

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL  
SOUTHERN ZONE, CHENNAI**

**Appeal No.61 of 2024 (SZ)**

Thiru. K. Ravikumar,  
S/o. Kandasamy,  
No.3/320, Kottamettupatti Village,  
Mettupatti Post, Omalur Taluk,  
Salem District-363455

**... Appellant**

**Vs**

1. **State Level Environment Impact Assessment Authority (SEIAA),**  
Through the Member Secretary,  
& ors.

**... Respondents**

**INDEX**

<b>S.NO.</b>	<b>DESCRIPTION</b>	<b>PG. NO.</b>
<b>1.</b>	Memo filed by the Counsel for 2nd Respondent	<b>1 - 2</b>
<b>2.</b>	District Groundwater brochure of Dharmapuri district - October 2009	<b>3 - 22</b>
<b>3.</b>	Central ground water board report of Pennagaram firka, Dharmapuri district	<b>23 - 31</b>
<b>4.</b>	Newspaper articles stating the elephants passing through the area and CCTV being installed	<b>32 - 41</b>

Dated at Chennai on this the 4th Day of August, 2025



**COUNSEL FOR 2nd RESPONDENT**

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL  
SOUTHERN ZONE, CHENNAI**

**Appeal No.61 of 2024 (SZ)**

Thiru. K. Ravikumar,  
S/o. Kandasamy,  
No.3/320, Kottamettupatti Village,  
Mettupatti Post, Omalur Taluk,  
Salem District-363455

**... Appellant**

**Vs**

**1. State Level Environment Impact Assessment Authority (SEIAA),**

Through the Member Secretary,  
3rd Floor, Panagal Maaligai, No.1, Jeenis Road,  
Saidapet, Chennai – 600 015.  
Email: [seiaamstn@gmail.com](mailto:seiaamstn@gmail.com)  
Phone No. 044-24359973

**2. State Level Expert Appraisal Committee (SEAC),**

Through the Member Secretary,  
3rd Floor, Panagal Maaligai, No.1, Jeenis Road,  
Saidapet, Chennai – 600 015.  
Email: [seacchairmantn@gmail.com](mailto:seacchairmantn@gmail.com)  
Phone No. 044-24359973.

**3. Department of Geology and Mining,**

Through the Assistant Director,  
Geology and Mining, Dharmapuri – 636 701  
Ph: 04342-232327  
Email: [ddminesdpi@gmail.com](mailto:ddminesdpi@gmail.com)

**... Respondents**

**MEMO FILED BY THE COUNSEL FOR RESPONDE NO. 2**

1. The above Appeal came up for final hearing on 15.07.2025. The Case was heard by the Hon'ble Tribunal and is "Reserved for Orders."

2. In the above case, the Counsel for the 2nd Respondent while arguing the matter relied on the following documents;

- i. District Groundwater brochure of Dharmapuri district - October 2009
- ii. Central ground water board report of Pennagaram firka, Dharmapuri district
- iii. Newspaper articles stating the elephants passing through the area and CCTV being installed.

The above documents were not part of the typeset filed by the 2nd Respondent along with the counter, therefore, the same was directed to be filed by the Hon'ble Tribunal.

Therefore, it is respectfully prayed that this Hon'ble Tribunal may be pleased to take this memo on record and thus render justice.

Dated at Chennai on this the 4th Day of August, 2025



**COUNSEL FOR 2nd RESPONDENT**



**For official use**

**Technical Report Series**

**DISTRICT GROUNDWATER BROCHURE  
DHARMAPURI DISTRICT, TAMIL NADU**

**A.BALACHANDRAN, SCIENTIST-D**

---

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

**OCTOBER 2009**

**DISTRICT GROUND WATER BROCHURE (DHARMAPURI DISTRICT)****DISTRICT AT A GLANCE (DHARMAPURI)**

S.NO	ITEMS	STATISTICS	
1.	<b>GENERAL INFORMATION</b>		
	<b>i. Geographical area (Sq. km)</b>	<b>4452.64</b>	
	<b>ii. Administrative Divisions as on 31-3-2007</b>		
	Number of Taluks	4	
	Number of Blocks	8	
	Number of Villages	476	
	<b>iii. Population (as on 2001 Censes)</b>		
	Total Population	1286552	
	Male	666418	
	Female	620134	
	<b>iv. Normal Annual Rainfall (mm)</b>	760	
2.	<b>GEOMORPHOLOGY</b>		
	i. Major physiographic Units	( i ). Mysore Plateau ( ii ). Shevaroy Hills	
	ii. Major Drainages	Cauvery & Ponnaiyar.	
3.	<b>LAND USE (Sq. km) during 2005-06</b>		
	i. Forest area	163.82	
	ii. Net area sown	219.01	
	iii. Barren & Uncultivable waste	17.16	
4.	<b>MAJOR SOIL TYPES</b>	1.Block soil 2.Red loamy soil 3 Loamy soil. 4. Sandy soil 5. Clayey soil.	
5.	<b>AREA UNDER PRINCIPAL CROPS (AS ON 2005-2006)</b>	1.Groundnut -7493 Ha 16% 2.Paddy – 64284 Ha 14% 3.Ragi – 5403 Ha 12% 4.Jowar – 1011Ha < 5 %	
6.	<b>IRIGATION BY DIFFERENT SOURCES (During 2005-06)</b>	<b>Number</b>	<b>Area irrigated (Ha)</b>
	i. Dug wells	75673	51301
	ii. Tube wells	727	2056
	iii. Tanks	926	6482
	iv. Canals	85	6844
	vi. Net irrigated area	66690 ha	
	vii. Gross irrigated area	78381 ha	
7.	<b>NUMBERS OF GROUND WATER MONITORING WELLS OF CGWB (AS ON 31.03.2007)</b>		
	i. No of dug wells	30	
	ii. No of piezometers	22	
8.	<b>PREDOMINANT GEOLOGICAL FORMATIONS</b>	River Alluvium, Colluvium, Granites, Granite and Hornblende Gneisses and Charnockites.	
9.	<b>HYDROGEOLOGY</b>		
	i. Major water bearing formations	Crystalline rocks, Recent alluvial deposits	

