Quality

Ground water in phreatic aquifers in Coimbatore district in general is colorless, odorless and slightly alkaline in nature. The specific electrical conductance of ground water in phreatic zone (µS at 25 o C) during May 2006 was in the range of 597 to 4810 in the district. It is between 750 and 2250 µS/cm at 25°C in the major part of the district. Conductance below 750 µS/cm has been observed in Kaltanpet whereas conductance exceeding 2250 µS/cm has been observed in parts of Avinashi, P.N.Palayam, Tiruppur, Nachipalayam, Vadavalli, Singanallur, Slur, Podanur and Chinnaripalayam.

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 $CaCO_3$ is observed to be in excess of permissible limits in about 39 percent of samples analyzed, whereas Nitrate is found in excess of 45 mg/l in about 80 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 foe irrigation.

4.4 Status of Ground Water Development

The estimation of groundwater resources for the district has shown that out of 19 blocks, 11 blocks are over exploited and 4 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 utilizing the available ground water resources. The status of urban and rural water supply in the district is furnished below

Total Number of Rural Habitants	: 3039
Not Covered	: 0 (0-9 LPCD)
Partly Covered	: 1192 (10-39 LPCD)
Fully Covered	: 1847 (>= 40 LPCD)

The habitants of one Corporation is provided with 110 LPCD water and the habitants of 11 Municipalities and 52 Town Panchayats are provided with 53 – 113 LPCD and 40 - 116 LPCD water respectively.

Dug wells and bore wells are the most common ground water abstraction structures used for irrigation in the district. The yield of dug wells range from 50 to 300 lpm for draw down varying from 0.5 to 3.5 m for a pumping period of 2to 4 hours. The yield of bore wells is < 1 to 5 lps for pumping period of 6-10 hours.

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 yield of dug wells is improved at favorable locations by construction of extension bores, which are 25 to 100 m deep. In recent years, the bore wells have started replacing dug wells for irrigation purposes.

5.2 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 Programme (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 programmes.

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 Rs4000/- for small and marginal farmers and Rs2000/- 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 programme.

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.

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.

6.0 GROUNDWATER RELATED ISSUES & PROBLEMS

The ground water development in the district, in general, is high and as many as 15 out of 19 blocks in the district have been categorised as either 'overexploited' or 'critical'. The trend analysis of historical ground water level data also indicates a long-term fall in a major part of the district. Drying up of shallow wells, decrease in yield of bore wells are being observed in major parts of the district.

Incidence of high TDS, Fluoride, Chloride and Nitrate has been reported from localised areas. Ground water in small packets of the district is likely to cause high to very high salinity hazard when used for irrigation.

An area of about 202.68 Sq. Km covering Tiruppur and its environ is affected by industrial pollution. There are about 669 dyeing and bleaching industries under operation as per the available statistical data. The liquid and solid waste discharged into the nearby land and watercourses have contaminated the ground water.

Excessive use of fertilizers and pesticides in agriculture has also reportedly resulted in localized enrichment of nitrate in the top unconfined aquifer.

The water quality data of urban area indicates that the ground water in a major part of the area do not conform to the standards prescribed for drinking with respect to all the parameters as prescribed by BIS due to urban pollution.

7.0 AWARENESS & TRAINING ACTIVITY

One Mass Awareness Campaign on "Ground Water Management, Regulation & Conservation" was organized at V.Kallipalayam, Coimbatore district in the year 2000.

The findings of exploration carried out by CGWB, the results of Geophysical investigations for source finding and their limitations, Ground water resource potential of Coimbatore district, Techniques on Ground water resource management and need for regulation and water conservation were explained to the gathering of 300 people.

8.0 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 restricted groundwater development for irrigation in the over exploited blocks of Tamil Nadu. The over exploited blocks in this district are as follow.

1. Annur
2. Avinashi
3. Kinathukadavu
4. Madukarai
5. P.N.Palayam
6. Pollachi -North
7. Pollachi - south
8. Sarkarsamakulam
9. Sultanpet
10. Sulur
11. Thondamuthur

9.0 RECOMMENDATIONS

As the development of ground water has already reached an alarming stage in many blocks of this district, 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.

