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Ministry of Water Resources
CENTRAL GROUND WATER BOARD
South Eastern Coastal Region
Chennai

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धुव विजय सिंह
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GOVERNMENT OF INDIA
MINISTRY OF WATER RESOURCES
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MESSAGE

Ground water utilization has increased significantly during the last two decades. The unplanned and indiscriminate use of this vital resource has resulted in declining water levels and water quality deterioration in certain areas. The apparent stress on ground water resources is more often a management issue, and this needs to be addressed in a holistic manner, for its long term sustainability, through an integrated approach. Aquifer mapping is an essential step towards the effective management of ground water resources.

The atlas entitled “**Aquifer Systems of Tamil Nadu**” is a step towards achieving the ultimate goal of aquifer wise management of ground water resources in Tamil Nadu State.

I congratulate Central Ground Water Board, Ministry of Water Resources for its efforts to bring out this document containing data and information pertaining to various aspects of ground water including aquifer disposition in the State. I am sure this atlas will be of immense use to planners, policy makers, researchers and users involved in ground water sector.


(Dhruv Vijai Singh)

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Foreword

Availability of fresh water has always been a prime consideration in fostering the socio economic growth of the people. Rapid urbanization coupled with industrialization has resulted in increased demand of ground water at an alarming rate. Dependence on ground water is increasing continuously in order to supplement the domestic, agricultural and industrial requirements. In the last two decades there is a paradigm from development to management of Ground Water. The management of ground water is to be focussed on aquifers, which act as the repository of ground water.

To meet these challenges, it has become imperative to formulate aquifer management plan to establish the priorities for ground water use with community involvement at various levels of implementation. Central Ground Water Board over the years has generated enormous data on various aspects of ground water and has been utilised to prepare aquifer maps depicting their extent and characteristics and are compiled in the form of Atlas on "Aquifer Systems of Tamil Nadu & Puducherry".

This will provide a framework for prioritizing the aquifer level management strategies and build inventory of the aquifers for better understanding of the groundwater resources. An attempt has been made to present various aquifer systems in the form of maps by integrating all thematic information to formulate the aquifer wise ground water management plans.

The sincere efforts of the dedicated team of officers of Central Ground Water Board, South Eastern Coastal Region, Chennai is highly appreciated. I am sure this atlas would be of immense use in formulating scientifically viable implementable strategies for efficient management of ground water resources ensuring sustainability.

(Dr. S.C. Dhiman)

Preface

Groundwater is the major source of freshwater that caters the demand of ever growing domestic, agricultural and industrial sectors of the country and forms a decisive factor for sustained socio-economic development. This renewable resource has been indiscriminately exploited in some parts of the country by several users as it is easily available and reliable. On the other hand, rapid urbanization and land use changes has drastically reduced the infiltration rate into the soil and has diminished the natural recharging of aquifers by rainfall. This has lead to decline in water levels, depletion of groundwater resource and deterioration in groundwater quality. Hence, better understanding of the aquifer system is essential for proper management and effective governance of groundwater.

Central Ground Water Board (CGWB) has been pioneering, instrumental and demonstrating several scientific studies through publication of reports and maps for effective management of the aquifers. One such release is the Aquifer Atlas of Tamilnadu and Puducherry. The atlas is an amalgamation of voluminous data on the aquifer systems available in the state of Tamilnadu and UT of Puducherry. The atlas would be of immense help to the water managers, NGO's, local bodies including panchayats for proper governance of groundwater.

The efforts put by team of officers viz. Ms.D.Dayamalar, Scientist-C, Dr.M.Senthilkumar, Scientist-C, Sh.R.Arumugam, Scientist-B, Sh.N.Rameshkumar, AHG, Sh.S.P.Nayagam, Scientist-B and Dr.D.Gnanasundar, Scientist-C of South Eastern Coastal Region, Chennai is highly commendable. I am sure this aquifer atlas of Tamilnadu would form a baseline for better administration and management of the aquifer system.


(D.S.C. Thambi)

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INTRODUCTION

Ground water is one of the primary resources to meet the water requirements of our country. It is of vital importance for sustaining life, health & agriculture. However the distribution of availability of ground water resources across the country is uneven.

Tamil Nadu, the sixth most populous state in India is a water stressed state. The total population of the state as per 2011 Census is 7, 21, 38, 958, of which 62 percent of the people are engaged in agriculture. Tamil Nadu state, the southern most state in the Indian Union, lies between N Latitudes 08°00' and 13°30' and E.Longitudes 76°14' and 80°18'. The state is bounded by Bay of Bengal in the east, the Indian Ocean in the south and the states of Kerala, Karnataka and Andhra Pradesh in the west, north west and north respectively with a geographical extent of 1,30,060 sq.km. It has a shoreline of about 1000 km. For administrative purposes, Tamil Nadu state is divided into 32 districts. These districts are divided into 220 taluks, which are further divided into 386 developmental blocks. These are subdivided into Panchayats representing the constituent Revenue villages and hamlets.

The Tamil Nadu state is underlain by diverse hydrogeological formations, nearly 73% of the state is occupied by hard rocks, the semi consolidated and consolidated formations are mainly confined in the eastern part which is the coastal tract. In the hard rock area, ground water is mainly developed through dug wells and dug cum bore wells tapping the weathered zone, the yield of open wells vary from 1 – 3 lps, whereas in dug wells tapping soft rocks including sedimentary formations, the yield is up to 5 lps.

Dynamic ground water resources have been assessed block-wise and during the recent resources estimation (2009), the Annual Replenishable Ground Water Resource of the state has been estimated as 22.94 bcm and Net Annual Ground Water Availability is 20.65 bcm. The Annual Ground Water Draft is 16.56 bcm and Stage of Ground Water Development is 80% leaving limited scope for further development of the dynamic ground water resources. Out of 386 assessment units (blocks), 139 have been categorized as Over-exploited, 33 as Critical, 67 as Semi-critical, 136 as Safe and 11 as Saline. Larger ground water development is noticed in the Central part of the State and it is brought out in the category map showing concentration of Overexploited and Critical block in a linear pattern extending along NE-SW direction in the Central part of the State. There has been about 6% decrease in the estimates of ground water draft in 2009 as compared to 2004. This is attributed to reduction in irrigation draft due to urbanization in some areas and reduction in usage of dugwells for domestic use. Further, recharge has enhanced in some areas because of increase in normal rainfall and enhanced activity of water conservation and canal irrigation.

The increasing stress on the limited ground water resources calls for immediate action for sustainable ground water resource management in the State. Groundwater resources available within aquifers needs to be sustainably managed with a combination of reasonable scientific knowledge, adequate monitoring and sustained political commitment and provisions for institutional arrangements. Considering the complexity of the ground water regime and the intrinsic variability of ground water systems and socio-economic situations, no single approach can fully relieve pressures on its groundwater resources. Incremental improvements in resource management and protection can, however, be achieved through suitable means. The added uncertainty of global environmental and climate change reinforces the need for sound resource management and for providing additional social and political impetus for scientific management interventions. Groundwater also needs to be considered as part of an integrated water resources management approach that co-ordinates land and water resources management, recognises water quantity and quality linkages, manages surface water and groundwater resources conjunctively and protects and restores natural systems. This integrated approach presents new challenges for groundwater management such as the need for better understanding of the effects on groundwater recharge quantity and quality of various ground water systems and many other issues.

It is in this context that systematic mapping of aquifer systems assumes great relevance in a State. Aquifer mapping is a scientific process wherein a combination of geologic, geophysical, hydrologic, and chemical field and laboratory analyses are applied to characterize the quantity, quality, and "sustainability" of ground water in aquifers. The objective of aquifer mapping is to provide critically needed information on the State's ground water for planning its sustainable development. The products of aquifer mapping studies improve our understanding of the geologic framework of aquifers, their hydrologic characteristics, water levels in the aquifers and how they change over time, and the occurrence of natural and anthropogenic contaminants that affect the quality of ground water. Results of aquifer mapping can significantly contribute to resource management tools such as long-term aquifer monitoring networks and conceptual and quantitative regional ground-water-flow models besides helping planners, policy makers and other stakeholders in taking scientifically defensible decisions.

The present aquifer mapping at Regional scale (1:250,000) forms the foundation for assessment of groundwater availability. The primary issues affecting groundwater availability vary from location to location and commonly require analysis in the context of groundwater flow systems to achieve any purposeful meaning. With this principle in mind, the studies of water balance can be taken up involving all the input and output components – rainfall, evaporation, evapotranspiration, soil moisture balance, groundwater recharge through rainfall, groundwater extraction, canal seepage, irrigation, water bodies and river-aquifer interaction etc. Multiple techniques including physical, chemical/tracer and numerical modelling approach can be used for simulating groundwater conditions and to develop aquifer management plans for optimal utilization of groundwater resources.

The aquifer mapping is of due importance in the XII five year plan. As an initiative, considering the geological and hydrologic properties of the wide array of geological formations in the state, 12 principal aquifer systems have been delineated at 1:250,000 scale. This forms the base for aquifer mapping at 1: 50,000 scale. With further inputs from the detailed Hydrogeological studies (aquifer mapping studies) in the 12th year plan, aquifer mapping can be done at cadastral level. Thus after a period of time, we shall have the status on water availability both surface and ground water and its demand at cadastral level i.e., in village wise information. This will be useful in planning/tackling at village wise. The inputs on the groundwater pollution due to natural and anthropogenic needs to be identified at cadastral level. The Atlas of aquifer mapping for the state of Tamilnadu and UT of Puducherry has enabled to have a base and to identify the data gaps, delineate the vulnerable areas and demarcate areas which may attract government intervention.

Table 1: ADMINISTRATIVE DIVISIONS

Sl No.	Name of the District	Area (Sq.Km.)	No of Tehsils	Development Blocks	No. of Towns
1	Ariyalur	1952	3	6	2
2	Chennai	178	5	0	1
3	Coimbatore	4838	6	12	2
4	Cuddalore	3715	7	13	5
5	Dharmapuri	4358	5	8	1
6	Dindigul	6088	8	14	4
7	Erode	5713	5	14	4
8	Kancheepuram	4429	10	13	10
9	Kanyakumari	1689	4	9	4
10	Karur	2905	5	8	4
11	Krishnagiri	5270	5	10	2
12	Madurai	3711	7	13	7
13	Nagapattinam	2420	8	11	4
14	Namakkal	3419	4	15	5
15	Nilgiris	2546	6	4	4
16	Perambalur	1767	3	4	1
17	Pudukottai	4669	11	13	2
18	Ramanthapuram	4217	7	11	4
19	Salem	5237	9	20	5
20	Sivaganga	4089	6	12	3
21	Thanjavur	3438	8	14	3
22	Theni	2854	5	8	6
23	Tiruvarur	2344	7	10	4
24	Tiruchirapalli	4527	9	14	4
25	Tirunelveli	6812	11	19	8
26	Tiruvallur	5093	9	14	12
27	Tiruvannamalai	3327	7	18	4
28	Tiruppur	6208	7	13	7
29	Tuticorin	4648	8	12	3
30	Vellore	6066	9	20	12
31	Villupuram	7214	8	22	3
32	Virudhunagar	4314	8	11	7
Total		130058	220	385	147
33	U.T. of Puducherry	480	7	0	0

Source: censusindia.gov.in-census-2011

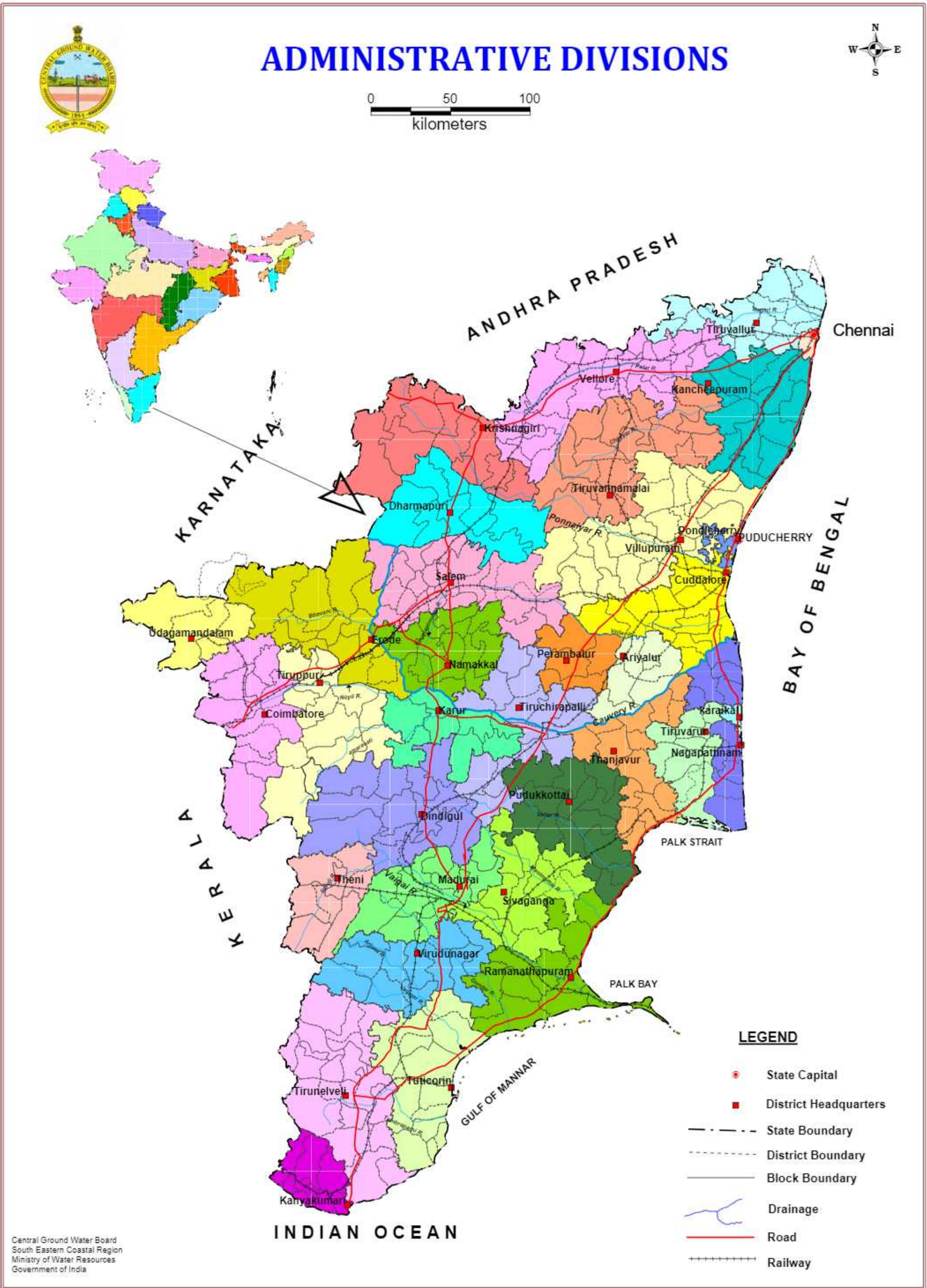


Table 2 : River Basins and Sub Basins

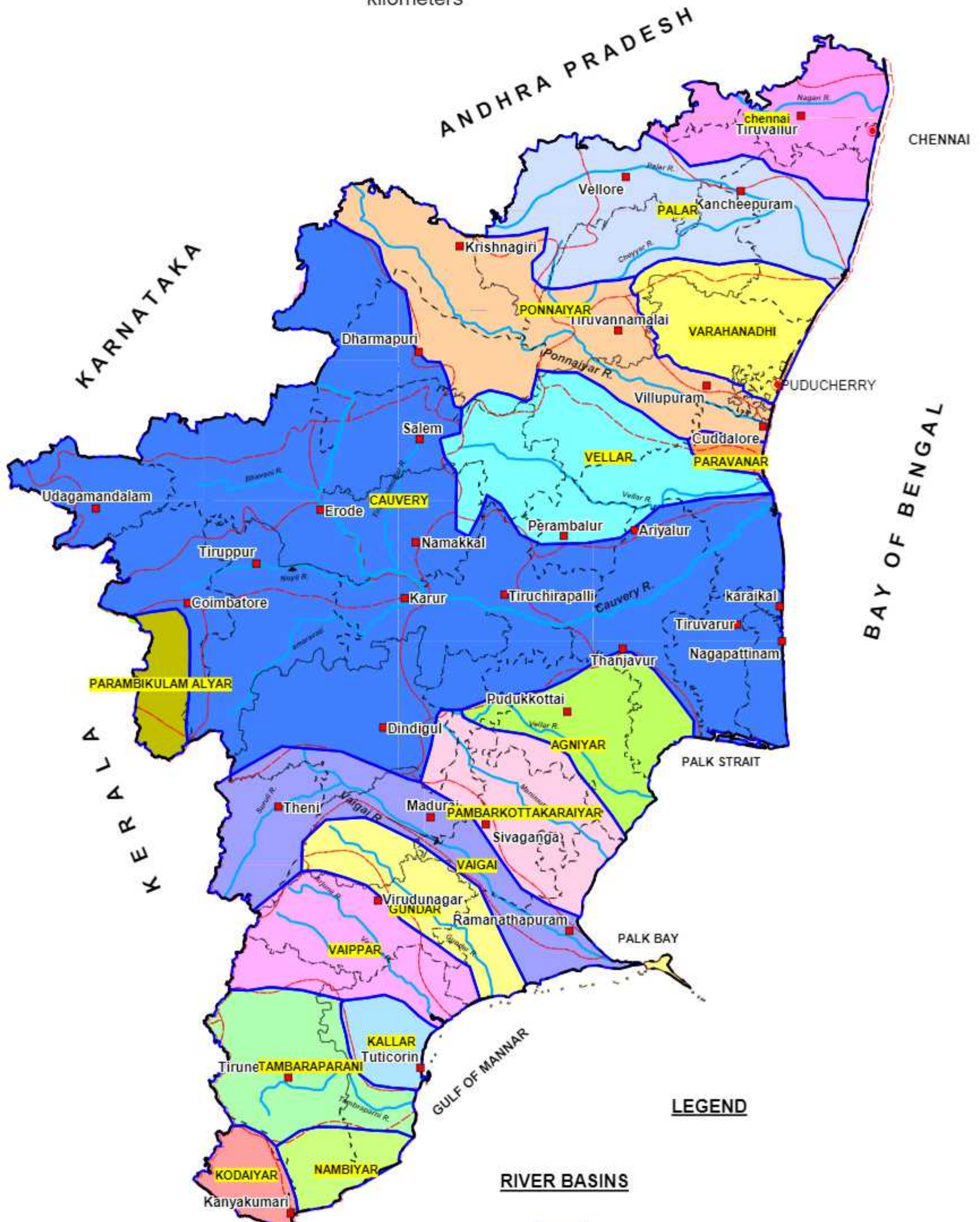
S. No.	Basin	Place of origin of main river	Catchment area in sq.km		Sub basin	No. of water sheds	Sharing state	Sub Basin Area in Tamil Nadu (Sq.Km.)	Area in Tamil Nadu River Basin (Sq.Km.)
			Total	in Tamilnadu					
1	AK BASIN (CHENNAI)	Tiruvalluar District	5254	5254	Misc. between Madras and Nellore	1	Andhra Pradesh and Tamil Nadu	629	6597
					Misc. around Madras	7	Andhra Pradesh and Tamil Nadu	5968	
2	AGNIYAR	Tiruchirapalli district	4756	4756	Vaigai to Cauvery	9	Tamil Nadu	4756	4756
3	CAUVERY	Talakaveri, Kodugu, Karnataka	85448	49200	Left Bank	5	Karnataka and Tamil Nadu	4541	47976
					Right Bank	3	Karnataka and Tamil Nadu	2079	
					Kabbani	1	Karnataka and Tamil Nadu	269	
					Pulantoa to Mahe	1	Karnataka and Tamil Nadu	475	
					Bhavani	5	Kerala, Karnataka and Tamil Nadu	5526	
					Noyil	4	Tamil Nadu	4615	
					Amaravati	7	Kerala and Tamil Nadu	8687	
					L.B.Nanganji confluence to Stanley	4	Tamil Nadu	4966	
					Thanjavur to Amaravati Confluence	4	Tamil Nadu	6408	
					Cauvery Delta upto Thanjavur	7	Tamil Nadu	10410	
4	GUNDAR	Madurai District	4118	4118	Gundar	7	Tamil Nadu	4118	4118
5	KALLAR	Tuticorin District			Chittar to Vaigai	7	Tamil Nadu	1699	1699
6	KODIYAR	Kanyakumari District	1695	1695	Cape Comorin to Kolloda	2	Kerala and Tamil Nadu	1695	1695
7	NAMBIYAR	Tirunelveli District			Cape Comorin to Chittar	3	Tamil Nadu	2202	2202
8	PALAR	Nandi hills, Kolar district Karnataka		9784	Upper Palar	4	Andhra Pradesh, Karnataka and Tamil Nadu	2198	10142
					Lower Palar upto Vellore	7	Andhra Pradesh and Tamil Nadu	7944	
9	PARAMBIKULAM	Coimbatore district	1766	1766	Pulantoa - Ponndni	3	Kerala and Tamil Nadu	2039	2465
					Periyar to Ponndni	1	Kerala and Tamil Nadu	426	
10	PARAVANAR	Cuddalore District	615	615	Between Cauvery and Ponnaiyar	1	Tamil Nadu	336	615
					Lower Pannaiyar upto Sathanur Dam			279	
11	PK ARIYAR	Dindigul District	5775	5775	Vaigai to Cauvery	4	Tamil Nadu	5775	5775
12	PONNIYAR	Karnataka			Upper Pannaiyar beyond Sathanur dam	8	Karnataka and Tamil Nadu	7135	11319
			Lower Pannaiyar upto Sathanur Dam	5	Tamil Nadu	4184			
13	TAMBIRAPARANI	Agastyarkoodam peak , Podhigai hills, Tirunelveli District			Tambaraparni to Chittar	5	Tamil Nadu	5410	5483
					Cape Comorin to Kolloda	1	Kerala and Tamil Nadu	51	
					Achankord - Pamliyar	1	Kerala and Tamil Nadu	22	
14	VAIGAIYAR	Varushanad hills, Theni District	7981	7981	Vaigai	7	Tamil Nadu	7234	7234
15	VAIPPAR	Theni district			Chittar to Vaigai	6	Tamil Nadu	5317	5317
16	VARAHANADI	Kilpenathur, Tiruvannamalai District	4814	4814	Misc. around Pondicherry	6	Tamil Nadu	4841	4841
17	VELLAR	Shevaroy hills, Salem District			Between Cauvery and Ponnaiyar	8	Tamil Nadu	7824	7824
	Total			130058		144		130058	130058

Source: State Ground & Surface Water Resources Data Centre, Tirumani, Chennai



RIVER BASINS

0 50 100
kilometers



LEGEND

RIVER BASINS

AGNIYAR	KODAIYAR	PARAVANAR
CAUVERY	NAMBIYAR	PONNIAR
A K BASIN (CHENNAI)	PALAR	TAMBARAPARANI
GUNDAR	PAMABARKOTTAKARAIYAR	VAIGAI
KALLAR	PARAMBIKULAMALYAR	VAIPPAR
		VARAHANADI
		VELLAR

- State Capital
- District Headquarters
- State Boundary
- District Boundary
- Drainage
- Sub Basin

Table 3 : District wise distribution of Principal Aquifer Systems

S.N.	District Name	Alluvium		Laterite		Sand Stone		Shale		Limestones		Granite		Schist		Quartzite		Charnockite		Khondalite		B G C		Gneiss		Intrusives		Total Area
		Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	
1	ARIYALUR	365	18.7	NA	NA	1393	71.3	5	0.3	50	2.6	NA	NA	NA	NA	NA	NA	36	1.8	NA	NA	NA	NA	103	5.3	NA	NA	1952
2	CHENNAI	149	84.0	4	2.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24	13.6	NA	NA	NA	NA	NA	NA	NA	NA	178
3	COIMBATORE	307	6.3	NA	NA	NA	NA	NA	NA	NA	NA	192	4.0	NA	NA	NA	NA	121	2.5	115	2.4	245	5.1	3728	77.1	130	2.69	4838
4	CUDDALORE	1781	47.9	0	0.0	1115	30.0	60	1.6	12	0.3	NA	NA	NA	NA	NA	NA	371	10.0	NA	NA	NA	NA	377	10.1	NA	NA	3715
5	DHARMAPURI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	57	0.0	NA	NA	NA	NA	2508	57.5	49	0.0	275	0.1	1438	0.3	31	0.01	4358
6	DINDIGUL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2349	0.4	63	0.0	1201	0.2	2415	0.4	59	0.01	6088
7	ERODE	23	0.4	NA	NA	NA	NA	NA	NA	NA	NA	60	0.0	14	0.2	NA	NA	2300	40.3	28	0.5	0	0.0	3254	57.0	35	0.62	5713
8	KANCHEEPURAM	591	13.4	26	0.6	1108	25.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2629	59.4	NA	NA	NA	NA	75	1.7	NA	NA	4429
9	KANYAKUMARI	332	19.6	NA	NA	24	1.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	416	24.6	312	18.5	NA	NA	605	35.8	NA	NA	1689
10	KARUR	136	4.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	16	0.6	31	1.1	2664	91.7	58	1.99	2905
11	KRISHNAGIRI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	245	4.7	NA	NA	NA	NA	1124	21.3	19	NA	2879	54.6	902	17.1	101	1.92	5270
12	MADURAI	158	4.3	NA	NA	67	1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1539	41.5	197	5.3	NA	NA	1749	47.1	NA	NA	3711
13	NAGAPPATTINAM	2420	100.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2420
14	NAMAKKAL	76	2.2	NA	NA	NA	NA	NA	NA	NA	NA	76	2.2	NA	NA	NA	NA	1405	41.1	32	0.9	24	0.7	1791	52.4	17	NA	3419
15	NILGIRIS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1865	73.2	NA	NA	674	26.5	7	NA	NA	NA	2546
16	PERAMBALUR	51	2.9	NA	NA	290	16.4	100	5.7	1	0.0	NA	NA	NA	NA	NA	NA	410	23.2	10	0.6	NA	NA	906	51.3	NA	NA	1767
17	PUDUKKOTTAI	996	21.3	1431	30.6	61	1.3	NA	NA	NA	NA	265	5.7	NA	NA	NA	NA	NA	NA	NA	NA	1795	38.4	122	2.6	NA	NA	4669
18	RAMANATHAPURAM	4168	98.9	NA	NA	29	0.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4217
19	SALEM	16	0.3	NA	NA	NA	NA	NA	NA	NA	NA	272	5.2	NA	NA	NA	NA	2736	52.2	67	1.3	NA	NA	2117	40.4	30	0.58	5237
20	SIVAGANGA	1671	40.9	18	0.4	1121	27.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3	0.1	19	0.5	1257	30.8	NA	NA	4089
21	THANJAVUR	1834	53.3	27	0.8	1389	40.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	146	4.2	42	1.2	NA	NA	3438
22	THENI	366	12.8	NA	NA	NA	NA	NA	NA	NA	NA	47	1.7	NA	NA	NA	NA	2170	76.0	NA	NA	NA	NA	270	9.5	NA	NA	2854
23	THIRUVARUR	2025	86.4	293	12.5	27	1.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2344
24	TIRUCHIRAPPALLI	260	5.7	NA	NA	126	2.8	73	1.6	NA	NA	1	0.0	NA	NA	NA	NA	746	16.5	91	2.0	50	1.1	3133	69.2	46	1.02	4527
25	TIRUNELVELI	372	5.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	29	0.4	1817	26.7	922	13.5	NA	NA	3672	53.9	NA	NA	6812
26	TIRUPPUR	177	3.5	NA	NA	NA	NA	NA	NA	NA	NA	63	1.2	NA	NA	NA	NA	233	4.6	0	NA	32	0.6	4589	90.1	NA	NA	5093
27	TIRUVALLUR	1654	49.7	580	17.4	487	14.6	NA	NA	NA	NA	NA	NA	1	0.0	NA	NA	3	0.1	NA	NA	602	18.1	NA	NA	NA	NA	3327
28	TIRUVANNAMALAI	46	0.7	NA	NA	88	1.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4397	70.8	54	0.9	165	2.7	1458	23.5	NA	NA	6208
29	TUTICORIN	1190	25.6	NA	NA	28	0.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	62	1.3	NA	NA	NA	NA	3368	72.5	NA	NA	4648
30	VELLORE	511	8.4	NA	NA	53	0.9	NA	NA	NA	NA	210	3.5	309	5.1	NA	NA	1421	23.4	NA	NA	2033	33.5	1529	32.9	NA	NA	6066
31	VILLUPPURAM	914	12.7	23	0.3	283	3.9	12	NA	1	NA	NA	NA	NA	NA	NA	NA	2449	33.9	0	NA	47	0.7	3485	48.3	NA	NA	7214
32	VIRUDUNAGAR	292	6.8	NA	NA	456	10.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	230	5.3	NA	NA	NA	NA	3335	77.3	NA	NA	4314
Total		22882	17.6	2401	1.8	8144	6.3	250	0.2	63	0.0	1488	1.1	324	0.2	29	0.0	33362	25.7	1978	1.5	10218	7.9	48411	37.2	509	0.4	130058
U.T.of Puducherry																												
1	PUDUCHERRY	287	90.5	NA	NA	30	9.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	317
2	KARAIKAL	63	38.7	NA	NA	100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	163
Total		350	72.9	NA	NA	130	27.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	480

Area in Sq.Km.



