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Technical Report Series

DISTRICT GROUNDWATER BROCHURE NAMAKKAL DISTRICT, TAMIL NADU

By

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**Government of India
Ministry of Water Resources
Central Ground Water Board
South Eastern Coastal Region
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DISTRICT AT A GLANCE (NAMAKKAL DISTRICT)

S.NO	ITEMS	STATISTICS	
1.	GENERAL INFORMATION		
	i. Geographical area (Sq. Km)	3363	
	ii. Administrative Divisions AS on (31-3-2007)		
	Number of Tehsils	04	
	Number of Blocks	15	
	Number of Panchayats	331	
	Number of Villages	454	
	iii. Population (As on 2001 Censes)		
	Total Population	14,95,661	
	Male Population	7,60,409	
	Female Population	7,35,252	
	iv. Average Annual Rainfall (mm)	650 – 900 (1901 - 2001)	
2.	GEOMORPHOLOGY		
	i. Major physiographic Units	Upland plateau region with hill ranges and undulating plain.	
	ii. Major Drainages	Cauvery, Tirumanimutar, Vasista and Sweta.	
3.	LAND USE (Sq. Km)		
	i. Forest area	439	
	ii. Net area sown	1765	
	iii. Cultivable area	48	
4.	MAJOR SOIL TYPES	Red soil, black soil, Brown soil, Alluvial soil & mixed soil.	
5.	AREA UNDER PRINCIPAL CROPS IN Ha. (AS ON 31.3.2007)		
		Paddy	18832 (9.20%)
		Ground nut	47639 (23.0%)
		Sugarcane	13278 (6.4%)
		Fodder	38010 (18.5%)
6.	IRIGATION BY DIFFERENT SOURCES	Number	Area irrigated
	i. Dug wells	75961	40879
	ii. Tube wells/ Bore wells	5144	21730
	iii. Tanks/Ponds	259	799
	iv. Canals	3	4915
	v. Other Sources	NA	5995
	vi. Net irrigated area	74318	
	vii. Cross irrigated area	88146	
7.	NUMBERS OF GROUND WATER MONITORING STATIONWELLS OF CGWB (AS ON 2007)		
	i. No of dug wells	22	
	ii. No of piezometers	08	
8.	PREDOMINANT GEOLOGICAL FORMATIONS	Alluvium, Colluvium, Laterite, Granite, Dolerite, Quartzite, Charnockite and Granite Gneiss.	

9.	HYDROGEOLOGY	
	i. Major water bearing formations	Alluvium, Colluvium, weathered & fractured Granite Gneiss, Charnockite.
	ii. Pre- monsoon depth to water level (2006)	1.20 – 14.33
	iii. Pre- monsoon depth to water level (2006)	0.86 - 16.60
	iv. Long term water level trend in 10 years (1997-2006) in m/yr	Rise (m/year) Fall (m/year)
		Min.-0.0335 Min.-0.0186
		Max.-0.6159 Max.-0.9738
10.	GROUND WATER EXPLORATION BY CGWB (As on 31-03-2007)	
	i. Number of Exploratory wells drilled	14
	ii. Number of Observation wells drilled	07
	iii. Number of Piezometers drilled under HP.	13
	iv. Depth range (m)	76.61 – 300.00
	v. Discharge (Litres per second)	0.50 – 15.26
	vi. Specific capacity (Lpm/m)	4.491-57.85
	vii. Transmissivity (m ² /day)	2 – 45
11.	GROUND WATER QUALITY	
	i. Presence of chemical constituents more than permissible limit	TH as Ca CO ₃ , NO ₃ , F
	ii. Type of water	NaCl & mixed type
12.	DYNAMIC GROUND WATER RESOURCES (2004) in mcm	
	i. Annual Replenishable Ground Water Resources	493.51
	ii. Net Annul Ground Water Draft	514.31
	iii. Projected demand for Domestic and Industrial Uses upto 2025	24.47
	iv. Stage of Ground Water Development	106 %
13.	AWARENESS AND TRAINING ACTIVITY	
	i. Mass Awareness Programme Organized	
	Year	2001 - 2002
	Place	Rasipuram
	No of Participants	350
	ii. Water Management Training Organized	
	Year	2001 - 2002
	Place	Rasipuram
	No of Participants	25

14.	EFFORTS OF ARTIFICIAL RECHARGE & RAINWATER HARVESTING	
	i. Projects completed by CGWB Number of structures Amount spent	Construction of Subsurface Dyke at Kunavelampatti under Central Sector Scheme Amount – Rs 1.26 Lakhs
	ii. Projects under technical guidance of CGWB Number of structures	Nil
15.	GROUND WATER CONTROL AND REGULATION	
	i. Number of OE Blocks	08
	ii. Number of Critical Blocks	02
	iii. Number of Blocks Notified	Nil
16.	MAJOR GROUND WATER PROBLEMS AND ISSUS	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. (Sago industries)

1.0 INTRODUCTION

1.1 Administrative Details

Namakkal district is divided into 5 taluks. The taluks are further divided into 15 blocks, which further divided into 391 villages.

Administrative Set-up of Namakkal District					
S.No.	Taluk	Area (Sq.km)	No.of Villages	Block	No.of Villages
1	Namakkal	1244.6	117	Namakkal	23
				Puduchatram	30
				Sendamangalam	17
				Erumaipatti	25
				Kolli Hills (Part)	7
				Mohanur (Part)	15
2	Paramathi Velur	523.06	60	Paramathi	23
				Mohanur (Part)	11
				Kabilarmalai	26
3	Rasipuram	817.48	102	Rasipuram	25
				Vennandur	30
				Namagiripet	38
				Kolli Hills (Part)	9
4	Tiruchengode	844.16	112	Tiruchengode	38
				Mallasamudram	27
				Elachipalayam	29
				Pallipalayam	18
	Total	3429.3	391		391

(Source: Office of the Assistant Director of Statistics, Namakkal)

1.2 Basin and sub-basin

The district is falling in part of east flowing Cauvery and Vellar river basins as per the Irrigation Atlas of India. Tirumanimuttar, Vasista and Sweta are the important minor basins.

