For official use

Technical Report Series

DISTRICT GROUNDWATER BROCHURE

THIRUVARUR DISTRICT,

TAMIL NADU

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Government of India
Ministry of Water Resources

Central Ground Water Board

South Eastern Coastal Region
Chennai

November 2008

DISTRICT AT A GLANCE (THIRUVARUR)

S. No.	ITEMS	STATISTICS	
1.	**GENERAL INFORMATION**		
	i. Geographical area (Sq. km.)	**2097.97**	
	ii. Administrative Divisions (As on 31-3-2007)		
	1. Number of Taluks	7	
	2. Number of Blocks	10	
	3. Number of Panchayats/Town Panchayats/Municipalities	10 / 7 / 4	
	4. Number of Villages	573	
	iii. Population (2001 Census)		
	Total Population	1,169,474	
	Male	5,80,784	
	Female	5,88,690	
	iv. Average Annual Rainfall (mm) (1901-2000)	1184	
2.	**GEOMORPHOLOGY**		
	i. Major physiographic Units	1. Deltaic plain, 2. Pediment and buried pediment 3. Natural levee- swale, 4. Lagoon/Backwater Coastal plain and 5. Beach and Beach ridges	
	ii. Major Drainages	Vennar and Vettar	
3.	**LAND USE (Sq. km.) (2005-06)**		
	i. Forest area	24.52	
	ii. Net area sown	1532.27	
	iii. Cultivable waste	18.96	
4.	**MAJOR SOIL TYPES**	Alluvial soil	
5.	**AREA UNDER PRINCIPAL CROPS (Ha.) (2005-06)** (Figures given in the bracket are % of Total geographical area)	1.Paddy –156098 (74.4%) 2. Oil seeds-9772 (4.6%) 3. Cocunut-5371 (26%) 4. Sugarcane-3722 (2%)	
6.	**IRRIGATION BY DIFFERENT SOURCES (2005-06)**	**Number**	**Area irrigated (Ha.)**
	i. Dug wells	31256	-
	ii. Tube wells	8	-
	iii. Tanks	34	-
	iv. Canals	13	147564

	v. Other Sources	-	-
	vi. Net irrigated area	147564 (Ha)	
	vii. Gross irrigated area	165362 (Ha.)	
7.	**NUMBER OF GROUND WATER MONITORING WELLS OF CGWB (As on 31.03.2007)**		
	i. Dug wells	11	
	ii. Piezometers	1	
8.	**PREDOMINANT GEOLOGICAL FORMATIONS**	Recent and Tertiary formations	
9.	**HYDROGEOLOGY**		
	i. Major water bearing formations	Alluvium, sand stone, sand,	
	ii. Pre- monsoon depth to water level (May 2006)	3.07 - 7.01 m bgl	
	iii. Post- monsoon depth to water level (Jan. 2007)	0.37 – 4.71 m bgl	
	iv. Long term water level trend in 10 years (1998-2007) (m/yr)	**Annual**	
		Rise	**Fall**
		Min.: Nil Max: Nil	Min.: 0.0368 Max :0. 4262
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 Hydrology Project-I	8 NIL NIL	
	iv. Depth range (m)	280-666	
	v. Discharge (lps)	3.4 – 63.20	
	vi. Storativity (S)	$4.67x10^{-10}$	
	vii. Transmissivity (m^2/day)	8-1672	
11.	**GROUND WATER QUALITY (As on May 2006)**		
	i. Presence of chemical constituents more than permissible limit	Total hardness & Cl	
	ii. Type of water	Nacl, $MgCl_2$ mixed	
12.	**DYNAMIC GROUND WATER RESOURCES (As on 31.03.2004) (MCM)**		
	i. Annual Replenish able Ground Water Resources	324.37	
	ii. Total Annul Ground Water Draft for all purposes	268.03	
	iii. Projected demand for Domestic and Industrial Uses up to 2025	19.01	
	iv. Stage of Ground Water Development (%)	83	
13.	**AWARENESS AND TRAINING ACTIVITY**		
	i. Mass Awareness Programs Organized	Nil	
	ii. Water Management Training Organized	Nil	

14.	**EFFORTS OF ARTIFICIAL RECHARGE & RAINWATER HARVESTING**	Technical Guidance were provided as and when sought
15.	**GROUND WATER CONTROL AND REGULATION**	
	i. Number of OE Blocks	1
	i. Number of Critical Blocks	1
	ii. Number of Blocks Notified	Nil
16.	**MAJOR GROUND WATER PROBLEMS AND ISSUES**	The ground water in the phreatic zone in the major part of the district is of medium to high salinity. The high temperature in tube well giving fresh/ brackish water is not suitable for raising paddy nursery.

1.0. INTRODUCTION

1.1 Administrative details

Thiruvarur district has been divided into 7 taluks, 10 blocks and 573 villages for the administrative convenience (Plate-I). The details of number of blocks and villages falling in each taluk are given in the table below.

S. No.	Taluk	No. of Villages	Block`	No. of villages
1	Kodavasal	106	1. Kodavasal	60
			2. Koradacheri	58
2	Nannilam	73	1. Nannilam	61
3	Valangaiman	71	1. Valangaiman	71
4	Thiruvarur	48	1. Thiruvarur	48
5	Mannargudi	128	1. Mannargudi	83
			2. Kottur	56
6	Thiruthuraipoondi	77	1. Thiruthuraipoondi	42
			2. Muthupetai	35
7	Needamangalam	70	1. Needamangalam	59
Total		**573**		**573**

1.2 Basin and Sub-basin

The district falls in Cauvery sub-basin. The tributaries of the river Cauvery are; Vennar, Vettar and Bamini rivers.

1.3 Drainage:

The Vennar and Vettar rivers play an important role in draining the district. There are 13 irrigation canals branching from these rivers. There are 34 irrigation tanks, which serve as major source of irrigation the district. Out of 34 tanks in the district Mannargudi taluk accounts for 22, followed by Thiruthuraipoondii. Surface water canals are the major sources of irrigation water accounting for about 89 percentage of the area irrigated in the district, whereas dug wells and tube wells accounts for 11 percentages.