PRINCIPAL AQUIFER SYSTEMS



0 50 100
kilometers

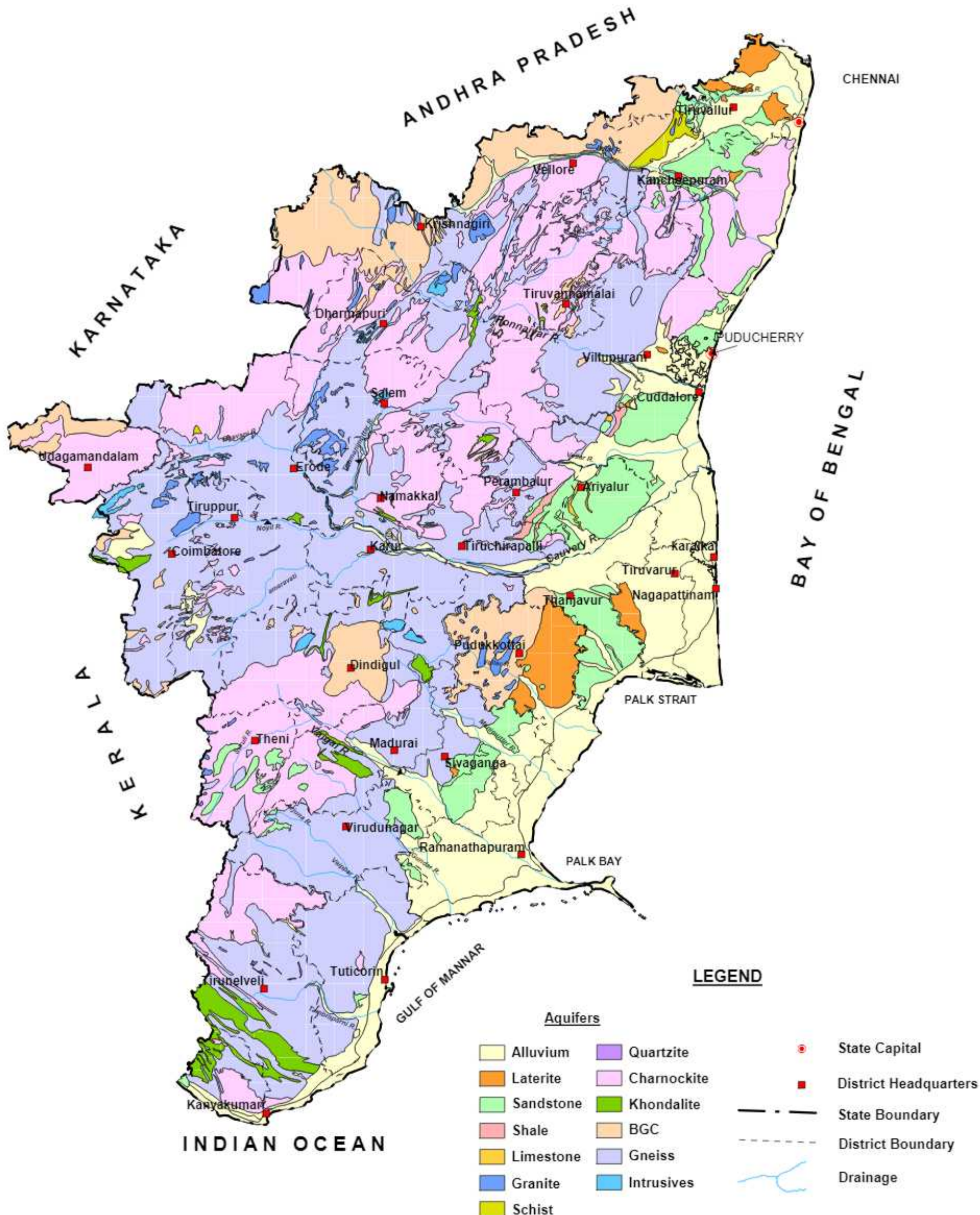


Table 4: Aquifer Systems

Sl.No.	Principal Aquifers code	Principal Aquifers	Area	Major Aquifer Code	Major Aquifer	Area	% of Total area
1	AL	Alluvium	22882	AL01	Fluvial Alluvium	16776	17.54
				AL02	Pebble/Gravel	86	
				AL04	Aeolian Alluvium	56	
				AL05	Coastal Alluvium	5965	
2	LT	Laterite	2401	LT01	Laterite / Ferruginous concretions	2401	1.85
3	ST	Sand Stone	8144	ST01	Sand Stone/Conglomerate	3551	6.26
				ST04	Sandstone with clay	4592	
4	SH	Shale	250	SH01	Shale with Lime stone	245	0.19
				SH03	Shale,Limestone,Sandstone	5	
5	LS	Limestones	63	LS02	Dolomite, Limestones	63	0.05
6	GR	Granite	1488	GR02	Acidic Rocks (Pegmatite, Granite, Syenite, Rhyolite etc.)	1488	1.14
7	SC	Schist	324	SC01	Schist	14	0.25
				SC02	Phyllite	310	
8	QZ	Quartzite	29	QZ01	Quartzite	29	0.02
9	CK	Charnockite	33362	CK01	Charnockite	33362	25.65
10	KH	Khondalite	1978	KH01	Khondalite , Granulites	1978	1.52
11	BG	Banded Gneissic Complex (BGC)	10218	BG01	Banded Gneissic Complex (BGC)	10218	7.86
12	GN	Gneiss	48411	GN02	Gneiss	453	37.22
				GN03	Migmatitic Gneiss	47958	
13	IN	Intrusives	509	IN01	Basic Rock (Dolerite, Anorthosite etc.)	200	0.39
				IN02	Ultramafic (Epidiorite, Granphyre, etc)	308	
Total			130058			130058	100
U.T. OF PUDUCHERRY							
1	AL	Alluvium	450	AL01	Fluvial Alluvium	450	93.75
2	ST	Sand Stone	30	ST1	Sand Stone	30	6.25
Total			480			480	100

Area : in Sq.Km.



MAJOR AQUIFER SYSTEMS



0 50 100
kilometers

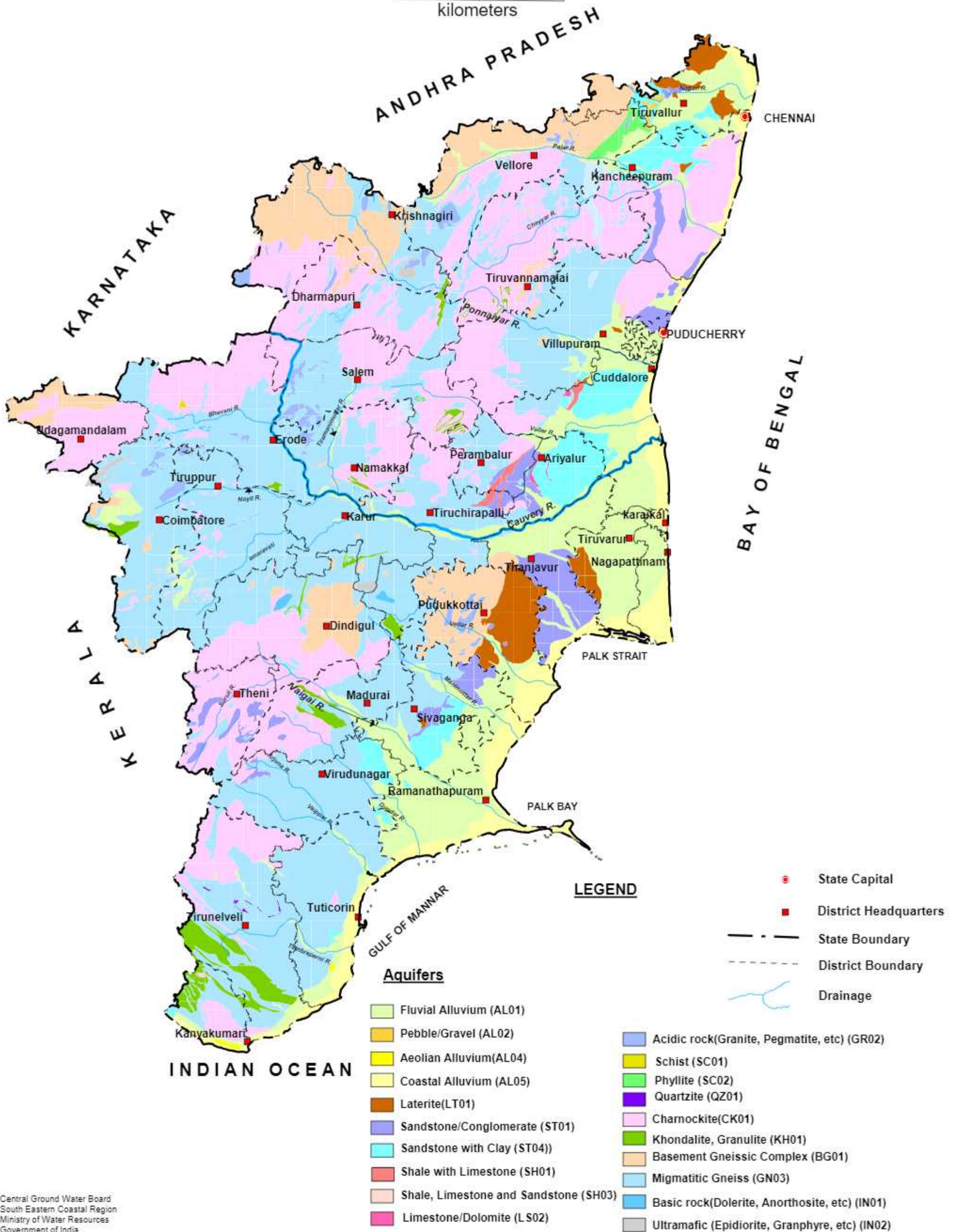


Table 5 : Parliamentary Constituencies

S.N.	PC Code	Parliamentary Constituencies Name	Alluvium	Laterite	Sand Stone	Shale	Limestones	Granite	Schist	Quartzite	Charnockite	Khondalite	BGC	Gneiss	Intrusives	Total Area (Sq.km.)
1	S2201	Madras North	190	100	16						5					311
2	S2202	Madras Central	123								14					137
3	S2203	Madras South	43								221					264
4	S2204	Sriperumbudur	1637	433	766						233		87			3156
5	S2205	Chengalpattu	486		708						2304			64		3562
6	S2206	Arakkonam	302		111			49	310		533		1143	580		3027
7	S2207	Vellore	204					24			723		1233	351		2534
8	S2208	Tirupattur						137			2587	46	228	1112		4110
9	S2209	Vandavasi									2351		161	1562		4074
10	S2210	Tindivanam	901	23	271	10					550		25	1128		2907
11	S2211	Cuddalore	456		424						1056		20	1467		3423
12	S2212	Chidambaram	1315		725	62	12				354			205		2672
13	S2213	Dharmapuri						118			2635	68	40	2174	32	5067
14	S2214	Krishnagiri						204			1428		3043	662	91	5428
15	S2215	Rasipuram	28								2927	87		954	20	4016
16	S2216	Salem	18								1167			860	30	2076
17	S2217	Tiruchengode	106					302			65	40	20	2340	15	2888
18	S2218	Nilgiris	326					120			1916	41	700	1372	123	4599
19	S2219	Gobichettipalayam	26					57	14		2252			2526	35	4910
20	S2220	Coimbatore	64					107			44	84	0	1313		1612
21	S2221	Pollachi	282					11			223		165	3910		4591
22	S2222	Palani						15			420	43	752	3847	59	5135
23	S2223	Dindigul	66								1883	204	450	738		3341
24	S2224	Madurai	145								7	13		984		1148
25	S2225	Periyakulam	104		435			45			3769			457		4811
26	S2226	Karur	217								122	112	68	3954	104	4576
27	S2227	Tiruchirappalli	186		122	63					90		34	1528		2022
28	S2228	Perambalur	239		1648	116	51				998	9		1291		4353
29	S2229	Mayiladuturai	1955													1955
30	S2230	Nagapattinam	2934	159	36											3129
31	S2231	Thanjavur	1372	160	801								121	58		2512
32	S2232	Pudukkottai	1386	1354	544			201					1254	78		4817
33	S2233	Sivaganga	2155	172	870			98					674	1292		5261
34	S2234	Ramanathapuram	3384		546									1208		5138
35	S2235	Sivakasi	82		69						444			3236		3831
36	S2236	Tirunelveli	728		28						80			3016		3853
37	S2237	Tenkasi	164							29	1468	408		1661		3730
38	S2238	Tiruchendur	925								279	551		2129		3884
39	S2239	Nagercoil	333		22						214	273		354		1195
Total			22882	2401	8144	250	63	1488	324	29	33362	1978	10218	48411	509	130058
UT of Puducherry																
40		Puducherry	350		130											480



PARLIAMENTARY CONSTITUENCIES

0 50 100
kilometers



ANDHRA PRADESH

KARNATAKA

BAY OF BENGAL

PALK STRAIT

PALK BAY

GULF OF MANNAR

INDIAN OCEAN

LEGEND

Alluvium	Quartzite
Laterite	Charnockite
Sandstone	Khondalite
Shale	BGC
Limestone	Gneiss
Granite	Intrusives
Schist	

- State Capital
- District Headquarters
- State Boundary
- District Boundary
- Drainage



Parliamentary Constituency

Table.6 : Population Census

S.N.	District	Population 2011			Population 2001			Density of Population	Decennial Growth rate (%)	Sex Ratio No of females per 1000 males
		Persons	Male	Female	Persons	Male	Female			
1	ARIYALUR	752481	373319	379162	695524	346763	348761	387	7.57	1016
2	CHENNAI	4681087	2357633	2323454	4343645	2219539	2124106	26903	7.21	986
3	COIMBATORE	3472578	1735362	1737216	2916620	1482228	1434392	748	16.01	1001
4	CUDDALORE	2600880	1311151	1289729	2285395	1150908	1134487	702	12.13	984
5	DHARMAPURI	1502900	772490	730410	1295182	670520	624662	332	13.82	946
6	DINDIGUL	2161367	1081934	1079433	1923014	968137	954877	357	11.03	998
7	ERODE	2259608	1134191	1125417	2016582	1024732	991850	397	10.76	992
8	KANCHEEPURAM	3990897	2010309	1980588	2877468	1457242	1420226	927	27.90	985
9	KANNIYAKUMARI	1863174	926800	936374	1676034	832269	843765	1106	10.04	1010
10	KARUR	1076588	534392	542196	935686	465538	470148	371	13.09	1015
11	KRISHNAGIRI	1883731	963152	920579	1561118	803077	758041	370	17.13	956
12	MADURAI	3041038	1528308	1512730	2578201	1303363	1274838	823	15.22	990
13	NAGAPATTINAM	1614069	797214	816855	1488839	739074	749765	668	7.76	1025
14	NAMAKKAL	1721179	866740	854439	1493462	759551	733911	506	13.23	986
15	PERAMBALUR	564511	281436	283075	493646	246141	247505	323	12.55	1006
16	PUDUKKOTTAI	1618725	803337	815388	1459601	724300	735301	348	9.83	1015
17	RAMANATHAPURAM	1337560	676574	660986	1187604	583376	604228	320	11.21	977
18	SALEM	3480008	1780569	1699439	3016346	1563633	1452713	663	13.32	954
19	SIVAGANGA	1341250	670597	670653	1155356	566947	588409	324	13.86	1000
20	THANJAVUR	2402781	1183112	1219669	2216138	1096638	1119500	691	7.77	1031
21	THE NILGIRIS	735071	360170	374901	762141	378351	383790	288	-3.68	1041
22	THENI	1243684	624922	618762	1093950	552986	540964	433	12.04	990
23	THIRUVALLUR	3725697	1878559	1847138	2754756	1397407	1357349	1049	26.06	983
24	THIRUVARUR	1268094	627616	640478	1169474	580784	588690	533	7.78	1020
25	THOOTHUKUDI	1738376	858919	879457	1592769	776880	815889	378	8.38	1024
26	TIRUCHIRAPPALLI	2713858	1347863	1365995	2418366	1208534	1209832	602	10.89	1013
27	TIRUNELVELI	3072880	1518595	1554285	2703492	1323882	1379610	458	12.02	1024
28	TIRUPPUR	2471222	1242974	1228248	1920154	978349	941805	476	22.30	988
29	TIRUVANNAMALAI	2468965	1238688	1230277	2186125	1095859	1090266	399	11.46	993
30	VELLORE	3928106	1959676	1968430	3477317	1741083	1736234	646	11.48	1004
31	VILLUPURAM	3463284	1744832	1718452	2960373	1492442	1467931	482	14.52	985
32	VIRUDHUNAGAR	1943309	967437	975872	1751301	870376	880925	454	9.88	1009
Total		72138958	36158871	35980087	62405679	31400909	31004770	555	13.49	995
U.T. OF PUDUCHERRY										
1	Puducherry	946600	466143	480457	735332	369428	365904	3231	22.32	1031
2	Karikal	200314	97796	102518	170791	84487	86304	1252	14.74	1048
Total		1146914	563939	582975	906123	453915	452208	2389	20.99	1034

Source: Census Hand Book India-2011



POPULATION DENSITY

0 50 100
kilometers

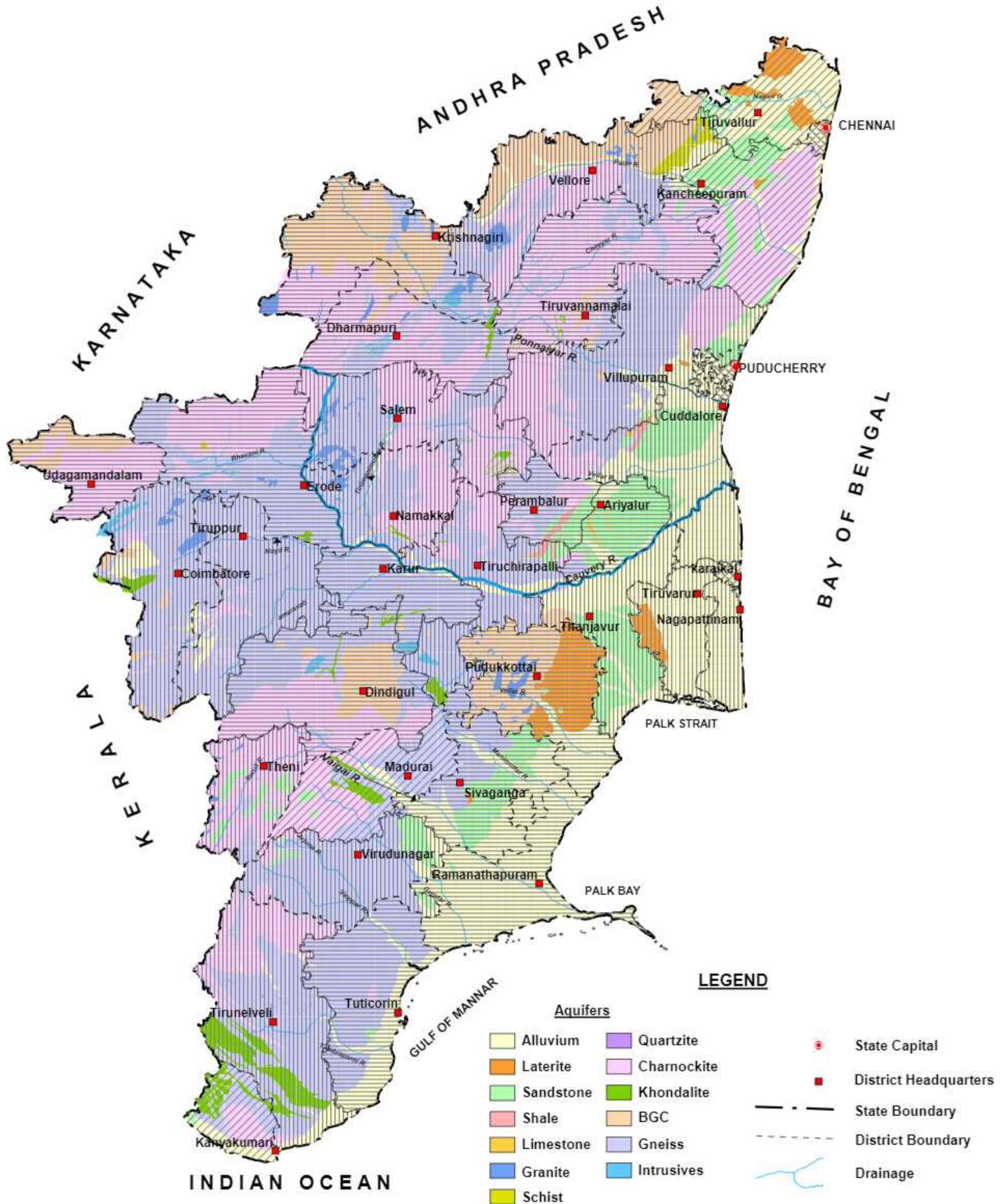


Table 7: Aquifer Distribution - River basin wise

S.N.	Basin	Alluvium	Laterite	Sand Stone	Shale	Limestones	Granite	Schist	Quartzite	Charnockite	Khondalite	BGC	Gneiss	Intrusives	Total
1	AK BASIN	2012	588	846	NA	NA	18	195	NA	499	NA	1095	NA	NA	5254
2	AGANIYAR	1182	1366	937	NA	NA	219	NA	NA	NA	NA	794	259	NA	4756
3	GUNDAR	1448	NA	477	NA	NA	NA	NA	NA	863	148	NA	1182	NA	4118
4	KALLAR	266	NA	15	NA	NA	NA	NA	NA	34	NA	NA	1385	NA	1699
5	KAVERI	7855	309	2311	156	47	850	14	NA	11287	217	4038	21699	417	49200
6	KODIYAR	336	NA	24	NA	NA	NA	NA	NA	438	292	NA	605	NA	1695
7	NAMBIYAR	676	NA	0	NA	NA	NA	NA	NA	32	365	NA	799	NA	1872
8	PALAR	882	22	638	NA	NA	57	114	NA	4899	NA	1497	1674	NA	9784
9	PARAMBIKULAM	NA	NA	NA	NA	NA	NA	NA	NA	30	40	139	1556	NA	1766
10	PARAVANAR	136	NA	479	NA	NA	NA	NA	NA	NA	NA	NA	0	NA	615
11	PKARIYAR	2277	94	894	NA	NA	22	NA	NA	245	93	363	1789	NA	5775
12	PONNIYAR	1041	18	0	NA	NA	275	NA	NA	3131	121	2255	4067	91	11000
13	TAMBARAPARANI	418	NA	13	NA	NA	NA	NA	29	825	577	NA	3649	NA	5511
14	VAIGAIYAR	2351	NA	609	NA	NA	47	NA	NA	3580	48	NA	1345	NA	7981
15	VAIPPAR	491	NA	74	NA	NA	NA	NA	NA	1279	NA	NA	3902	NA	5746
16	VARAHANADI	572	NA	436	NA	NA	NA	NA	NA	2152	NA	38	1615	NA	4814
17	VELLAR	863	5	466	94	16	NA	NA	NA	4067	77	NA	2884	NA	8472
Total		22806	2401	8219	250	63	1488	324	29	33362	1978	10218	48411	509	130058

Units: sq. km.