	ii. Pre- monsoon depth to water level (May 2006)	2.66 – 20.06
	iii. Pre- monsoon depth to water level (Jan'2007)	1.19 – 14.57
	iv. Long term water level trend in 10 years (1998-2007) in m/yr	<b>Annual</b>
		<b>Rise (m/year)</b> <b>Fall (m/year)</b>
		Min : 0.1119      Min : 0.0417 Max : 0.5744      Max : 0.6789
<b>10.</b>	<b>GROUND WATER EXPLORATION BY CGWB (As on 31-03-2007)</b>	
	i. Number of Exploratory wells	12
	ii. Number of Observation wells	11
	iii. Number of Piezometers under Hydrology Project.	22
	iv. Depth range(m)	36 – 200
	v. Discharge(lps)	1.6 – 12
	vi. Storativity (S)	$5.693 \times 10^{-3}$ – $1.42 \times 10^{-2}$
	vii. Transmissivity (m <sup>2</sup> /day)	10 – 300
<b>11.</b>	<b>GROUND WATER QUALITY AS ON MAY 2006</b>	
	i. Presence of chemical constituents more than permissible limit	TH as CaCO <sub>3</sub> , NO <sub>3</sub> , and F
	ii. Type of water	Ca-Cl, Ca-HCO <sub>3</sub>
<b>12.</b>	<b>DYNAMIC GROUND WATER RESOURCES (as on 31.03.2004) in MCM</b>	
	i. Net Groundwater Availability	496.62
	ii. Total Annual Ground Water Draft for all purposes	737.69
	iii. Projected demand for Domestic and Industrial Uses up to 2029	20.00
	iv. Stage of Ground Water Development	149%
<b>13.</b>	<b>AWARENESS AND TRAINING ACTIVITY</b>	
	<b>i. Mass Awareness Programmes Organized</b>	
	Year	1998
	Place	Madam
	No of Participants	200
	<b>ii. Water Management Training Organized</b>	
	Date	NIL
	Place	
	No of Participants	
<b>14.</b>	<b>EFFORTS OF ARTIFICIAL RECHARGE &amp; RAINWATER HARVESTING</b>	
	Technical Guidance were provided as when sought	
<b>15.</b>	<b>GROUND WATER CONTROL AND REGULATION</b>	
	i. Number of Over Exploited Blocks	7
	ii. Number of Critical Blocks	1
	ii. Number of Blocks Notified	Nil
<b>16.</b>	<b>MAJOR GROUND WATER PROBLEMS AND ISSUES.</b>	
	<ol style="list-style-type: none"> <li>Ground water in phreatic aquifers in general, is slightly alkaline in nature.</li> <li>TH as CaCO<sub>3</sub> and NO<sub>3</sub> concentration are found in more than permissible limit at select places in the district.</li> <li>Fluoride is in excess in number of places</li> <li>The entire district is having water scarcity and out of eight blocks, seven are over exploited and one is critical.</li> </ol>	

## 1.0 INTRODUCTION

### 1.1 Administrative Details

Dharmapuri district is divided into 4 taluks. The taluks are further divided into 8 blocks (**Plate-I**), which further divided into 476 villages.

**Table : 1.1 Administrative Set-up of Dharmapuri District**

S.No.	Taluk	Area (Sq.km)	No.of Villages	Block	No.of Villages
1	Dharmapuri	788.87	62	Dharmapuri	31
				Nallampalli	31
2	Harur	975.36	235	Harur	152
				Morappur	83
3	Palacode	733.36	54	Palacode	54
4	Pappireddipatti	835.29	86	Papireddipatti	46
5	Pennagaram	1119.76	39	Karimangalam	40
				Pennagaram	39
<b>Total</b>		<b>4452.64</b>	<b>476</b>		<b>476</b>

### 1.2 Basin and sub-basin

The district is part of the composite east flowing river basin "Between Cauvery and Ponnaiyar as per the Irrigation Atlas of India.

### 1.3 Drainage

Dharmapuri district is drained by Cauvery and Ponnaiyar rivers and their tributaries. Cauvery river flows along the south western boundary of the district. It flows in an easterly direction up to Bellgundla and then takes a more or less southerly course till it reaches the Stanley Reservoir. The Doddahalla and the Chinnar R. are important tributaries of Cauvery river in the district.

Ponnaiyar is the major river draining the district and is ephemeral in nature. It originates from Nandhi hills in Karnataka, enters Tamil Nadu west of Bagalur and flows almost in a south easterly direction till it reaches Daddampatti from where it takes an easterly course. Pambar, Vaniyar and Kallar are the important tributaries of Ponnaiyar draining the eastern part of the district whereas the Chinnar and Markandeya Nadhi drain the northern part of the district.

### 1.4 Irrigation Practices

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

S.No	Classification	Area (Ha)
1	Forests	164177
2	Barren & Uncultivable Lands	19648
3	Land put to non agricultural uses	51248

S.No	Classification	Area (Ha)
4	Cultivable Waste	5364
5	Permanent Pastures & other grazing lands	6209
6	Groves not included in the area sown	2894
7	Current Fallows	31464
	Other Fallow Lands	5720
9	Net Area sown	163053
	<b>Total</b>	<b>449777</b>

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

The chief irrigation sources in the area are the Canals, tanks, wells and bore wells and other sources. Irrigation is highest in Harur, Morappur and Karimangalam block followed by Palacode, Papireddipatti, Nallampalli, Dharmapuri, and Pennagaram blocks. The block wise and source wise net area irrigated (Ha) (2005-06 is given below).

S. No	Block	Net area irrigated by					Total Net Area irrigated
		Canals	Tanks	Tube/Bore wells	Ordinary wells	Other Sources	
1	Dharmapuri	0	805	50	3928	0	4783
2	Nallampalli	134	639	51	4539	0	5363
3	Harur	830	1238	574	12767	0	15409
4	Morappur	1097	525	195	9019	0	10836
5	Palacode	1316	1122	405	6035	0	8878
6	Papireddipatti	2473	988	401	3918	0	7780
7	Karimangalam	884	698	358	7114	0	9054
8	Pennagaram	110	467	22	3981	7	4587
	<b>Total</b>	<b>6844</b>	<b>6482</b>	<b>2056</b>	<b>51301</b>	<b>7</b>	<b>66690</b>

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

### 1.5 Studies /Activities carried out by CGWB

Ground water exploration for delineation of deeper fractured aquifers by drilling of exploratory wells was taken up by Central Ground Water Board during 1988 – 91. A total of 12 exploratory wells and 11 observation wells were drilled for this purpose in the district in the depth range of 105 to 300 m bgl.

Geophysical investigations for assessing the geo-electric characteristics of sub-surface litho-units were carried out in parts of the district during 1973-75, Remote sensing studies for delineation of areas suitable for ground water development and artificial recharge were carried out in Vaniar watershed comprising parts of Harur and Uthangarai taluks during 2001 – 02.

Monitoring of ground water levels and water quality in the district is being carried out by Central Ground Water Board since 1972 through a network of National Hydrograph Stations. At present, 32 such stations are being monitored 4 times a year.

The ground water monitoring network has been expanded through the construction of 29 purpose-built observation wells, constructed as part of the World Bank aided Hydrology Project during 1997-98.

Systematic Hydrogeological studies were carried out in the district by CGWB during 1980-1983. Reappraisal hydrogeological surveys were taken up in different parts of the district during 84-85, 87-88 and 2000-01.

CGWB constructed Sub Surface Dykes as a part of experimental studies to determine the efficacy of the structure in water conservation techniques. 2 sub surface dykes were constructed during 1998-1999 under Central Sector Schemes in the district and the impact assessment studies have shown that they were found very effective in water conservation.