1.4 Irrigation practices:

The nine-fold land use classification (2005-06) for the district is given below

S. No.	Classification	Area (Ha)
1	Forest	2452
2	Barren and uncultivable land	113
3	Non-agriculture uses	37059
4	Cultivable waste	1896
5	Pastures and grassing land	768
6	Miscellaneous trees and grasses	2132
7	Current Fallows	5709
8	Other Fallow lands	6353
9	Net area sown	153227
Total		**209709**

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

The main source of irrigation in the district is canals. Canal irrigation is highest in the Mannargudi block, which is followed by Needamangalam block. The block-wise gross area irrigated by canal is given in Table below.

S. No.	Block	Gross area irrigated by canals (Ha)
1	Thiruvarur	10209
2	Nannilam	16334
3	Kodavasal	14721
4	Koradacheri	12641
5	Valangaiman	16867
6	Mannargudi	24619
7	Kottur	19073
8	Needamangalam	22589
9	Thiruthuraipoondi	15418
10	Muthupetai	12891
Total		**165362**

(Source: Dept. of Economics and Statistics, Govt. of Tamil Nadu)

1.5 Studies/Activities carried out by CGWB

Ground water Exploration by test drilling, construction and testing of wells was first carried out in the composite Tanjore district during the year 1957-58 jointly by Groundwater Wing of Geological Survey of India and Exploration Tube well Organization (ETO), subsequently during 1969-72, the then ETO as part of the second phase of Exploration drilled 7 bore holes ranging in depth from 280.26 to 465.61 m bgl.

The above drilling was carried out as part of the U.N. assisted Ground Water Project to collect data on deeper aquifer of the area.

Central Ground Water Board (CGWB) as part of the third phase of Ground water Exploration drilled one borehole down to a depth of 666.20 at Thiruthuraipoondi, which was a free flowing well.

Systematic survey and Ground water Management studies were made under various phases.

2.0. RAINFALL AND CLIMATE:

The district receives rainfall from both southeast and northeast monsoons. The normal annual rainfall in the district ranges from 1100 to 1260 mm. It gradually increases towards east and south and attains a maximum around Thiruvarur in the eastern part. It is observed that the chances of receiving normal annual rainfall vary from 40 percentages at Needamangalam to 51 percentages at Thiruthuraipoondi. These changes are the highest (50-55 percentage) in a small area around Thiruthuraipoondi in the eastern part.. In the rest of the district these chances are in the range 40-50 percentages.

The district has a hot tropical climate the summer season, which is very oppressive, is from March to about the end of May. The humidity is generally high in the coastal region throughout the year and exceeds 70 percentages during period from August to May. It is much drier towards the interior of the district.

3.0. GEOMORPHOLOGY AND SOIL TYPES:

Thiruvarur district is a plain terrain with a gentle slope towards east in the northern and central parts and towards south in the southern part. The maximum surface elevation is about 30 m a msl in the western part of the district.

The prominent geomorphic units identified in the district through interpretation of Satellite imagery are, 1. Deltaic plain, 2. Pediment and buried pediment 3. Natural levee- swale, 4. Lagoon/Backwater Coastal plain and 5. Beach and Beach ridges. Major part of the district including Valangaiman, Nannilam, Thiruvarur and part of Thiruthuraipoondi taluks is occupied by delta plain. Sedimentary high land having pediment and buried pediment landforms are observed in Mannargudi and Needamangalam taluks. Sedimentary plain consisting various landforms like natural levee, swale and marshy area, lagoon/Back water costal plain and Beach ridges are seen in the southern part of the district.

3.1 Soils:

The district has mainly alluvial soil consisting of sand, silt and clay.

4.0 GROUND WATER SCENARIO:

Hydrogeology:

The entire district is covered by semi-consolidated formations consisting of sand, silt and clays (Plate-II). Ground water occurs under water table, semi-confined and confined conditions. The important aquifer systems in the district are i) Lower Miocene deeper aquifers and ii) Pliocene Quaternary shallow aquifers.

i) Lower Miocene Deeper Aquifers: These are the deeper aquifer system which can be divided into two hydraulically interconnected aquifers namely a) Lower Orathanadu aquifer zone b) the upper or Main flowing aquifer zone.

a) Orathanadu Aquifer: These aquifers occur through out the entire Cauvery delta area. The aquifers of "Primordial delta" grade laterally into fine facies both towards northeast in the Cauvery sub basin and southeast in the Vennar sub basin of the district. The facies changes are effected due to presence of sub stratum ridges in the basement. The thickness of the aquifer ranges between 30 and 70 m. In general, the tube wells tapping these aquifers range in depth 150 to 350 m bgl.

b) Main flowing zone: The main flowing zone consisting of the coarse grained sands lies over the "Primordial delta" of the Cauvery basin. In the Vennar sub basin, it is changing to fine-grained sand with clay. The thickness of the aquifer is around 35 m. Tube wells tapping these aquifers range in depth between 100 and 250 m bgl in the east.

ii) Quaternary formations: Comprises mainly sand intercalated with clay, sand and silt having grain size variations both laterally and vertically resulting wide variations in permeability values. Ground water occurs in these aquifers under water table to confined conditions. The thickness of the aquifer ranges between 5 to 25 m within the depth of 45 m bgl. These aquifers are being developed by means of dug wells and filter points.

Ground water occurs under phreatic conditions in the shallow zones of sedimentary formations in the range of 2 m bgl in major parts of the district i.e., Nannilam, Kodavasal, Thiruvarur, Valangaiman, Koradacheri, Mannargudi and Thiruthuraipoondi, Muthupetai blocks while it is 5 to 10 m bgl in Needamangalam and Kottur blocks. The pre monsoon (May 2006) depth to water level ranges from 3.07 to 7.01 m bgl and post monsoon (January 2007) depth to water levels ranges from 0.37 to 4.71 m bgl. The pre monsoon

and post monsoon water levels are presented in Plate-III & IV respectively.

4.2. Long term Fluctuation

The long-term water level fluctuation for the period 1998-2007 indicates rise in water level in the area in the order of max. 0.31 m/year. The fall in the water level ranges from 0.022 to 0.29 m/year.

4.3. Aquifer Parameters

The formations in the district have recorded discharges ranging from 3.4 to 63.2 lps for drawdowns ranging from 4.36 to 23.03 m. The Sp. Capacity of wells ranges from 13.43 to 870 lpm/m of drawdown. The transmissivity value ranges from 8 to 1672 m^2/day and the storativity is in the order of 4.67 x 10^{-10}.