1.3 Drainage

Cauvery river, which is perennial in nature, flows along the western and southern boundaries of the district. Tirumanimuttar river, which is the most important tributary of Cauvery in the district, has its origin in Manjavadi area of *Shevroy* hills in Salem district and traverses the district before its confluence with Cauvery at Nanjai Edayar village of Paramathi taluk. A small area in the northeastern part, which is drained mainly by *Vasista Nadi* and *Sweta Nadi* rivers, which are tributaries of *Vellar* River.

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	43909
2	Barren & Uncultivable Lands	24743
3	Land put to non agricultural uses	38302
4	Cultivable Waste	4781
5	Permanent Pastures & other grazing lands	6684
6	Groves not included in the area sown	3854
7	Current Fallows	28375
8	Other Fallow Lands	9143
9	Net Area sown	176544
	Total	336335

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

The data available indicate that an area of about 74318 ha (22%) is under irrigated agriculture. Dug wells are the major source of water for irrigation in the district, accounting for about 55% of the total area irrigated in the district. Tube wells accounting for about 29% of the total area irrigated in the district. Canals and tanks account for about 8% each.

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	Elachipalayam	0.00	0.00	2410	1506	0.00	3916
2	Erumaipatti	0.00	1268	1120	5622	218	8228
3	Kabilarmalai	3149	0.00	0.00	3507	3050	9706
4	Kolli hills	0.00	0.00	6.00	0.00	788	794
5	Mallasamudram	0.00	2724	142	1567	0.00	4433
6	Mohanur	412	206	757	5318	8.00	6701
7	Namagiripet	0.00	0.00	291	4893	20.00	5204
8	Namakkal	0.00	0.00	96	1667	0.00	1763
9	Pallipalayam	1209	0.00	296	2383	986	4874
10	Paramathi velur	337	0.00	95	5983	0.00	6415
11	Puduchatram	0.00	0.00	258	4059	0.00	4317
12	Rasipuram	0.00	0.00	496	1711	0.00	2207
13	Sendamangalam	0.00	0.00	130	5413	1057	6600
14	Thiruchengode	1040	0.00	406	4564	0.00	6010
15	Vennandur	0.00	0.00	242	2908	0.00	3150
		6147	4198	6745	51101	6127	74318

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

1.5 Studies/Activities carried out by CGWB

Central Ground Water Board completed systematic surveys in 1982-83 and District Ground Water Management studies were taken up during 1990-92 and subsequently in 2000-01. 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 1985-86 and 1990-91. 17 exploratory wells and 9 observation wells in the depth range of 76 to 300 m. bgl were drilled for this purpose in the district. In 2004-05, 12 exploratory wells were constructed by Central Ground Water Board for drought mitigation through out-sourcing.

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.

CGWB is monitoring the groundwater regime for the changes in water level and water quality through 22 dug wells and 8 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 with time.

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. Most of the precipitation occurs in the form of cyclonic storms caused due to the depressions in Bay of Bengal. The southwest monsoon rainfall is highly erratic 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 640 mm to 880 mm. It is the minimum around Paramathi (640.50 mm) in the southwestern part of the district. It gradually increases towards north, northeast and east and attains a maximum around Rasipuram (880.5 mm) in the northern part.

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 hot weather begins early in March, the highest temperature being felt in April and May. Weather cools down progressively from about the middle of June and by December, the mean daily maximum temperature drops to 30.2°C, while the mean daily minimum drops to 19.2°C and 19.6°C in January in Salem and Mettur Dam

respectively. Though the maximum temperatures in February are about the same as in July, the nights are much cooler in February.

Being an interior district, the diurnal range of temperature is large, particularly in the dry and hot seasons. In February-March the mean diurnal range of temperature is as high as 13.7°C while in October-November it is only about 9°C.

3.0 GEOMORPHYLOGY AND SOIL TYPES

3.1 Geomorphology

Namakkal district forms part of the upland plateau region of Tamil Nadu with many hill ranges, hillocks and undulating terrain with a gentle slope towards east.

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

A number of hill ranges are located in the eastern and northeastern parts of the district, whereas the southern, western and northern parts of the district are plain to undulating, dotted with a few isolated hillocks. The important hill ranges in the district are *Kollimalai* hills, *Bodamalai* hills, *Naraikinaru* hills and *Pachamalai* hills. The highest peak in the district is the *Kollimalai* hill peak with an elevation of 1293 m. above MSL. Other important peaks are *Kedda Malai* (1284 m) and *Melur* hill in the Bodamalai hill range.

3.2 Soils

The soils of Namakkal district can be broadly classified into 5 major soils types viz., Red Soil, Black Soil, Brown soil, Alluvial and Mixed Soil. Major part of the district covered by Red Soil. Block soils are mostly seen in Namakkal taluk. Brown Soil occupies only a small portion of Tiruchengode taluk and the Alluvial Soil is seen along the river courses in Namakkal, Paramathi and Tiruchengode taluks. Mixed soil is the second major soil type occurring all the taluks of the districts

4.0 GROUND WATER SCENARIO

4.1 Hydrogeology

Namakkal district is underlain entirely by Archaean Crystalline formations with Recent alluvial deposits occurring along the river courses and Colluvium at the foot hills. The important aquifer systems in the district are constituted by weathered & fractured crystalline rocks and Colluvial deposits.