## **2.0 RAINFALL AND CLIMATE**

The normal annual rainfall over the district varies from about 760mm to about 910mm. It is lowest around Rayakota (766.5mm) in the northern part of the district. It gradually increases towards south, west and east and attains a maximum around Denkanikota (912.0mm) in the northwestern part small area the northwestern part around Thally. It increases towards the north and reaches a maximum in the northern part around Rayakota

The district temperature is a gradual decrease of both day and night temperatures from June onwards till December, when the mean daily maximum is about 30°C and the mean daily minimum about 19°C in the plains. The day temperatures increase gradually from January onwards. The lowest temperature is reached in January when the mean daily minimum is about 19°C. April and May are the hottest months in the year with the mean daily maximum temperature of about 37°C and the mean daily minimum temperature of about 25°C in the plains. However, in the higher areas in Hosur, Thally and Krishnagiri taluks day and night temperatures are lower by about 2°C to 3°C. In these areas weather is comparatively pleasant round the year. In the lower plains weather is also pleasant except on individual days in May, June and July when weather becomes occasionally oppressive and sultry due to high temperatures (about 42°C).

The climate of the district on the whole is slightly humid. The driest months are February and March with average relative humidity of about 30% in the afternoons. During the rainy months the average humidity is appreciably below the saturation level.

Skies are generally clear or lightly clouded during the period January to about the middle of April. The cloudiness increases from the later half of April and from middle of June onwards when the skies are generally clouded till about the middle of November.

Winds are generally light to moderate in strength round the year. In open areas, winds blow from northeasterly to easterly directions during the period November to March and from southwesterly to westerly directions during the period May to September. April and October are the transition months. During March, winds are mainly from easterly directions, and in October, winds are mainly from southwest direction in the

morning and easterly direction in the afternoon. However, winds in the higher and sheltered places or valleys may differ very much.

### **3.0 GEOMORPHYLOGY AND SOIL TYPES**

#### **3.1 Geomorphology**

Dharmapuri district forms part of the upland plateau region of Tamil Nadu with many hill ranges and undulating plains. The western part of the district between Pennagaram and Denkanikottai has hill ranges of Mysore Plateau with a chain of undulating hills. The southern boundary of the district is occupied by the Shevaroy hill ranges. The plains occupying the central, eastern and southern parts of the district have an average elevation of 488 m. above Mean Sea Level. The Plateau region along the western boundary and the northwestern part of the district has an average elevation of 914 m. above Mean Sea Level.

The prominent geomorphic units identified in the district through interpretation of Satellite imagery are 1) Structural Hills 2) Inselberg 3) pediments, 4) Buried pediments 5) Shallow Buried Pediments 6) Plateau, 7) Flood plain, and 8) Bazada Zone.

#### **3.2 Soils**

The soils of Dharmapuri district can be classified into i) Red Soil, ii) Red lateritic soil, (iii) Brown soil and iv) alluvial soil. The soils are mostly in-situ in nature, lateritic, earthy and pale reddish in colour. They are derived from laterisation of gneisses. The soils derived from gneisses are mostly brownish. The thickness of soils in the mounts is almost negligible whereas in the valleys it is around 2 m.

### **4.0 GROUND WATER SCENARIO**

#### **4.1 Hydrogeology**

The district is underlain by Archaean Crystalline formations with recent alluvial deposits of limited areal and vertical extents along major rivers. **(Plate-II)**. The important aquifer systems in the district are constituted by i) unconsolidated & semi-consolidated formations and (ii) weathered and fractured crystalline rocks.

In the areas underlain by crystalline rocks, occurrence of ground water is essentially limited to zone of weathering and fracturing. Generally the hard rock aquifers are heterogeneous in nature, which is indicated by the variations in lithology, structure and texture. Ground water occurs under phreatic condition in the weathered mantle and semi confined to confined condition in the fracture and fissured zones of these rocks. Thickness of weathered material varied widely from less than 1m bgl to more than 20m bgl.

The Alluvium with intervening crystalline outcrops are noticed as patches west of Dharmapuri, and Papireddipatti areas. The ground water occurs under water table to semi-confined conditions. The discharge ranges from 10 to 20 m<sup>3</sup>/day.

The yield of large diameter wells in the district, tapping the weathered mantle of crystalline rocks ranges from 150-200 m<sup>3</sup>/day and are able to sustain pumping for 2 to 4 hours per day. The yield of large diameter wells tested in crystalline rocks ranges from 150 to 200 m<sup>3</sup>/day for drawdown of 1 to 3 m. The yield characteristics of wells vary considerably depending on the topographic set-up, litho logy and nature of weathering. The transmissivity of weathered formations computed from pumping test data using empirical methods range from 12 to 22 m<sup>2</sup>/day. The specific capacity in the fissured formation ranges from 2.89 to 153.74 lpm/m/dd. In the porous formation the specific capacity values vary from 6.31 to 28.7 lpm/m/dd.

The yield of bore wells drilled down to a depth of 36 to 200 m bgl, by various state agencies mainly for domestic purposes. The discharge ranged from 2 to 33 lps. The yield of successful bore wells drilled down to a depth of 200 m bgl during the ground water exploration programme of Central Ground Water Board ranged from 1 to 12 lps. The aquifer and well parameters of the wells show wide variation, both in crystalline and sedimentary formations.

The depth to water level in the district varied between 5.27 and 16.70 m bgl during pre-monsoon (**Plate-III**) and varied between 2.47 and 11.32 m bgl during post monsoon (**Plate-IV**). The seasonal fluctuation shows a rise in water level, which ranges from 3.71 to 7.06 m bgl. The piezometric head varied between 2.66 to 20.06 m bgl (May 2006) during pre monsoon and 1.19 to 14.57 m bgl during post monsoon.

#### **4.1.1 Long Term Fluctuation (1998-2007)**

The long-term water level fluctuation for the period 1998-2007 indicates rise in water level in the area 0.0225 to 0.5744 m/year and fall in the range between 0.0600 to 0.6789 m/year.

#### **4.1.2 Aquifer Parameters**

The Transmissivity values in weathered, partly weathered and jointed rocks vary from 12 to 300 m<sup>2</sup>/day and specific yield in this formation is less than 2% and the Transmissivity values ranged from 4 to 16 m<sup>2</sup>/day. The specific yield varied formations is around 2% to 4%.

### **4.2 Ground Water Resources**

The ground water resources have been computed jointly by Central Ground Water Board and State Ground & Surface Water Resources and Data Center (PWD, WRO, Government of Tamil Nadu) as on 31<sup>st</sup> March 2004. The salient features of the computations are furnished below. The computation of ground water resources available in the district has been done using GEC 1997 methodology.