4.4. Ground Water Resources:

The Ground Water Resources have been computed jointly by Central Ground Water Board & State Ground and Surface Water Resources Data Center (PWD, WRO, Govt. of Tamil Nadu) as on 31st March 2004. The salient features of computations are furnished below.

	Stage of Groundwater Development of Tamil Nadu as on 31st March 2004								
							(in Ham)		
S. No.	Name of Groundwater Assessment Unit	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 groundwatre Availability for future Irriation Development	Stage of Groundwater Development	Categorization for Future groundwater development (Safe/Semi Critical/Critical/ Over Exploited)
1	KODAVASAL	3708.71	3414.49	210.77	3625.25	217.74	76.48	98	Critical
2	KORADACHERI	3774.74	2097.15	209.80	2306.95	216.75	1460.84	61	Safe
3	KOTTUR	3943.16	1445.38	224.19	1669.57	231.61	2266.17	42	Safe
4	MANNARGUDI	5571.44	2783.03	301.96	3084.98	311.95	2476.46	55	Safe
5	MUTHUPETAI								
6	NANNILAM	3172.02	2545.00	138.42	2683.42	143.00	484.02	85	Semi Critical
7	NEEDAMANGALAM	6149.41	3928.68	531.93	4460.61	549.54	1671.19	73	Semi Critical
8	THIRUTHURAIPOONDI								
9	THIRUVARUR	1560.05	748.44	38.81	787.25	40.09	771.52	50	Safe
10	VALANGAIMAN	4557.79	7999.91	184.60	8184.51	190.71	-3632.84	180	Over Exploited

4.5. Ground Water Quality:

Ground water in phreatic aquifer in Thiruvarur district, in general, is colourless, odorless and slightly Alkaline in nature.

The specific electrical conductance of ground water in phreatic (in Micro Seimens/centimeter at 25º C) during May 2007 was in the range 620 (Alankottai) to 4400 (Muthupetai) in the district. It is between 750 and 2250 µs/cm at 25º C in the major part of the district, whereas, conductance exceeding 2250 µs/cm at 25º C has been observed in parts of Muthupetai block.

It is observed that the ground water is suitable for drinking and domestic uses, in general, and all the constituents are with in the permissible limits for domestic use, except at Muthupetai where Chloride is found to be in excess of the permissible limit, with regard to irrigation suitability based on specific electrical conductance and Sodium Absorption Ratio (SAR). It is observed, that the phreatic aquifer in a major part of the district has medium to high salinity. It is recommended that proper soil management strategies may be adopted.

4.6. Status of Ground water development:

Development of ground water in the district is mainly through dug wells, filter points and Tube wells. Out of 10 blocks, one block is over exploited, one block is in critical category, two blocks are in semi-critical category, four blocks are in safe category and two blocks are totally saline. The gross ground water draft for irrigation in the district as on 31.03.2004 is of the order of 249.62 MCM where as the draft for domestic and industrial water supply is computed as 18.4 MCM. Hence, the existing gross ground water draft for all uses in the district is of the order of 268.02 MCM. A quantum of 19.01 MCM has been allocated for domestic and industrial requirement for next 25 years as per norm.

Urban, Rural and industrial water supply schemes

Tamil Nadu water supply and Drainage Board (TWAD) is providing drinking water supply to the urban and rural areas in the district. The water requirements of the habitations are met with through surface water sources or through various Mini water supply schemes or integrated water supply schemes utilizing the available ground water resources. A Quantum of 121.25 lakhs liters of protected water supply is made available for the population in the district. The average per capita water supply is around 47.33 Lpcd for the district. The Municipalities of Thiruvarur, Mannargudi and Koothanallur have the highest per capital consumption of 55 LPCD each, while the Town Panchayat of Muthupetai has 50 LPCD.

5. GROUND WATER MANAGEMENT STRATEGY:

5.1 Ground water Development

Forests cover about 1 percent of the total geographical area of the district and 37 percent of the area has been categorized as land not put for cultivation, including current and other fallow lands. Hence, about 62% of the total geographical area is available for planning of ground water development in the district. In view of the quality problems due to lithogenic and anthropogenic factors it is necessary to exercise caution while planning for the development of available ground water resources.

A number of percolation tank/ponds have been constructed by the Agricultural Engineering Department, Govt. of Tamil Nadu in the district. The existing tanks/ponds can be strengthened and rejuvenated/de-silted periodically so that the shallow aquifer in the area can be recharged.

5.2 Water Conservation and Artificial Recharge:

On the basis of experimental studies, it has been found that the de-silting of existing tanks followed by percolation pond with recharge wells /recharge shafts are economical, wherever it is feasible.

There is a considerable scope for implementation of rooftop rainwater harvesting in the habitations for domestic requirements. Such schemes, which are simple in design and are comparatively cheap, could serve to isolated house in ground water quality areas where piped water supply scheme is not implemented.

As per the studies carried in parts of Tamil Nadu coast by injection wells, it is clear that the artificial recharge of deeper aquifers is not an easy task. Hence, artificial recharge of shallow ground water zones through cost effective rainwater harvesting systems like farm ponds may be popularized in the district.

6 GROUND WATER RELATED ISSUES AND PROBLEMS

6.1 The ground water in the phreatic zone in the major part of the district is of medium to high salinity. It is recommended that proper soil management strategies are to be adopted while using the ground water for irrigation. In view of rather high ground water development in two blocks further ground water development has to be carried out in a judicious manner.

6.2 Scope for Conjunctive use of surface and Ground water:

Canals constitute one of the most important sources of irrigation water in Thiruvarur district accounting for about 89% of the total area irrigated by all sources. There is a possibility of using ground water in conjunction with surface water in a judicious way,

through community tube wells in each small units of identified canal irrigation sections. In view of the increasing dependence on ground water as a source of irrigation water and the availability of abundant surface water in the canal command areas of the district, it is imperative that plans for conjunctive use of surface and ground water be drawn up and implemented for the district in a more holistic approach with provision for drainage system for flood waters. Ground water will be used as the major source of irrigation water supplementation during drought period and rain gap days. This will help in sustained development of the ground water resources and will also prevent the crop failure due to vagaries of monsoon.