AQUIFER - RIVER BASIN WISE



0 50 100
kilometers

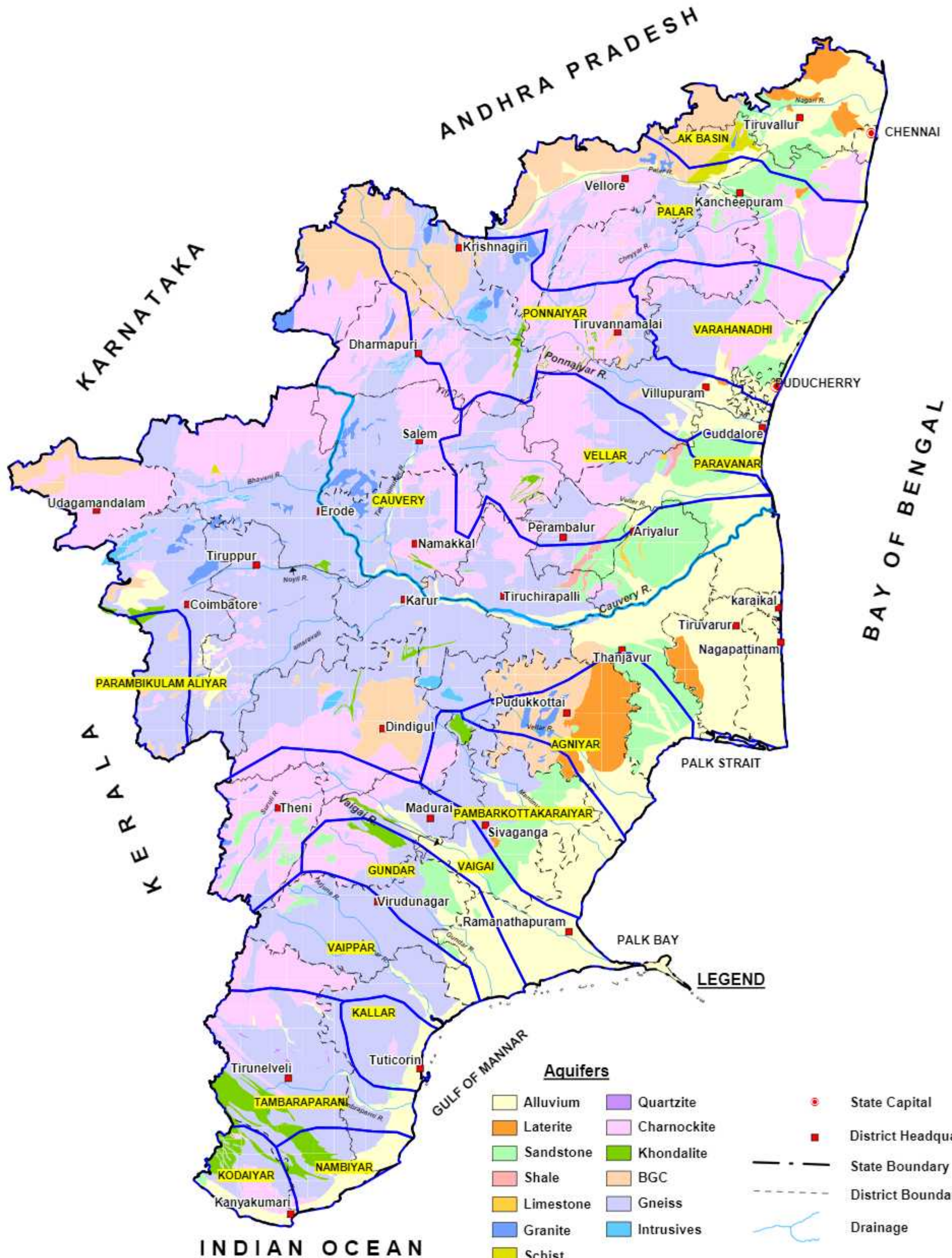


Table 8: River Gauge and Discharge (G&D) Sites in Different Aquifers

S.N.	Basin	Alluvium	Laterite	Sand Stone	Shale	Limestones	Granite	Schist	Quartzite	Charnockite	Khondalite	BGC	Gneiss	Intrusives	Total
1	AK BASIN	0	0	0	NA	NA	0	0	NA	0	NA	0	NA	NA	0
2	AGANIYAR	0	0	0	NA	NA	0	NA	NA	NA	NA	0	0	NA	0
3	CAUVERY	6	0	0	0	0	0	0	NA	2	0	0	12	0	20
4	GUNDAR	0	NA	0	NA	NA	NA	NA	NA	0	0	NA	0	NA	0
5	KALLAR	0	NA	0	NA	NA	NA	NA	NA	0	NA	NA	0	NA	0
6	KODIYAR	0	NA	0	NA	NA	NA	NA	NA	1	0	NA	1	NA	2
7	NAMBIYAR	0	NA	NA	NA	NA	NA	NA	NA	0	0	NA	0	NA	0
8	PALAR	2	0	0	NA	NA	0	0	NA	1	NA	1	1	NA	5
9	PARAMBIKULAM	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	NA	0
10	PARAVANAR	0	0	0	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	0
11	PKARIYAR	0	0	0	NA	NA	0	NA	NA	0	0	0	0	NA	0
12	PONNIYAR	0	0	NA	NA	NA	0	NA	NA	1	0	0	2	0	3
13	TAMBARAPARANI	1	0	NA	NA	NA	NA	NA	0	0	0	NA	1	NA	2
14	VAIGAIYAR	0	0	NA	NA	NA	0	NA	NA	2	0	NA	0	NA	2
15	VAIPPAR	1	0	NA	NA	NA	NA	NA	NA	0	0	NA	1	NA	2
16	VARAHANADI	1	0	NA	NA	NA	NA	NA	NA	0	NA	0	0	NA	1
17	VELLAR	1	0	0	0	0	NA	NA	NA	0	NA	NA	0	NA	1
Total		12	0	0	0	0	0	0	0	7	0	1	18	0	38

source: CWC Statistical Hand book 2011

NA: Formation Not Available; 0: Stations of CWC not available



RIVER GAUGE AND DISCHARGE SITES



0 50 100
kilometers

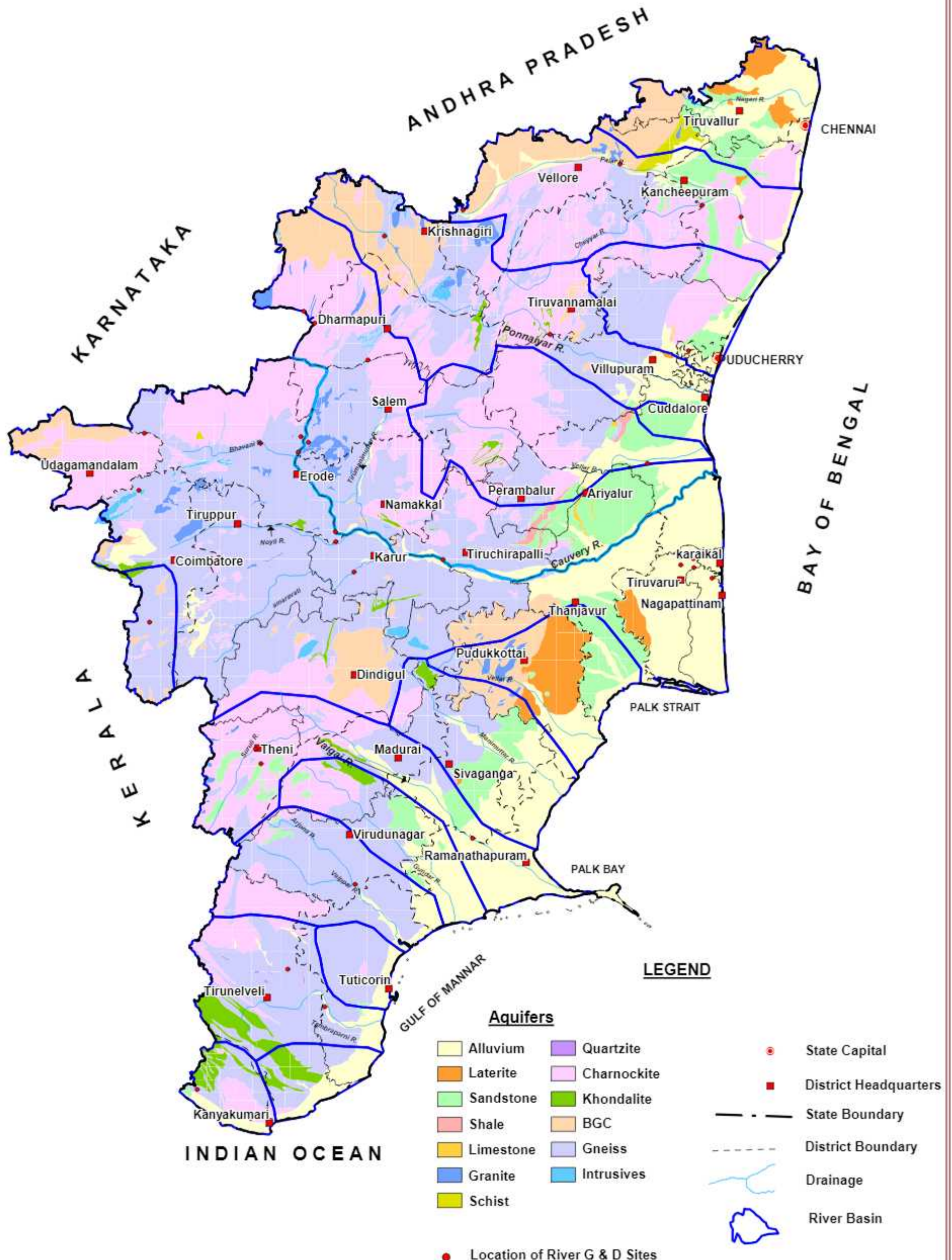


Table 9 : Districts having Multi Aquifer Systems

Sl.No.	Districts	Alluvium	Sandstone
1	Ariyalur	365	1393
2	Cuddalore	0	1115
3	Kancheepuram	0	1108
4	Nagapattinam	2422	NA
5	Ramanthapuram	4168	29
6	Sivaganga	1671	1121
7	Thanjavur	0	1389
8	Tiruvarur	2025	0
9	Tiruvallur	0	487
10	Tiruchirapalli	260	0
UT of Puducherry			
1	Karaikal	163	NA

NA: Formation not Available; 0: Multi Aquifer System do not exist



AQUIFER SYSTEM

0 50 100
kilometers

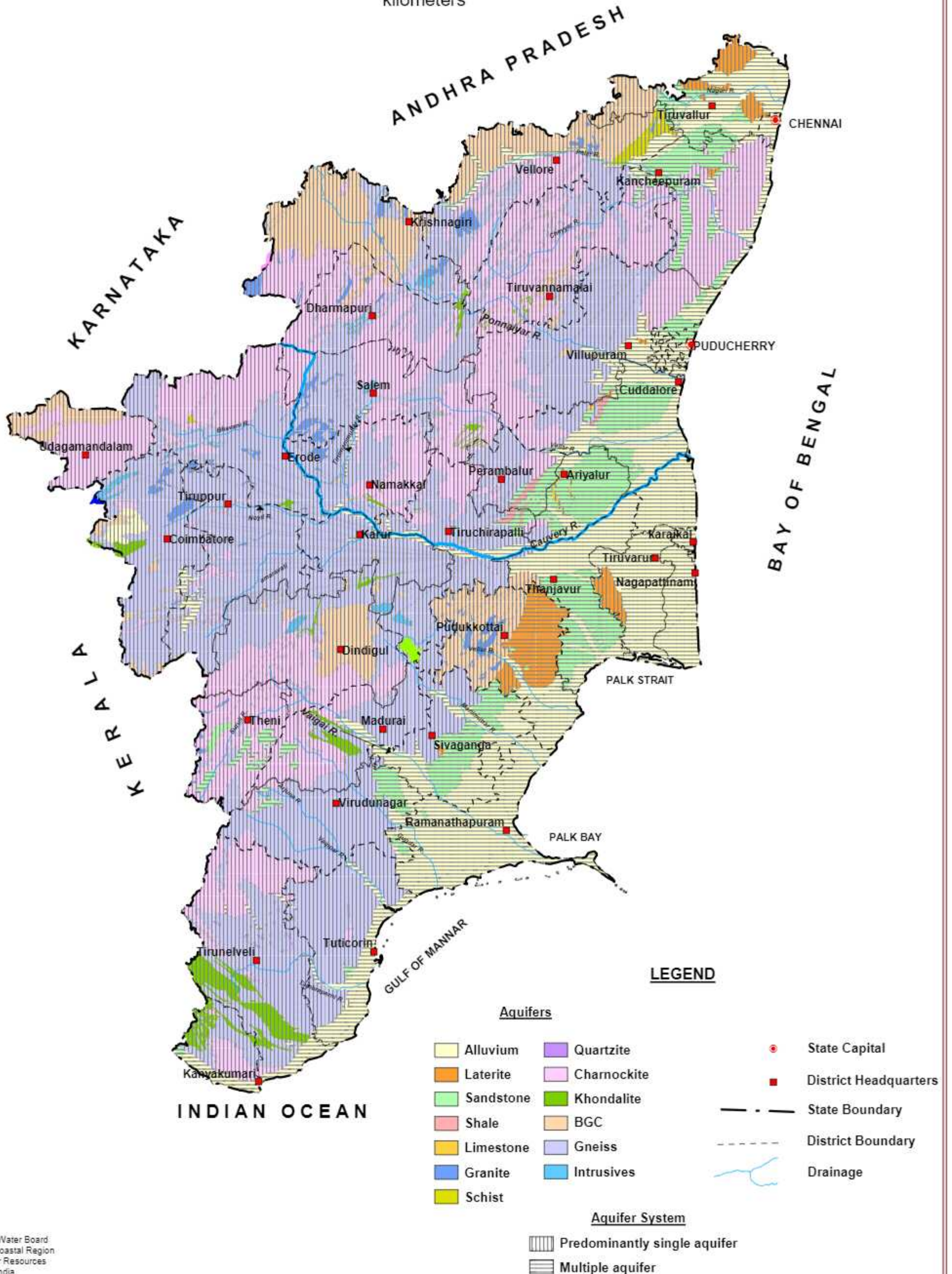


Table 10: District wise & Aquifer wise Number of Exploratory Wells

S.N.	District Name	Alluvium	Laterite	Sand Stone	Shale	Limestone	Granite	Schist	Quartzite	Charnockite	Khondalite	BGC	Gneiss	Intrusives	Total
1	ARIYALUR	0	NA	14	0	1	NA	NA	NA	0	NA	NA	0	NA	15
2	CHENNAI	8	0	NA	NA	NA	NA	NA	NA	3	NA	NA	NA	NA	11
3	COIMBATORE	0	NA	NA	NA	NA	2	NA	NA	1	2	4	119	1	129
4	CUDDALORE	28	0	67	0	0	NA	NA	NA	1	NA	NA	5	NA	101
5	DHARMAPURI	NA	NA	NA	NA	NA	0	NA	NA	25	0	1	18	1	45
6	DINDIGUL	NA	NA	NA	NA	NA	NA	NA	NA	20	1	26	23	2	72
7	ERODE	0	NA	NA	NA	NA	4	0	NA	32	0	0	113	3	152
8	KANCHEEPURAM	5	0	19	NA	NA	NA	NA	NA	75	NA	NA	0	NA	99
9	KANYAKUMARI	0	NA	0	NA	NA	NA	NA	NA	15	5	NA	5	NA	25
10	KARUR	0	NA	NA	NA	NA	NA	NA	NA	NA	1	0	68	0	69
11	KRISHNAGIRI	NA	NA	NA	NA	NA	6	NA	NA	12	0	60	16	0	94
12	MADURAI	0	NA	0	NA	NA	NA	NA	NA	9	1	NA	75	NA	85
13	NAGAPPATTINAM	35	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	35
14	NAMAKKAL	0	NA	NA	NA	NA	0	NA	NA	15	0	1	56	1	73
15	NILGIRI	NA	NA	NA	NA	NA	NA	NA	NA	0	NA	1	0	NA	1
16	PERAMBALUR	0	NA	54	1	0	NA	NA	NA	3	0	NA	13	NA	71
17	PUDUKKOTTAI	0	0	0	NA	NA	1	NA	NA	NA	NA	27	3	NA	31
18	RAMANATHAPURAM	80	NA	0	NA	NA	NA	NA	NA	NA	NA	NA	3	NA	83
19	SALEM	0	NA	NA	NA	NA	8	NA	NA	33	0	NA	31	0	72
20	SIVAGANGA	13	0	8	NA	NA	NA	NA	NA	NA	0	0	24	NA	45
21	THANJAVUR	15	0	13	NA	NA	NA	NA	NA	NA	NA	0	0	NA	28
22	THENI	0	NA	NA	NA	NA	0	NA	NA	50	NA	NA	15	NA	65
23	THIRUVARUR	13	9	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23
24	TIRUCHCHIRAPPALI	0	NA	0	0	NA	0	NA	NA	9	1	3	38	1	52
25	TIRUNELVELI	3	NA	NA	NA	NA	NA	NA	0	20	9	NA	42	NA	74
26	TIRUPPUR	0	NA	NA	NA	NA	1	NA	NA	1	0	1	34	NA	37
27	TIRUVALLUR	33	15	12	NA	NA	NA	0	NA	0	NA	17	NA	NA	77
28	TIRUVANNAMALAI	1	NA	1	NA	NA	NA	NA	NA	45	0	2	19	NA	68
29	TUTICORIN	15	NA	0	NA	NA	NA	NA	NA	1	NA	NA	37	NA	53
30	VELLORE	0	NA	0	NA	NA	1	15	NA	25	NA	46	35	NA	122
31	VILUPPURAM	13	0	4	0	0	NA	NA	NA	23	0	1	28	NA	69
32	VIRUDUNAGAR	0	NA	0	NA	NA	NA	NA	NA	0	NA	NA	61	NA	61
Total		262	24	193	1	1	23	15	0	418	20	190	881	9	2037
U T of PUDUCHERRY															
1	PUDUCHERRY	34	NA	13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	47
2	KARAIKAL	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15
Total		49	0	13	0	0	0	0	0	0	0	0	0	0	62
Grand Total		311	24	206	1	1	23	15	0	418	20	190	881	9	2099

NA: Formation Not available; 0: Wells do not exist



GROUND WATER EXPLORATORY WELLS



0 50 100
kilometers

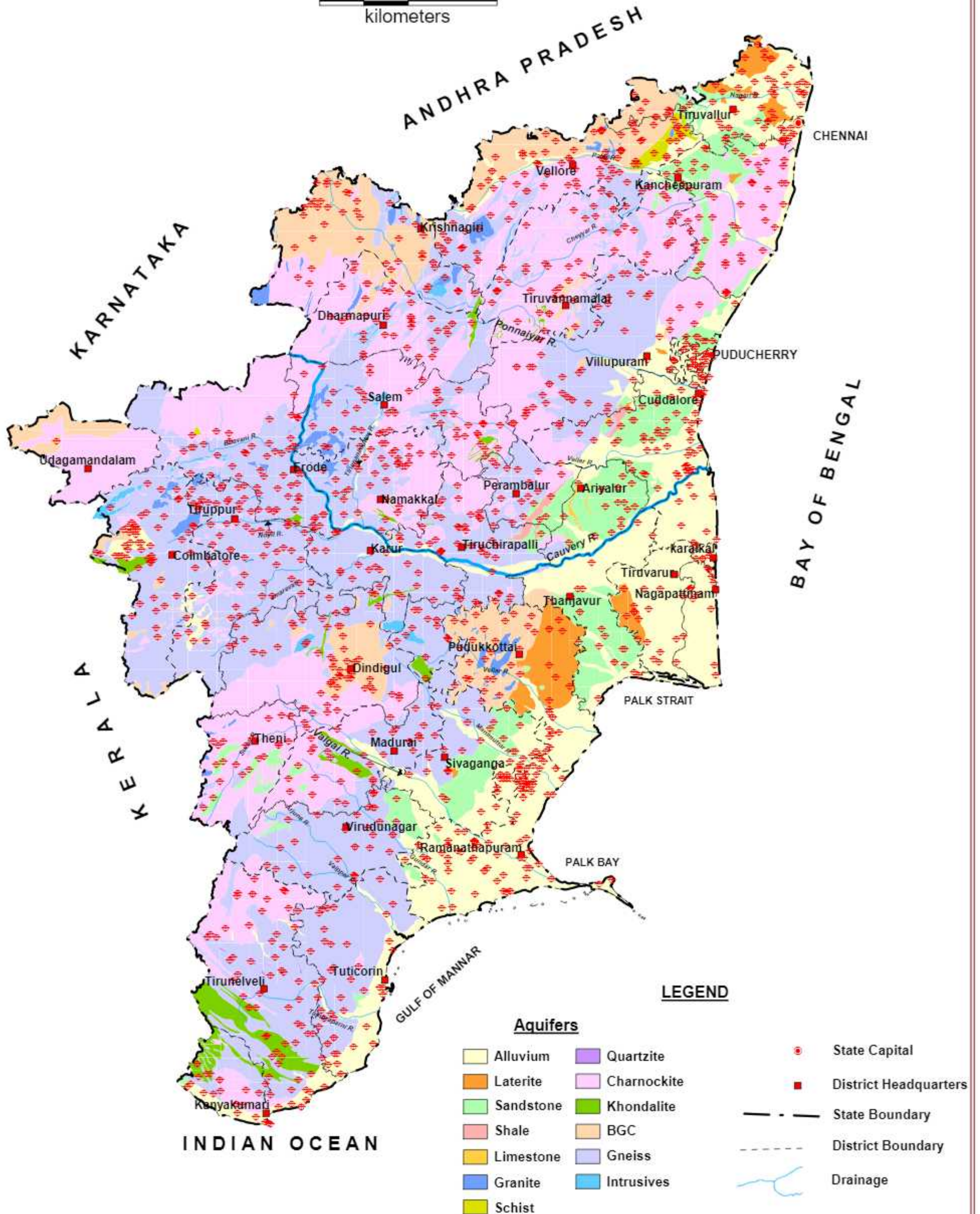


Table 11 : District wise and Aquifer wise number of GW Observation Wells (Dugwells/ Peizometers)

S.N.	District Name	Alluvium		Laterite		Sand Stone		Shale		Limestone		Granite		Schist		Quartzite		Charnockite		Khondalite		B G C		Gneiss		Intrusives		Total		Grand Total
		DW	Pz	DW	Pz	DW	Pz	DW	Pz	DW	Pz	DW	Pz	DW	Pz	DW	Pz	DW	Pz	DW	Pz	DW	Pz	DW	Pz	DW	Pz	DW	Pz	
1	Ariyalur	0	0	NA	NA	6	2	0	0	0	0	NA	NA	NA	NA	NA	NA	0	0	NA	NA	NA	NA	0	0	NA	NA	6	2	8
2	Chennai	10	3	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	0	NA	NA	NA	NA	NA	NA	NA	NA	11	3	14
3	Coimbatore	0	0	NA	NA	NA	NA	NA	NA	NA	NA	1	1	NA	NA	NA	NA	1	0	0	5	0	4	8	69	0	1	10	80	90
4	Cuddalore	5	19	0	0	6	14	1	0	0	0	NA	NA	NA	NA	NA	NA	0	2	NA	NA	NA	NA	2	1	NA	NA	14	36	50
5	Dharmapuri	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	0	NA	NA	NA	NA	5	6	0	0	5	7	4	12	1	1	16	26	42
6	Dindigul	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	2	0	0	8	9	4	4	1	1	19	16	35
7	Erode	0	0	NA	NA	NA	NA	NA	NA	NA	NA	1	0	0	0	NA	NA	2	8	0	0	0	0	17	52	0	0	20	60	80
8	Kancheepuram	7	1	2	0	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	17	26	NA	NA	NA	NA	0	0	NA	NA	26	27	53
9	Kanyakumari	6	5	NA	NA	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4	1	2	2	NA	NA	2	1	NA	NA	14	9	23
10	Karur	1	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	9	4	0	0	10	5	15
11	Krishnagiri	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5	2	NA	NA	NA	NA	6	3	0	0	10	5	2	4	0	0	23	14	37
12	Madurai	4	0	NA	NA	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4	8	0	0	NA	NA	2	43	NA	NA	10	51	61
13	Nagapattinam	10	7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10	7	17
14	Namakkal	1	0	NA	NA	NA	NA	NA	NA	NA	NA	0	0	NA	NA	NA	NA	7	1	0	0	0	1	10	21	0	0	18	23	41
15	Nilgiris	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	0	NA	NA	4	1	0	0	NA	NA	10	1	11
16	Perambalur	1	0	NA	NA	2	0	0	0	0	0	NA	NA	NA	NA	NA	NA	3	2	0	0	NA	NA	2	5	NA	NA	8	7	15
17	Pudukkottai	7	0	6	0	0	0	NA	NA	NA	NA	3	1	NA	NA	NA	NA	NA	NA	NA	NA	3	8	0	0	NA	NA	19	9	28
18	Ramanathapuram	25	4	NA	NA	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	NA	NA	25	4	29
19	Salem	0	0	NA	NA	NA	NA	NA	NA	NA	NA	1	1	NA	NA	NA	NA	8	10	0	0	NA	NA	10	15	0	0	19	26	45
20	Sivaganga	3	1	0	0	8	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	4	3	NA	NA	15	6	21
21	Thanjavur	15	0	0	0	10	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	0	0	0	NA	NA	26	0	26
22	Theni	6	0	NA	NA	NA	NA	NA	NA	NA	NA	0	0	NA	NA	NA	NA	7	37	NA	NA	NA	NA	0	0	NA	NA	13	37	50
27	Tiruvarur	29	3	2	0	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	31	3	34
28	Tiruchirapalli	1	0	NA	NA	0	1	0	0	NA	NA	0	0	NA	NA	NA	NA	3	1	1	0	0	0	9	10	0	0	14	12	26
25	Tirunelveli	3	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0	6	7	5	4	NA	NA	15	13	NA	NA	29	26	55
24	Tiruppur	0	0	NA	NA	NA	NA	NA	NA	NA	NA	0	0	NA	NA	NA	NA	5	2	0	0	2	2	14	3	NA	NA	21	7	28
26	Tiruvallur	15	15	1	0	5	0	NA	NA	NA	NA	NA	NA	0	0	NA	NA	0	0	NA	NA	3	8	NA	NA	NA	NA	24	23	47
23	Thiruvannamalai	0	0	NA	NA	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7	0	0	0	0	0	3	2	NA	NA	10	2	12
29	Tuticorin	6	0	NA	NA	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	0	NA	NA	NA	NA	16	12	NA	NA	23	12	35
30	Vellore	6	1	NA	NA	0	0	NA	NA	NA	NA	0	1	2	2	NA	NA	2	4	NA	NA	10	9	11	7	NA	NA	31	24	55
31	Villupuram	3	3	0	0	1	0	0	0	0	0	NA	NA	0	0	NA	NA	8	6	0	0	0	0	9	8	NA	NA	21	17	38
32	Virudhunagar	0	0	NA	NA	0	0	NA	NA	NA	NA	NA	NA	0	0	NA	NA	1	0	NA	NA	NA	NA	11	14	NA	NA	12	14	26
Total		165	72	11	0	38	17	1	0	0	0	12	6	2	2	0	0	110	126	8	11	46	54	164	303	2	3	558	589	1147
U.T. OF PUDUCHERRY																														
1	Puducherry	4	7	NA	NA	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4	7	11
2	Karaikal	3	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3	0	3
Total		7	7	NA	NA	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7	7	14
Grand Total		172	79	0	0	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	565	596	1161

NA: Formation Not available; 0: Wells do not exist



GROUND WATER MONITORING WELLS



0 50 100
kilometers

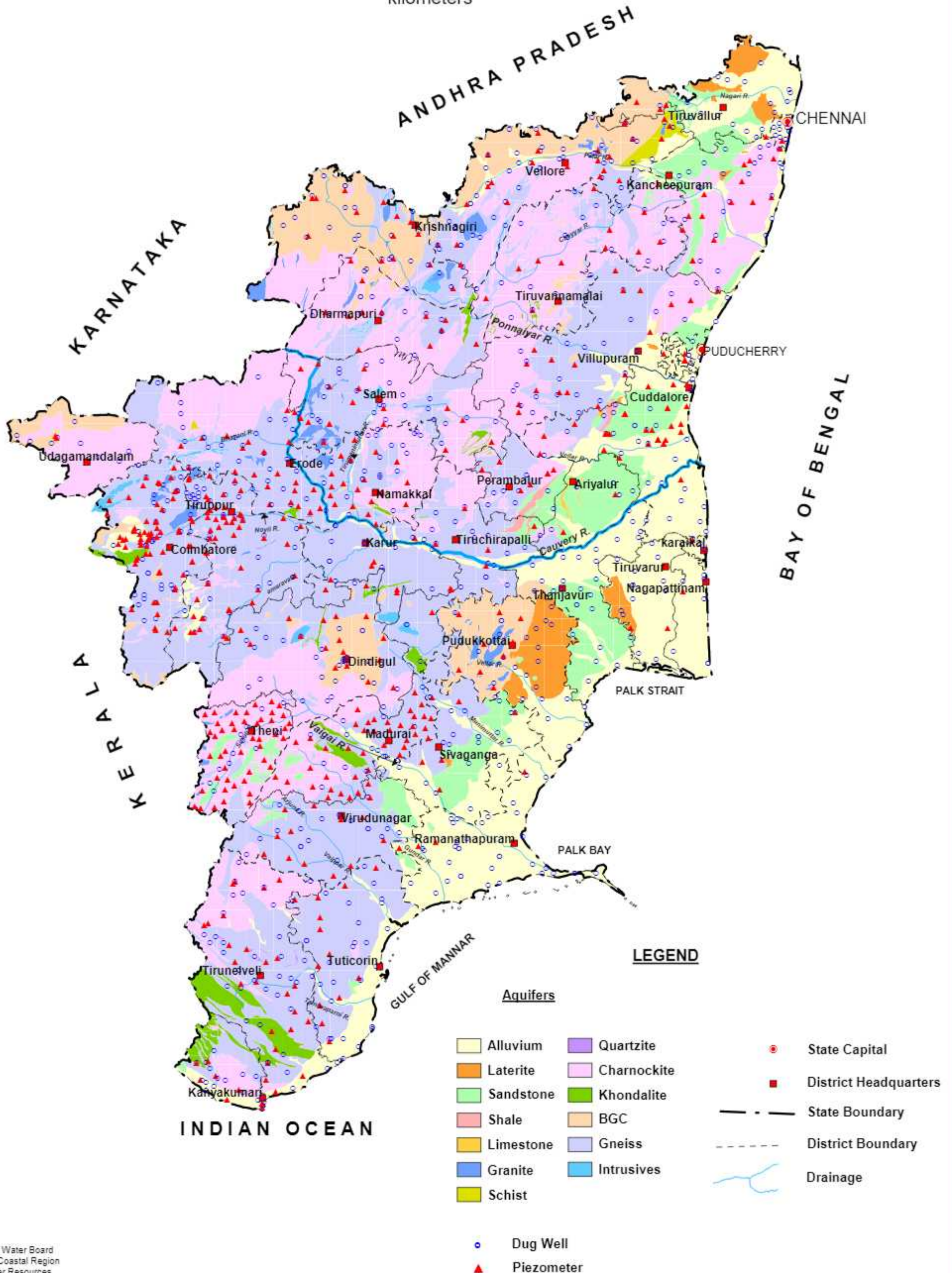


Table 12: District wise and Aquifer wise Depth to Water Level (Pre-monsoon 2011)