Stage of Groundwater Development in Dharmapuri as on 31st March 2004 (in Ham)								
Block	Net Groundwater Availability	Existing Gross Draft for Irrigation	Existing Gross Draft for Domestic and industrial water supply	Existing Gross Draft for all uses	Allocation for Domestic and Industrial Requirement supply up to next 25 years (2029)	Net groundwater Availability for future Irrigations Development	Stage of Groundwater Development	Categorization for Future groundwater development (Safe/Semi Critical/Critical/Over Exploited)
	4	5	6	7= 5+6	8	9 = 4-(6+8)	10 = (7/4)*100	6
Dharmapuri	5434.10	6693.37	264.22	6957.60	277.39	-1536.66	128	Over Exploited
Harur	7366.46	9479.24	219.88	9699.12	230.84	-2343.61	132	Over Exploited
Karimangalam	4771.41	6465.42	274.20	6739.63	287.87	-1981.88	141	Over Exploited
Morappur	7047.62	12301.27	223.48	12524.75	234.62	-5488.27	178	Over Exploited
Nallampalli	5657.18	7162.10	297.73	7459.83	312.57	-1817.49	132	Over Exploited
Palacode	6207.44	9467.64	250.68	9718.32	263.17	-3523.37	157	Over Exploited
Pappireddipatti	7589.42	14950.55	161.75	15112.30	169.81	-7530.94	199	Over Exploited
Pennagaram	5588.80	5344.72	213.26	5557.98	223.89	20.20	99	Critical
	<b>49662.43</b>	<b>71864.29</b>	<b>1905.22</b>	<b>73769.51</b>	<b>2000.16</b>	<b>-24202.02</b>	<b>149</b>	

### 4.3 Ground Water Quality

The chemical characteristics of ground water in the phreatic zone in Dharmapuri district has been studied using the analytical data of ground water samples collected from Network Hydrograph Stations of Central Ground Water Board. The study of quality of ground water in deeper aquifers in the district has been attempted using the data collected from exploratory bore/tube wells constructed in the district.

Ground water in phreatic aquifers in Dharmapuri district in general, is colourless, odourless and slightly alkaline in nature. The specific electrical conductance of ground water in phreatic zone (in MicroSeimens at 25°C) during May 2006 was in the range of 320 to 6010 in the district. It is between 750 and 2250  $\mu\text{S}/\text{cm}$  at 25°C in the major part of the district. Conductance below 750  $\mu\text{S}/\text{cm}$  have been observed in ground water in only one sample is Dharmapuri block Whereas Conductance exceeding 2250 $\mu\text{S}/\text{cm}$  have been observed in parts of Papireddipatti, Pennagaram and Morappur block

It is observed that the ground water is suitable for drinking and domestic uses in respect of all the constituents except total hardness and Nitrate in more than 90 percent of samples analysed. Total Hardness as  $\text{CaCO}_3$  is observed in all samples have with in the excess of permissible limits in about 40 percent of samples analysed whereas Nitrate is found in excess of 45 mg/l in about 32 percent samples. The incidence of high total hardness is attributed to the composition of lithounits constituting the aquifers in the district, whereas the Nitrate pollution is most likely due to the use of pesticides and fertilizers for agriculture.

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

### 4.4 Status of Ground Water Development

The estimation of groundwater resources for the district has shown that all block is under "Over Exploited" category. The shallow alluvial aquifers along Cauvery and Ponnaiyar rivers serve as an important source of drinking water irrigation development for Dharmapuri district. Dug wells are the most common ground water abstraction structures used for irrigation in the district. The yield of dug wells range from 150 to 200  $\text{m}^3/\text{day}$  in weathered crystalline rocks and 20 to 200  $\text{m}^3/\text{day}$  in Recent alluvial formations along major drainage courses.

## 5.0 Groundwater Management Strategy

### 5.1 Groundwater Development

The yields of dug wells in crystalline are improved at favorable locations by construction of extension bores, which are 20 to 40 m. deep. In recent years, a large number of bore wells have also been drilled by farmers for irrigation purposes.

The development of ground water for irrigation in the district is mainly through dug wells tapping the weathered residuum or recent alluvial deposits. Bore wells have also become popular as the source for irrigation in the district in recent years. Dug wells with extension bores wherever necessary is ideal for hard rock areas whereas large diameter dug wells with radials is suitable for alluvial areas.

The map showing the development prospects for the district is shown in (**Plate VI**).

## **5.2 Water Conservation and Artificial Recharge**

The topography of Dharmapuri district, in general, is suited for construction of various artificial recharge structures such as percolation ponds, check dams and sub-surface dykes. However, detailed studies are necessary to formulate a comprehensive scheme for artificial recharge of phreatic ground water in the district in view of the variations in the geomorphic set-up and the complex hydrological and hydrogeological conditions.

Free technical guidance for implementation of rooftop rainwater harvesting schemes is also being provided by Central Ground Water Board, and manual is also published to give more scientific design tips.

## **6.0 Groundwater related Issues & Problems**

TH as  $\text{CaCO}_3$  and Nitrate concentration are found more than permissible limit at select places. Fluoride is in excess in number of places. The entire district is having water scarcity and out of eight blocks seven are over exploited and one is critical. Limited Groundwater potential and excess fluoride are the main issues in the district

## **7.0 Awareness & Training Activity**

Mass Awareness Campaign was conducted at Madam, adjacent to the site, where sub surface dyke was constructed in 1998 and about 200 farmers participated in the programme.

## **8.0 Area Notified by CGWA/SGWA**

Neither Central Ground Water Authority nor State Government of Tamil Nadu has notified any block in the district.

## **9.0 Recommendations**

The occurrence and movement of ground water in the hard rock is limited to weathered, jointed, fractured and sheared zones. Ground water occurs under phreatic and confined conditions. Thickness and aerial extent of formations is very limited. In the bore wells tapping deep fracture zones, in certain pockets, water is brackish in nature and hence need treatment before using for the drinking purposes.

Large scale rainwater harvesting to strengthen the sustainability of groundwater system is necessary and micro level water balance studies and detailed action plan for recharge under various central and State schemes need to be prepared and implemented in a given time frame.