The porous formations in the district are represented by alluvium and colluvium. The alluvial deposits are confined to the major river courses only. Ground water occurs under phreatic conditions. The maximum saturated thickness of these aquifers is up to 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 up to 20 m depending upon the topographic conditions. Ground water occurs under phreatic conditions.

The hard consolidated crystalline rocks of Archaean age represent weathered and fractured formations of Granite Gneiss, Granite, Charnockite 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 weathered zone in the district ranges from <1m to 30m. 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 dug wells ranged from 7 to 45m bgl. The yield of the open wells range from <50 to 200 m³/day in weathered crystalline rocks and up to 400 m³/day in Recent alluvial formations along major drainage courses.

The Specific capacity of large diameter wells tested in crystalline rocks from 59 to 270 lpm/m of drawdown. The yield characteristics of wells vary considerably depending on the topographic set-up, lithology and the degree of weathering

The yield of bore wells drilled down to a depth of 40 to 100 m, by various state agencies mainly for domestic purposes ranged from 90 to 360 litres per hour (<1 lps). 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 <1 to 15 lps. The aquifer and well parameters of the wells show wide variation.

The depth to water level in the district varied between 1.20 – 14.33 m bgl during pre-monsoon depth to water level (May 2006) and varied between 0.86 – 16.60 m bgl during post monsoon depth to water level (Jan 2007). The seasonal fluctuation shows a rise in water level, which ranges from 0.03 to 3.51 m bgl. The piezometric head varied between 1.35 to 9.40 m bgl (May 2006) during pre-monsoon 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 both rise and fall in water level in different parts of the district. The rise is of the order of 0.0335 - 0.6159 m/year, while the fall in water level range between 0.0186 - 0.9738 m/year.

4.1.2 Aquifer Parameters

Aquifer Parameters	Weathered Residuum	Fractured Aquifer
Transmissivity (m ² /day)	<1 - 100	2 -106
Storativity	-	9.6 x 10 ⁻⁵ - 4.3 x 10 ⁻²
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. The computation of ground water resources available in the district has been done using GEC 1997 methodology.

Stage of Groundwater Development in Namakkal District as on 31st March 2004									
									(in Ham)
S.No	Name of Groundwater Assessment Unit (Block): District/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 upto next 25 years (2029)	Net groundwater Availability for future Irriation Development	Stage of Groundwater Development
1	Namakkal	Elachipalayam	2032.64	510.11	143.19	653.30	148.41	1374.12	32
2	Namakkal	Erumaipatti	3504.73	4627.15	167.39	4794.54	173.49	-1295.91	137
3	Namakkal	Kabilarmalai	6091.86	4804.02	172.77	4976.79	179.07	1108.77	82
4	Namakkal	Kolli Hills	2501.90	0.00	15.02	15.02	15.57	2486.33	1
5	Namakkal	Mallasamudram	1788.35	1637.01	127.99	1765.00	132.66	18.68	99
6	Namakkal	Mohanur	4776.78	3598.63	183.81	3782.44	190.52	987.63	79
7	Namakkal	Namagiripettai	4490.32	6712.28	201.03	6913.31	208.36	-2430.32	154
8	Namakkal	Namakkal	2258.51	2176.82	171.77	2348.59	178.03	-96.35	104
9	Namakkal	Pallipalayam	4210.65	4089.47	310.14	4399.61	321.45	-200.27	104
10	Namakkal	Paramathi	5722.13	5136.98	156.48	5293.47	162.19	422.96	93
11	Namakkal	Puduchatram	2038.64	2278.74	154.94	2433.69	160.59	-400.70	119
12	Namakkal	Rasipuram	1729.93	3077.25	134.35	3211.60	139.25	-1486.57	186
13	Namakkal	Sendamangalam	2844.83	4696.52	144.87	4841.39	150.15	-2001.84	170
14	Namakkal	Tiruchengodu	2943.24	2362.77	150.57	2513.34	156.06	424.41	85
15	Namakkal	Vennandur	2416.64	3362.05	126.90	3488.95	131.53	-1076.94	144
	Total		49351.15	49069.81	2361.24	51431.05	2447.34	-2166.00	104

4.3 Ground Water Quality

Ground water in phreatic aquifers in Namakkal district is in general colorless, odorless and predominantly alkaline in nature. The specific electrical conductance of ground water in phreatic zone (in Micro Seimens at 25° C) during May 2006 was in the range of 1300 to 7080 in the district. It is between 2000 and 4000 $\mu\text{S}/\text{cm}$ at 25°C in the major part of the district.

It is observed that only in selected places of the district, the ground water is suitable for drinking and domestic uses in respect of all the constituents. The total Hardness as CaCO_3 as well as nitrate is observed to be in excess of permissible limits in about 66 and 86 percent of samples analysed. Fluoride in excess of the drinking water limit of 1.5 mg/l is observed in 30 percent of the samples. In about 14 percent of the samples sulphates was in excess of the drinking water limit of 400 mg/l. The incidence of high total hardness and fluoride 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 and other improper waste disposal. Excess of fluoride is observed in places such as Venandur, Udaiyarpalayam, Talamabadi, V.G.Patti and Mohanur.

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 8 blocks are over exploited and 2 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 as in March 2007 is furnished below

Total Number of Rural Habitants	:	2875
Not Covered	:	395 (0-9 LPCD)
Partly Covered	:	1422 (10-39 LPCD)
Fully Covered	:	1058 (>40 LPCD)

The habitants of 5 Municipalities of the district are provided with 70 - 90 LPCD water and the habitants 19 Special Panchayats are provided with 20 – 70 LPCD water. 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 m^3/day in weathered crystalline rocks and up to 400 m^3/day in Recent alluvial formations along major drainage courses.

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 favourable locations by construction of extension bores, which are 40 to 70m 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 whereas large diameter dug wells with radials is suitable for alluvial areas. The map showing the development prospects for the district is shown in Plate VI.