Intensive monitoring of ground water levels and water quality has to be taken up in Tiruppur area of the district to monitor the quality of ground water.

The heterogeneity of crystalline formation and poor yield prospects make it difficult for further development and scientific methods may adopted for siting of new wells.

On the basis of experiences in execution of Central Sector Scheme and Demonstrative Projects on artificial recharge, the desilting of existing ponds/tanks will be the most cost effective structures. The provision of recharge wells/shafts in percolation ponds/check dams will enhance the efficiency of these structures.

Rainwater Harvesting has already been made mandatory by the Govt. of Tamil Nadu and people have already made provision for roof top rainwater harvesting. However, efforts may be made to apply corrections if required to make these structures effective. Further, operation and maintenance of artificial recharge structures are essential to make them efficient and priority may be given to this activity so as to make these structures effective. A concerted effort involving various Government agencies and NGOs can create the necessary awareness among the rural masses. Action plan in this direction with participation of state and central agencies and industrial establishments is recommended.

PLATE - I

CENTRAL GROUND WATER BOARD, SECR, CHENNAI

COIMBATORE DISTRICT, TAMIL NADU

LOCATION

(NOT TO SCALE)

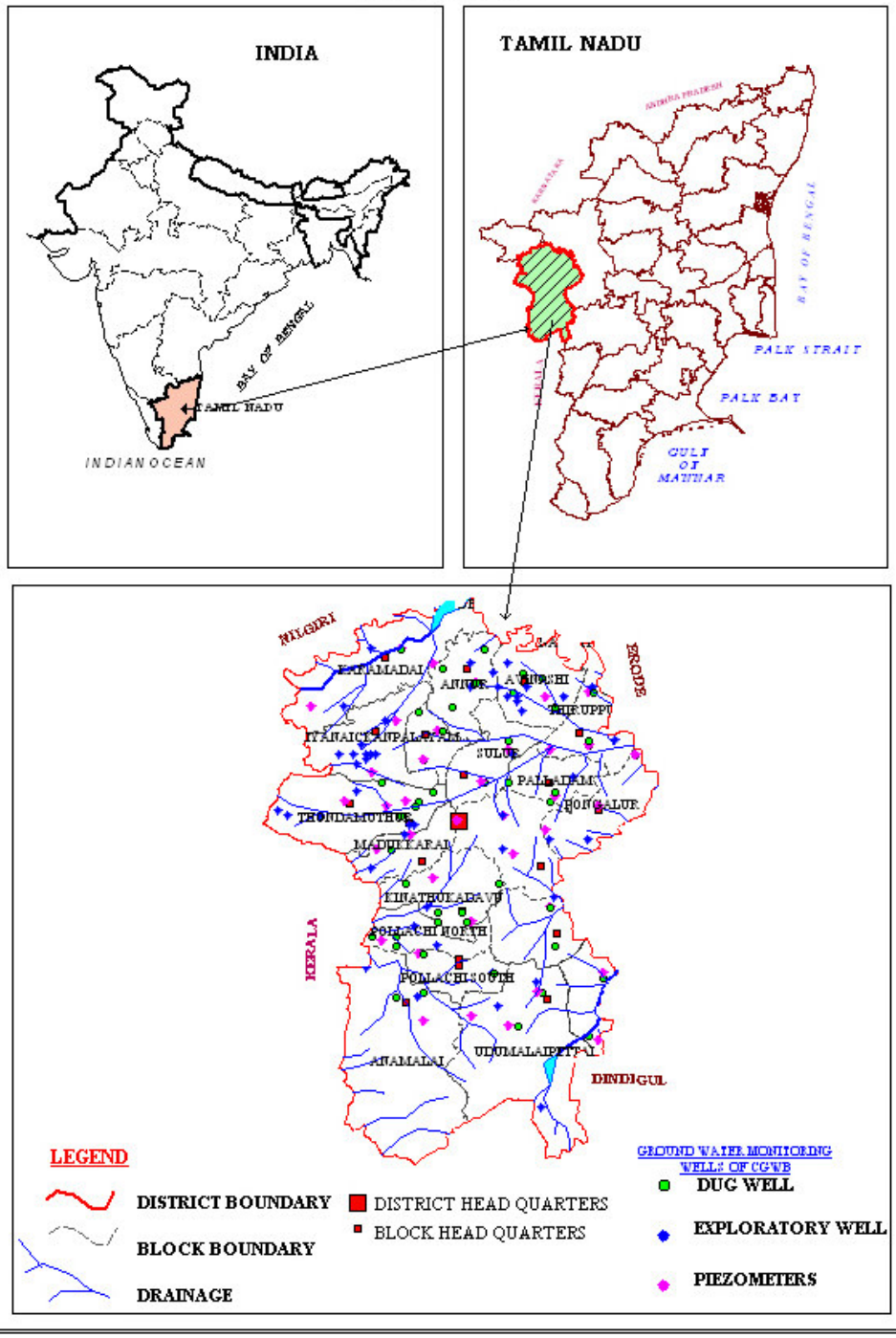


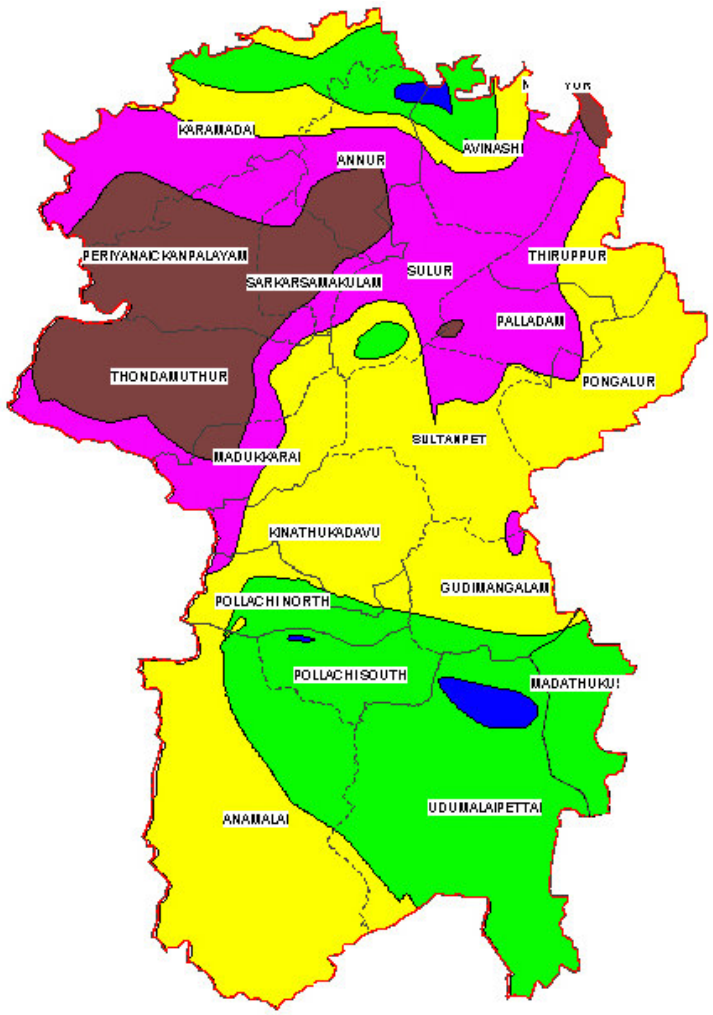
PLATE II

CENTRAL GROUND WATER BOARD, SECR, CHENNAI

COIMBATORE DISTRICT, TAMIL NADU

DEPTH TO WATER LEVEL

PREMONSOON (MAY 2006)



LEGEND

DISTRICT BOUNDARY

BLOCK BOUNDARY

DEPTH TO WATER LEVEL (m.bgl.)