CENTRAL GROUND WATER BOARD, SECR, CHENNAI  
**DHARMAPURI DISTRICT, TAMIL NADU**

**LOCATION**

(NOT TO SCALE)

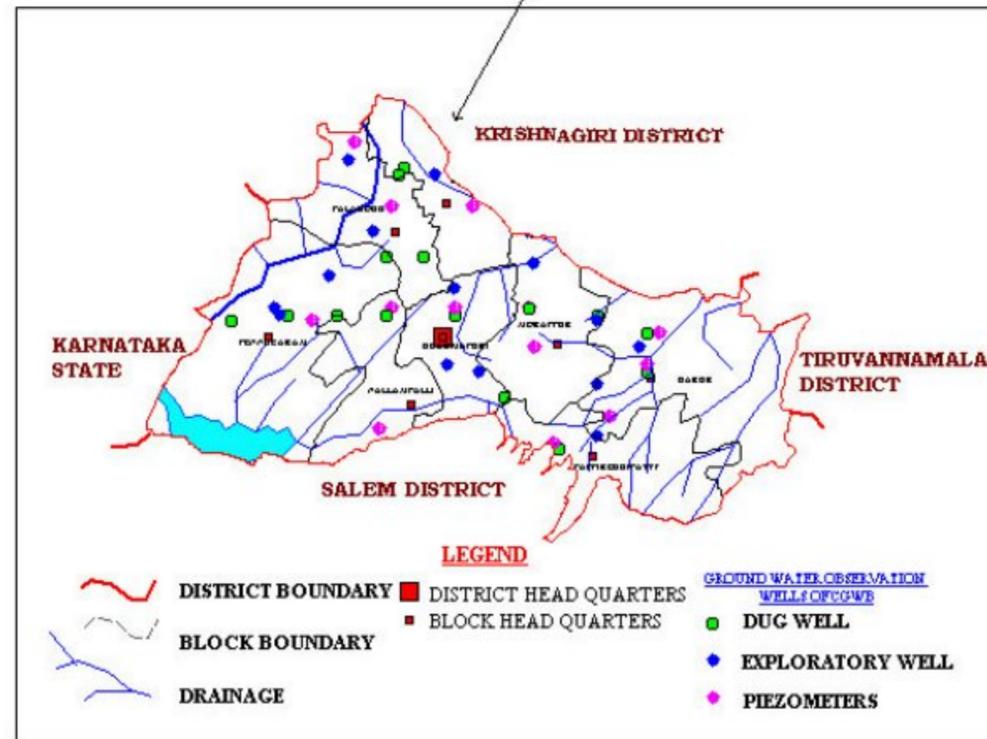
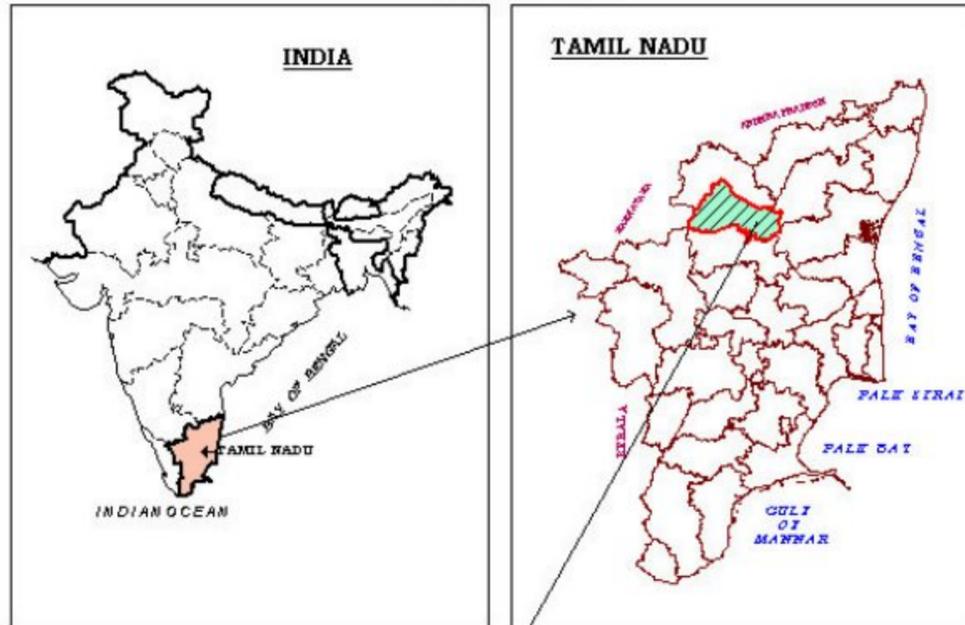
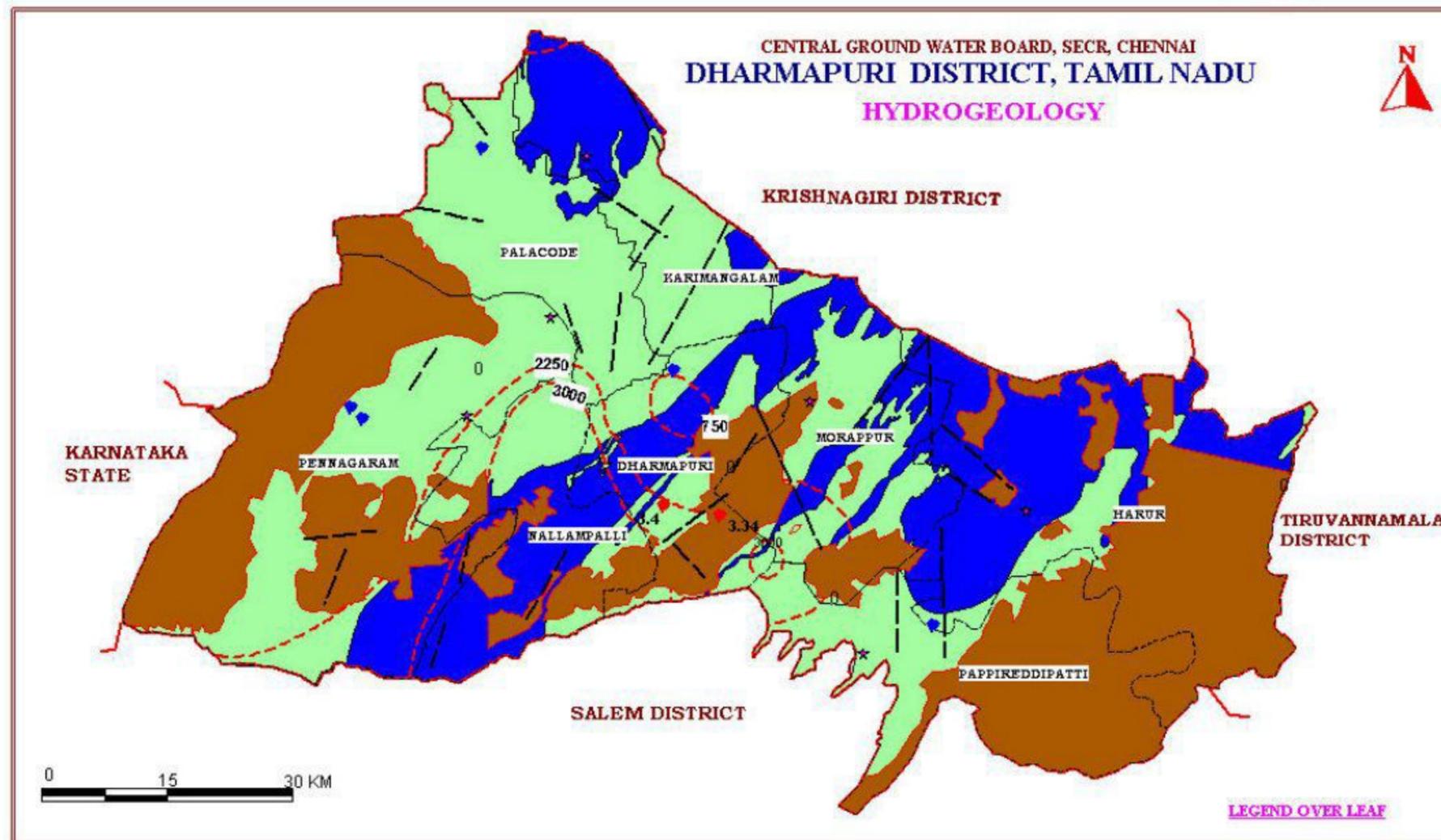