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 when compared to many other districts in the state. 10 out of 15 blocks in the district have been categorized as either 'overexploited' or 'critical'. The trend analyses of historical ground water level data also indicate a long-term fall in a major part of the district. Based on the factors mentioned, it is inferred that a major 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 and decrease in yield of bore wells.

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. Tamil Nadu Water Supply and Drainage (TWAD) Board have provided a number of villages in the district with fluoride-free drinking water supplies. Excessive use of fertilisers and pesticides in agriculture has also reportedly resulted in localised enrichment of nitrate and other harmful chemicals in the ground water, especially in the phreatic zone.

Pollution of ground water due to Sago industry is also one of the issues in the district. The effluents from which have caused local pollution of surface and ground water resources.

7.0 MASS AWARENESS & TRAINING ACTIVITY

7.1 Mass Awareness Campaign (MAP) & Water Management Training Programme (WMTP) by CGWB

One Mass Awareness Campaign on "Ground Water Management, Regulation & Conservation" was organized at Rasipuram in Namakkal district.. The programme was organized on 06.03.2003 and about 300 people participated in the programme.

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

One Water Management Training Programme (WMTP) was organized on "Water Management" at Rasipuram. 25 officers attended the training from various State Government agencies, Representatives of Panchayat Administration, Farmers Association, etc.

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. Erumapetti
2. Namagiripettai
3. Namakkal
4. Pallipalayam
5. Puduchatram
6. Rasipuram
7. Sendamangalam
8. Vennandur

9.0 RECOMMENDATIONS

The development of ground water has already reached an alarming stage in many blocks of this district and further development of ground water for creation of additional irrigation potential has to be carried out with extreme caution.