6.3 Area notified by CGWA/SGWA:

Central Ground water Authority has not notified any area in the district. Govt. of Tamil Nadu has imposed regulations for ground water schemes in the over exploited blocks of Tamil Nadu. Valangaiman block in the district is identified as over exploited

7 RECOMMENDATIONS:

In view of the comparatively high level of ground water development in two blocks of the district and medium to high salinity of ground water due to depositional environment of the aquifers, it is necessary to exercise caution while planning for development of ground water resources and proper irrigation management strategies are to be adopted.

Intensive monitoring of ground water levels and water quality has to be taken up in the canal command areas, areas of water logging and pollution prone pockets around industrial units in the district.

There is need to formulate and implement schemes for conjunctive use of surface and ground water resources. The construction of community tube wells and modernized irrigation practices in the delta is necessary to improve the crop productivity and agricultural income.

Artificial recharge of ground water through cost effective water harvesting systems may be popularized in the district by providing subsidies to individuals as the case of dug well recharge scheme implemented in hard rock areas.

The free flowing aquifer system and mangrove forests in the district need proper protection from environmental degradation by restricting the polluting industries and aquaculture.

PLATE - I

CENTRAL GROUND WATER BOARD, SECR, CHENNAI

THIRUVARUR DISTRICT, TAMIL NADU

LOCATION

(NOT TO SCALE)

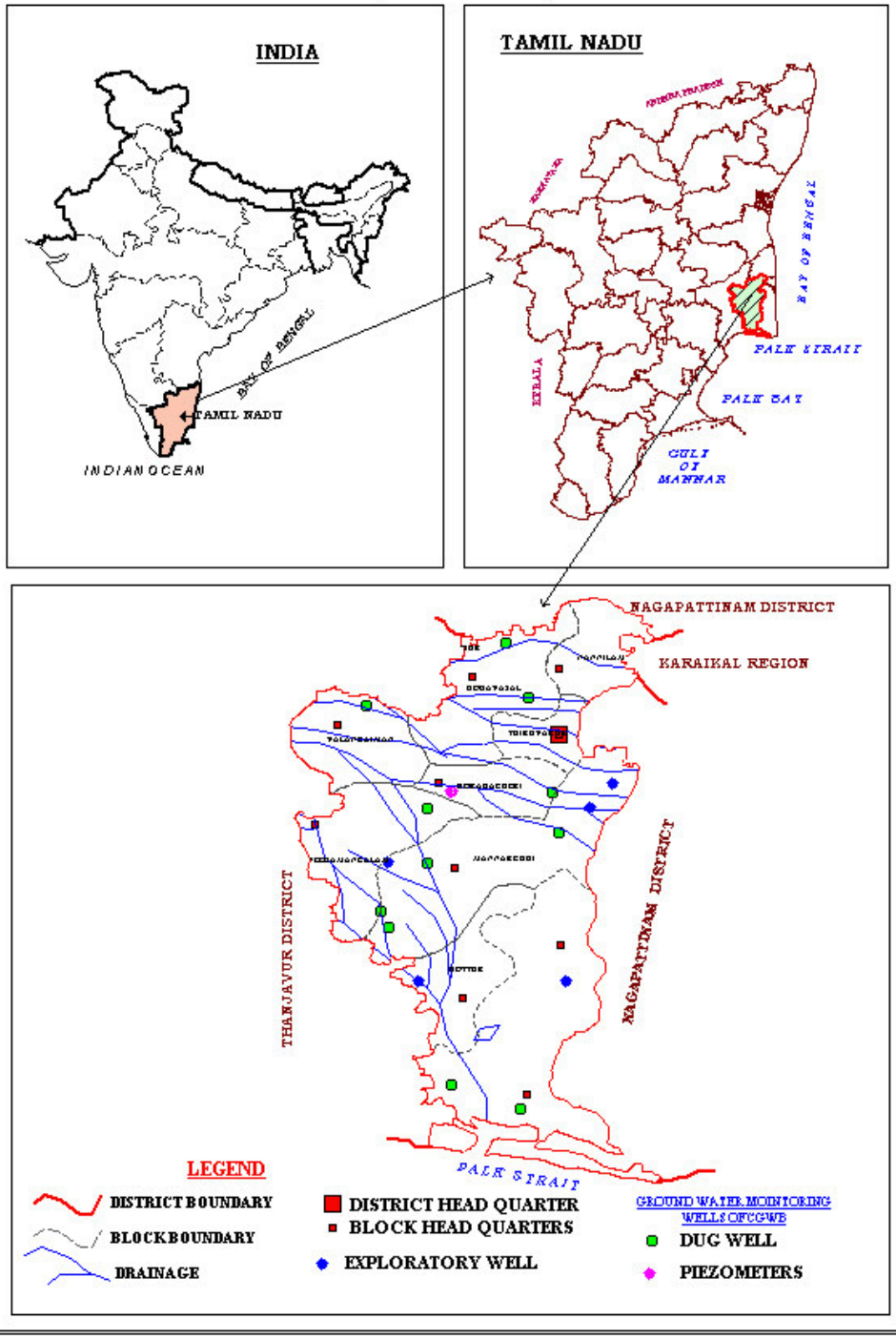
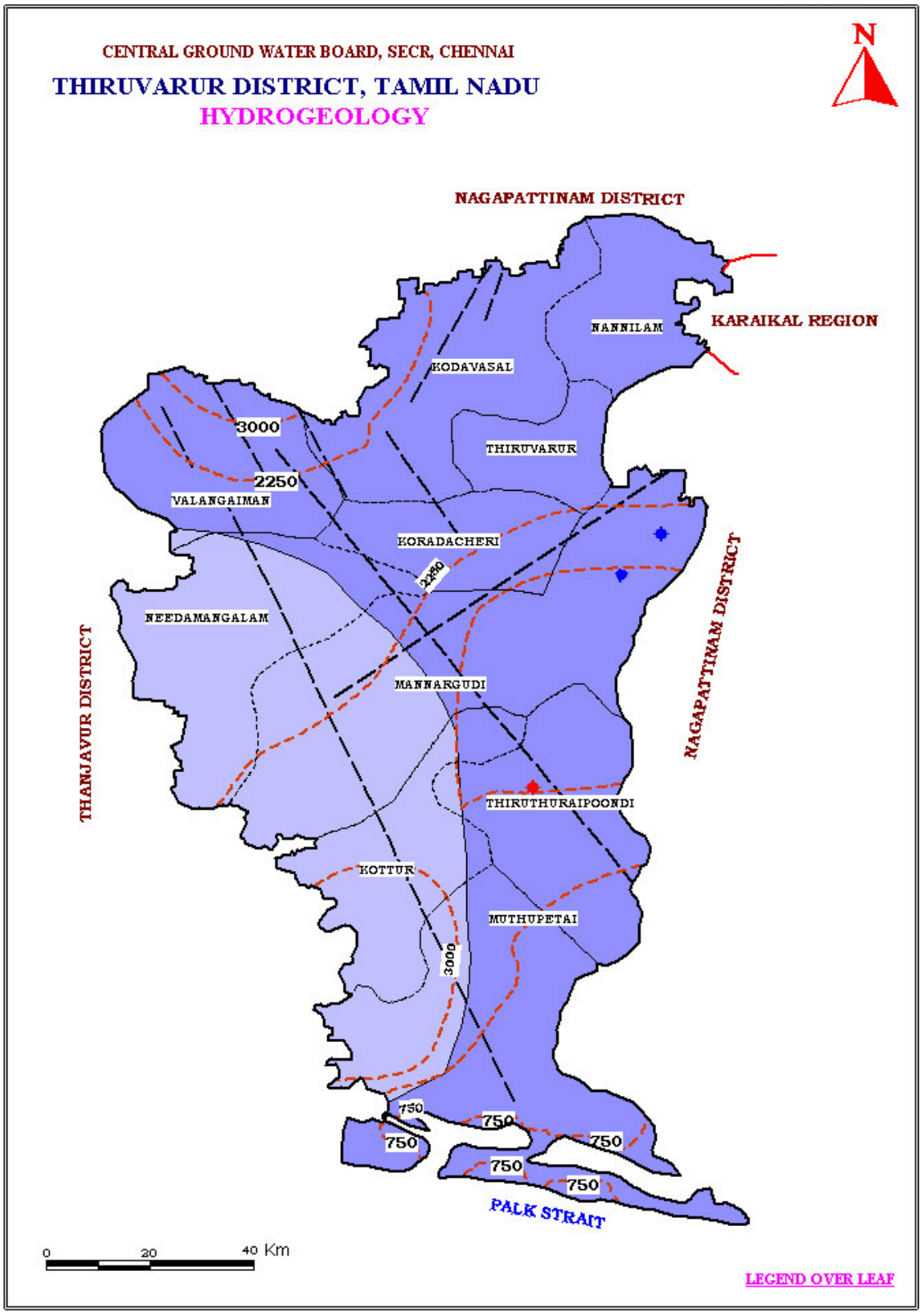