PLATE - II



## LEGEND FOR PLATE - II

### ADMINISTRATIVE SETUP

- DISTRICT BOUNDARY
- BLOCK BOUNDARY
- HILLY AREA

### GROUND WATER HYDROLOGY

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

### HYDROCHEMISTRY

- ISOCONS [ Sp ELECTRICAL CONDUCTANCE (  $\mu S / Cm$  at 25° C )

### STRUCTURE

- TRACE OF LINEAMENT

	<u>AQUIFER</u>	<u>AGE</u>	<u>LITHOLOGY</u>	<u>GROUND WATER CONDITIONS</u>	<u>YIELD PROSPECTS (lpm)</u>	<u>GROUND WATER DEVELOPMENT STRATEGIES</u>
	SEMI CONSOLIDATED	ARCHAEAN	WEATHERED GRANITE & GNEISS	THIN, UNCONFINED AQUIFERS	200 - 400	DEVELOPMENT THROUGH LARGE DIAMETER DUG WELLS & BOREWELLS
	CONSOLIDATED	ARCHAEAN	GRANITE, GNEISSES, CHARNOCKITE	DISCONTINUOUS, UNCONFINED TO SEMICONFINED AQUIFERS, RESTRICTED TO WEATHERED RESIDUUM AND FRACTURES	400 - 600	SUITABLE FOR DEVELOPMENT THROUGH DUG WELLS, BOREWELLS FEASIBLE IN FRACTURE ZONES, BEST LOCATIONS BEING INTERSECTION OF FRACTURES

PLATE - III

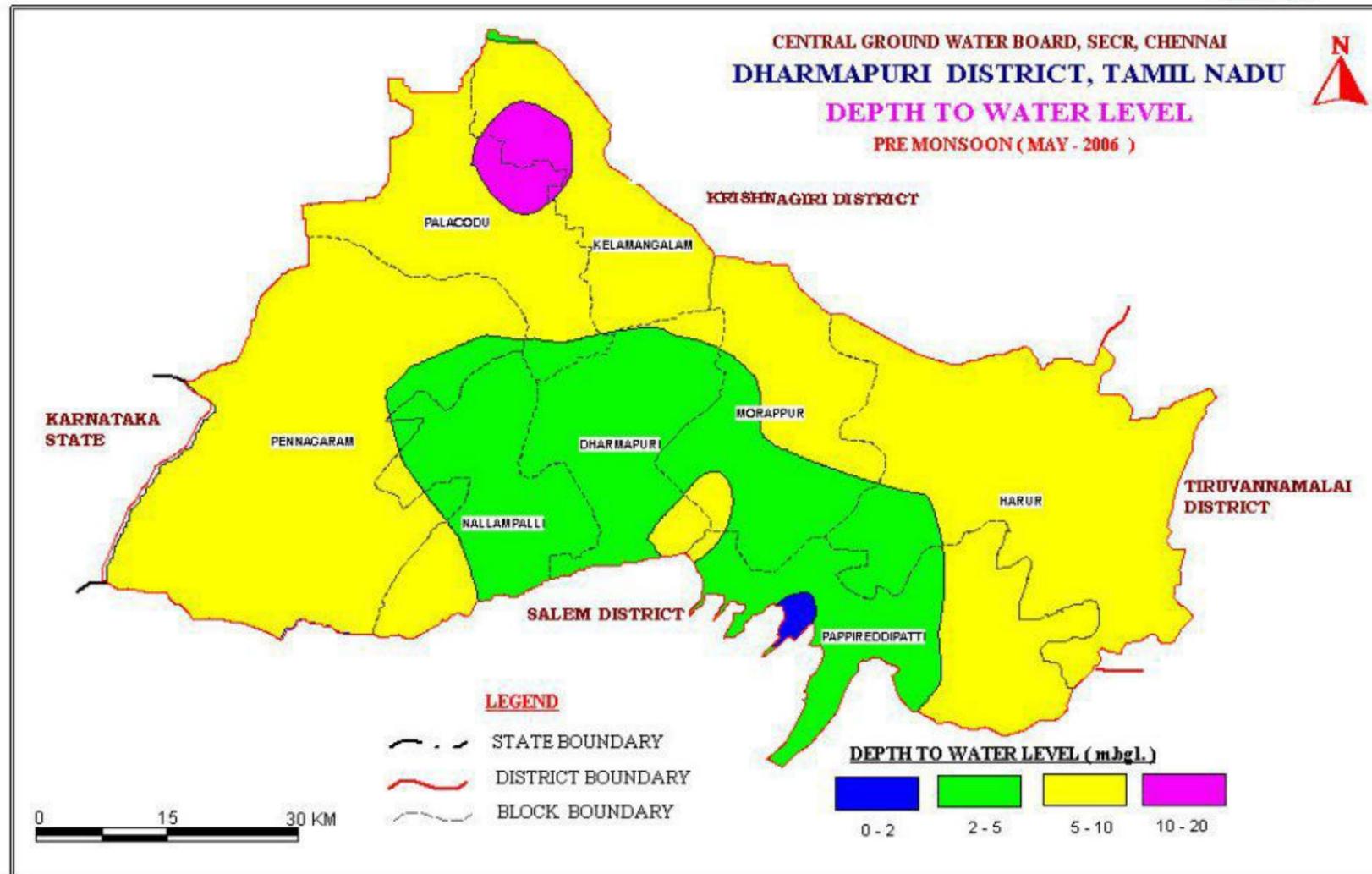
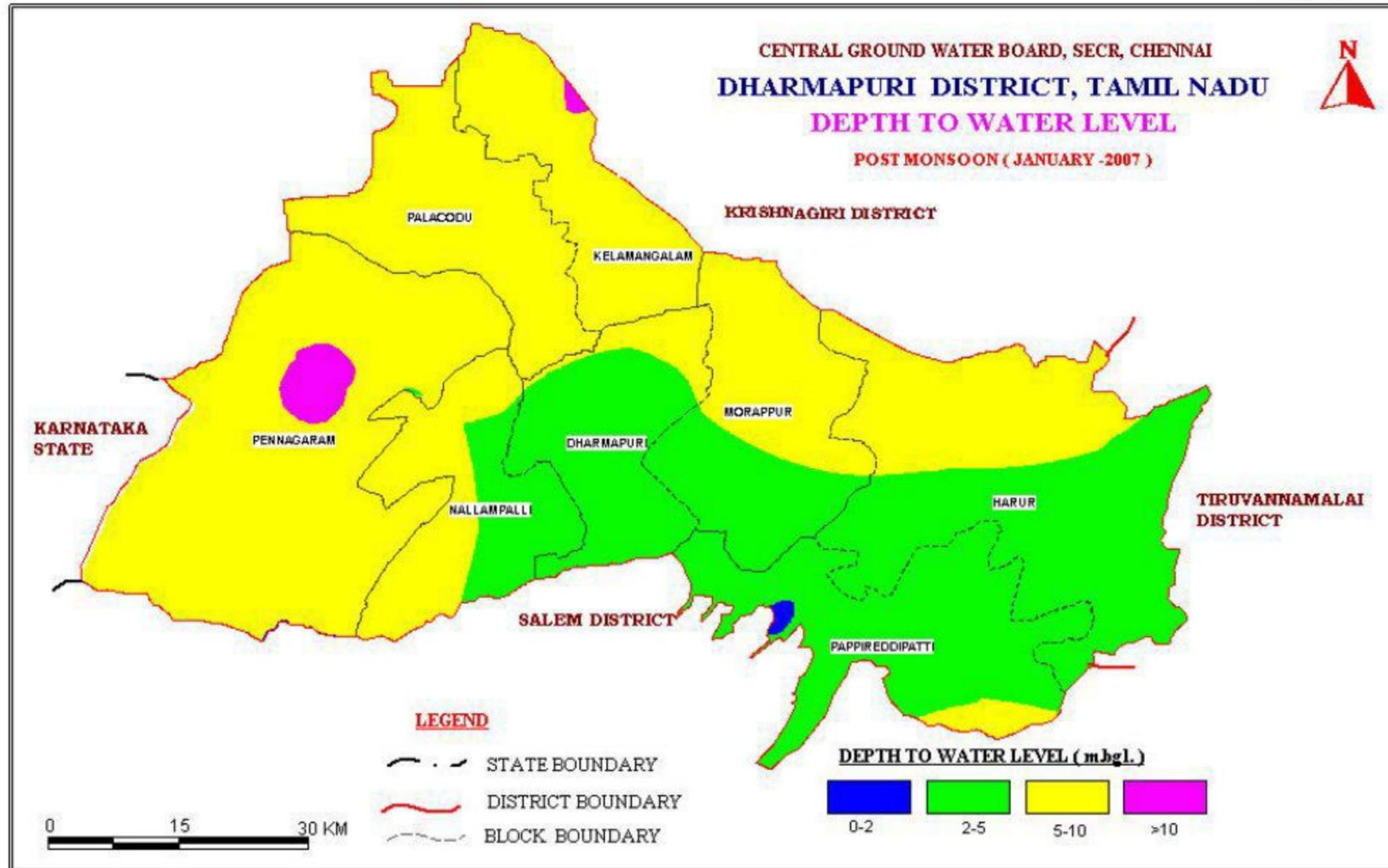