0-2	2-5	5-10	10-20	>20

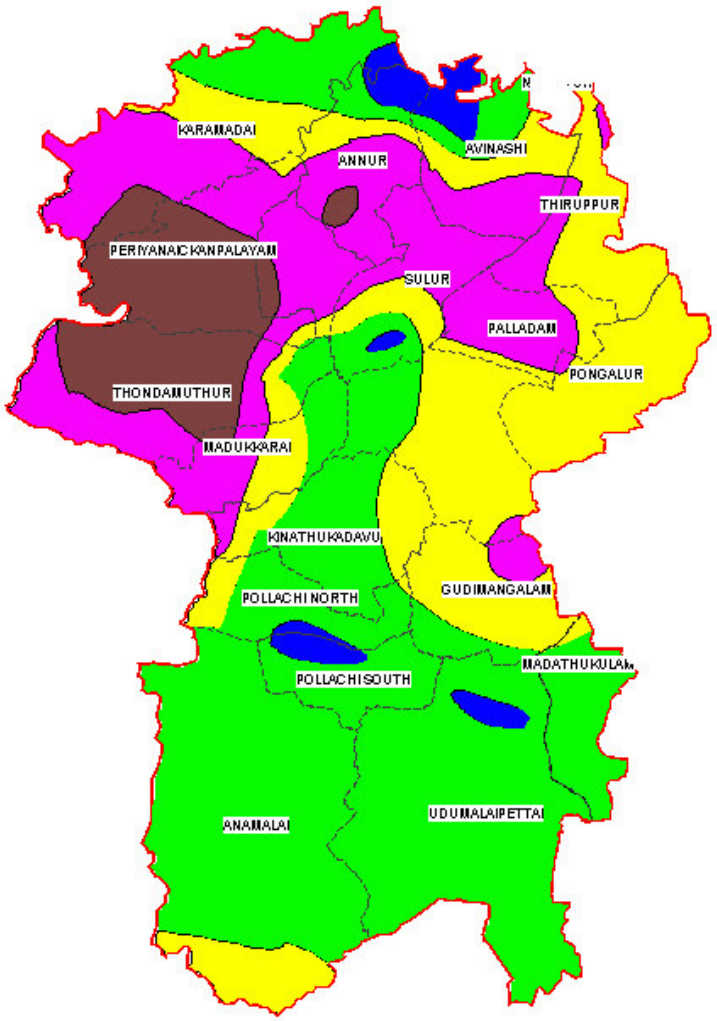
PLATE III

CENTRAL GROUND WATER BOARD, SECR, CHENNAI

COIMBATORE DISTRICT, TAMIL NADU

DEPTH TO WATER LEVEL

POSTMONSOON (JANUARY -2007)



LEGEND

DISTRICT BOUNDARY

BLOCK BOUNDARY

DEPTH TO WATER LEVEL (m.bgl.)