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

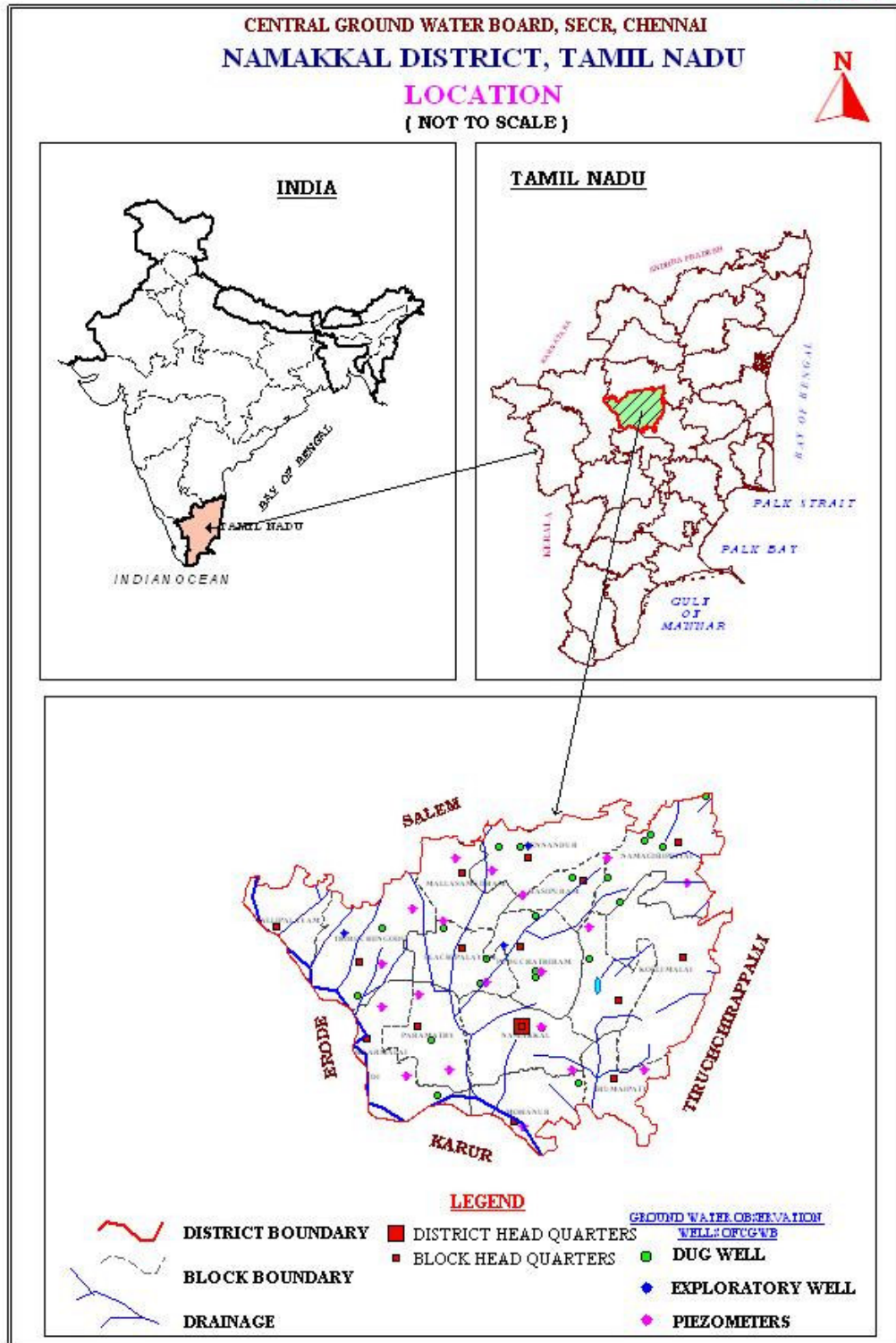