PLATE - IV



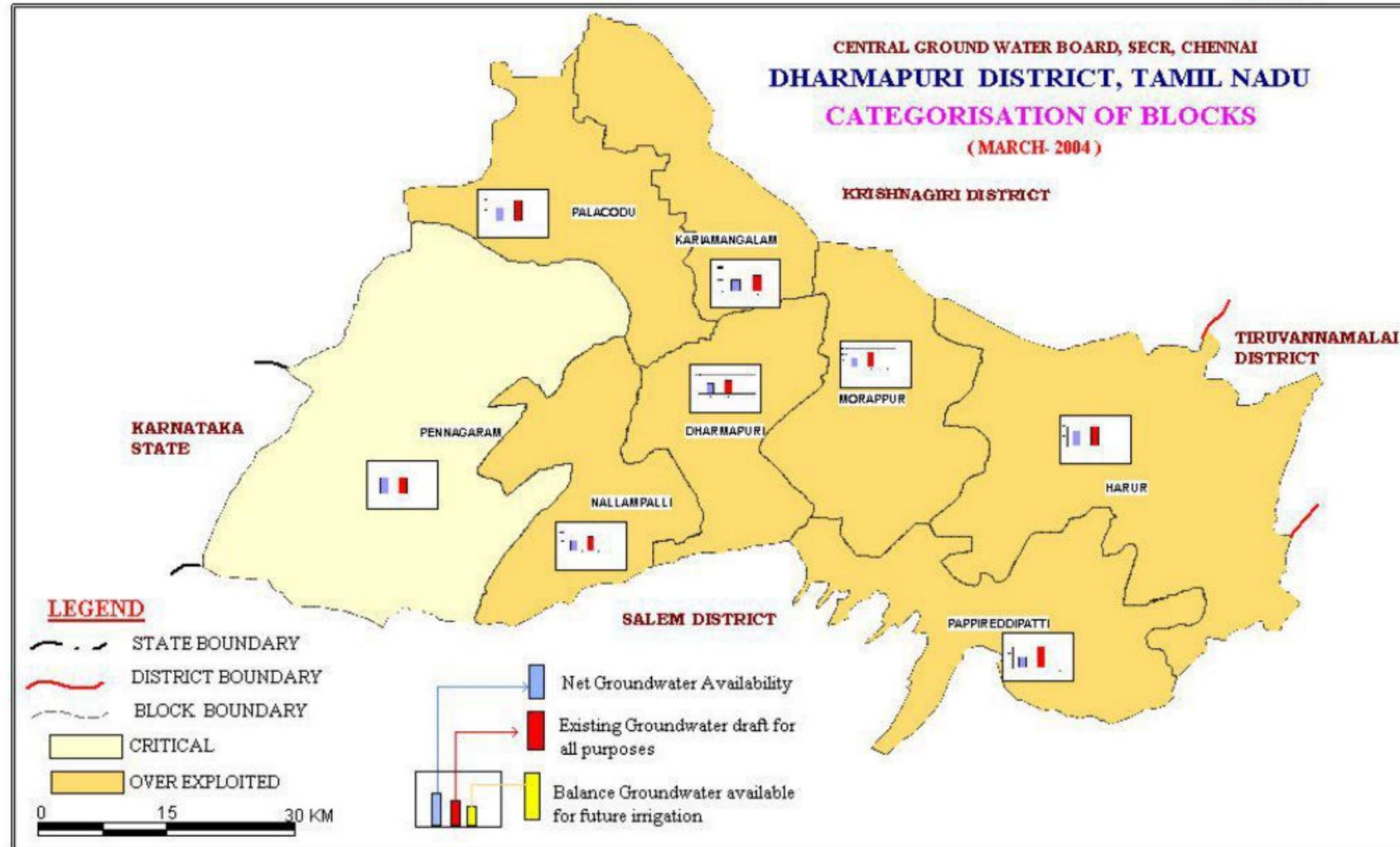
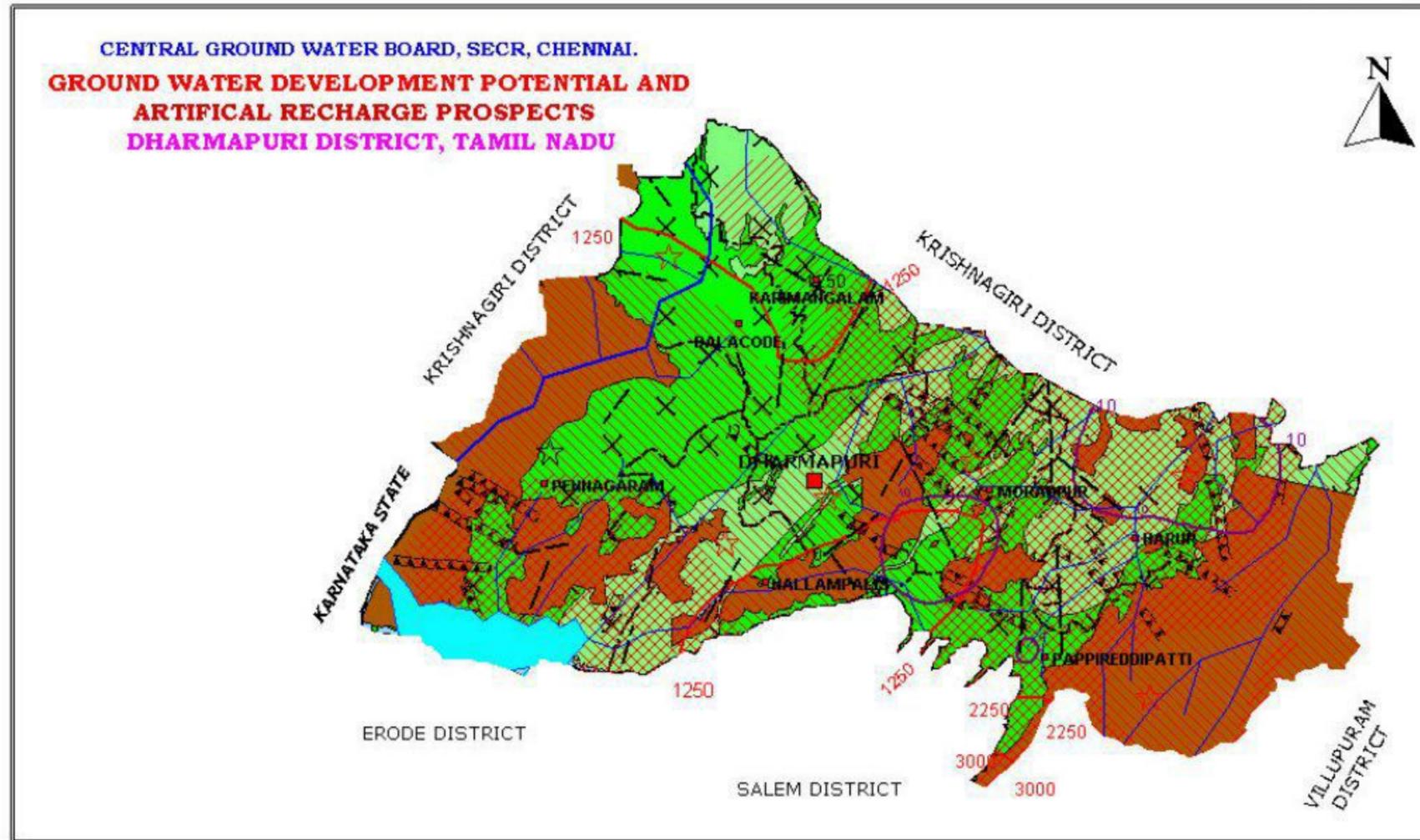
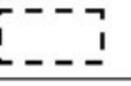
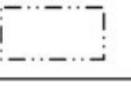
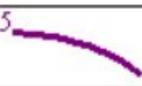
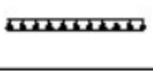


PLATE-VI



**LEGEND FOR PLATE- VI****DISTRICT – DHARMAPURI**

	<b>Wells Feasible</b>	<b>Rigs Suitable</b>	<b>Depth Of Well (M)</b>	<b>Discharge (LPM)</b>	<b>Suitable Artificial Recharge Structures</b>
 Hard Rock Aquifer	Dug Well Bore Well	Manual DTH	15 – 20 100 - 300	60 - 180	Gully Plugs / Percolation Ponds
 Hard Rock Aquifer	Dug Well Bore Well	Manual DTH	15 – 20 100 - 300	180 - 300	Gully Plugs / Recharge Shafts / Percolation Ponds
	District Boundary			Block Boundary	
	District Headquarters			Block Headquarters	
	Water Level-Pre-Monsoon (Decadal Mean 1993-2002) Mbgl			EC In Microsiemens / Cm At 25°C	
	River			Nitrate Greater Than Maximum Permissible Limit ( $\geq 45\text{mg/L}$ )	
	Fluoride Greater Than Maximum Permissible Limit (1.5mg/L)			Dyke	