0-2	2-5	5-10	10 -20	>20

PLATE IV

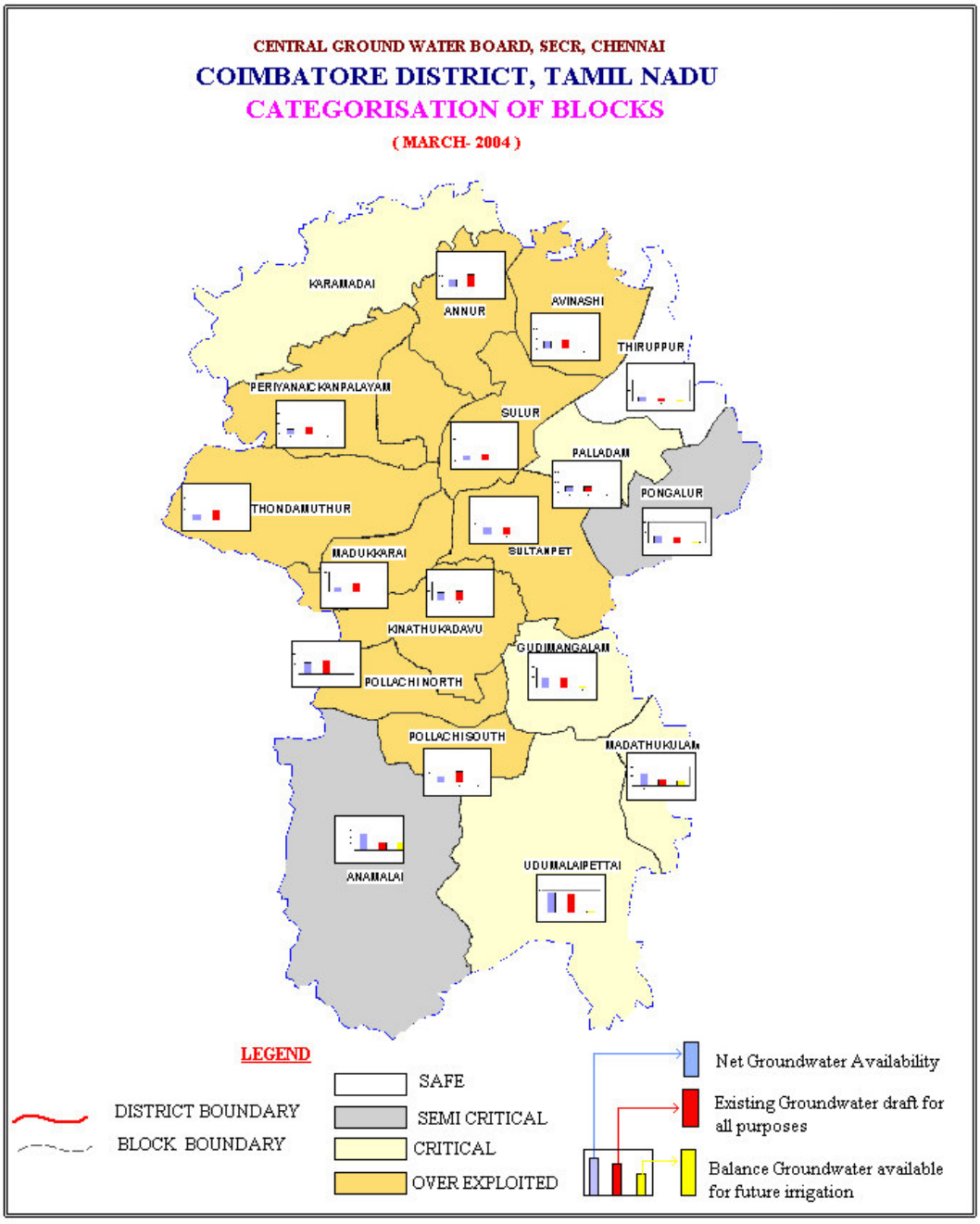

CENTRAL GROUND WATER BOARD, SECR, CHENNAI
COIMBATORE DISTRICT, TAMIL NADU
CATEGORISATION OF BLOCKS
(MARCH- 2004)
KARAMADAI
ANNUR
AVINASHI
THIRUPPUR
PERIYANAICKANPALAYAM
SULUR
PALLADAM
PONGALUR
THONDAMUTHUR
SULTANPET
MADUKKARAI
KINATHUKADAVU
GUDIMANGALAM
POLLACHI NORTH
POLLACHI SOUTH
MADATHUKULAM
ANAMALAI
UDUMALAIPETTAI
LEGEND
DISTRICT BOUNDARY
BLOCK BOUNDARY
SAFE
SEMI CRITICAL
CRITICAL
OVER EXPLOITED
Net Groundwater Availability
Existing Groundwater draft for all purposes
Balance Groundwater available for future irrigation

PLATE V

CENTRAL GROUND WATER BOARD, SECR, CHENNAI

COIMBATORE DISTRICT, TAMIL NADU

HYDROGEOLOGY

LEGEND OVER LEAF

LEGEND FOR PLATE V

ADMINISTRATIVE SETUP

STATE BOUNDARY

DISTRICT BOUNDARY

BLOCK BOUNDARY

HILLY AREA

Δ^{752} TRIANGULATION HEIGHT [elevation in m.amsl]