PLATE II

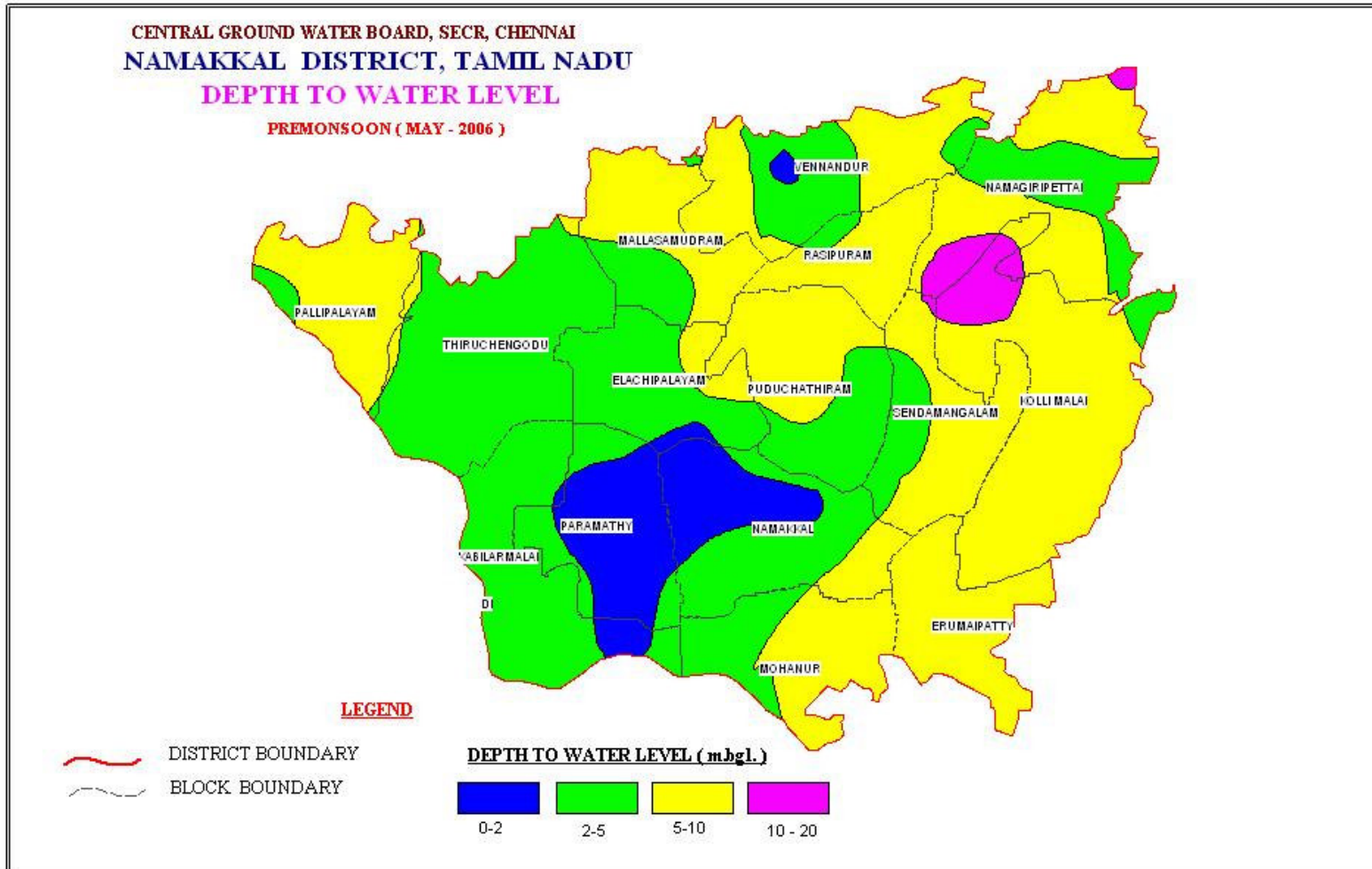


PLATE III

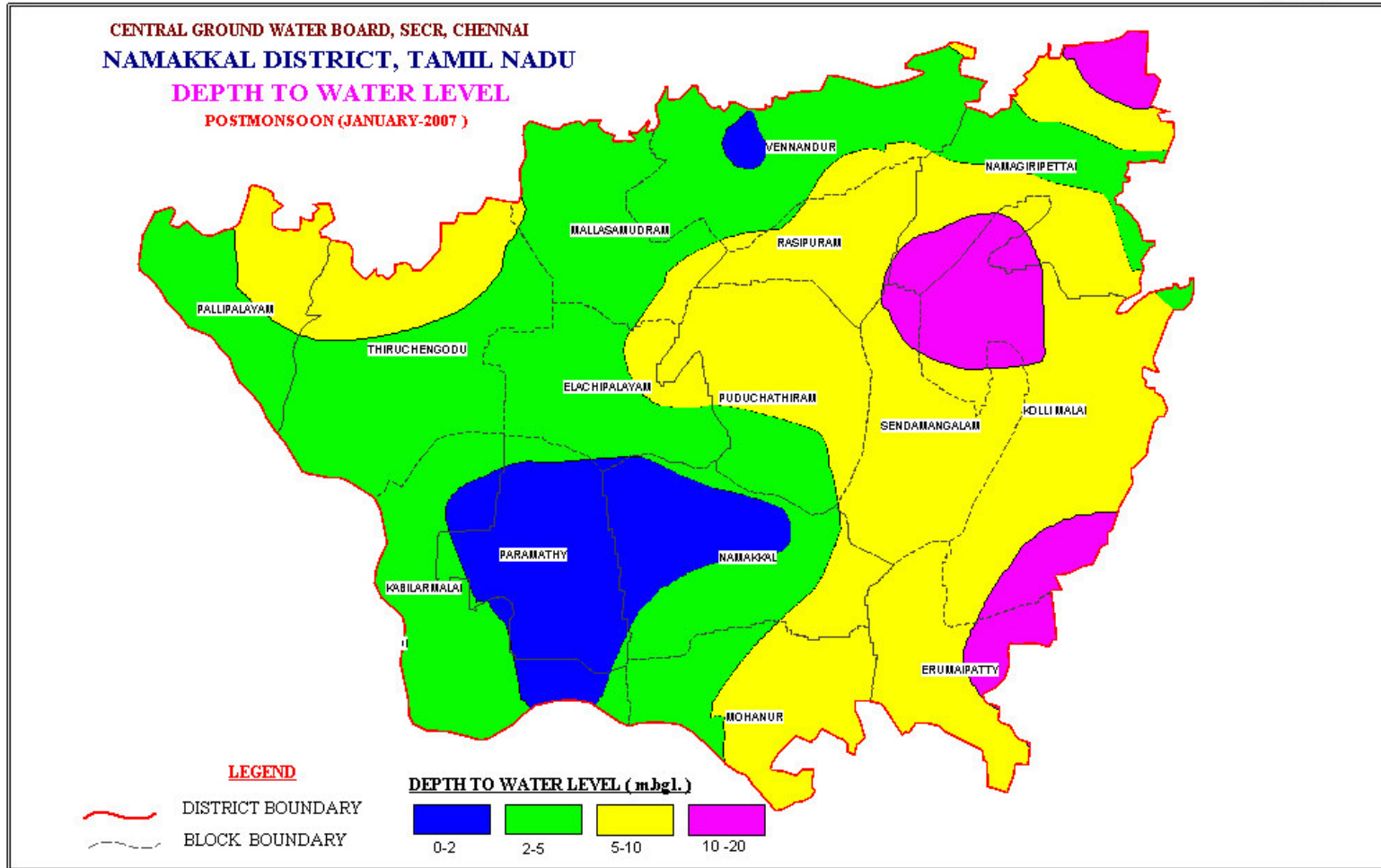