S.N.	District Name	Alluvium		Laterite		Sand Stone		Shale		Limestone		Granite		Schist		Quartzite		Charnockite		Khondalite		B G C		Gneiss		Intrusives	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1	Ariyalur	5.95	5.95															1.13	1.10								
2	Chennai	2.15	6.47																								
3	Coimbatore	28.30	28.30									12.55	14.65											1.35	22.00		
4	Cuddalore	3.21	4.92			2.04	11.00	0.00	4.00									1.17	1.20								
5	Dharmapuri																	0.00	6.50	2.62	5.50	9.76	9.80				
6	Dindigul																	0.00	6.50			1.64	7.40	1.40	9.80	7.70	8.00
7	Erode																	5.34	7.50					1.69	11.00		
8	Kancheepuram	3.29	4.91	1.57	1.60	8.56	11.00											2.04	8.90								
9	Kanyakumari	4.91	11.00															4.60	7.40					0.00	11.00		
10	Karur	5.14	5.14																					3.82	8.50		
11	Krishnagiri											6.45	8.12									2.85	16.00	8.96	9.00		
12	Madurai																	3.69	3.70					3.59	5.70		
13	Nagapattinam	2.02	5.58																								
14	Namakkal																	3.90	12.00					1.79	12.00		
15	Nilgiris																	0.65	5.70			4.24	9.00				
16	Perambalur					2.80	2.81																	4.51	8.50		
17	Pudukottai	2.00	4.57	4.00	11.00							3.12	4.50									3.34	4.70				
18	Ramanthapuram	1.47	7.53																								
19	Salem											3.66	16.00					2.62	7.10					0.60	12.00		
20	Sivaganga	4.10	4.24			3.33	4.50																	1.28	9.40		
21	Thanjavur	2.15	13.40			3.60	17.00																	6.10	6.10		
22	Theni																	1.12	6.50								
23	Tiruvarur	1.51	5.55	6.10	6.13																						
24	Tiruchirapalli	1.55	1.55															7.50	7.60	4.00	4.00			0.00	15.00		
25	Tirunelveli	3.38	7.13															3.68	17.00	2.69	7.30			0.55	13.00		
26	Tiruppur																							1.92	12.00		
27	Tiruvallur	1.49	7.24			1.85	5.00															3.78	3.80				
28	Tiruvannamalai																	5.33	8.90	6.20	6.24			4.35	4.40		
29	Tuticorin	1.27	5.35																					0.80	14.00		
30	Vellore	3.20	12.00									6.30	6.30	6.25	6.25			7.40	7.43			7.28	16.00	4.57	11.00		
31	Villupuram					3.65	3.70											1.85	5.10					2.39	8.00		
32	Virudhunagar																							3.20	7.90		
		1.27	28.30	1.57	11.00	1.85	17.00	0.00	4.00			3.12	16.00	6.25	6.25			0.00	17.00	2.62	7.30	1.64	16.00	0.00	22.00	8.00	8.00
U.T.OF PUDUCHERRY																											
1	Puducherry	2.20	3.66																								
2	Karaikal	2.04	3.57																								
		2.04	3.66																								

Units: mbgl (metre below ground level)



DEPTH TO WATER LEVEL (PREMONSOON - MAY 2011)



0 50 100
kilometers

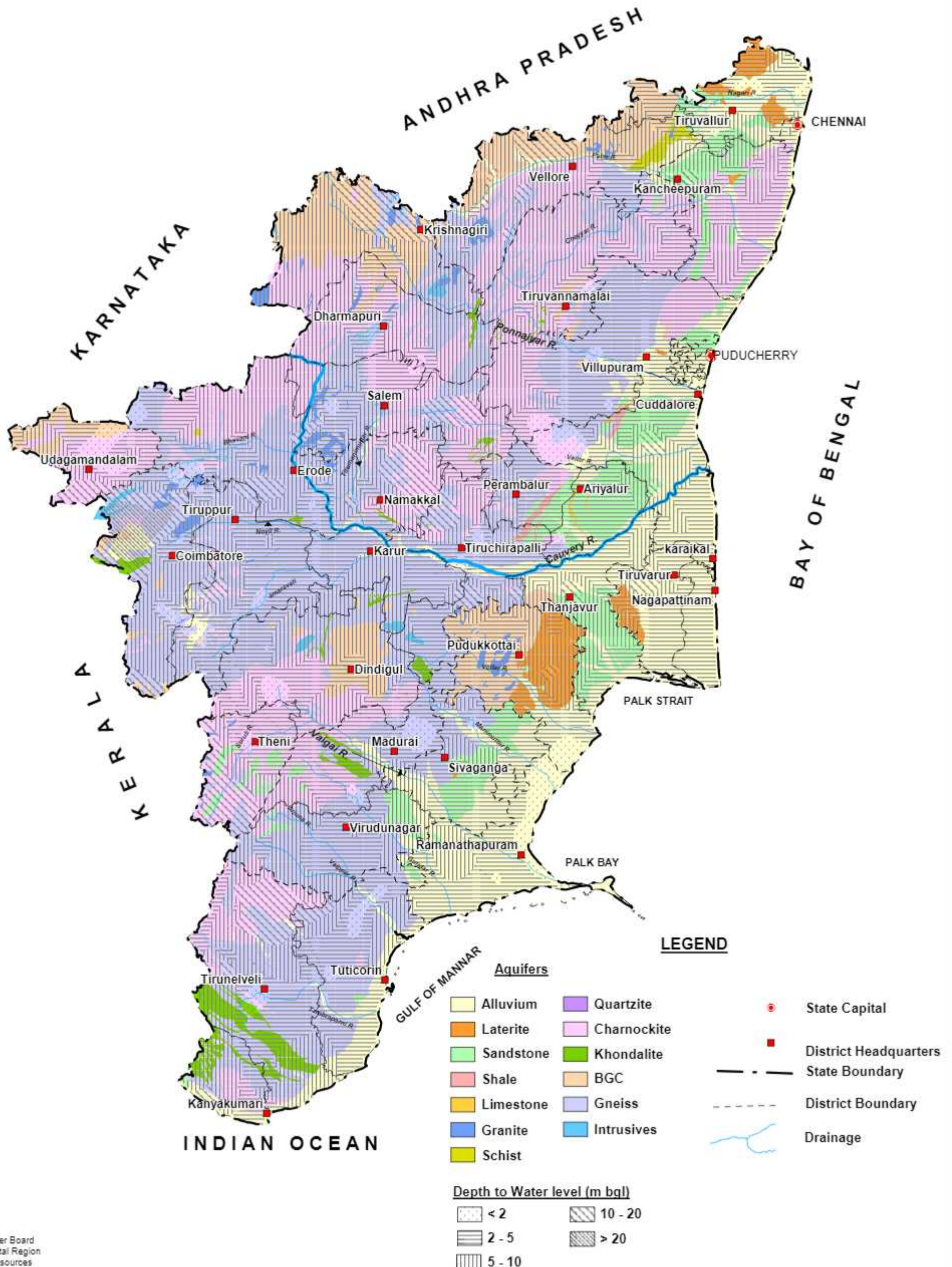


Table 13 : District wise and Aquifer wise Depth to Water Level (Post-monsoon - 2012)

S.N.	District Name	Alluvium		Laterite		Sand Stone		Shale		Limestones		Granite		Schist		Quartzite		Charnockite		Khondalite		B G C		Gneiss		Intrusives	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1	Ariyalur	4.44	4.44															0.47	0.47								
2	Chennai	2.20	4.61																								
3	Coimbatore	26.80	26.80									6.55	6.55											1.70	14.73		
4	Cuddalore	0.88	28.12			0.60	1.15	2.10	2.11	0.50	0.50							0.73	0.73								
5	Dharmapuri																	3.08	5.55			6.60	6.62	6.00	5.96		
6	Dindigul																	3.77	4.13			0.80	3.55	1.40	8.88	3.80	4.00
7	Erode																	7.01	8.74					1.00	8.06		
8	Kancheepuram	0.90	1.75	0.87	0.87	4.30	4.29											0.76	2.48								
9	Kanyakumari	5.55	12.13															4.33	4.51					5.30	7.67		
10	Karur	4.24	4.24																					1.10	6.97		
11	Krishnagiri											5.15	5.15									1.10	7.44	6.20	6.16		
12	Madurai																	1.39	1.39					0.90	5.35		
13	Nagapattinam	1.06	1.74																								
14	Namakkal																	3.15	8.02					1.40	13.68		
15	Nilgiris																	1.02	17.40			3.20	7.87				
16	Perambalur					1.19	1.20																	2.60	2.79		
17	Pudukottai	0.84	3.20	0.82	5.62							1.10	1.90									0.80	3.80				
18	Ramanthapuram	0.40	5.50																								
19	Salem											4.15	5.12														
20	Sivaganga	2.79	3.57			1.40	2.20																	0.30	7.40		
21	Thanjavur	1.15	6.48			1.70	4.35																	2.20	2.23		
22	Theni																	1.04	5.20								
23	Tiruvarur	0.20	3.92	0.49	0.49																						
24	Tiruchirapalli																	5.70	5.70	2.00	2.00			2.40	12.96		
25	Tirunelveli	3.54	4.13															0.04	3.52	0.70	3.18			0.20	4.49		
26	Tiruppur																							1.30	9.60		
27	Tiruvallur	0.20	4.05			1.40	1.90															0.50	0.49				
28	Tiruvannamalai																	0.90	4.02	3.80	3.81			0.02	0.02		
29	Tuticorin	0.12	3.72																					0.20	8.09		
30	Vellore	2.20	2.20											3.25	3.25			3.51	3.51			3.70	12.04	1.70	12.54		
31	Villupuram					2.20	2.22											0.35	2.08					0.30	2.75		
32	Virudhunagar																							1.10	5.10		
Total		0.12	28.12	0.49	5.62	0.60	4.35	2.10	2.11	0.50	0.50	1.10	6.55	3.25	3.25	0.00	0.00	0.04	17.40	0.70	3.81	0.50	12.04	0.02	14.73	3.80	4.00
U.T.OF PUDUCHERRY																											
1	Puducherry	0.47	2.55																								
2	Karaikal	0.25	1.51																								
Total		0.25	2.55																								

Units : mbgl (metre below ground level)



DEPTH TO WATER LEVEL (POSTMONSOON - JAN 2012)

0 50 100
kilometers

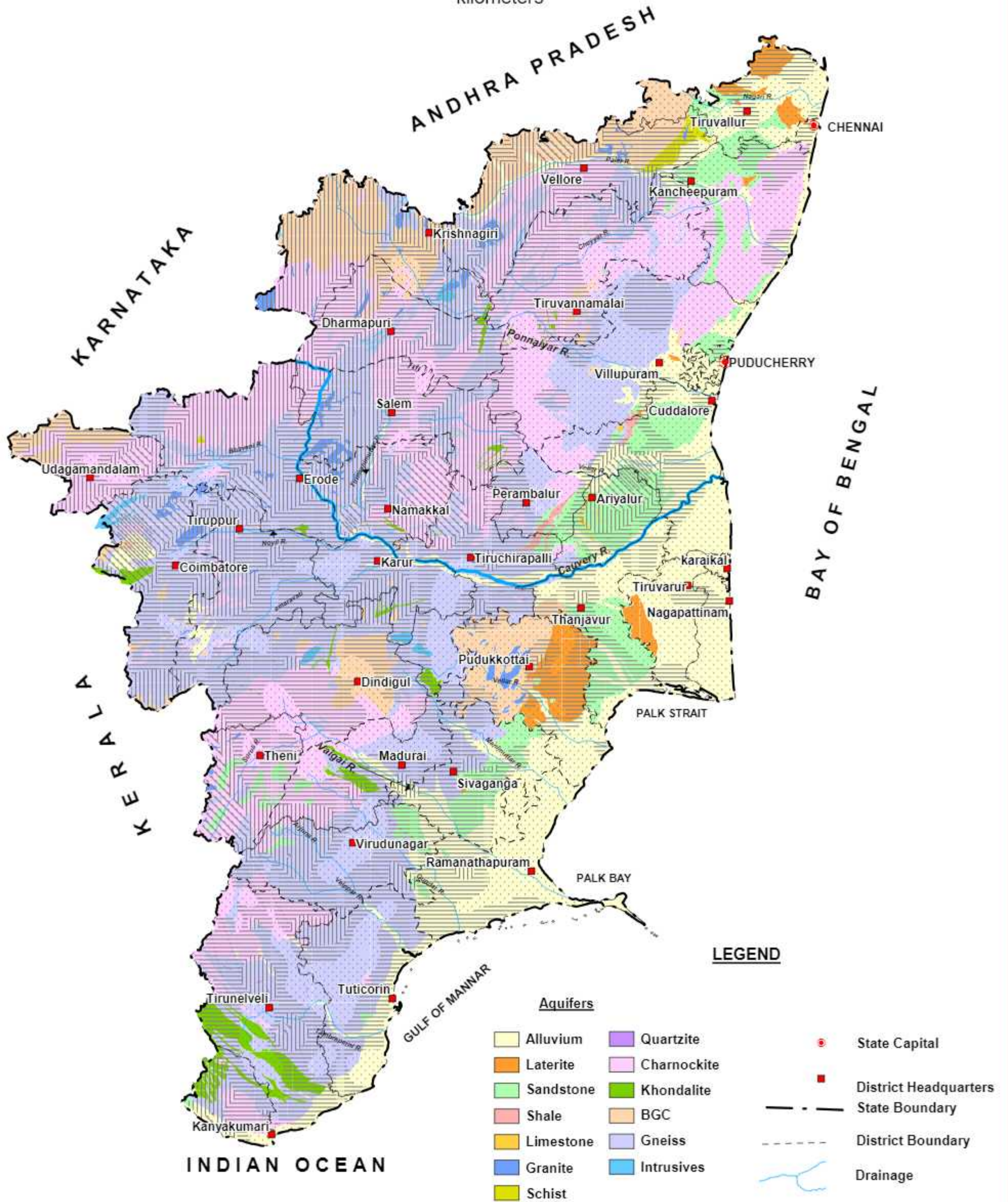


Table 14 : District wise and Aquifer wise Seasonal Ground water level fluctuation

Sl.N.	District Name	Alluvium		Laterite		Sand Stone		Shale		Limestone		Granite		Schist		Quartzite		Charnockite		Khondalite		B G C		Gneiss		Intrusives	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1	Ariyalur	1.51	1.51															0.66	0.66								
2	Chennai	-2.46	2.12																								
3	Coimbatore	1.50	1.50									6.00	6.00											-0.31			
4	Cuddalore	-8.12	2.44			0.89	3.06	2.29	2.29	3.89	3.89							0.44	0.44								
5	Dharmapuri																	-2.45	1.25			-1.15	-1.15	3.80	3.80		
6	Dindigul																	0.88	2.68			0.55	5.20	0.30	5.25	3.90	3.90
7	Erode																	-3.40	0.49					-1.05	7.49		
8	Kancheepuram	1.54	4.01	0.70	0.70	4.27	4.27											1.28	6.24								
9	Kanyakumari	0.07	6.65															0.16	2.84					1.92	5.52		
10	Karur	0.90	0.90																				1.52	2.70			
11	Krishnagiri											0.70	0.70									0.90	8.26	2.80	2.80		
12	Madurai																	2.30	2.30					0.39	2.65		
13	Nagapattinam	0.28	4.31																								
14	Namakkal																	-0.20	4.08					-1.50	3.70		
15	Nilgiris																	-11.70	1.03			0.70	1.10				
16	Perambalur					1.62	1.62																	1.87	5.81		
17	Pudukottai	1.16	1.35									0.98	2.80									0.88	2.58				
18	Ramanthapuram	-1.52	2.54																								
19	Salem											0.49	10.88														
20	Sivaganga	0.53	1.54			-2.16	2.36																	0.98	2.00		
21	Thanjavur	0.86	6.92			2.87	12.55																	3.87	3.87		
22	Theni																	0.08	2.60								
23	Tiruvarur	1.23	2.10																								
24	Tiruchirapalli																	1.85	1.85	2.00	2.00			-4.92	9.09		
25	Tirunelveli	-0.16	3.00															3.10	16.24	2.00	4.14			-1.88	10.05		
26	Tiruppur																							-6.60	4.80		
27	Tiruvallur	-2.94	6.20			1.42	3.13															3.39	3.29				
28	Tiruvannamalai																	3.29	6.03	2.43	2.43			4.33	4.33		
29	Tuticorin	1.29	1.37																					0.19	5.81		
30	Vellore	5.23	5.23									0.80	0.80	3.00	3.00			3.92	3.92			0.95	4.16	-8.56	5.55		
31	Villupuram					1.43	1.43											1.39	3.07					1.55	3.13		
32	Virudhunagar																							-5.10	4.08		
Total		-8.12	6.92	0.7	0.7	-2.16	12.55	2.29	2.29	3.89	3.89	0.49	10.88	3	3	0	0	-11.7	16.24	2	4.14	-1.15	8.26	-8.56	10.05	3.9	3.9
U.T.OF PUDUCHERRY																											
1	Puducherry	1.11	1.73																								
2	Karaikal	1.79	2.06																								
Total		1.11	2.06																								

Units: metre



WATER LEVEL FLUCTUATION (MAY 2011-JAN 2012)

0 50 100
kilometers

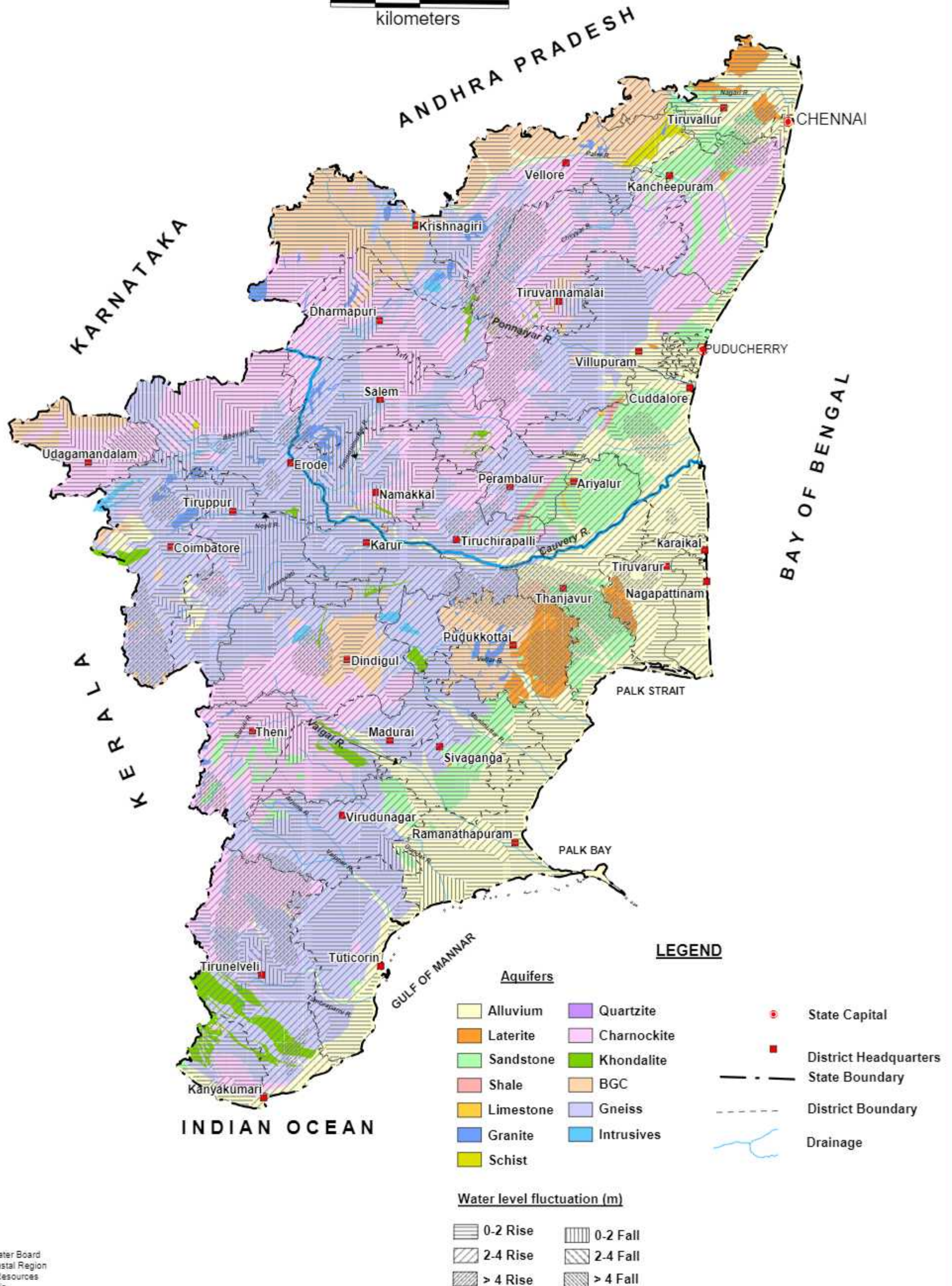


Table 15 : District wise Pre monsoon Depth to Water Level (Decadal Mean 2002- 2011)

S.N.	District Name	Alluvium		Laterite		Sand Stone		Shale		Limestones		Granite		Schist		Quartzite		Charnockite		Khondalite		B G C		Gneiss		Intrusives	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1	Ariyalur	1.75	36.02			3.89	13.91											3.88	3.88					1.89	42.54		
2	Chennai	3.06	8.59															2.85	9.03								
3	Coimbatore	1.43	47.30									8.72	8.72					1.27	17.29	17.30	17.30	20.53	20.53	1.89	42.54	11.33	11.33
4	Cuddalore	1.75	36.02			2.70	55.24											1.60	18.93					3.11	9.25		
5	Dharmapuri																	1.60	22.55			2.50	15.21	1.89	42.54		
6	Dindigul																	1.26	13.89			1.99	15.31	1.89	42.54	11.45	13.08
7	Erode											25.06	25.06					1.27	19.31			3.91	9.33	1.89	42.54		
8	Kancheepuram	3.06	8.59	3.78	3.78	3.15	10.25											2.85	9.03					3.11	9.25		
9	Kanyakumari	1.49	16.14															2.48	10.04	2.34	10.61			4.74	15.22		
10	Karur	3.12	7.73																			1.99	15.31	1.89	42.54		
11	Krishnagiri																	1.60	22.55			2.50	15.21	1.89	42.54		
12	Madurai	1.71	29.81															1.26	13.89					1.01	42.54		
13	Nagapattinam	0.83	36.02																								
14	Namakkal	3.12	3.12									9.06	9.06					1.60	18.93			3.02	3.02	1.89	42.54		
15	Nilgiris																	1.27	17.29			3.91	9.33	1.89	42.54		
16	Perambalur	1.75	36.02			4.63	13.91	5.72	5.72	5.72	5.72							1.60	18.93					1.89	42.54		
17	Pudukottai	0.83	29.81	3.05	12.87	4.11	15.30					2.65	2.65									3.59	7.28	1.89	42.54		
18	Ramanthapura	0.83	29.81			4.35	7.26																	1.01	11.96		
19	Salem											9.06	14.92					1.60	22.55					1.89	42.54		
20	Sivaganga	0.83	29.81			4.11	15.30															3.59	7.28	1.01	42.54		
21	Thanjavur	0.83	36.02	3.05	12.87	3.16	15.11															3.59	7.28	1.89	42.54		
22	Theni					17.15	41.66											1.26	13.89					1.01	11.96		
23	Tiruvarur	0.83	36.02	5.80	5.80	3.16	15.11																				
24	Tiruchirapalli	1.75	36.02			4.63	13.91	5.72		5.72	5.72							1.26	18.93			1.99	15.31	1.89	42.54	8.39	
25	Tirunelveli	1.49	16.14					5.72										1.75	10.81	1.07	10.61			1.01	15.22		
26	Tiruppur	1.43	5.67									8.72	25.06					1.26	13.89					1.89	42.54	8.39	
27	Tiruvallur	3.06	8.59			3.15	10.25											2.85	9.03			1.13	20.25				
28	Tiruvannamalai	1.42	11.80															1.60	18.93	11.06	11.06	1.13	20.25	1.89	42.54		
29	Tuticorin	0.83	29.81															1.75	10.81					1.01	11.96		
30	Vellore	1.42	11.80			5.43	5.43					10.00	10.00	5.95	5.95			1.60	18.93			1.13	20.25	1.89	42.54		
31	Villupuram	3.06	22.51			2.70	55.24											1.60	18.93					3.11	24.32		
32	Virudhunagar	1.71	29.81															1.26	13.89					1.01	11.96		
Total		0.83	47.30	3.05	12.87	2.70	55.24	5.72	5.72	5.72	5.72	2.65	25.06					1.26	22.55	1.07	17.30	1.13	20.53	1.01	42.54	8.39	13.08
U.T.OF PUDUCHEI																											
1	Puducherry	3.06	8.59			7.33	7.33																				
2	Karaikal	1.75	36.02																								
Total		1.75	36.02			7.33	7.33																				

Units: mBgl (metre below ground level)



DEPTH TO WATER LEVEL (PREMONSOON DECADAL MEAN 2002 - 2011)



0 50 100
kilometers

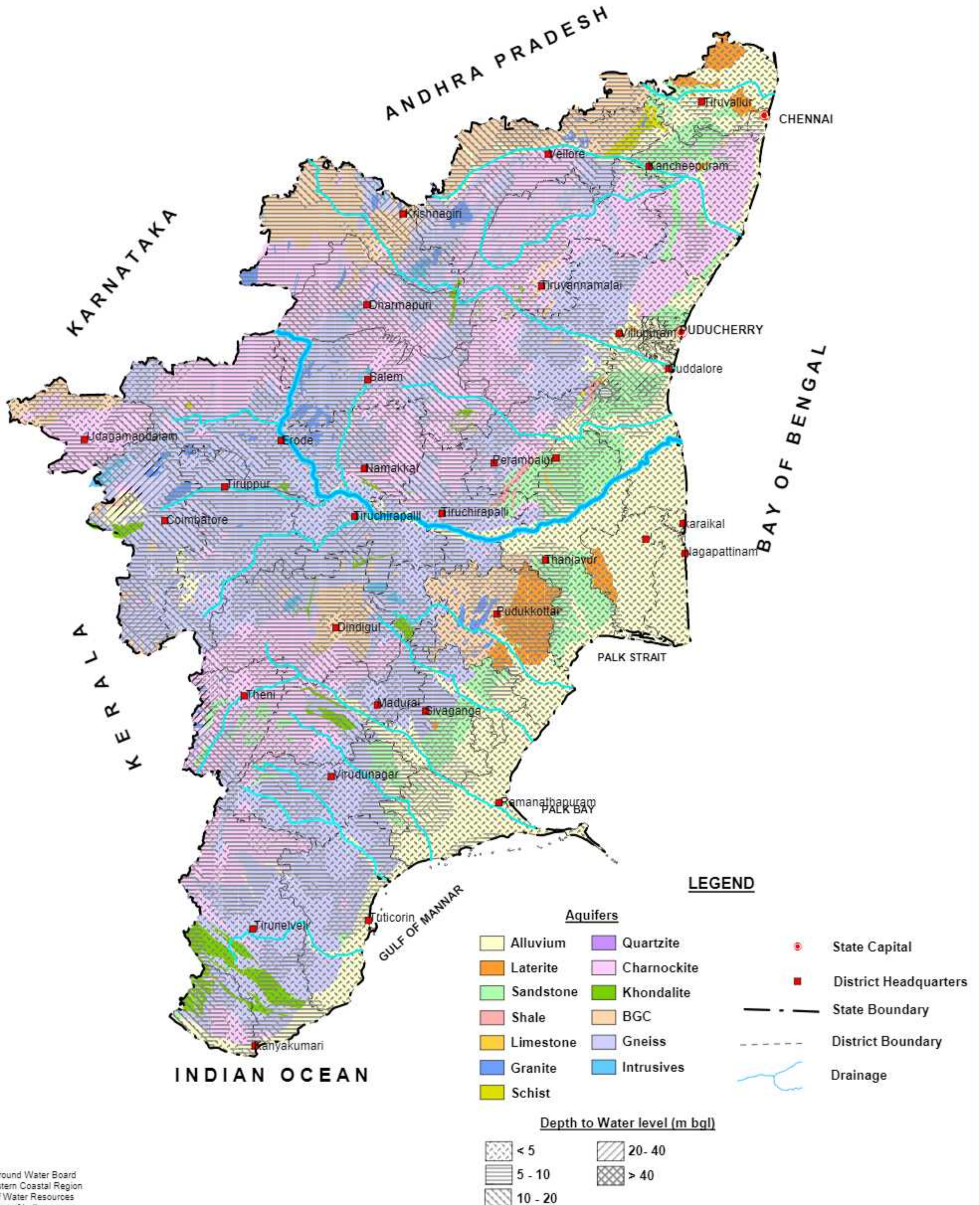


Table 16: District wise Post monsoon Depth to Water Level (Decadal Mean 2002- 2011)