PLATE - II


CENTRAL GROUND WATER BOARD, SECR, CHENNAI
THIRUVARUR DISTRICT, TAMIL NADU
HYDROGEOLOGY
N
NAGAPATTINAM DISTRICT
KARAIKAL REGION
NANNILAM
KODAVASAL
THIRUVARUR
VALANGAIMAN
KORADACHERI
NEEDAMANGALAM
MANNARGUDI
THIRUTHURAIPOONDI
KOTTUR
MUTHUPETAI
THANJAVUR DISTRICT
NAGAPATTINAM DISTRICT
3000
2250
2250
3000
750
750
750
750
750
750
PALK STRAIT
0
20
40 Km
LEGEND OVER LEAF

LEGEND FOR PLATE - II

ADMINISTRATIVE SETUP

DISTRICT BOUNDARY

BLOCK BOUNDARY

GROUND WATER HYDROLOGY

EXPLORATORY BORE WELL [CGWB]

HIGH YIELDING BORE WELL [CGWB]

HYDROCHEMISTRY

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

STRUCTURE

TRACE OF LINEAMENT

AQUIFER	AGE	LITHOLOGY	GROUND WATER CONDITIONS	YIELD PROSPECTS (lpm)	GROUND WATER DEVELOPMENT STRATEGIES
SEMI-CONSOLIDATED	QUATERNARY	SAND & SILT FORMATION	WATER TABLE SEMI-CONFINED AND CONFINED CONDITIONS THICKNESS 5 TO 25 M	300 TO 500	SUITABLE FOR DUG WELLS, FILTER POINT WELLS, SHALLOW TUBEWELLS.
	TERTIARY	FINE GRAINED WITH CLAY SAND AND SILT AND COARSE GRAINED SAND	SEMI-CONFINED CONDITIONS IN THE UPPER AND MIDDLE MIOCENE FORMATIONS (ENTIRE CAUVERY DELTA REGION) THICKNESS 2 5 TO 450 m	500 TO 17000	SUITABLE FOR DUG WELLS, FILTER POINT WELLS, SHALLOW AND DEEP TUBEWELLS.