GROUND WATER HYDROLOGY

EXPLORATORY BORE WELL [CGWB]

HIGH YIELDING BORE WELL [CGWB]

FLORIDE > 1.5 (mg/l)

HYDROCHEMISTRY

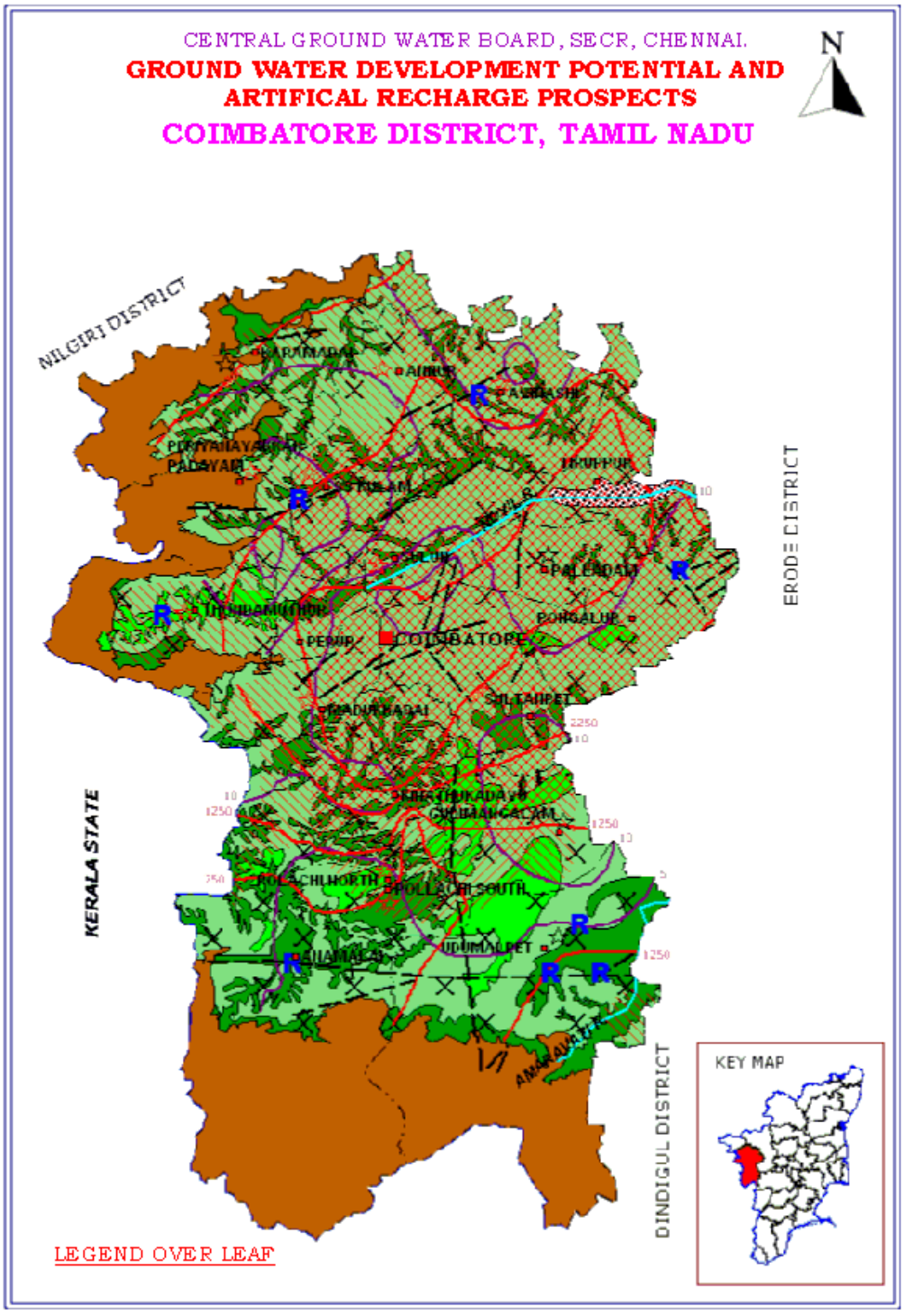
750 ISOCONS [Sp ELECTRICAL CONDUCTANCE [µs /Cm at 25° C]