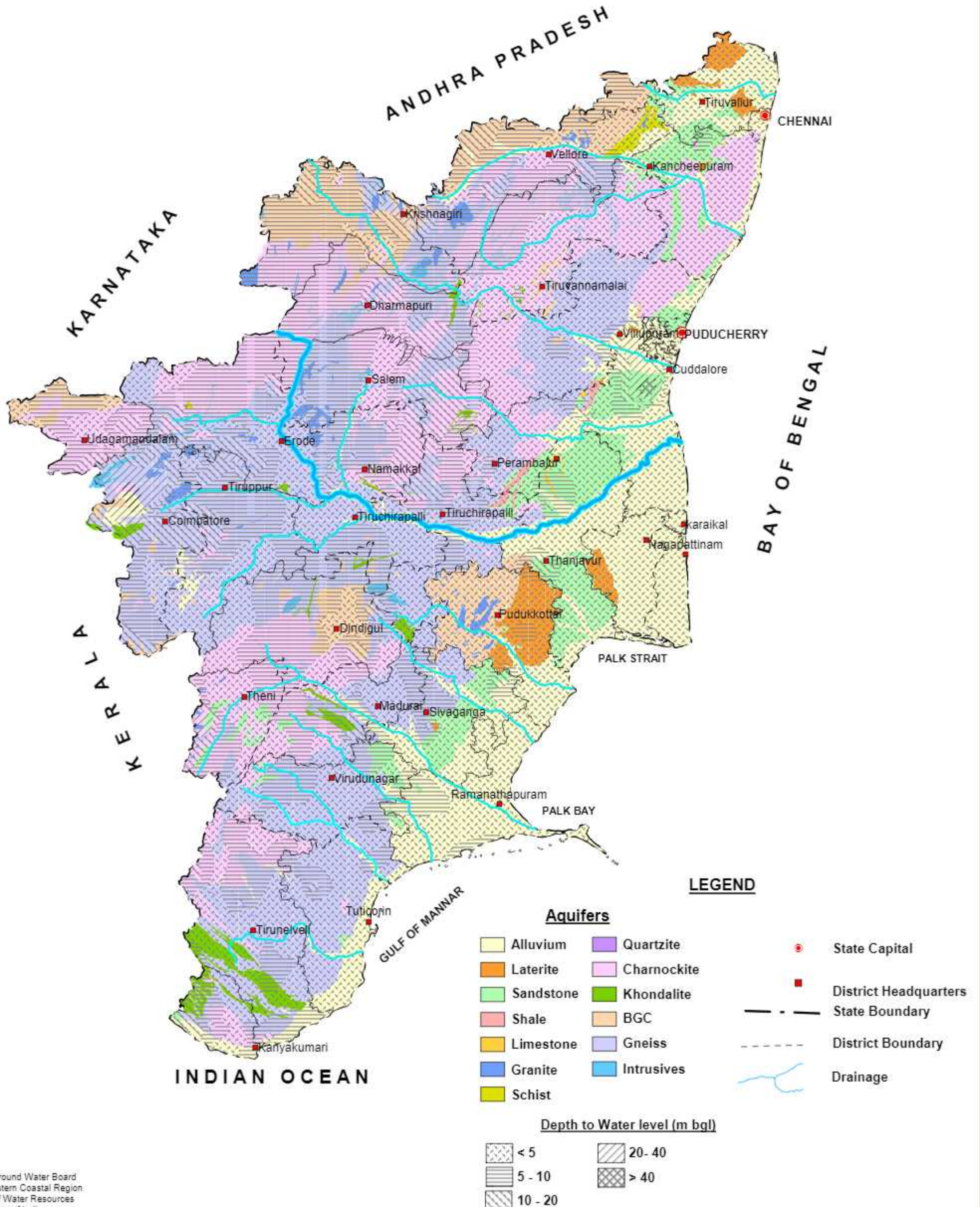
S.N.	District Name	Alluvium		Laterite		Sand Stone		Shale		Limestones		Granite		Schist		Quartzite		Charnockite		Khondalite		B G C		Gneiss		Intrusives	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1	Ariyalur	1.12	6.88			1.05	11.21											1.14	1.14					0.86	29.19		
2	Chennai	1.76	6.29															0.98	4.55								
3	Coimbatore	1.52	47.59									5.00	5.00					1.24	14.62	18.54	18.54			0.86	29.19		
4	Cuddalore	1.03	19.70			1.09	51.83	1.88	1.88	1.88	1.88							0.86	12.00					0.88	7.24		
5	Dharmapuri																	0.86	13.17			1.77	14.00	0.86	29.19		
6	Dindigul																	0.86	8.65			1.15	13.84	0.86	29.19	6.43	10.69
7	Erode											22.46	22.46					1.24	14.62			2.97	15.85	0.86	29.19		
8	Kancheepuram	1.76	6.29	1.31	1.31	1.72	6.76											0.98	4.55					0.88	7.24		
9	Kanyakumari	0.44	12.95															1.97	7.24	1.25	8.98			3.93	13.68		
10	Karur	4.91	4.91																			1.15	13.84	0.86	29.19		
11	Krishnagiri																	0.86	13.17			1.77	14.00	0.86	29.19		
12	Madurai	1.31	11.89															0.86	8.65	3.96	3.96			0.33	29.19		
13	Nagapattinam	0.56	6.88																								
14	Namakkal																	0.86	12.00			2.28	2.28	0.86	29.19		
15	Nilgiris																	1.24	14.62			2.97	15.85	0.86	29.19		
16	Perambalur	1.12	6.88			1.05	11.21	3.84	3.84									0.86	12.00					0.86	29.19		
17	Pudukottai	0.56	11.89	1.35	7.29	1.64	16.07					1.45	2.34									1.49	5.28	0.86	29.19		
18	Ramanthapuram	0.56	11.89			2.60	4.55																	0.33	14.48		
19	Salem																	0.86	13.17					0.86	29.19		
20	Sivaganga	0.56	11.89			2.10	16.07													3.96	3.96	1.49	5.28	0.33	29.19		
21	Thanjavur	0.56	11.89	0.65	7.29	0.85	15.14															1.49	5.28	0.86	29.19		
22	Theni					2.97	30.24											0.86	8.65					0.33	14.48		
23	Tiruvarur	0.56	6.88	0.65	0.65	0.85	15.14																				
24	Tiruchirapalli	1.12	6.88			1.05	11.21	3.84	3.84									0.86	12.00	3.96	3.96	1.15	13.84	0.86	29.19	4.96	4.96
25	Tirunelveli	0.44	12.95															0.89	11.96	0.61	8.98			0.33	14.48		
26	Tiruppur	1.52	2.47									5.00	22.46					0.86	8.65					0.86	29.19		
27	Tiruvallur	1.76	6.29			3.20	6.76											0.98	4.55			1.62	14.41				
28	Tiruvannamalai	1.76	12.24															0.86	12.00	6.18	6.18	1.62	14.41	0.86	29.19		
29	Tuticorin	0.44	12.95															0.89	11.96					0.33	14.48		
30	Vellore	1.76	12.24			3.20	3.20					7.89	7.89	3.10	3.10			0.86	12.00			1.62	14.41	0.86	29.19		
31	Villupuram	2.18	37.90			1.09	51.83	1.88	1.88	1.88	1.88							0.86	12.00					0.88	18.30		
32	Virudhunagar	1.31	11.89															0.86	11.96					0.33	14.48		
Total		0.44	47.59	0.65	7.29	0.85	51.83	1.88	3.84	1.88	1.88	1.45	22.46	3.10	3.10			0.86	14.62	0.61	18.54	1.15	15.85	0.33	29.19	4.96	10.69
U.T.OF PUDUCHERRY																											
1	Puducherry	2.18	37.90			3.34	3.34																				
2	Karaikal	1.03	6.88																								
Total		1.03	37.9			3.34	3.34																				

Units: mbgl (metre below ground level)



DEPTH TO WATER LEVEL (POSTMONSOON DECADAL MEAN 2002 - 2011)

0 50 100
kilometers





WATER TABLE ELEVATION

0 50 100
kilometers

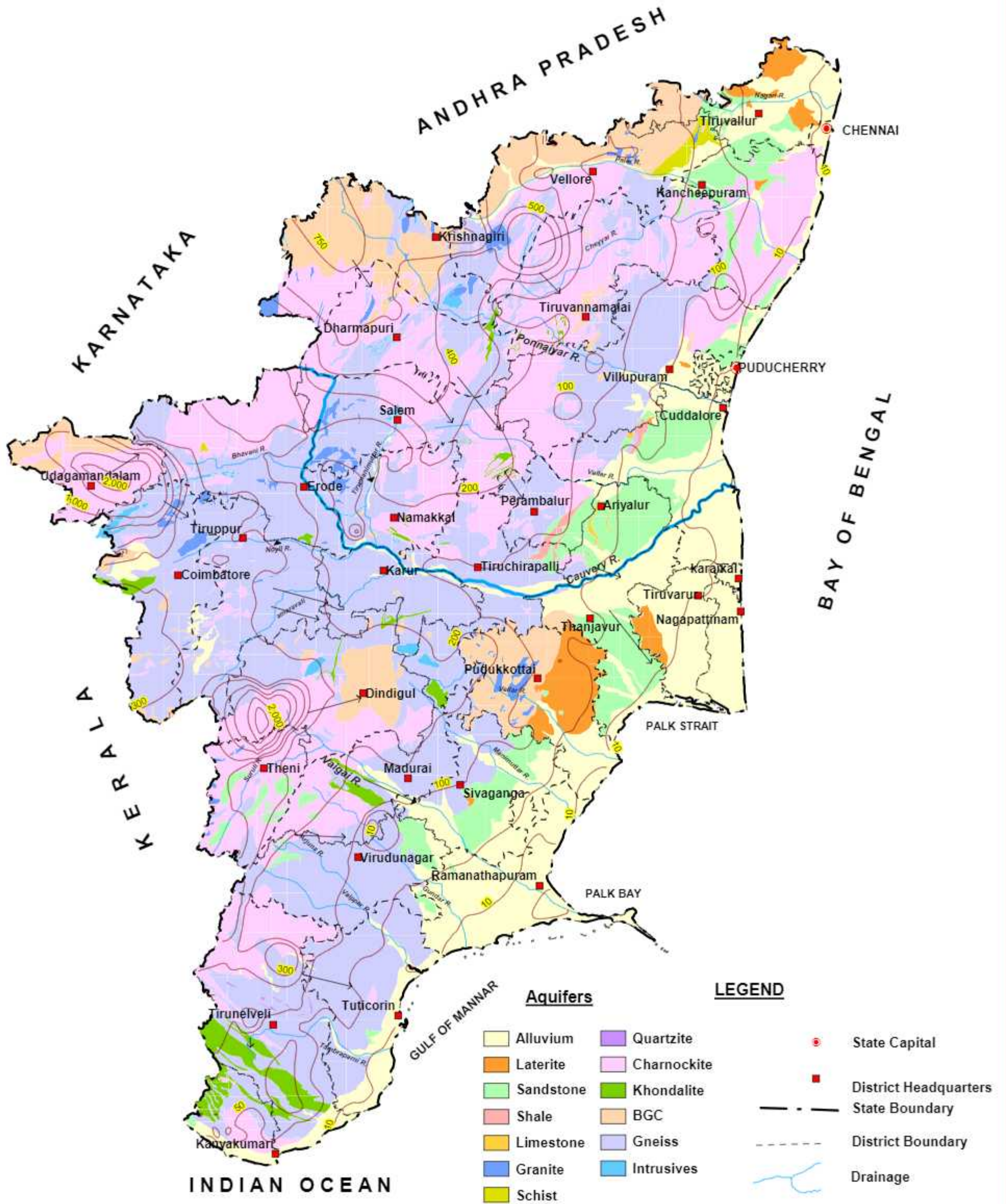


Table 17: Districts showing more than permissible limits of Salinity, Nitrate and Fluoride

S.N.	Constituents	Parts of Districts having more than permissible limits of Salinity, Nitrate and Fluoride
1	EC (> 3000 μ simens/cm at 25°C)	Chennai, Coimbatore, Cuddalore, Dindigul, Dharmapuri, Erode, Karur, Namakkal, Nagapattinam, Perambalur, Pudukkottai, Ramanathapuram, Salem, Tiruvannamalai, Thiruchirapalli, Thanjavur, Thoothukudi, Tirunelveli, Theni, Vellore, Villupuram, Virudunagar
2	NO ₃ (> 45 mg/l)	Chennai, Coimbatore, Cuddalore, Dindigul, Dharmapuri, Erode, Kancheepuram, Kanyakumari, Karur, Namakkal, Nilgiris, Perambalur, Pudukkottai, Ramanathapuram, Salem, Shivaganga, Theni, Tiruvannamalai, Thanjavur, Thoothukudi, Tirunelveli, Tiruvallur, Vellore, Villupuram, Virudunagar
3	F (>1.5 mg/l)	Coimbatore, Dindigul, Dharmapuri, Erode, Karur, Krishnagiri, Namakkal, Perambalur, Pudukkottai, Ramanathapuram, Salem, Shivaganga, Theni, Tiruvannamalai, Thiruchirapalli, Vellore, Virudunagar



GROUND WATER QUALITY

SHALLOW AQUIFER (EC, F, NO₃)

0 50 100
kilometers

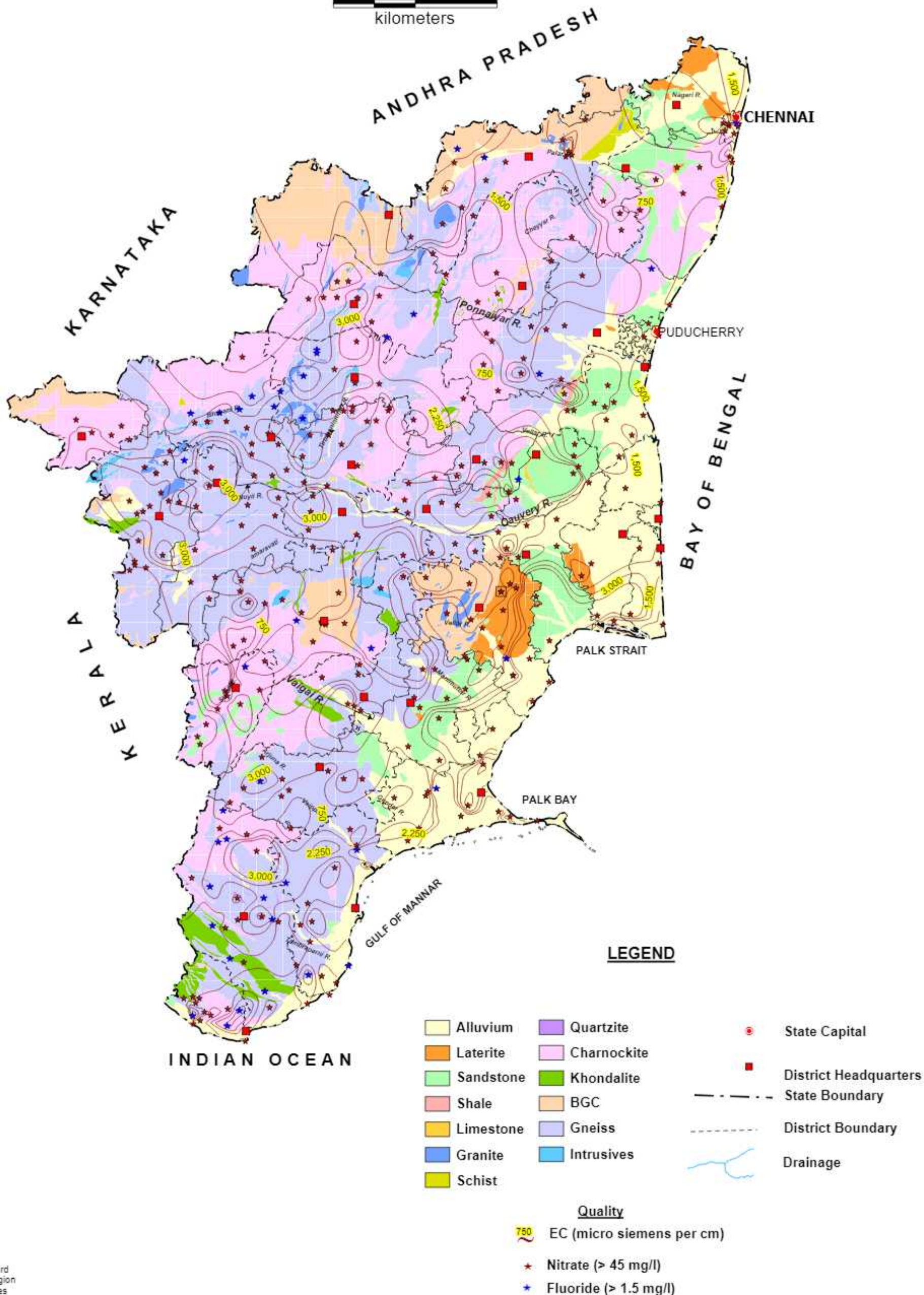


Table- 18 a: Aquifer wise Area under Over Exploited (OE) Blocks

S.N.	District Name	Alluvium	Laterite	Sand Stone	Shale	Limestones	Granite	Schist	Quartzite	Charnockite	Khondalite	B G C	Gneiss	Intrusives
1	CHENNAI	149	4	NA	NA	NA	NA	NA	NA	24	NA	NA	NA	NA
2	COIMBATORE	288	NA	NA	NA	NA	132	NA	NA	32	113	104	1784	6
3	CUDDALORE	283	0	363	37	0	NA	NA	NA	0	NA	NA	8	NA
4	DHARMAPURI	NA	NA	NA	NA	NA	35	NA	NA	1719	49	241	1237	30
5	DINDIGUL	NA	NA	NA	NA	NA	NA	NA	NA	998	61	1207	1608	46
6	KANCHEEPURAM	204	NA	292	NA	NA	NA	NA	NA	751	0	NA	1	NA
7	KARUR	7	NA	NA	NA	NA	NA	NA	NA	NA	16	31	1644	58
8	KRISHNAGIRI	NA	NA	NA	NA	NA	121	NA	NA	109	19	833	895	91
9	MADURAI	0	NA	67	NA	NA	NA	NA	NA	1081	69	NA	428	NA
10	NAGAPPATTINAM	983	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	NAMAKKAL	9	NA	NA	NA	NA	0	NA	NA	742	0	0	513	0
12	PERAMBALUR	51	NA	290	100	1	NA	NA	NA	410	10	NA	906	NA
13	SALEM	12	NA	NA	NA	NA	71	NA	NA	1438	67	NA	883	9
14	THANJAVUR	1242	15	872	NA	NA	NA	NA	NA	NA	NA	0	15	NA
15	THENI	0	NA	NA	NA	NA	22	NA	NA	523	NA	NA	38	NA
16	THIRUVARUR	387	6	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
17	TIRUCHIRAPPALLI	79	NA	7	6	NA	1	NA	NA	705	2	33	2184	46
18	TIRUNELVELI	165	NA	NA	NA	NA	NA	NA	NA	856	174	NA	603	NA
19	TIRUVALLUR	650	32	167	NA	NA	NA	NA	NA	3	NA	539	NA	NA
20	TIRUVANNAMALAI	46	NA	74	NA	NA	NA	NA	NA	2500	54	88	519	NA
21	TUTICORIN	426	NA	NA	NA	NA	NA	NA	NA	34	NA	NA	862	NA
22	VELLORE	256	NA	NA	NA	NA	130	0	NA	1001	NA	1496	1030	NA
23	VILLUPPURAM	296	0	45	NA	1	NA	NA	NA	672	NA	0	1904	NA
24	VIRUDUNAGAR	NA	NA	NA	NA	NA	NA	NA	NA	93	NA	NA	491	NA
Total		5732	58	2176	143	1	508	0	NA	13540	636	4571	17536	287
U.T Of Puducherry														
1	PUDUCHERRY	100.00	NA	193.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total		100.00	NA	193.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table- 18 b: Aquifer wise Area under Critical Blocks (Sq.km)

S.N.	District Name	Alluvium	Laterite	Sand Stone	Shale	Limestones	Granite	Schist	Quartzite	Charnockite	Khondalite	B G C	Gneiss	Intrusives
1	COIMBATORE	NA	NA	NA	NA	NA	NA	NA	NA	16	NA	NA	193	NA
2	ERODE	NA	NA	NA	NA	NA	17	NA	NA	NA	NA	NA	128	NA
3	KANCHEEPURAM	59	NA	33	NA	NA	NA	NA	NA	247	NA	NA	NA	NA
4	KARUR	32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	303	NA
5	KRISHNAGIRI	NA	NA	NA	NA	NA	NA	NA	NA	25	NA	623	NA	NA
6	MADURAI	NA	NA	NA	NA	NA	NA	NA	NA	139	99	NA	54	NA
7	NAGAPPATTINAM	197	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	NAMAKKAL	23	NA	NA	NA	NA	NA	NA	NA	206	12	NA	206	NA
9	SALEM	NA	NA	NA	NA	NA	33	NA	NA	238	NA	NA	644	NA
10	THENI	NA	NA	241	NA	NA	26	NA	NA	1772	NA	NA	232	NA
11	TIRUNELVELI	181	NA	NA	NA	NA	NA	NA	7	NA	56	NA	226	NA
12	TIRUVANNAMALAI	NA	NA	NA	NA	NA	NA	NA	NA	906	NA	77	432	NA
13	TUTICORIN	142	NA	24	NA	NA	NA	NA	NA	NA	NA	NA	165	NA
14	VELLORE	117	NA	NA	NA	NA	43	76	NA	368	NA	2	451	NA
15	VILLUPPURAM	197	NA	1	NA	NA	NA	NA	NA	NA	NA	NA	4	NA
16	VIRUDUNAGAR	NA	1	72	NA	NA	NA	NA	NA	138	NA	NA	1250	NA
Total		957	1	371	NA	NA	119	76	7	4057	167	703	4283	NA

Area in Sq.km.



CATEGORISATION OF GROUND WATER ASSESSMENT UNITS

(AS ON MARCH 2009)