PLATE - III

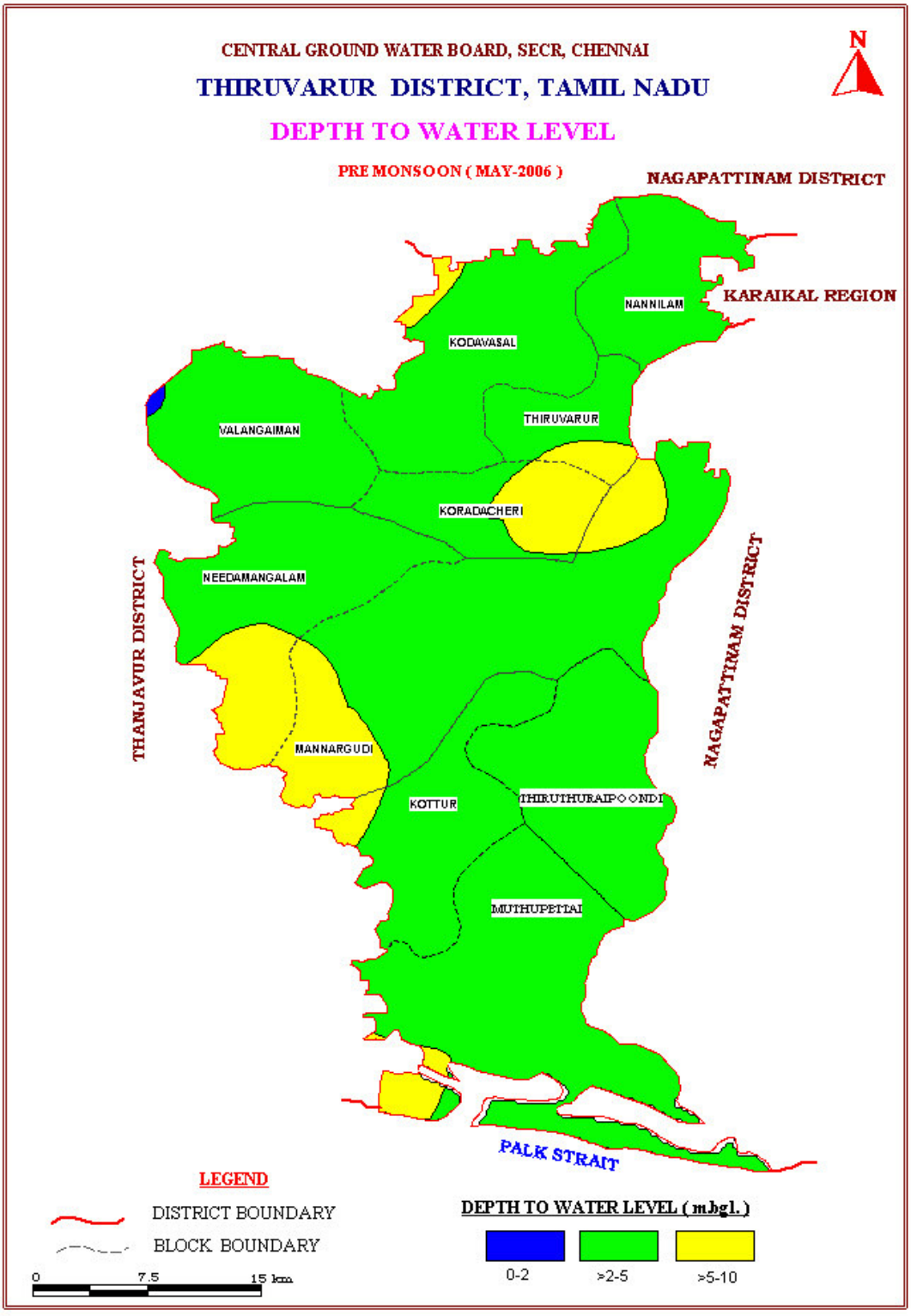

CENTRAL GROUND WATER BOARD, SECR, CHENNAI
N
THIRUVARUR DISTRICT, TAMIL NADU
DEPTH TO WATER LEVEL
PRE MONSOON (MAY-2006)
NAGAPATTINAM DISTRICT
KARAIKAL REGION
NANNILAM
KODAVASAL
VALANGAIMAN
THIRUVARUR
KORADACHERI
NEEDAMANGALAM
THANJAVUR DISTRICT
NAGAPATTINAM DISTRICT
MANNARGUDI
KOTTUR
THIRUTHURAIPOONDI
MUTHUPETTAI
PALK STRAIT
LEGEND
DISTRICT BOUNDARY
BLOCK BOUNDARY
0
7.5
15 km
DEPTH TO WATER LEVEL (mbgl.)
0-2
>2-5
>5-10