PLATE IV

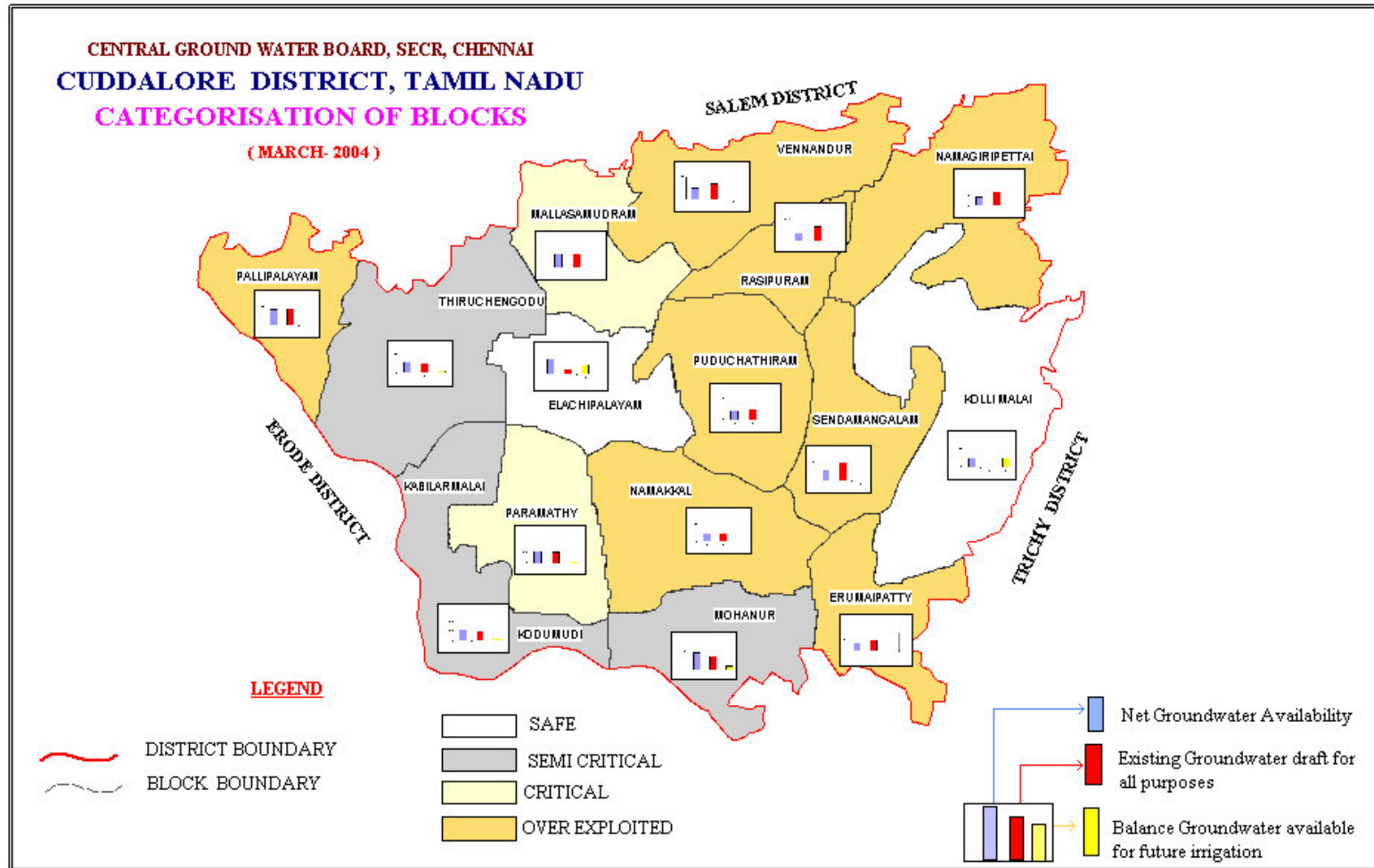
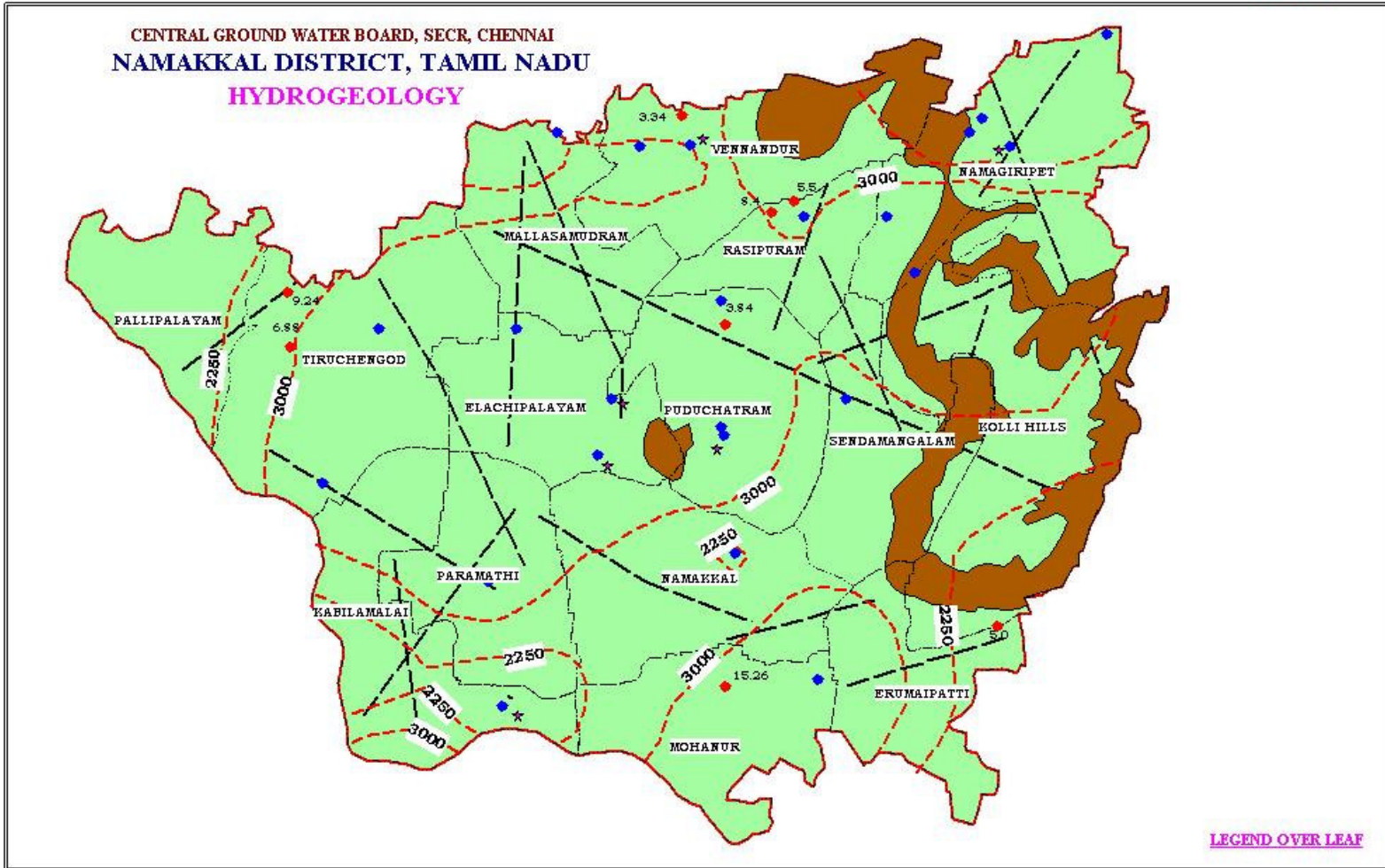