0 50 100
kilometers

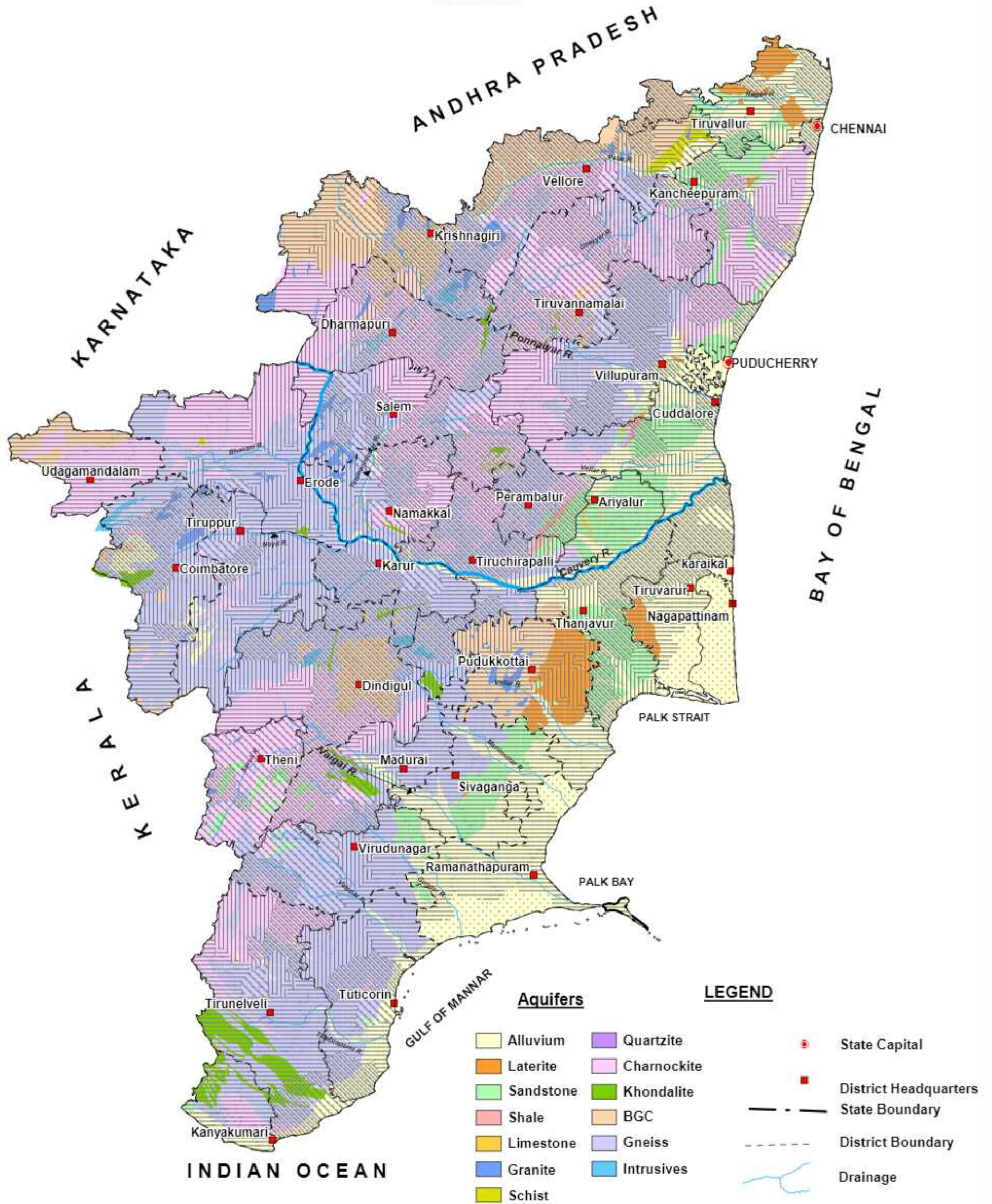


Table- 19: District-wise Distribution and Characteristics of Alluvium Aquifers

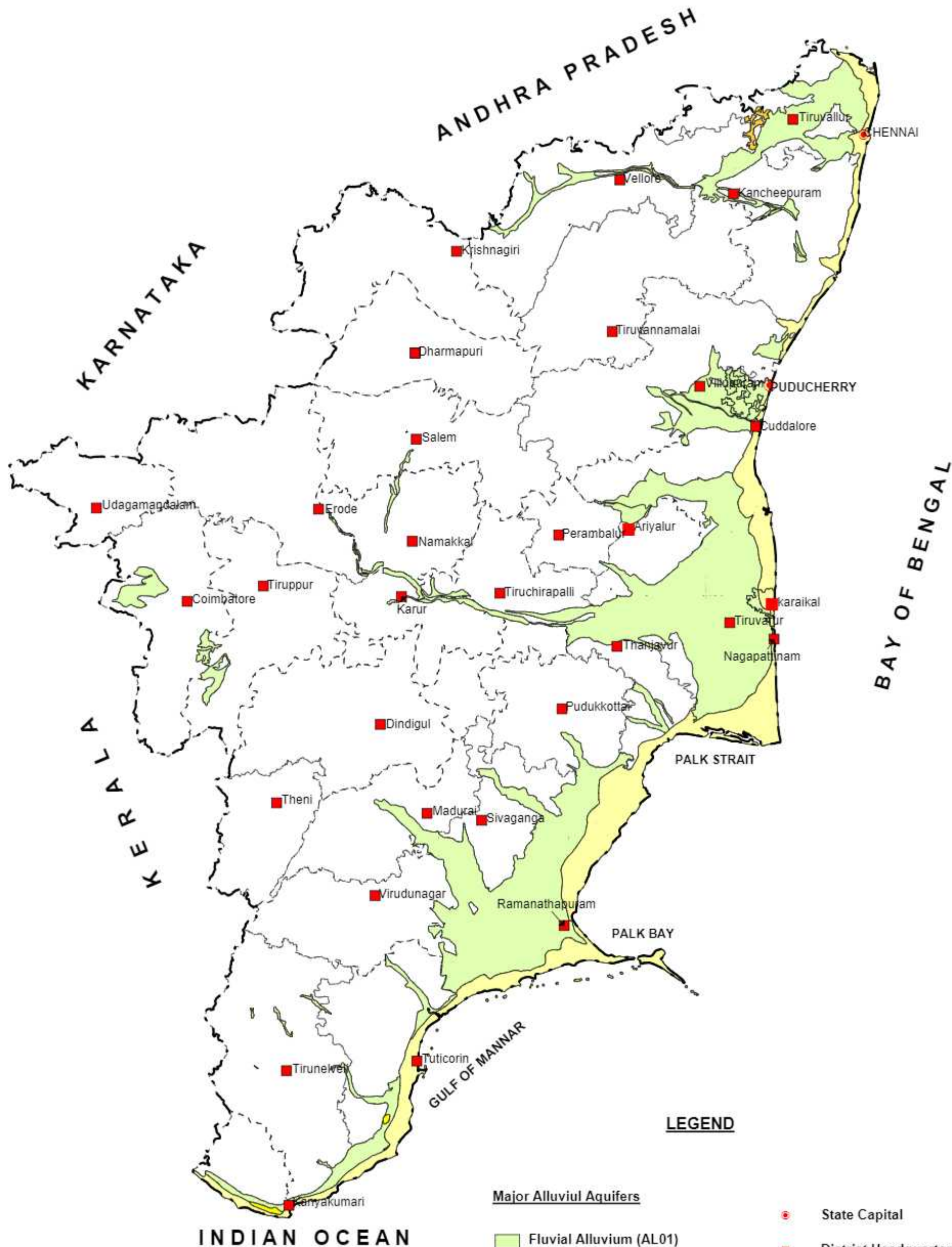
S.N.	District	Major Aquifers					Aquifer Properties									
		Alluvium (AL) (Sq.km)					Aquifer System	Type of Aquifer	Thickness of Weathered zone	DTWL (m) May 2011	Granular Zones encounter ed	Transmissivity (m ² /day)	S/Sy	Quality -EC (µS/cm)	Cl (mg/l)	Remarks
		Younger Alluvium AL01	Pebble/ Gravel AL02	Aeolian alluvium AL04	Coastal Alluvium AL05	Total										
1	Ariyalur	365				365	Multiple	Un confined to Confined	NA	5.95	30 - 528	44.8 - 145.6	7.7 x 10 ⁻⁴ -36 x 10 ⁻²	540 - 1546	26 - 228	
2	Chennai	42			107	149	Single	Un confined	NA	6.47	10 - 35	135 - 872	4.5 x 10 ⁻³ -2.9 x 10 ⁻⁴	680 - 4410	64 - 1234	
3	Coimbatore	307				307	Single	Un confined	NA	28.30						
4	Cuddalore	1379			402	1781	Single	Un confined	NA	4.92	38 - 85	323 - 8492	2.97 x 10 ⁻⁵ -2.57 x 10 ⁻¹	100 - 900	10 -125	
5	Erode	23				23	Single	Un confined	NA		-					
6	Kancheepuram	287			304	591	Single	Un confined	NA	4.91	6 - 45					
7	Kanyakumari	126		40	166	332	Single	Un confined	NA	11.00	6 - 30					
8	Karur	136				136	Single	Un confined	NA	5.14	-					
9	Madurai	158				158	Single	Un confined	NA		-					
10	Nagapattinam	1413			1010	2422	Multiple	Un confined to Confined	NA	5.58	10 - 339	8 - 1672	4.8 x 10 ⁻⁴ -4.4 x 10 ⁻²	296 - 5614	21 - 620	
11	Namakkal	76				76	Single	Un confined	NA		-					
12	Perambalur	51				51	Single	Un confined	NA		-					
13	Pudukottai	337			659	996	Single	Un confined	NA	7.53	26 - 532	29.74 - 400	4.4 x 10 ⁻⁴ -4.9 x 10 ⁻⁶	626 - 2830	74 -794	
14	Ramanthapuram	2824			1345	4168	Multiple	Un confined to Confined	NA		10 - 742	7.06 - 3616	2.72 x 10 ⁻⁴	330 - 7500	80 - 1382	
15	Salem	16				16	Single	Un confined	NA	4.24	-					
16	Sivaganga	1660			11	1671	Multiple	Un confined to Confined	NA	13.40	18 - 308	4.6 - 594	1.7 x 10 ⁻⁴ - 5.5 x 10 ⁻²	800 -2100	121 - 415	
17	Thanjavur	1577				377	1834	Multiple	Un confined to Confined	NA	5.55	30 - 245	110 - 3000	5 x 10 ⁻⁴ - 6.9 x 10 ⁻²	150 - 1830	20 - 390
18	Theni					366	Single	Un confined	NA		-					
19	Tiruvarur	1788			148	2025	Multiple	Un confined to Confined	NA	1.55	22 - 626	32 - 1202	9.9 x 10 ⁻⁵ - 4.6 x 10 ⁻²	875 - 3980	49 - 929	
20	Tiruchirapalli	260				260	Multiple	Un confined to Confined	NA		-					
21	Tirunelveli	230			142	372	Single	Un confined	NA	7.13	20 - 101	43.94 - 483	1.96 x 10 ⁻⁵	252 - 476	32	
22	Tiruppur	177				177	Single	Un confined	NA		-					
23	Tiruvallur	1327	71		328	1654	Single	Un confined	NA	7.24	4 - 80	370 - 1270	7.5 x 10 ⁻⁴ - 1.2 x 10 ⁻²	420 - 1800	70 - 400	Seawater intrusion observed in coastal areas
24	Tiruvannamalai	46				46	Single	Un confined	NA		20 - 94	-	-	250	35	
25	Tuticorin	547		14	628	1190	Single	Un confined	NA	5.35	9 - 120	99 - 716	1.32 x 10 ⁻³	235 - 2590	10.6 - 709	
26	Vellore	503	9		0	511	Single	Un confined	NA		-					
27	Villupuram	819			212	914	Single	Un confined	NA	12.00	70 - 394	748 - 830	2.75 x 10 ⁻⁵	2274-3370	450 - 1014	
28	Virudhunagar	292				292	Single	Un confined	NA							
Grand Total		16764	80	55	5838	22884					4-626	323-8492	7.7 x 10 ⁻⁵ -36 x 10 ⁻²	100-7500	10-1382	
1	Puducherry	287			30	317	Single	Un confined	NA	4.57	25 - 140	323 - 8492	2.97 x 10 ⁻⁵ -2.57 x 10 ⁻¹	100 - 900	10 -125	
2	Karaikal	63			100	163	Multiple	Un confined to Confined	NA		10 - 335	8 - 1672	4.8 x 10 ⁻⁴ -4.4 x 10 ⁻²	296 - 5614	21 - 620	
Grand Total		350			130	480				4.57	11 - 335	323-8492	2.97 x 10 ⁻⁵ -2.57 x 10 ⁻¹	100-5614	10-620	



ALLUVIUM AQUIFER SYSTEM



0 50 100
kilometers



LEGEND

Major Alluvial Aquifers

- Fluvial Alluvium (AL01)
- Pebble/Gravel/Bazada (AL02)
- Aeolian Alluvium (AL03)
- Coastal Alluvium (AL04)

- State Capital
- District Headquarters
- State Boundary
- District Boundary

Table- 20: District-wise Distribution and Characteristics of Sandstone Aquifers

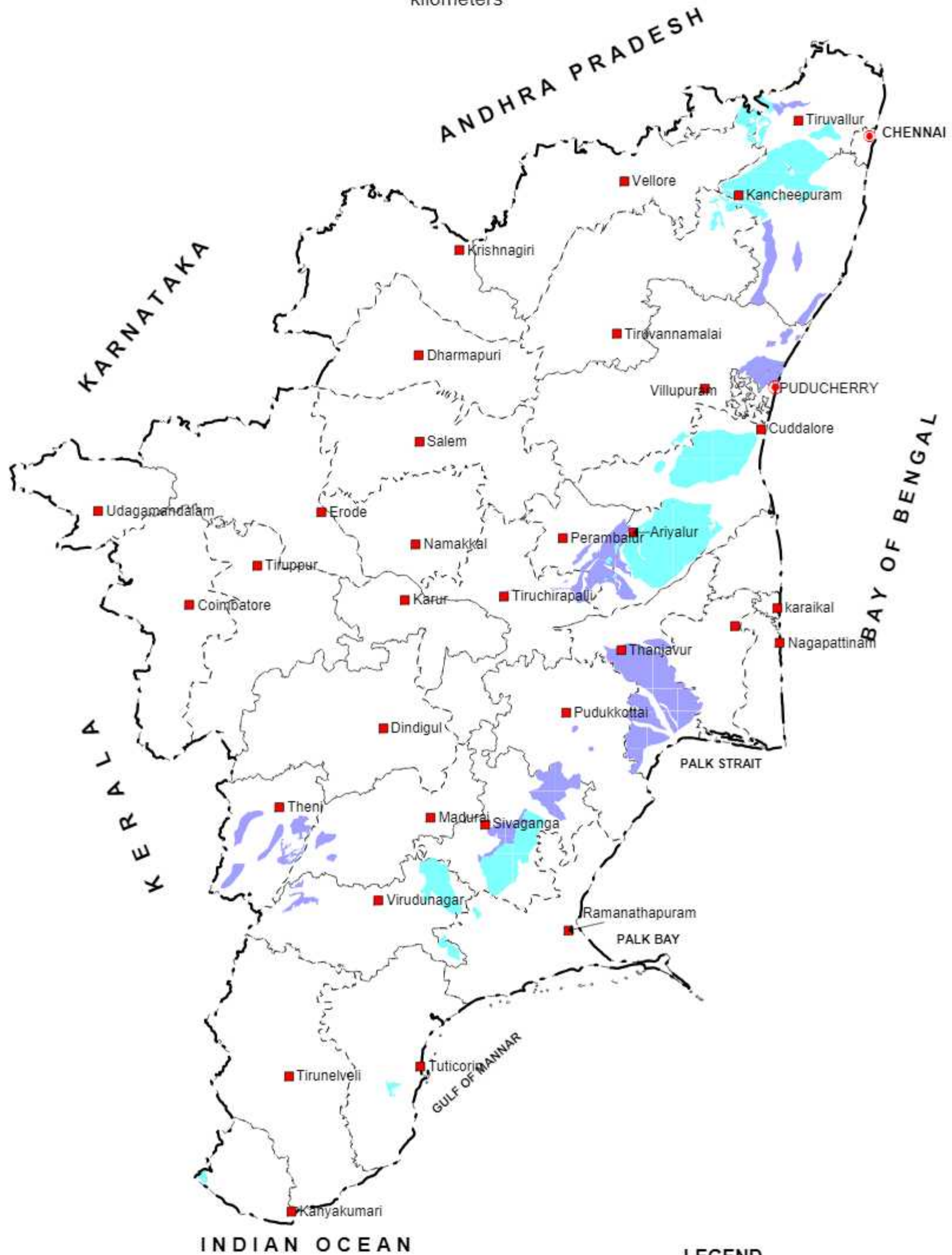
[illegible]



SANDSTONE AQUIFER SYSTEM



0 50 100
kilometers



LEGEND

Sandstone Aquifers

- Sandstone/Conglomerate (ST01)
- Sandstone with Clay (ST04)

- State Capital
- District Headquarters
- State Boundary
- District Boundary

Table-21 District-wise Distribution and Characteristics of Charnockite Aquifers

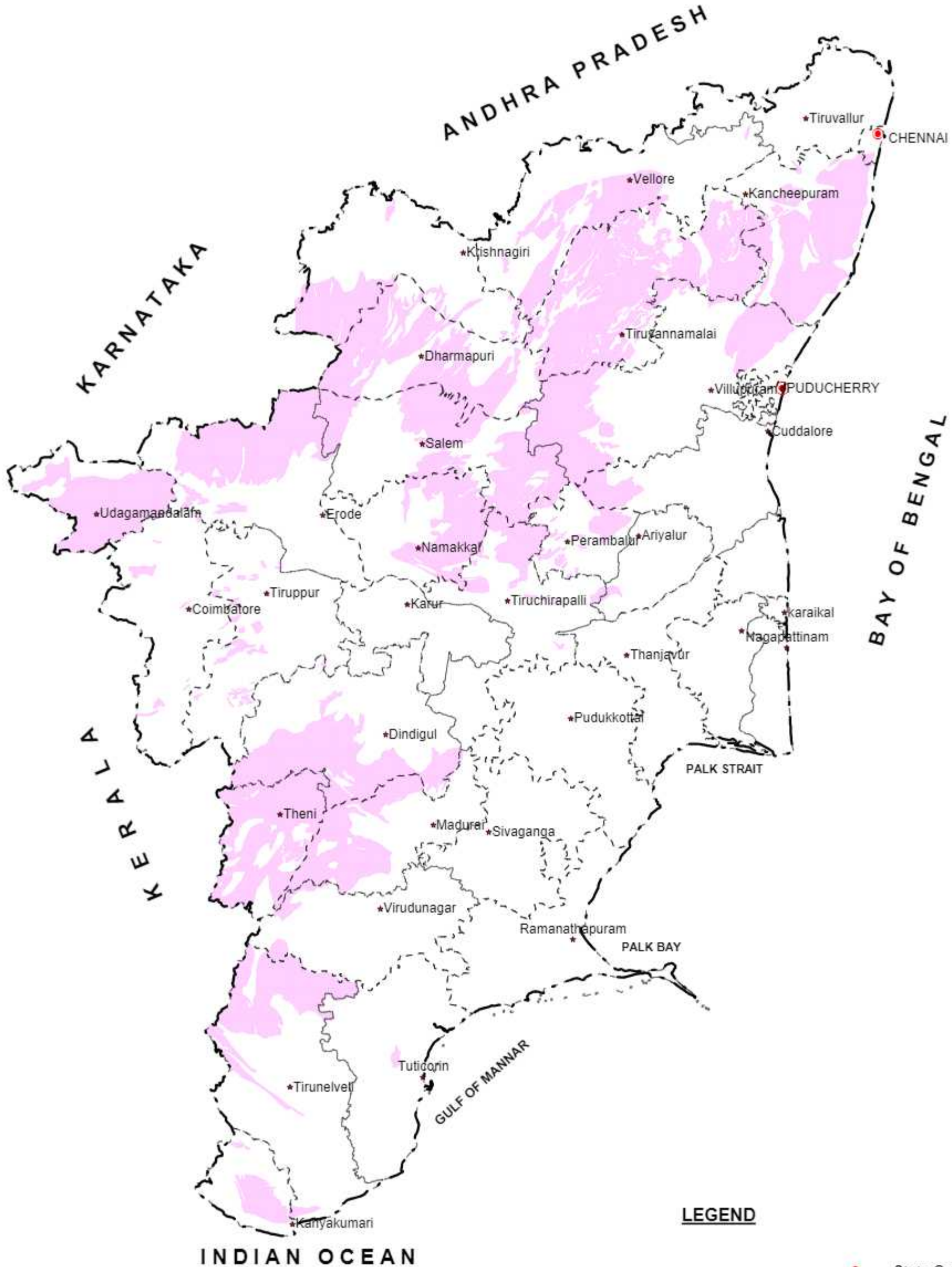
S.N.	District	Charnockite (sq.km)	Aquifer System	Type of Aquifer	Thickness of Weathered zone in mbgl	DTWL (m) May 2011	Yield in LPS	Transmissivity (m ² /day)	Storativity	Quality -EC (µS/cm)	Cl (mg/l)
1	Ariyalur	36				1.10					
2	Chennai	24									
3	Coimbatore	121									
4	Cuddalore	371				1.20					
5	Dharmapuri	2508	Single	Unconfined	1.95 - 16.12	6.50	0.078 - 10.12	2.00 - 17.32	4.37x10 ⁻⁴ - 7.89 x 10 ⁻³	780 - 7840	32 - 702
6	Dindigul	2349	Single	Unconfined	4.00 - 12.00	6.50	0.02 - 12.40	0.032 - 607	1.59x10 ⁻⁵ - 1.62 x 10 ⁻⁴	400 - 3280	4 - 503
7	Erode	2300	Single	Unconfined	3.57 - 27.25	7.50	0.01 - 27	0.05 - 457.27	0.08 x 10 ⁻³ - 1.60 x 10 ⁻³	685 - 23700	71 - 7100
8	Kancheepuram	2629	Single	Unconfined	6.00 - 18.6	8.90	0.045 - 10.13	0.65 - 170.94	3.076 x 10 ⁻⁴	413 - 7648	-
9	Kanyakumari	416	Single	Unconfined	NA	7.40					
10	Krishnagiri	1124	Multiple	Unconfined to Confined	1.76 - 36.00		0.05 - 26.00	1.05 - 187.80	2.55 x 10 ⁻⁵ - 3.60 x 10 ⁻²	153 - 6660	15.3 - 333
11	Madurai	1539	Multiple	Unconfined to Confined	5.50 - 11.00	3.70	1.00 - 21.72	5.99 - 333.40	5.7 x 10 ⁻⁴ - 8.7 x 10 ⁻³	480 - 2840	14 - 595
12	Namakkal	1405	Multiple	Unconfined to Confined	3.5 - 13.5	12.00	0.20 - 15.26	4.34 - 44.96	5.31x 10 ⁻³ - 9.62 x 10 ⁻⁵	1120 - 2200	121 - 275
13	Nilgiris	1865	Multiple	Unconfined to Confined							
14	Perambalur	410	Multiple	Unconfined to Confined	5.45 - 11.60	5.70	0.20 - 1.00			550 - 4920	110
15	Salem	2736	Multiple	Unconfined to Confined	4.70 - 20.50	7.10	0.16 - 14	1.61 - 266.55	1.8 x 10 ⁻⁴ - 8.9 x 10 ⁻³	93 - 2620	28 - 412
16	Theni	2170	Multiple	Unconfined to Confined	3.3 - 35	6.50	0.5 - 18.97	2.35 - 777.23	1.69 x10 ⁻³ - 8.3 x 10 ⁻⁶	440 - 3800	14 - 986
17	Tiruchirapalli	746	Multiple	Unconfined to Confined	3.00 - 28.00	7.60	0.07 - 6.88	0.975 - 222.75	1.6 x 10 ⁻⁴ - 9.6 x 10 ⁻⁴	607 - 3110	28 - 535
18	Tirunelveli	1817	Multiple	Unconfined to Confined	4.00 - 43.00	17.00	0.1 - 10.12	2.8 - 476.05	1.87x 10 ⁻³ - 4.8 x 10 ⁻³	487 - 3620	28 - 1049
19	Tiruppur	233	Single	Unconfined	NA						
20	Tiruvallur	3									
21	Tiruvannamalai	4397	Multiple	Unconfined to Confined	3.00 - 28.50	8.90	0.03 - 14.13	1 - 414	2.1 x 10 ⁻⁴ - 1.14 x 10 ⁻³	400 - 2080	15 - 596
22	Tuticorin	62									
23	Vellore	1421	Multiple	Unconfined to Confined	2.50 - 39.10	7.43	0.40 - 7.00	5.8 - 78.30	5.7 x 10 ⁻³ - 9.2 x 10 ⁻²	560 - 3080	25 - 710
24	Villupuram	2449	Multiple	Unconfined to Confined	5.00 - 12.45	5.10	0.215 - 10.30	0.86 - 141.20	2.84 x10 ⁻³ - 8.90x 10 ⁻³	273 - 5020	7.1 - 1347
25	Virudhunagar	230									
	Grand Total	33362			1.76-43.00		0.01-27	1-777.23	2.55 x 10⁻⁶ - 9.2 x 10⁻²	93-23700	4-1347



CHARNOCKITE AQUIFER SYSTEM



0 50 100
kilometers



LEGEND

- State Capital
- District Headquarters
- State Boundary
- - - District Boundary

Charnockite Aquifers

Charnockite (CK01)

Table-22 : District-wise Distribution and Characteristics of Khondalite Aquifers

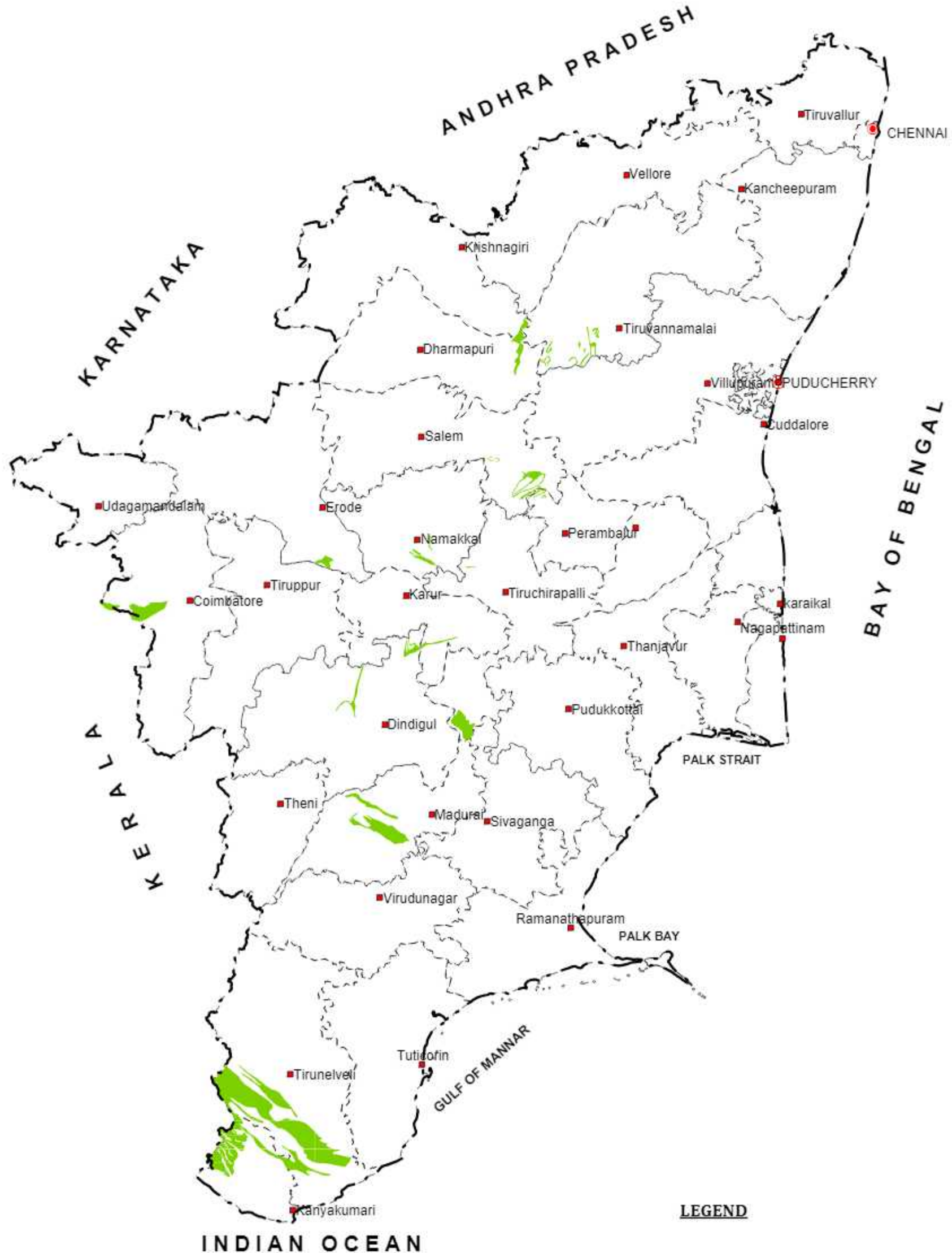
S.N.	District	Kondalite (sq.km)	Aquifer System	Type of Aquifer	Thickness of Weathered zone in mbgl	DTWL (m) May 2011	Yield in LPS	Transmissivity (m ² /day)	Storativity	Quality -EC (μS/cm)	Cl (mg/l)
1	Coimbatore	115									
2	Dharmapuri	49									
3	Dindigul	63									
4	Erode	28									
5	Kanyakumari	312	Multiple	Unconfined to Confined	9.00 - 23.00		0.75 - 4.28	0.98 - 63.00	-	4900 - 21200	60 - 7480
6	Karur	16									
7	Krishnagiri	19									
8	Madurai	197									
9	Namakkal	32									
10	Perambalur	10									
11	Salem	67									
12	Sivaganga	3									
13	Tiruchirapalli	91									
14	Tirunelveli	922	Multiple	Unconfined to Confined	12.00 - 16.00		0.50 - 6.88	2.8 - 476.05	1.87x 10 ⁻⁵ - 4.8 x 10 ⁻³	487 - 3620	28 - 1049
15	Tiruvannamalai	54									
	Grand Total	1978			9.00-23.00		0.50 - 6.88				



KHONDALITE AQUIFER SYSTEM



0 50 100
kilometers



LEGEND

- State Capital
- District Headquarters
- State Boundary
- - - District Boundary

Khondalite Aquifers

■ Khondalite/Granulite (KH01)

Table- 23: District-wise Distribution and Characteristics of Banded Gneissic Complex Aquifer

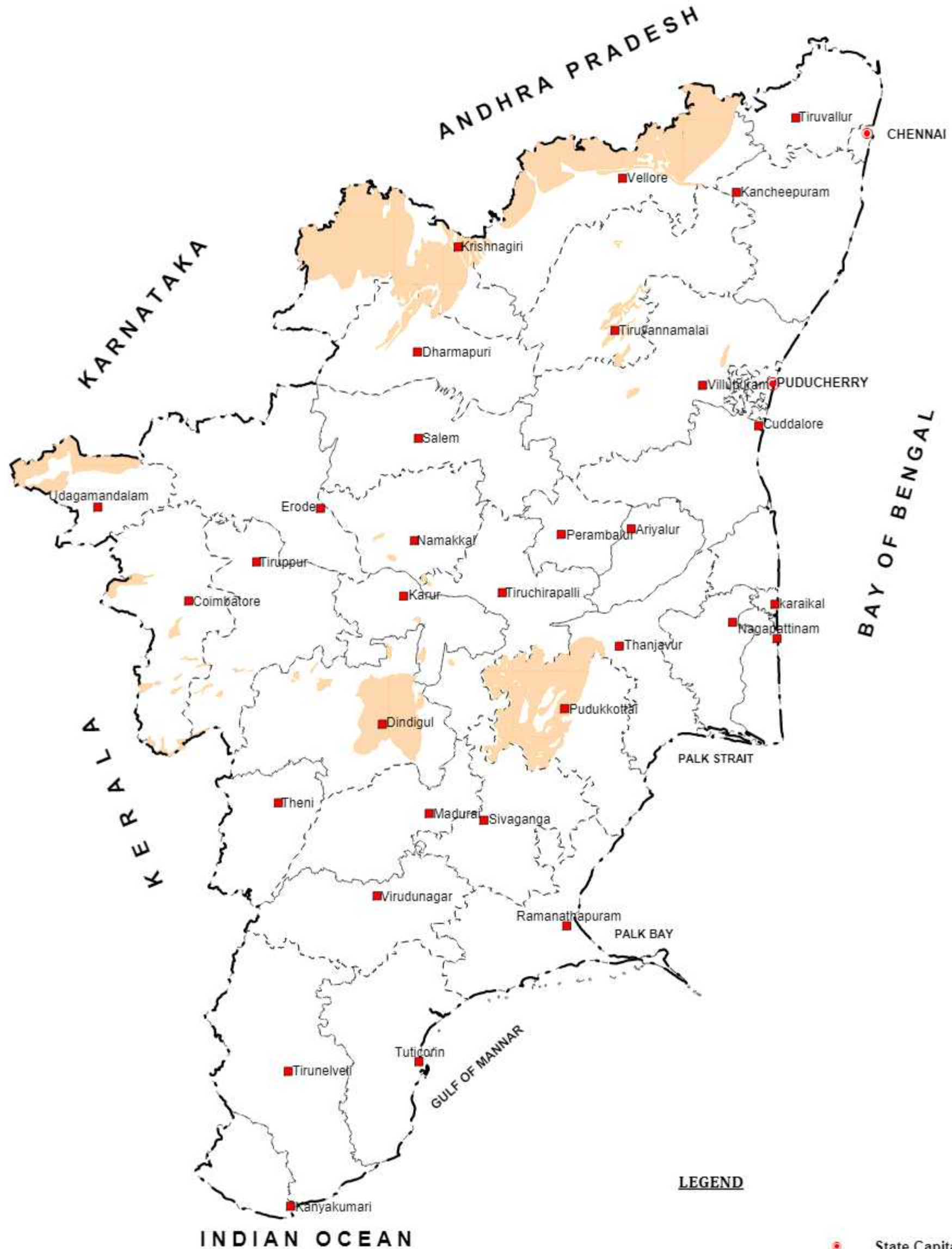
S.N.	District	Banded Gneissic Complex (BGC)	Aquifer System	Type of Aquifer	Thickness of Weathered zone in mbgl	DTWL (m) May 2011	Yield in LPS	Transmissivity (m ² /day)	Storativity	Quality -EC (μS/cm)	Cl (mg/l)
3	Coimbatore	245									
5	Dharmapuri	275									
6	Dindigul	1,207	Single	Un confined	5.60 - 30.0		0.02 - 12.40	0.032 - 607	1.59×10^{-5} - 1.62×10^{-4}	400 - 3280	4 - 503
10	Karur	31									
11	Krishnagiri	2,919	Multiple	Un confined to Confined	3.42 - 36.00		0.05 - 26.00	1.05 - 187.80	2.55×10^{-6} - 3.60×10^{-2}	153 - 6660	15 - 333
14	Namakkal	24									
15	Nilgiris	674									
17	Pudukottai	1,795	Multiple	Un confined to Confined	2.52 - 15.2		0.30 - 6.00	0.42 - 117.00		152 - 10360	110
20	Sivaganga	19									
21	Thanjavur	146									
24	Tiruchirapalli	50									
26	Tiruppur	32									
27	Tiruvallur	602									
28	Tiruvannamalai	165									
30	Vellore	2,033	Multiple	Un confined to Confined	2.50 - 28.50		0.40 - 7.00	5.8 - 78.30	5.7×10^{-5} - 9.2×10^{-2}	560 - 3080	25 - 710
31	Villupuram	47									
Grand Total		10264			2.50-36.00		0.02-26.00	0.032-607	2.55×10^{-6} - 9.20×10^{-2}	152-10360	4-710