PLATE - IV

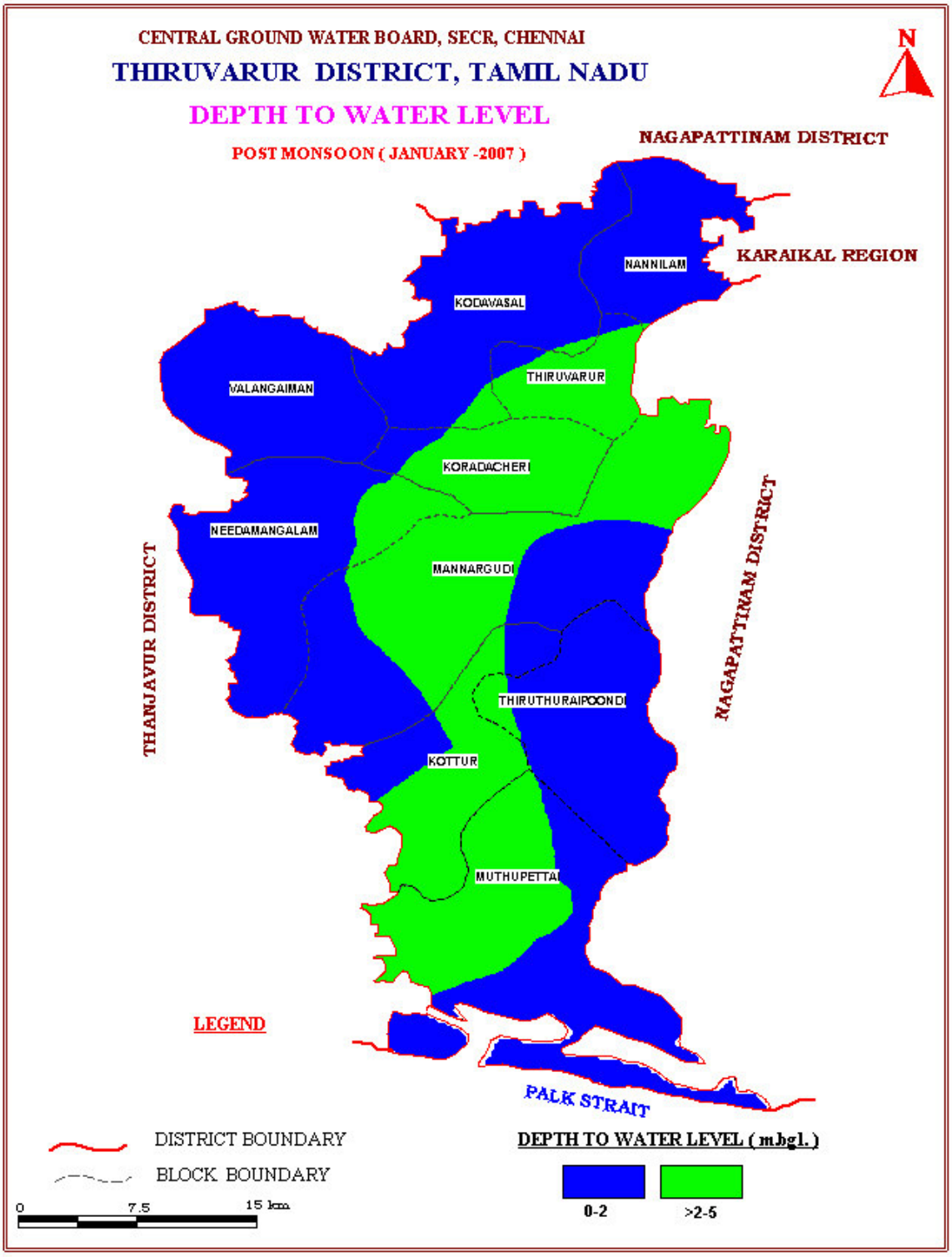

CENTRAL GROUND WATER BOARD, SECR, CHENNAI
THIRUVARUR DISTRICT, TAMIL NADU
DEPTH TO WATER LEVEL
POST MONSOON (JANUARY -2007)
N
NAGAPATTINAM DISTRICT
KARAIKAL REGION
NANNILAM
KODAVASAL
VALANGAIMAN
THIRUVARUR
KORADACHERI
NEEDAMANGALAM
MANNARGUDI
THANJAVUR DISTRICT
NAGAPATTIRAM DISTRICT
THIRUTHURAIPOONDI
KOTTUR
MUTHUPETTAI
PALK STRAIT
LEGEND
DISTRICT BOUNDARY
BLOCK BOUNDARY
0
7.5
15 km
DEPTH TO WATER LEVEL (mbgl.)
0-2
>2-5

PLATE - V

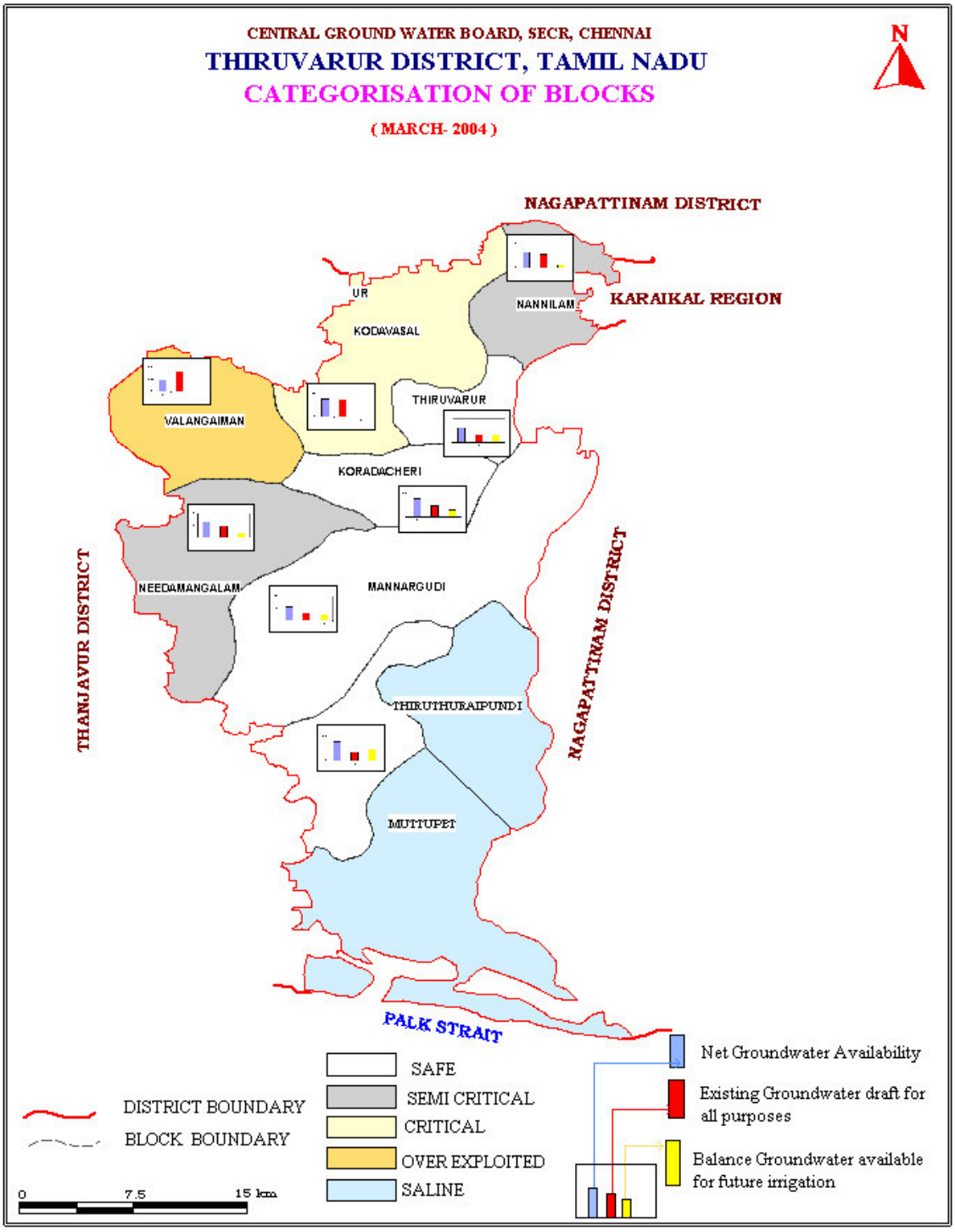
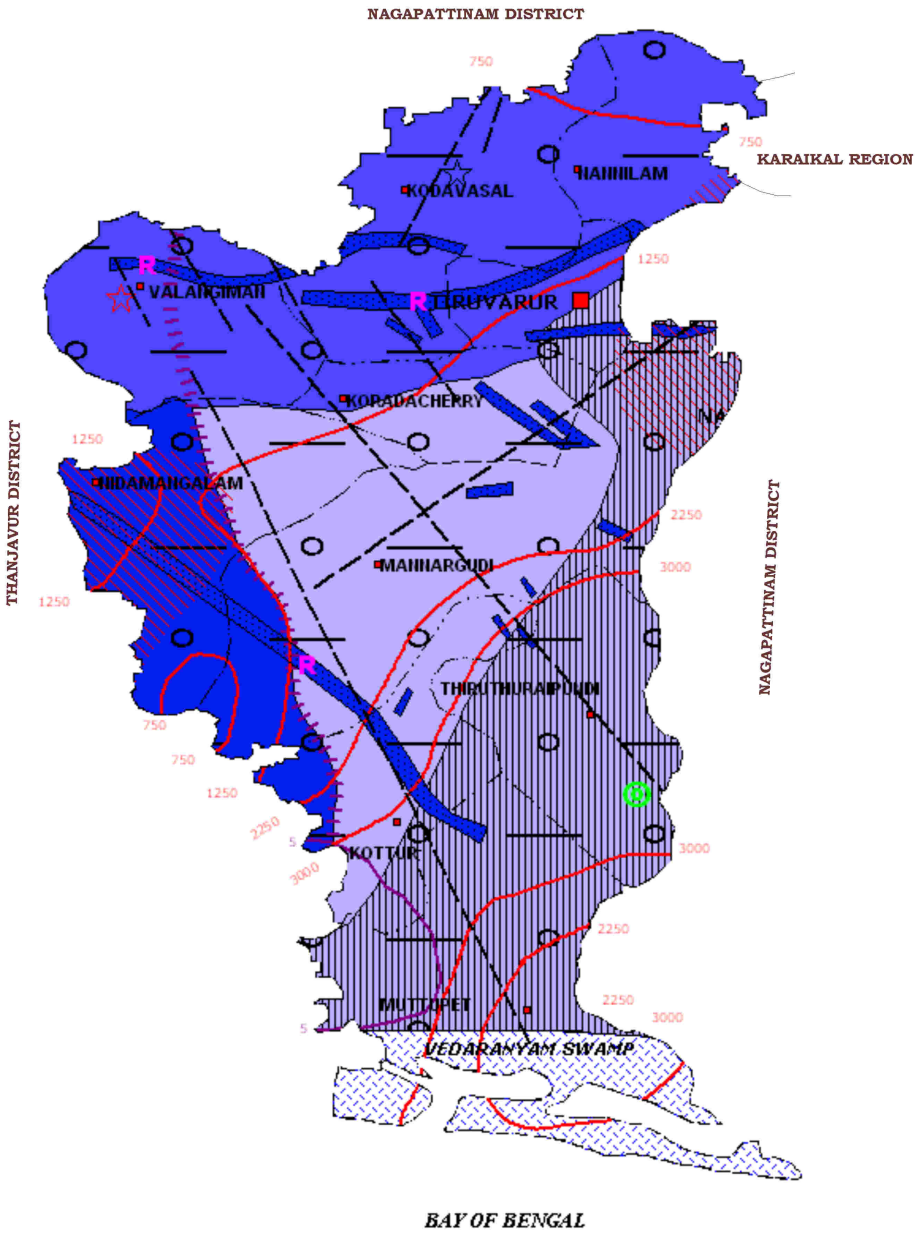