STRUCTURE

TRACE OF LINEAMENT

AQUIFER	AGE	LITHOLOGY	GROUND WATER CONDITIONS	YIELD PROSPECTS (CU.M/D)	GROUND WATER DEVELOPMENT STRATEGIES
UNCONSOLIDATED	RECENT	RIVER ALLUVIUM, VALLEY FILL-DEPOSITS	DISCONTINUOUS, THIN, UNCONFINED TO SEMI CONFINED	> 200	DEVELOPMENT THROUGH LARGE DIAMETER DUG WELLS AND SHALLOW TUBE WELLS.
CONSOLIDATED	ARCHAEAN	GRANITES, GNEISSES, CHARNOCKITE.	DISCONTINUOUS, UNCONFINED TO SEMICONFINED 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

PLATE VI


CENTRAL GROUND WATER BOARD, SECR, CHENNAI.
GROUND WATER DEVELOPMENT POTENTIAL AND ARTIFICAL RECHARGE PROSPECTS
COIMBATORE DISTRICT, TAMIL NADU
N
NILGIRI DISTRICT
KERALA STATE
ERODE DISTRICT
DINDIGUL DISTRICT
COIMBATORE
PERIYANAYAKKANPALAYAM
PADAVAI
PERUR
POLLACHI NORTH
POLLACHI SOUTH
UDUMALPET
PALLADAM
SULUR
SULTANPET
KEY MAP
LEGEND OVER LEAF

LEGEND PLATE FOR VI

DISTRICT – COIMBATORE

	Wells Feasible	Rigs Suitable	Depth Of Well (M)	Discharge (LPM)	Suitable Artificial Recharge Structures
Hard Rock Aquifer	Dug Well Dug Cum Bore Well Bore Well	Manual Manual+ DTH DTH	15 – 20 20 + 75 75 – 135	10 - 60	Check Dams/ Recharge Wells & Gully Plugs
Hard Rock Aquifer	Dug Well Dug Cum Bore Well Bore Well	Manual Manual+ DTH DTH	10 – 20 15 + 80 75 – 135	60 - 120	Check Dams/ Percolation Ponds/ Farm Ponds
Hard Rock Aquifer	Dug Well Dug Cum Bore Well Bore Well	Manual Manual+ DTH DTH	10 – 16 15 + 60 60 – 120	180 -	Check Dams/ Percolation Ponds/ Farm Ponds
State Boundary				District Boundary	
Block Boundary				District Headquarters	
5 Water Level-Pre-Monsoon (Decadal Mean 1993-2002) Mbgl				Block Headquarters	
River			1250	EC In Microsiemens / Cm At 25° C	
Fluoride Greater Than Maximum Permissible Limit (1.5mg/L)				Nitrate Greater Than Maximum Permissible Limit (45mg/L)	
R Recommended Site For Artificial Recharge Structure				Industrial Pollution	
Hilly Area				Lineament	

OTHER INFORMATION

Geographical Area	7471 Sq.Km.
Number Of Blocks	19
Major Drainage	Bhavani, Noyil, Amaravathi, & Ponnani
Population (2001)	42,71,856
Average Annual Rainfall	550-900 Mm
Annual Range of Temperature	19 – 43°C
Regional Geology	**Hard rocks**: Charnockites, Granites & Gneisses
Net Ground Water Availability For Future Irrigation	Nil
Stage Of Ground Water Development As On January 2003	104 %
Name Of Blocks Showing Intensive Ground Water Development	☆ **Over Exploited**: Avinashi, Annur, Kiranthukaduru, Madukkarai, Periyanaikkanpalayam, Pollachi – North, Pollachi – South, Sarkar Samakulam, Sulthanpet, Sulur And Thondamuthur ☆ **Critical**: Gudimangalam, Karamadai, Palladam And Udumalpet

SAVE WATER

AND

CONSERVE WATER

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