BANDED GNEISSIC COMPLEX AQUIFER SYSTEM



0 50 100
kilometers



LEGEND

- State Capital
- District Headquarters
- State Boundary
- - - District Boundary

BGC Aquifers

- Banded Gneissic Complex (BG01)

Table- 24: District-wise Distribution and Characteristics of Gneiss Aquifers

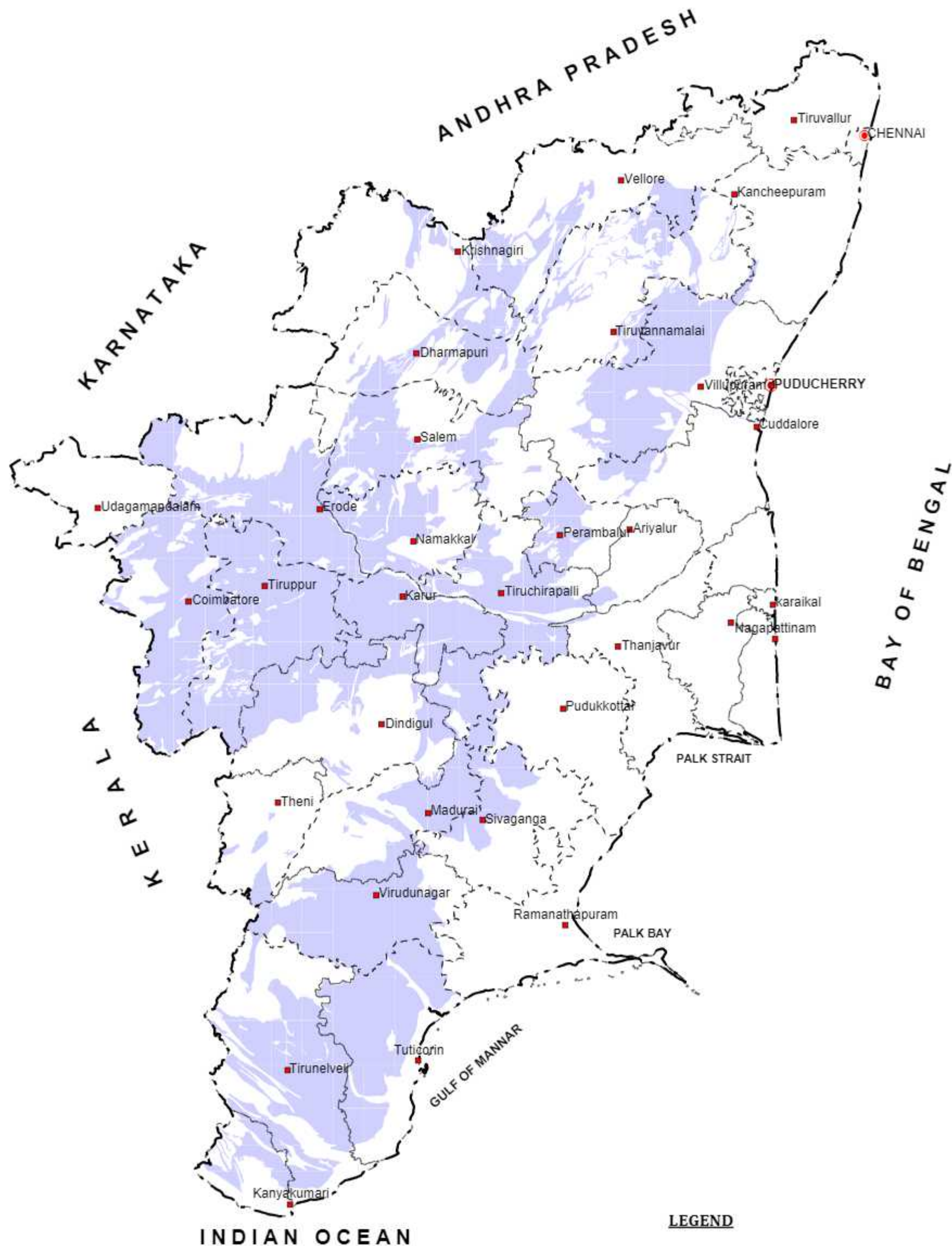
S.N.	District	Major Aquifers			Aquifer Properties									
		Gneiss (GN)			Aquifer System	Type of Aquifer	Thickness of Weathered zone in mbgl	DTWL (m) May 2011	Yield in LPS	Transmissivity (m ² /day)	Storativity	Quality -EC (μS/cm)	Cl (mg/l)	Remarks
		Gneiss	Migmatitic Gneiss	Total										
		GN02	GN03											
1	Ariyalur		103	103										
3	Coimbatore		3728	3728	Multiple	Unconfined to Confined	3.57 - 27.25		0.04 - 12	0.062 - 374	9.10 x 10 ⁻⁴	310 - 5780	9 - 1555	
4	Cuddalore		377	377										
5	Dharmapuri		1438	1438	Multiple	Unconfined to Confined	1.95 - 16.12		0.078 - 10.12	2.00 - 17.32	4.37x10 ⁻⁴ - 7.89 x 10 ⁻²	780 - 7840	32 - 702	
6	Dindigul		2415	2415	Multiple	Unconfined to Confined	4.00 - 12.00		0.02 - 12.40	0.032 - 607	1.59x10 ⁻⁴ - 1.62 x 10 ⁻⁴	400 - 3280	4 - 503	
7	Erode		3254	3254	Multiple	Unconfined to Confined	3.57 - 27.25		0.01 - 27	0.05 - 457.27	0.08 x 10 ⁻³ - 1.60 x 10 ⁻²	685 - 23700	71 - 7100	
8	Kancheepuram		75	75										
9	Kanyakumari		605	605										
10	Karur		2664	2664	Multiple	Unconfined to Confined			0.70 - 14.0	15 - 669	1.50 x 10 ⁻²	445 - 27800		
11	Krishnagiri		902	902	Multiple	Unconfined to Confined	1.76 - 36.00		0.05 - 26.00	1.05 - 187.80	2.55 x 10 ⁻⁶ - 3.60 x 10 ⁻²	153 - 6660	15.3 - 333	
12	Madurai		1749	1749	Multiple	Unconfined to Confined	5.50 - 11.00		1.00 - 21.72	5.99 - 333.40	5.7 x 10 ⁻⁴ - 8.7 x 10 ⁻²	480 - 2840	14 - 595	
13	Nagapattinam				Multiple	Unconfined to Confined								
14	Namakkal	65	1725	1791	Multiple	Unconfined to Confined	3.5 - 13.5		0.20 - 15.26	4.34 - 44.96	5.31x 10 ⁻² - 9.62 x 10 ⁻⁵	1120 - 2200	121 - 275	
15	Nilgiris		7	7										
16	Perambalur		906	906	Multiple	Unconfined to Confined	5.45 - 11.60		0.20 - 1.00			550 - 4920	110	
17	Pudukottai		122	122										
18	Ramanthapuram		19	19										
19	Salem		2119	2119	Multiple	Unconfined to Confined	4.70 - 20.50		0.16 - 14	1.61 - 266.55	1.8 x 10 ⁻⁴ - 8.9 x 10 ⁻²	93 - 2620	28 - 412	
20	Sivaganga		1257	1257	Multiple	Unconfined to Confined			0.44 - 6.1	0.54 - 25.54	0.3 x 10 ⁻⁴ - 4.9 x 10 ⁻⁵			
21	Thanjavur		42	42										
22	Theni		270	270	Multiple	Unconfined to Confined	3.3 - 35		0.5 - 18.97	2.35 - 777.23	1.69 x10 ⁻² - 8.3 x 10 ⁻⁴	440 - 3800	14 - 986	
24	Tiruchirappalli		3133	3133	Multiple	Unconfined to Confined	3.00 - 28.00		0.07 - 6.88	0.975 - 222.75	1.6 x 10 ⁻⁴ - 9.6 x 10 ⁻⁴	607 - 3110	28 - 535	
25	Tirunelveli		3672	3672	Multiple	Unconfined to Confined	4.00 - 43.00		0.1 - 10.12	2.8 - 476.05	1.87x 10 ⁻⁵ - 4.8 x 10 ⁻²	487 - 3820	28 - 1049	
26	Tiruppur		4589	4589	Multiple	Unconfined to Confined			0.4 - 12	0.05 - 374.1	4.35 x 10 ⁻⁴ - 3.2 x 10 ⁻²			
28	Tiruvannamalai	184	1274	1458	Multiple	Unconfined to Confined	3.00 - 28.50		0.03 - 14.13	1 - 414	2.1 x 10 ⁻⁴ - 1.14 x10 ⁻²	400 - 2080	15 - 596	
29	Tuticorin		3368	3368	Multiple	Unconfined to Confined			0.78 - 16.4	0.25 - 296.8	1.3 x 10 ⁻⁴ - 4.7 x10 ⁻²	210 - 5780	11 - 1475	
30	Vellore	166	1363	1529	Multiple	Unconfined to Confined	2.50 - 39.10		0.40 - 7.00	5.8 - 78.30	5.7 x 10 ⁻⁵ - 9.2 x 10 ⁻²	560 - 3080	25 - 710	
31	Villupuram	35	3450	3485	Multiple	Unconfined to Confined	5.00 - 12.45		0.215 - 10.30	0.86 - 141.20	2.84 x10 ⁻⁵ - 8.90x 10 ⁻²	273 - 5020	7.1 - 1347	
32	Virudhunagar			3335	Multiple	Unconfined to Confined			0.25 - 7.58	0.20 - 518.3	3.41 x10 ⁻⁶ - 0.17 x 10 ⁻²	400 - 5570	14 - 1136	
	Grand Total	451	44627	48414			1.76-43.00		0.01-27.00	0.032-777.23	0.08 x 10 ⁻³ - 9.10 x 10 ⁻⁵	93-27800	4.1-7100	



GNEISS AQUIFER SYSTEM



0 50 100
kilometers



LEGEND

- State Capital
- District Headquarters
- - - State Boundary
- District Boundary

Gneiss Aquifers

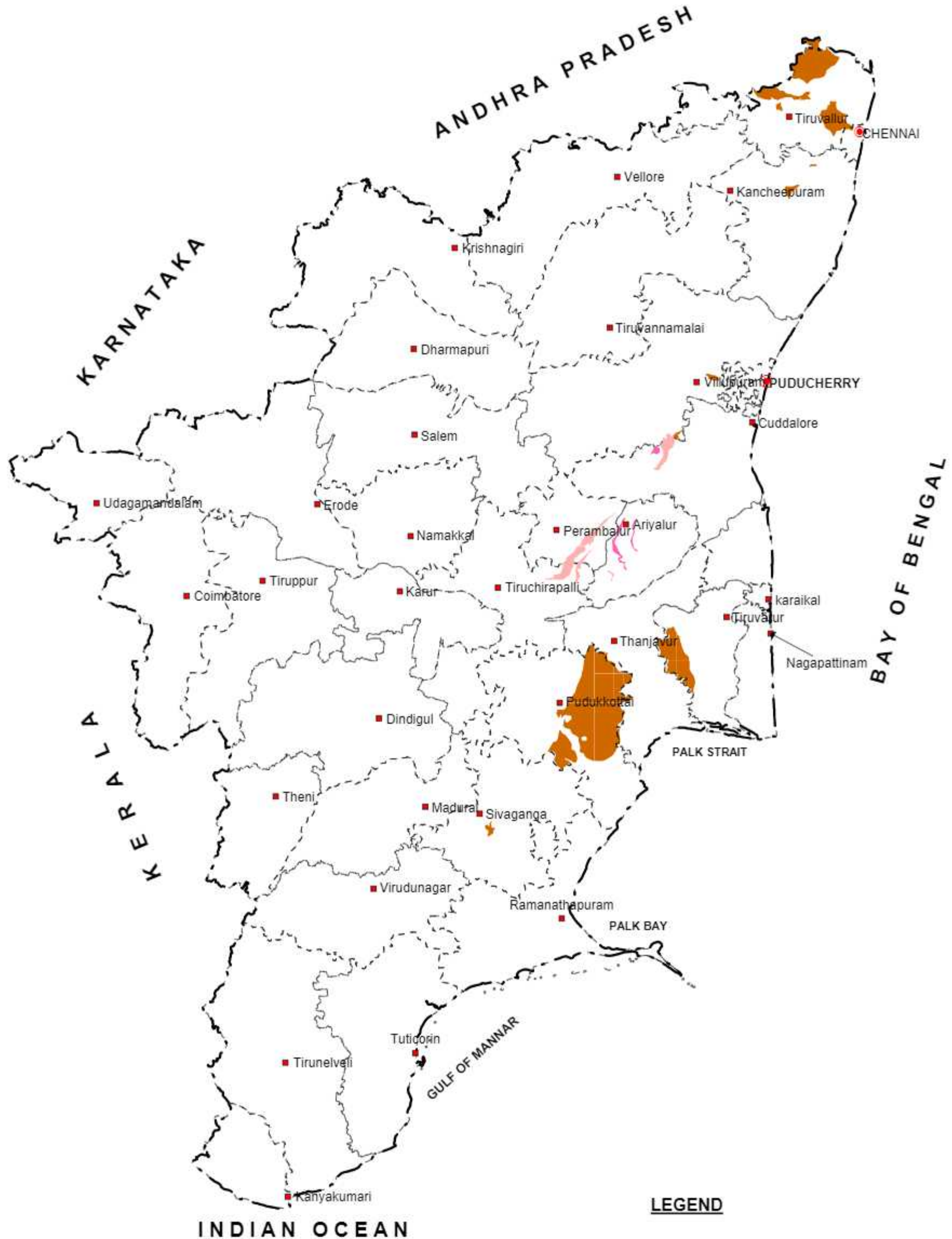
■ Migmatitic Gneiss(GN01)



LATERITE, SHALE AND LIMESTONE AQUIFER SYSTEMS



0 50 100
kilometers



LEGEND

Aquifers

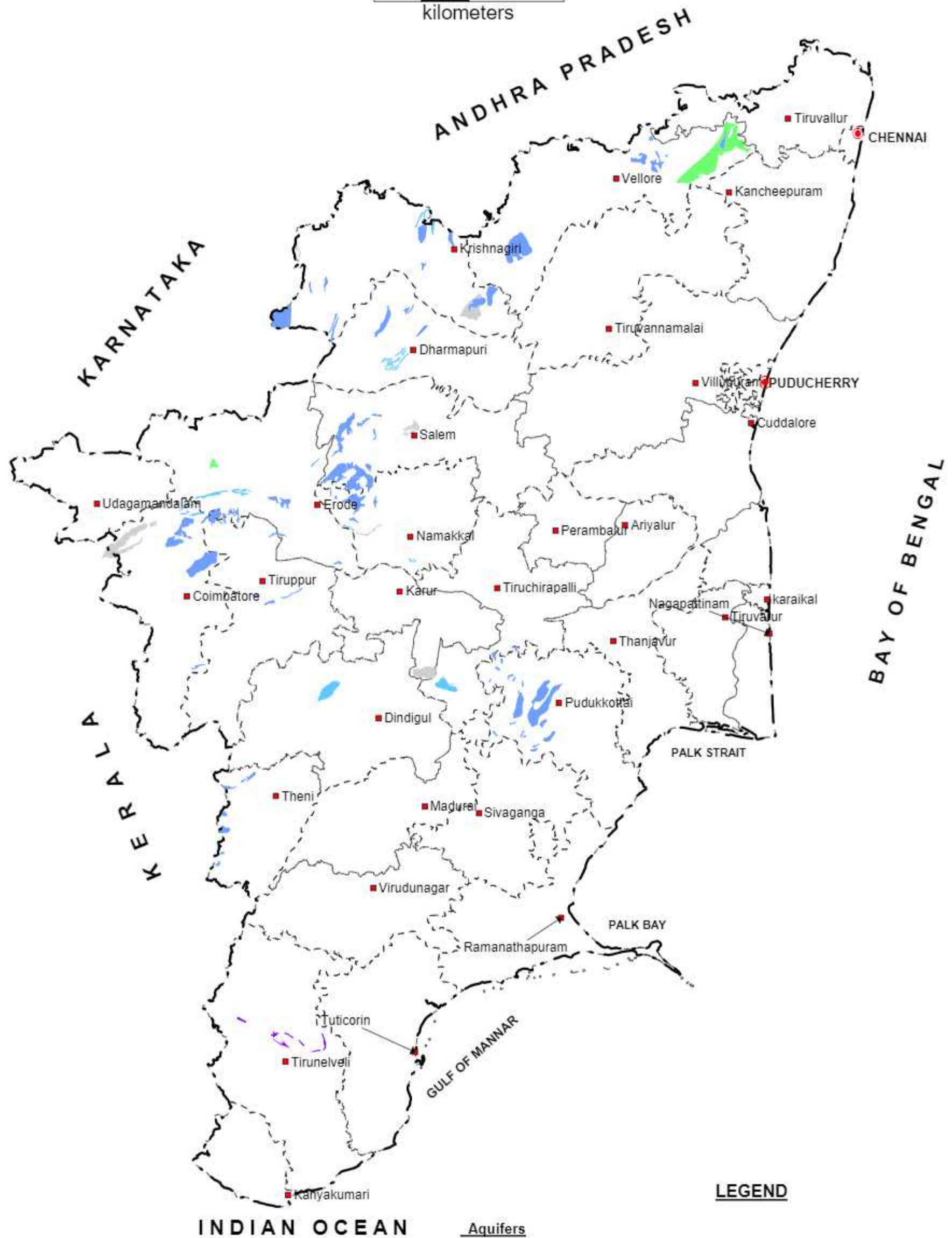
- Laterite (LT01)
- Shale with Limestone (SH01)
- Shale, Limestone, Sandstone (SH03)
- Dolomite, Limestones (LS02)

- State Capital
- District Headquarters
- State Boundary
- District Boundary



GRANITE, SCHIST, QUARTZITE AND INTRUSIVES AQUIFER SYSTEMS

0 50 100
kilometers



LEGEND

Aquifers	
	Acidic Rock (Granite, Pegmatite) (GR02)
	Phyllite (SC02)
	Quartzite (QZ01)
	Basic Rock (Dolerite, Anorthosite etc.)(IN01)
	Ultramafic (Epidiorite, Granphyre, etc)(IN02)
	State Capital
	District Headquarters
	State Boundary
	District Boundary

Table 25 : District-wise and Aquifer-wise Annual Replenishable Recharge

S.N.	District Name	Alluvium		Laterite		Sand Stone		Shale		Limestone		Granite		Schist		Quartzite		Charnockite		Khondalite		B G C		Gneiss		Intrusives	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1	Ariyalur	0.12	0.34			0.12	0.34	0.12	0.34	0.14	0.21							0.09	0.34	0.09	0.09			0.09	0.34		
2	Chennai	0.63	0.63	0.63	0.63													0.63	0.63								
3	Coimbatore	0.07	0.21									0.07	0.17					0.07	0.35	0.10	0.12	0.07	0.35	0.07	0.35	0.10	0.10
4	Cuddalore	0.21	0.68	0.37	0.37	0.27	0.68	0.37	0.41	0.41	0.41							0.21	0.31					0.21	0.68		
5	Dharmapuri											0.10	0.20					0.10	0.20	0.12	0.12	0.10	0.20	0.10	0.20	0.10	0.15
6	Dindigul																	0.08	0.18	0.08	0.14	0.08	0.18	0.08	0.18	0.11	0.13
7	Erode	0.23	0.32									0.08	0.48	0.03	0.10			0.03	0.44	0.11	0.32	0.03	0.03	0.03	0.48	0.10	0.44
8	Kancheepuram	0.14	0.50	0.21	0.37	0.21	0.50											0.14	0.50					0.29	0.36		
9	Kanyakumari	0.26	0.37			0.28	0.28											0.08	0.37	0.08	0.26			0.08	0.35		
10	Karur	0.08	0.33																	0.07	0.07	0.07	0.09	0.07	0.33	0.07	0.07
11	Krishnagiri											0.06	0.23					0.06	0.23	0.16	0.16	0.06	0.23	0.13	0.23	0.06	0.23
12	Madurai	0.18	0.36			0.10	0.12											0.10	0.32	0.12	0.30			0.10	0.36		
13	Nagapattinam	0.01	0.26																								
14	Namakkal	0.05	0.42									0.11	0.21					0.05	0.42	0.07	0.35	0.18	0.42	0.05	0.42	0.18	0.42
15	Nilgiris																	0.06	0.11			0.06	0.10	0.06	0.11		
16	Perambalur	0.12	0.34			0.12	0.34	0.12	0.34	0.14	0.21							0.09	0.34	0.09	0.09			0.09	0.34		
17	Pudukottai	0.21	0.34	0.17	0.31	0.17	0.31					0.10	0.22									0.10	0.22	0.10	0.22		
18	Ramanthapuram	0.00	0.23			0.13	0.23																	0.00	0.13		
19	Salem	0.14	0.21									0.11	0.25					0.05	0.26	0.15	0.26			0.11	0.26	0.05	0.21
20	Sivaganga	0.18	0.29	0.25	0.25	0.18	0.29													0.23	0.23	0.22	0.26	0.18	0.27		
21	Thanjavur	0.13	0.36	0.16	0.28	0.13	0.26															0.26	0.28	0.27	0.28		
22	Theni					0.10	0.28					0.12	0.19					0.10	0.28					0.10	0.28		
23	Tiruvavarur	0.01	0.27	0.13	0.25	0.00	0.25																				
24	Tiruchirapalli	0.13	0.52			0.13	0.52	0.13	0.52			0.20	0.20					0.13	0.52	0.14	0.14	0.14	0.21	0.13	0.52	0.14	0.15
25	Tirunelveli	0.09	0.32													0.18	0.30	0.09	0.38	0.09	0.38			0.09	0.38		
26	Tiruppur	0.07	0.21									0.07	0.17					0.07	0.35	0.10	0.12	0.07	0.35	0.07	0.35	0.10	0.10
27	Tiruvallur	0.16	0.45	0.16	0.45	0.27	0.45							0.27	0.27			0.27	0.34			0.18	0.27				
28	Tiruvannamalai	0.23	0.23			0.23	0.25											0.11	0.28	0.14	0.17	0.17	0.28	0.11	0.28		
29	Tuticorin	0.06	0.32			0.09	0.30											0.06	0.09					0.06	0.32		
30	Vellore	0.05	0.20			0.15	0.15					0.06	0.20	0.13	0.20			0.05	0.19			0.05	0.15	0.05	0.19		
31	Villupuram	0.22	0.58	0.44	0.58	0.28	0.58	0.51	0.51	0.39	0.39							0.05	0.59	0.42	0.42	0.28	0.55	0.05	0.59		
32	Virudhunagar	0.13	0.21			0.13	0.21											0.09	0.21					0.07	0.21		
Total		0.01	0.681	0.132	0.632	0	0.68	0.123	0.522	0.144	0.412	0.057	0.478	0.032	0.274	0.185	0.3	0.032	0.6316	0.072	0.424	0.032	0.55	0	0.681	0.052	0.442
U.T.OF PUDUCHERRY																											
1	Puducherry	0.21	0.68			0.27	0.68																				
2	Karaikal	0.01	0.26																								
Total		0.01	0.681			0.27	0.68																				

Units: m/yr



ANNUAL REPLENISHABLE RECHARGE



0 50 100
kilometers

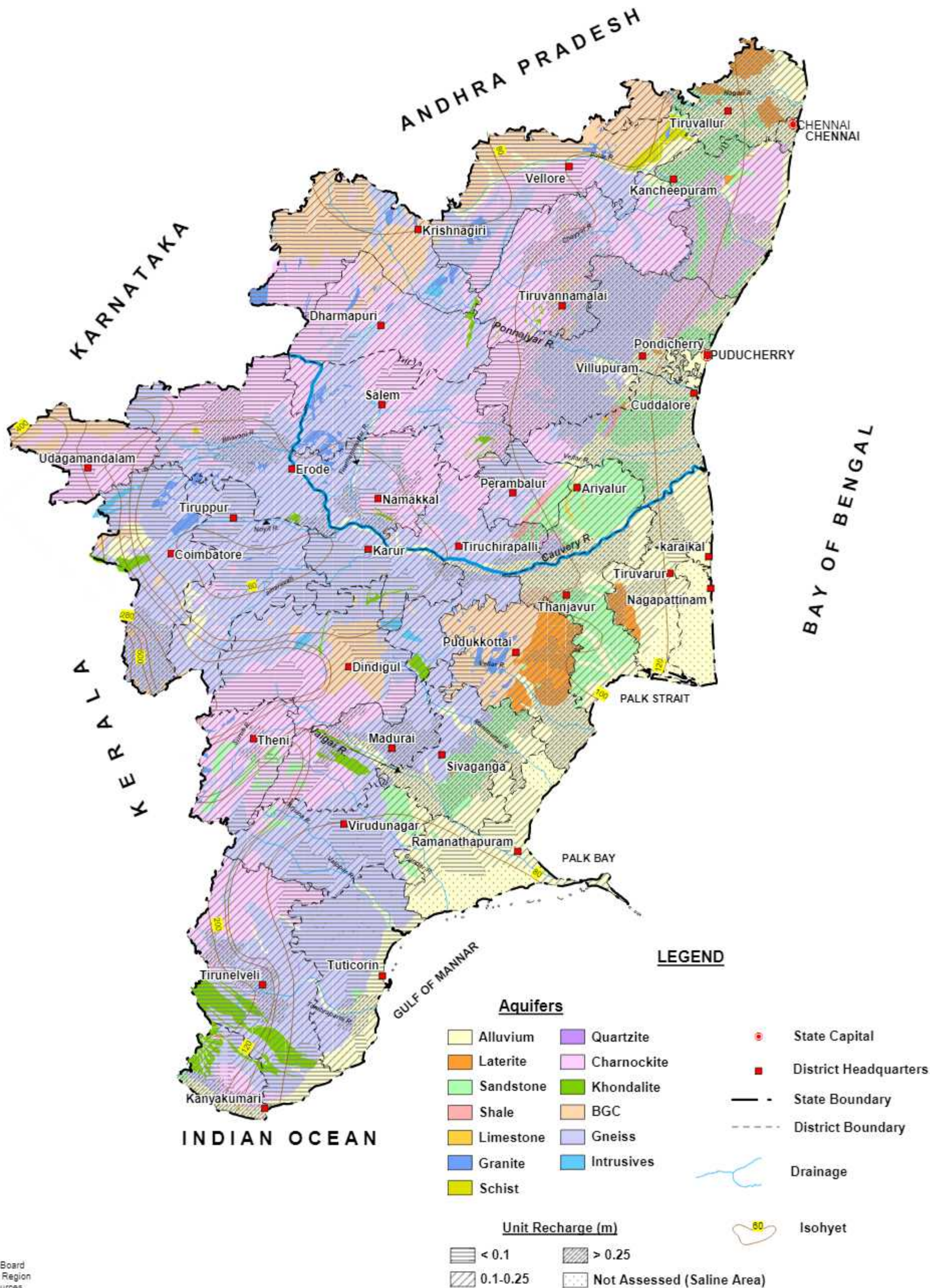


Table 26: District -wise & Aquifer-wise Area Prioritized for Artificial Recharge

Sl.N.	District	Alluvium		Laterite		Sand Stone		Shale		Limestones		Granite		Schist		Quartzite		Charnockite		Khondalite		B G C		Gneiss		Intrusives		TOTAL
		Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	
1	COIMBATORE	271	0.14									121	0.06					59	0.03	115	0.06	98	0.05	1316	0.66	6	0.00	1986
2	CUDDALORE	97	0.26			238	0.64	37	0.10																			372
3	DHARMAPURI																	998	0.28	61	0.02	1017	0.28	1500	0.41	46	0.01	3623
4	ERODE											17	0.12											128	0.88			145
5	KARUR	39	0.02																	16	0.01	31	0.01	1947	0.93	58	0.03	2091
6	KRISHNAGIRI											121	0.04					134	0.05	19	0.01	1456	0.54	895	0.33	91	0.03	2716
7	MADURAI					67	0.05											1008	0.80	16	0.01			168	0.13			1259
8	NAMAKKAL	32	0.02															948	0.55	12	0.01			719	0.42			1711
9	PERAMBALUR	6				162	0.12	50	0.04									241	0.18	10	0.01			882	0.65			1351
10	SALEM	12										104	0.03					1886	0.51	67	0.02			1627	0.44	9	0.00	3705
11	THANJAVUR	8	0.02			436	0.98																					445
12	THENI					351	0.13					47	0.02					2024	0.75					261	0.10			2683
13	TIRUCHIRAPPALLI	79	0.03			7		6	0.00									705	0.27			26	0.01	1790	0.68	4	0.00	2620
14	TIRUNELVELI	344	0.18															656	0.35	230	0.12			603	0.43			1876
15	TIRUPPUR											5	0.01					38	0.07					502	0.92			545
16	TIRUVALLUR	57	0.26			162	0.73											3	0.01									222
17	TIRUVANNAMALAI	46	0.01			74	0.02											2425	0.77	54	0.02	8	0.01	347	1.87			3142
18	TUTICORIN	251	0.53																					219	0.47			469
19	VELLORE	209	0.05									148	0.04	0				1066	0.27			1259	0.32	1103	0.28			3974
20	VIRUDUNAGAR					72	0.04											230	0.11					1741	0.85			2044
Grand Total		1451	3.92			1570	4.24	93	0.25			564	1.53	0				12423	33.59	603	1.63	3896	10.53	15748	42.58	214	0.58	36981
U.T. OF PUDUCHERRY																												
1	PUDUCHERRY	100	34.13			193	65.87																					293
Grand Total		100	34.13			193	65.87																					293

Area: in Sq.Km.