CENTRAL GROUND WATER BOARD, SECR, CHENNAI
THIRUVARUR DISTRICT, TAMIL NADU
CATEGORISATION OF BLOCKS
(MARCH- 2004)
N
NAGAPATTINAM DISTRICT
KARAIKAL REGION
UR
NANNILAM
KODAVASAL
VALANGAIMAN
THIRUVARUR
KORADACHERI
NEEDAMANGALAM
MANNARGUDI
THIRUTHURAIPUNDI
MUTTUPET
THANJAVUR DISTRICT
NAGAPATTINAM DISTRICT
PALK STRAIT
SAFE
SEMI CRITICAL
CRITICAL
OVER EXPLOITED
SALINE
DISTRICT BOUNDARY
BLOCK BOUNDARY
0
7.5
15 km
Net Groundwater Availability
Existing Groundwater draft for all purposes
Balance Groundwater available for future irrigation

PLATE VI

CENTRAL GROUND WATER BOARD, SECR, CHENNAI.

GROUND WATER DEVELOPMENT POTENTIAL AND ARTIFICAL RECHARGE PROSPECTS

THIRUVARUR DISTRICT, TAMIL NADU



LEGEND FOR PLATE -VI

DISTRICT – TIRUVARUR

	Wells Feasible	Rigs Suitable	Depth of Well (m bgl)	Discharge (lpm)	Suitable Artificial Recharge Structures
Soft Rock Aquifer	Dug Well Filter Point-Well Tube Well	Manual Hand Bore Direct Rotary	8 – 12 10 + 40 200 – 450	Less Than 300	Rain Water Harvesting /Check Dams /Percolation Pond/ Recharge Wells /Gabion Structures
Soft Rock Aquifer	Dug Well Filter Point-Well Tube Well	Manual Hand Bore Direct Rotary	8 – 12 10 – 15 100 – 450	300 – 500	Rain Water Harvesting /Check Dams /Percolation Pond/ Gabion Structures
Soft Rock Aquifer	Dug Well Dug Cum Bore Well Tube Well	Manual Manual + Rotary Direct Rotary	5 - 10 10 + 30 100 250	500 – 1700	Check Dams /Percolation Pond/ Recharge Wells/ Injection Wells
				District Boundary	
	Block Boundary			Palaeo Channel	
	District Headquarter			Block Headquarter	
	River		1250	EC (Micro Siemens / Cm at 25°C)	
	Saline Zone			Nitrate Greater than Maximum Permissible Limit (45mg/L)	
	Thermal Water			Auto Flow Zone	
	Lineament		R	Recommended Site for Artificial Recharge Structure	

OTHER INFORMATION

Geographical Area	2097.97 Sq. Km.
Number of Blocks	10
Major Drainage	Vennar & Vettar
Population (2001)	1, 169,474
Average Annual Rainfall	1184 mm
Annual Range of Temperature	22 – 37°C
Regional Geology	**Soft Rocks:** Alluvium, Laterite, Sandstone and Shale
Net Ground Water Availability for future Irrigation	56 MCM/Yr
Stage of Ground Water Development (As on March 2004)	83 %
Name of Blocks Showing Intensive Ground Water Development	☆ **Over-Exploited**: Valangaiman ☆ **Critical**: Kodavasal

SAVE WATER

AND

CONSERVE WATER

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