PLATE V






LEGEND FOR PLATE V

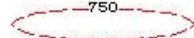
ADMINISTRATIVE SETUP

-  DISTRICT BOUNDARY
-  BLOCK BOUNDARY
-  HILLY AREA
-  TRIANGULATION HEIGHT
[elevation in m.amsl]


GROUND WATER HYDROLOGY

-  EXPLORATORY BORE WELL [CGWB]
- 3.34**  HIGH YIELDING BORE WELL [CGWB]
-  FLORIDE > 1.5 (mg/l)

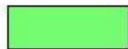
HYDROCHEMISTRY

 ISOCONS [Sp ELECTRICAL CONDUCTANCE [$\mu\text{s} / \text{Cm}$ at 25° C]

STRUCTURE

 TRACE OF LINEAMENT

AQUIFER



CONSOLIDATED

AGE

ARCHAIC

LITHOLOGY

GRANITES, GNEISSES,
CHARNOCKITE.

**GROUND WATER
CONDITIONS**

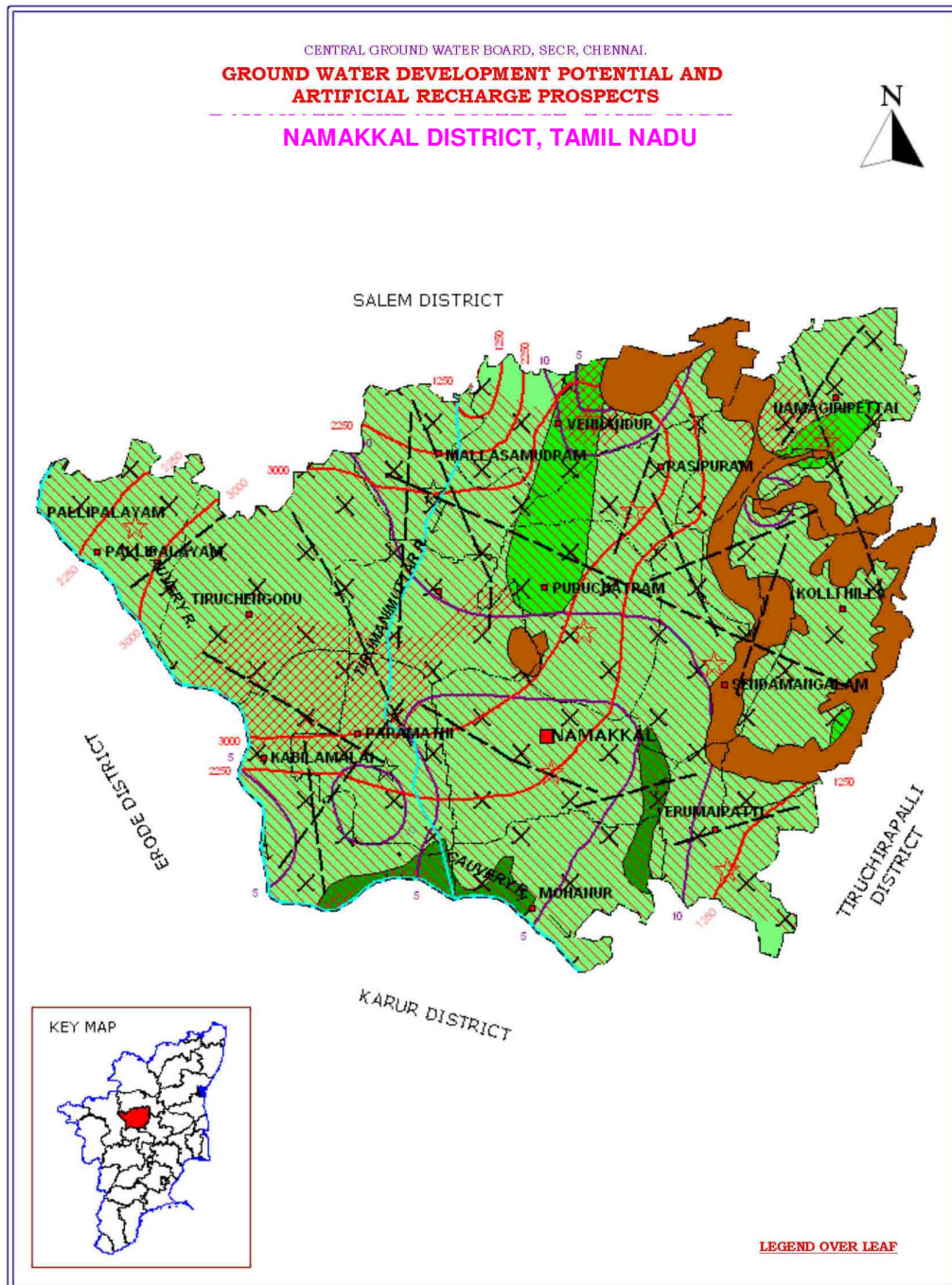
DISCONTINUOUS,
UNCONFINED TO
SEMICONFINED
AQUIFERS, RESTRICTED
TO WEATHERED
RESIDUUM
AND FRACTURES

**YIELD
PROSPECTS
(CU.M/D)**















= 50 NEAR
WATERSHED
DIVIDES & HIGH
GROUNDS. 50 - 200
NEAR THIRD ORDER
STREAMS AND LOW
GROUNDS.

**GROUND WATER
DEVELOPMENT
STRATEGIES**

SUITABLE FOR
DEVELOPMENT
THROUGH DUG
WELLS, BOREWELLS
FEASIBLE IN FRACTURE
ZONES, BEST LOCATIONS
BEING INTERSECTION
OF FRACTURES



LEGEND PLATE FOR VI
DISTRICT – NAMAKKAL

	Wells Feasible	Rigs Suitable	Depth Of Well (M)	Discharge (LPM)	Suitable Artificial Recharge Structures
 Hard Rock Low Yield	Dug Cum Bore Well Bore Well	Manual DTH	100 – 150	10 - 60	Check Dams/Recharge Wells/ Gully Plugs
 Hard Rock Med Yield	Dug Cum Bore Well Bore Well	Manual DTH	100 – 150	60 - 100	Check Dams/ Percolation Ponds/ Farm Ponds
 Hard Rock High Yield	Dug Cum Bore Well Bore Well	Manual+ DTH DTH	10 - 20 30 - 100	150 -200	Check Dams/ Percolation Ponds/ Farm Ponds /Gully Plugs
	District Boundary			Block Boundary	
	District Headquarters			Block Headquarters	
	Water Level Pre-Monsoon (Decadal Mean 1993-2002) Mtgl			EC In Microsiemens / Cm. At 25° C	
	River			Liream art	
	Fluoride Greater Than Maximum Permissible Limit (1.5mg/L)			Nitrate Greater Than Maximum Permissible Limit (45mg/L)	
	Hilly Area				

OTHER INFORMATION

Geographical Area	3363 Sq.Km .
Number Of Blocks	15
Major Drainage	Caavery
Population (2001)	14,95,661
Average Annual Rainfall	650-900 mm
Annual Range Of Temperature	19 - 37°C
Regional Geology	Hard Rocks: Charnodites and Gneisses
Net Ground Water Availability For Future Irrigation	Nil
Stage Of Ground Water Development As On January 2003	104 %
Names Of Blocks Showing Intensive Ground Water Development	<p>★ Over Exploited: Eruaipatti, Namagiripettai, Namakkal, Pallipalayam, Puthuchatram, Rasipuram, Sengamangalam, Verumandir</p> <p>☆ Critical: Mallasamudram & Paramathi</p>

SAVE WATER
AND
CONSERVE WATER