AQUIFER MANAGEMENT PLAN

ARTIFICIAL RECHARGE - PRIORITY AREA

0 50 100
kilometers

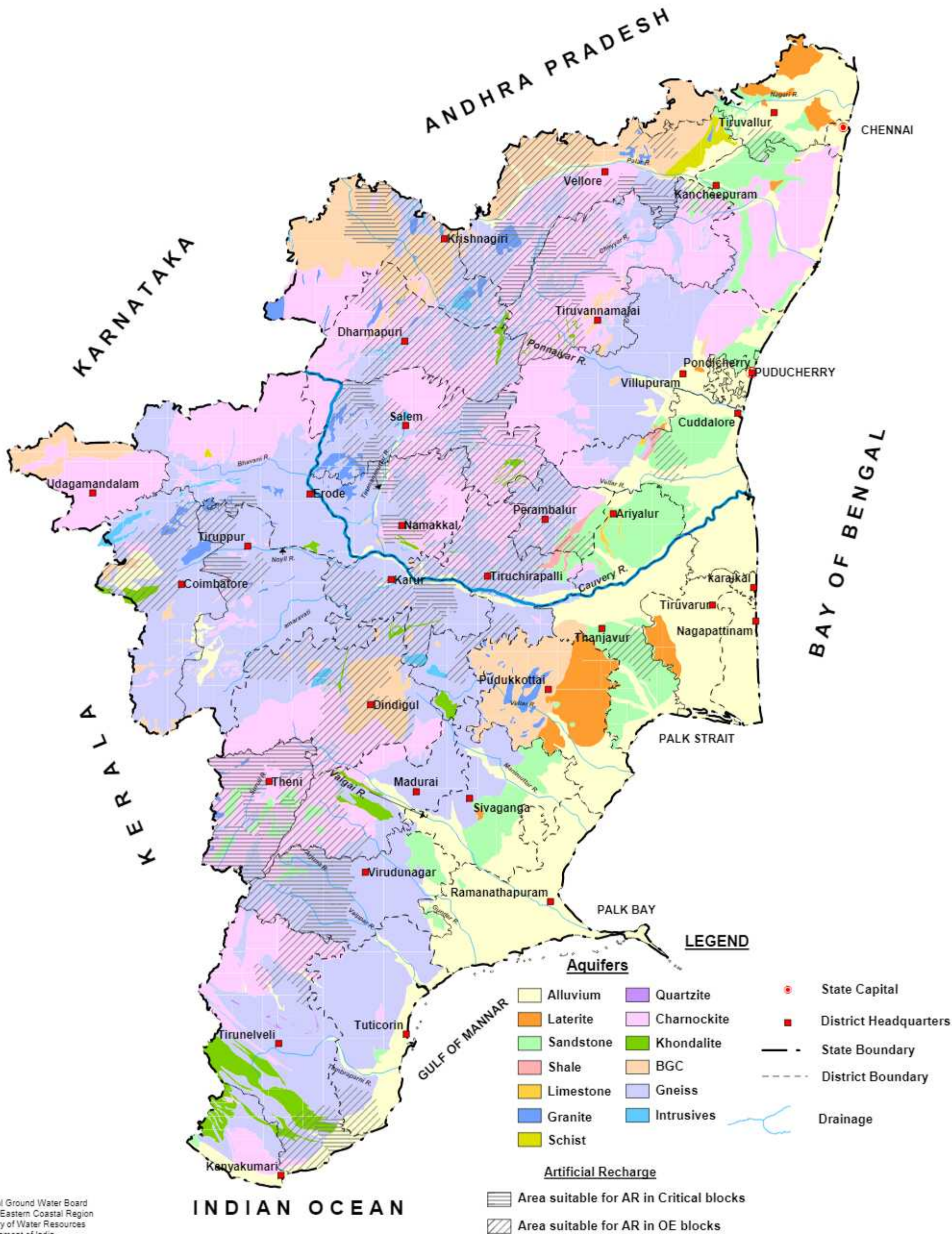


Table- 27: District-wise & Aquifer-wise Area Delineated for Rainwater Harvesting and Water Conservation

S.N.	District Name	Alluvium	Laterite	Sand Stone	Shale	Limestones	Granite	Schist	Quartzite	Charnockite	Khondalite	B G C	Gneiss	Intrusives	Total
1	ARIYALUR	9		55											64
2	CHENNAI														0
3	COIMBATORE									702			701		1402
4	CUDDALORE												23		23
5	DHARMAPURI									1888	27		192		2107
6	DINDIGUL									1721			142		1863
7	ERODE						17			2573			128		2718
8	KANCHEEPURAM	59		33						247					339
9	KANYAKUMARI									90			589		679
10	KARUR	32											303		335
11	KRISHNAGIRI									1160		623	103		1887
12	MADURAI									478	99		54		631
13	NAGAPPATTINAM	197													197
14	NAMAKKAL	23								557	12		206		798
15	NILGIRIS									2563					2563
16	PERAMBALUR									20			115		135
17	PUDUKKOTTAI		96										3		99
18	RAMANATHAPURAM	1200													1200
19	SALEM						33			1549			644		2227
20	SIVAGANGA												21		21
21	THANJAVUR														0
22	THENI			241			1209			1772			232		3454
23	THIRUVARUR	568													568
24	TIRUCHIRAPPALLI									273	16		122	15	426
25	TIRUNELVELI	181								1203	56		226		1666
26	TIRUPPUR												457		457
27	TIRUVALLUR	29	48									43			120
28	TIRUVANNAMALAI									906		77	872		1856
29	TUTICORIN	142		24									165		331
30	VELLORE	127					72	76		368		480	933		2056
31	VILLUPPURAM	197								737			409		1343
32	VIRUDUNAGAR			72						138			1250		1460
Total		2753	144	370	0	0	1332	76	0	18944	209	1224	7891	15	32959

Area: in Sq. Km.



AQUIFER MANAGEMENT PLAN

WATER CONSERVATION - PRIORITY AREA

0 50 100
kilometers

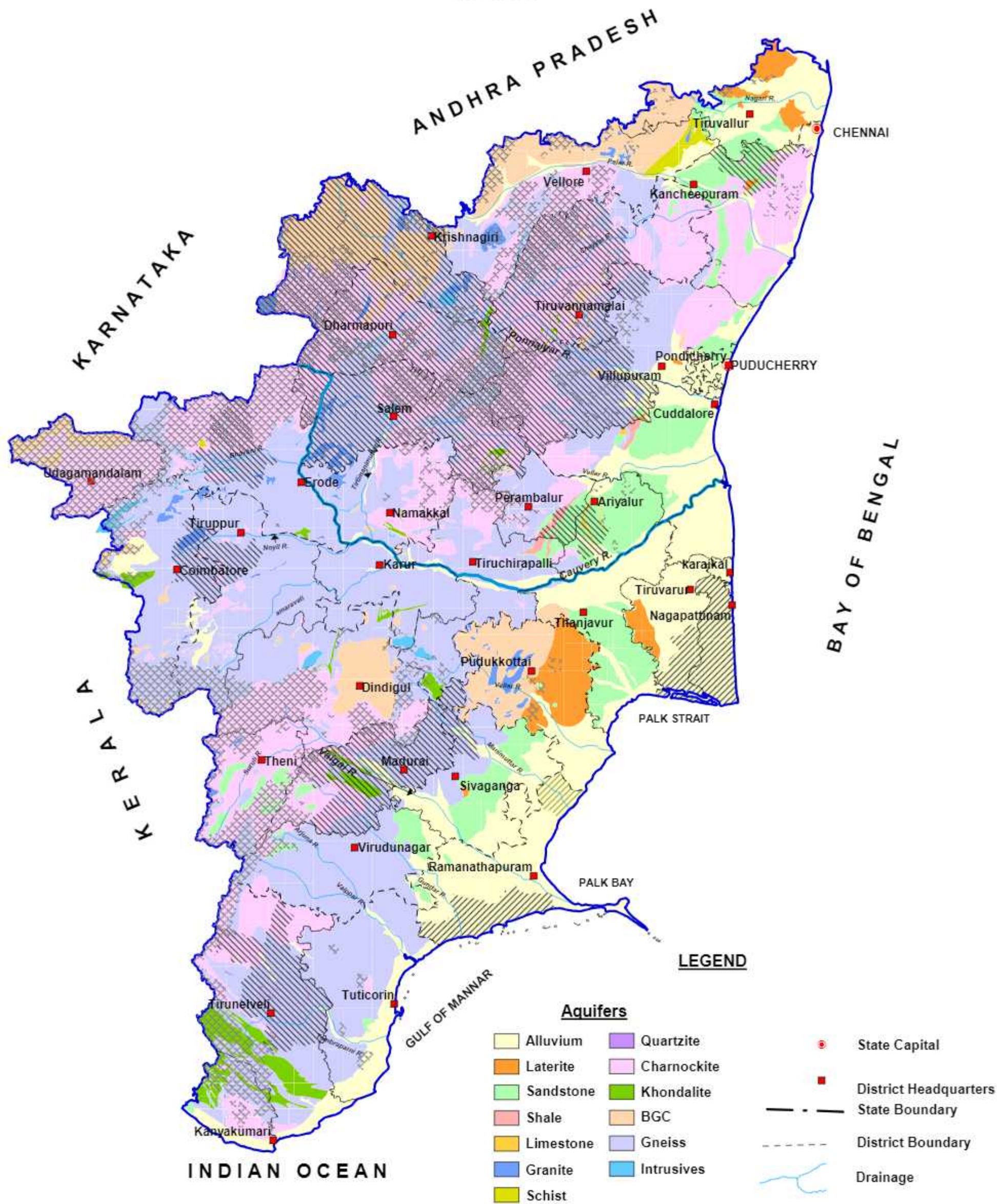


Table- 28: District -wise & Aquifer-wise Area Prioritized for GW Development

S.N.	District Name	Alluvium	Laterite	Sand Stone	Shale	Limestones	Granite	Schist	Quartzite	Charnockite	Khondalite	B G C	Gneiss	Intrusives
1	COIMBATORE	198					13			159		173	3952	124
2	CUDDALORE	1498		752	23	12				371			369	
3	DHARMAPURI						25			789		35	181	
4	DINDIGUL									136			87	13
5	ERODE	23					62	14		2395	29		553	35
6	KANCHEEPURAM	328	26	783						1611			74	
7	KANYAKUMARI	332		24						416	312		65	
8	KARUR	97											718	
9	KRISHNAGIRI						125			990		1462		
10	MADURAI	159								319	29		1267	
11	NAGAPPATTINAM	1243												
12	NAMAKKAL	44					76			457	19	24	172	17
13	NILGIRIS									1866		675	8	
14	PERAMBALUR	366		1393						36			13	
15	PUDUKKOTTAI	996	799	7			265					1795	122	
16	RAMANATHAPURAM	3796	632	29									19	
17	SALEM	3					167			158			587	21
18	SIVAGANGA	168	18	113								20	1257	
19	THANJAVUR	592		517								147	27	
20	THENI		10											
21	THIRUVARUR	1438	286	27										
22	TIRUCHIRAPPALLI	19		120	67					41	89	17	950	
23	TIRUNELVELI	27							22	1162	692		2843	
24	TIRUVALLUR	13	548	320								63		
25	TIRUVANNAMALAI			14						991			57	
26	TUTICORIN	620								28			2341	
27	VELLORE	129		53			37	232		53		439	48	
28	VILLUPPURAM	422	22	237	12					1777		47	1577	
29	VIRUDUNAGAR	292		384									1594	
Total		12800	2341	4772	102	12	772	246	22	13755	1170	4896	18881	211
U.T.Of Puducherry														
1	KARAIKAL	161												
Total		161												

Area : in Sq.Km.



AQUIFER MANAGEMENT PLAN

(SUITABLE AREA FOR GROUND WATER DEVELOPMENT)

0 50 100
kilometers

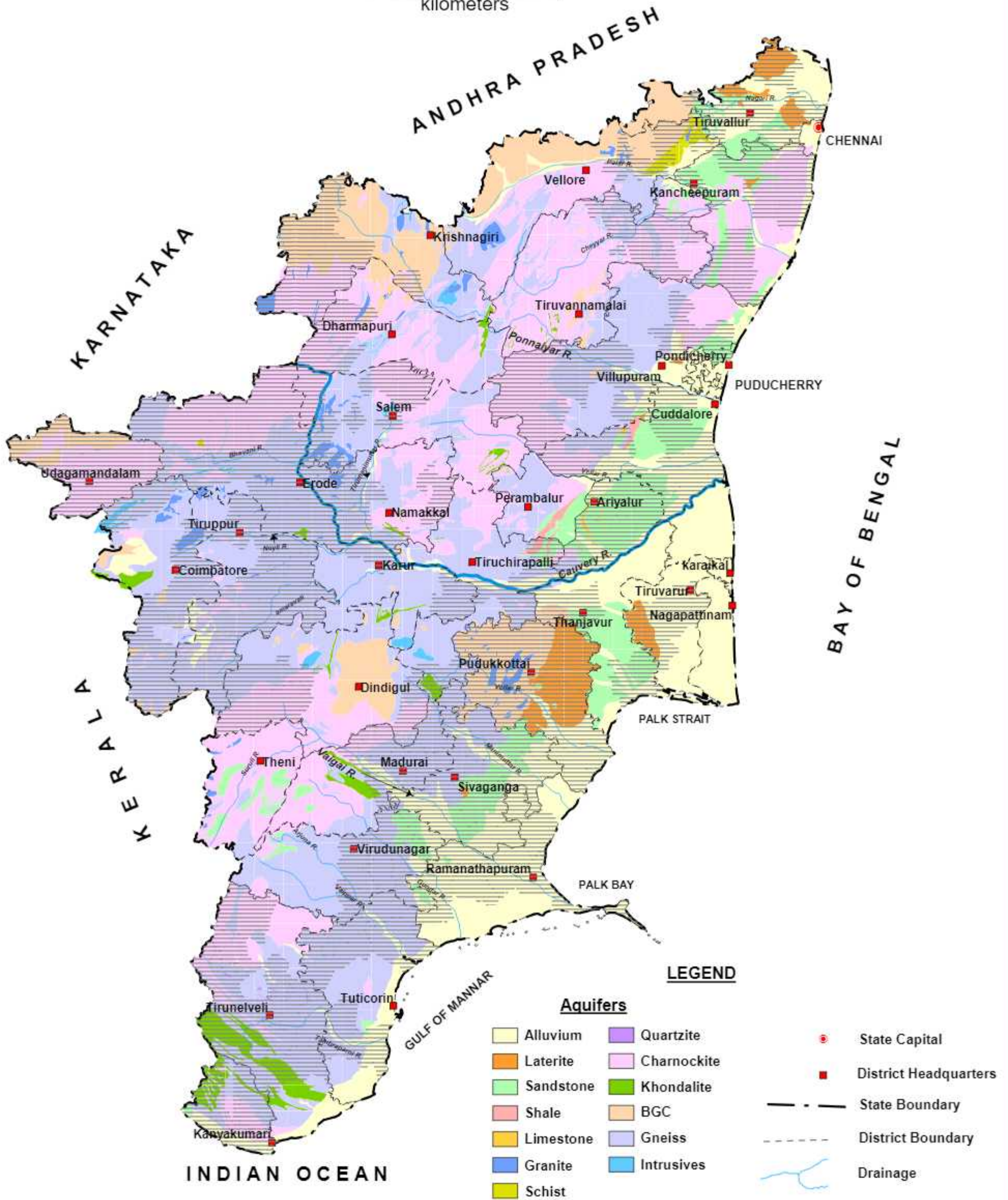


Table-29 : Vulnerable Areas

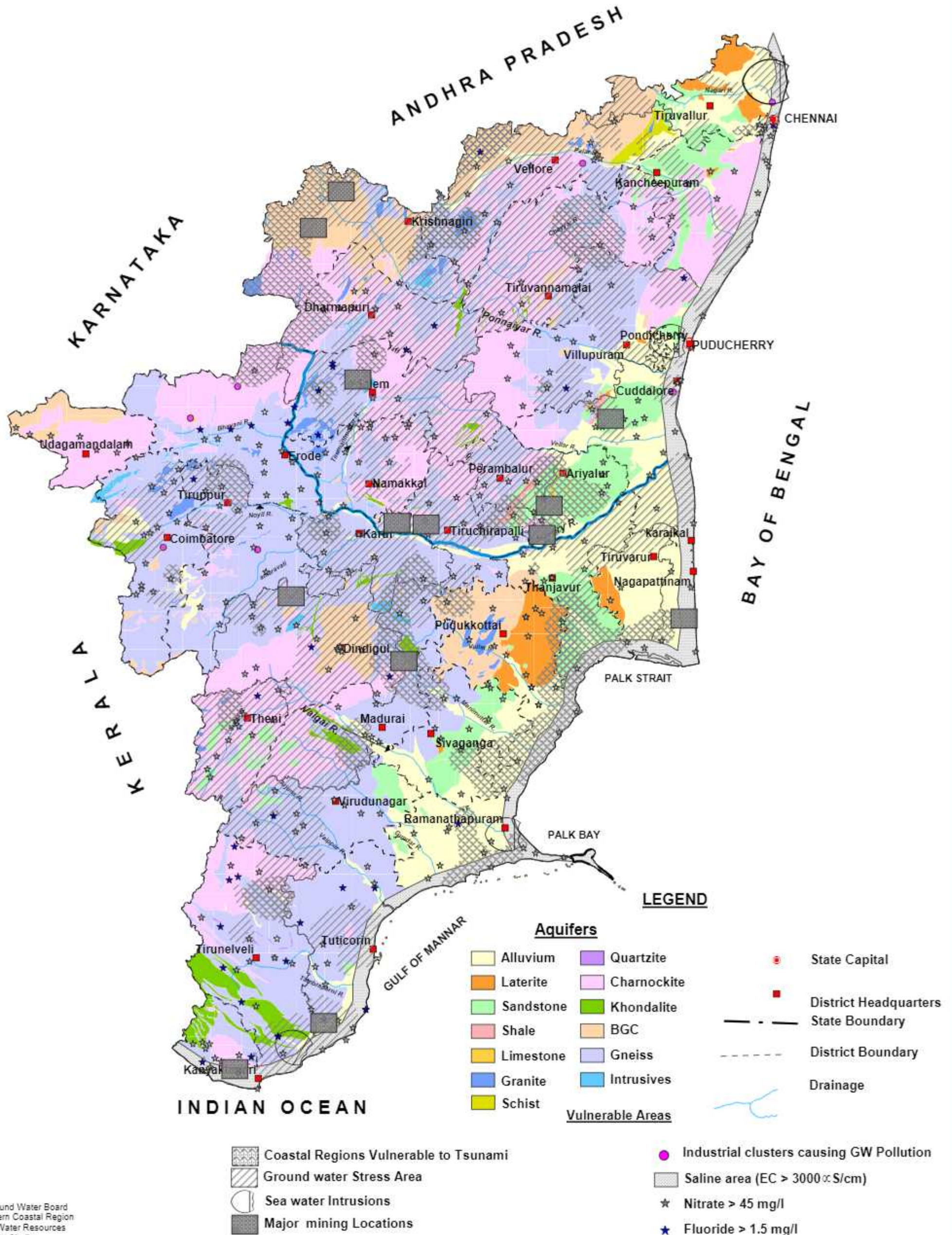
S.N.	Types of Vulnerability	District Name	Area in Sq Km
1	Over Exploitation	Chennai	178
		Coimbatore	2519
		Cuddalore	691
		Dharmapuri	3327
		Dindigul	3921
		Kancheepuram	1248
		Karur	1756
		Krishnagiri	2068
		Madurai	1645
		Nagapattinam	983
		Namakkal	1264
		Perambalur	1767
		Salem	2482
		Thanjavur	2145
		Theni	583
		Tiruvallur	593
		Tiruchirapalli	3064
		Tirunelveli	1598
		Tiruvallur	1391
		Tiruvannamalai	3280
		Tiruppur	1322
		Tuticorin	3912
		Vellore	2917
		Villupuram	584
Virudhunagar	45237		
U.T.Of Puducherry			
		Puducherry	293
2	Coastal Regions Vulnerable to Tsunami	Chennai, Kancheepuram , Villupuram, Cuddalore, Nagapattinam, Thanjavur, Pudukkottai, Ramanathapuram, Tuticorin and Kanyakumari districts of Tamil Nadu and Puducherry and Karaikal districtys of U.T. Of Puducherry	
3	Area Vulnerable to Sea water Intrusion	Chennai, Cuddalore, Ramanathapuram and Kanyakumari districts	
4	Districts affected by Major Mining activities	Kancheepuram, Villupuram, Ariyalur, Karur, Cudalore, Salem, and Tuticorin districts	
5	Industrial Clusters Causing GW Pollution	Vellore, Coimbatore and Tiruppur districts	
6	EC (> 3000 μ simens/cm at 25°C)	Chennai, Coimbatore, Cuddalore, Dindigul, Dharmapuri,Erode, Karur, Namakkal, Nagapattinam, Perambalur, Pudukkottai, Ramanathapuram, Salem, Tiruvannamalai, Thiruchirapalli, Thanjavur, Thoothukudi,Tirunelveli, Theni, Vellore, Villupuram, Virudunagar	
7	NO ₃ (> 45 mg/l)	Chennai, Coimbatore, Cuddalore, Dindigul, Dharmapuri, Erode, Kancheepuram, Kanyakumari, Karur, Namakkal, Nilgiris, Perambalur, Pudukkottai, Ramanathapuram, Salem, Shivaganga, Theni, Tiruvannamalai, Thanjavur, Thoothukudi,Tirunelveli, Tiruvallur, Vellore, Villupuram, Virudunagar	
8	F (>1.5 mg/l)	Coimbatore, Dindigul, Dharmapuri,Erode, Karur,Krishnagiri, Namakkal, Perambalur, Pudukkottai, Ramanathapuram, Salem, Shivaganga,Theni, Tiruvannamalai, Thiruchirapalli, Vellore, Virudunagar	



AQUIFER VULNERABLE MAP



0 50 100
kilometers



WAY FORWARD

Water is life as life do not exist where there is no water. Groundwater the nature's precious gift to the mankind easily occurs everywhere. Civilization started all along the river valleys and the development of the groundwater started from the very first day of civilization. Wherever potential groundwater was available, people dwelled around it. Further, with increase in human settlements and intensive irrigation, more stress was laid on the water bearing formations (Aquifer). Unless there is clear cut information of quantity, quality and nearness of the aquifer, the management of the aquifer is impossible.

Groundwater being a natural commodity within which life exists like air, the public has right to access the resource without fear and restrictions for their existence. At the same time the unscientific development by the affluent is a matter of concern wherein the government has to go in for groundwater governance for protecting the rights of everyone. For proper groundwater governance and management, the quantitative and qualitative distribution of groundwater is required. Aquifer mapping brings out the nature and extent of the aquifers and the availability of groundwater within the aquifers. Aquifer mapping is not about mapping the aquifers on the surface, but mapping the subsurface as well (3D disposition) which will exhibit the disposition of the aquifer, both horizontal and vertical. Aquifer systems are so different and at times complex and so as the societies that depends upon them and uses them. Ground water resources have to be conserved and utilized in an ecologically sustainable, economically efficient and socially equitable manner. Thus aquifer mapping will enable the government for judicial management of the resource so that equity is maintained between all section of people and users.

The aquifer mapping exercise integrates the existing information onto a GIS platform wherein different layers can be developed and can superimpose the layers to arrive at a solution for various groundwater management plans. The main idea behind the aquifer mapping is to go beyond the present practice of opting for a management solution based solely on the category of quantitative assessment. If aquifer wise information is available, the water managers can consult the atlas before taking decisions on various groundwater management options. A set of data on various attributes of groundwater will be available to the groundwater manager as atlas or maps and the management plans will be based on the analysis of the data or maps generated.

The aquifer mapping has brought out a strong data base by integrating the data obtained from geological, hydrogeological, hydrological, geophysical and geochemical studies. The strong data base generated for each principal aquifer in turn would facilitate in formulating aquifer management plan. Further, this has put a strong platform for micro level aquifer mapping wherein the aquifer units within the principal aquifers can be managed locally or at Panchayat level. With the availability of the aquifer maps, there can be a comprehensive assessment of the groundwater available in the state of Tamilnadu and UT of Puducherry. This can be done at appropriate scales by encompassing various administrative units like blocks, taluks and groups of Gram Panchayats overlying on an aquifer. Information of the aquifer and availability of the groundwater at Panchayat level will be crucial for sustained community action on managing groundwater.

The present aquifer mapping at Regional scale (1:250,000) forms the foundation for assessment of groundwater availability. The primary issues affecting groundwater availability vary from location to location and commonly require analysis in the context of groundwater flow systems to achieve any purposeful meaning. With this principle in mind, the studies of water balance can be taken up involving all the input and output components – rainfall, evaporation, evapotranspiration, soil moisture balance, groundwater recharge through rainfall, groundwater extraction, canal seepage, irrigation, water bodies and river-aquifer interaction etc. Multiple techniques including physical, chemical/tracer and numerical modeling approach can be used for simulating groundwater conditions and to develop aquifer management plans for optimal utilization of groundwater resources.

The aquifer mapping has been due importance in the XII five year plan. As an initiative, considering the geological and hydrologic properties of the wide array of geological formations in the state, 12 principal aquifer systems have been delineated at 1:250,000 scale. This forms the base for mapping at 1: 50,000 scale. With further inputs from the detailed Hydrogeological studies (aquifer mapping studies) in the 12th year plan, aquifer mapping can be done at cadastral level. Thus after a period of time, we shall have the status on water availability both surface and ground water and its demand at cadastral level i.e., in village wise information. This will be useful in planning/tackling at village wise. The inputs on the groundwater pollution due to natural and anthropogenic needs to be identified at cadastral level. The Atlas of aquifer mapping for the state of Tamilnadu and UT of Puducherry has enabled to identify the data gaps, delineate the vulnerable areas and demarcate areas which attract government intervention.