	Hilly Area			Lineament	

**OTHER INFORMATION**

Geographical Area	4453 Sq.Km
Number Of Blocks	8
Major Drainage	Cauvery
Population (2001)	1286552
Average Annual Rainfall	760 mm
Annual Range of Temperature	19 – 42°C
Regional Geology	<b>Hard rocks:</b> Gneisses, Granites & Basic Rocks
Net Ground Water Availability For Future Irrigation	Nil
Stage Of Ground Water Development as on 31 <sup>st</sup> March 2004	146 %
Names Of Blocks Showing Intensive Ground Water Development	★ <b>Over Exploited</b> –Dharmapuri, Nallanpalli, Harur, Morappur, Palacode, Papiredipatti and Karimangalam <b>Critical</b> - Permagaram

SAVE WATER

AND

CONSERVE WATER



## केन्द्रीय भूमि जल बोर्ड

जल संसाधन, नदी विकास और गंगा संरक्षण  
विभाग, जल शक्ति मंत्रालय

भारत सरकार

### **Central Ground Water Board**

Department of Water Resources, River  
Development and Ganga Rejuvenation,  
Ministry of Jal Shakti  
Government of India

## **AQUIFER MAPPING AND MANAGEMENT OF GROUND WATER RESOURCES**

**PENNAGARAM FIRKA, DHARMAPURI  
DISTRICT, TAMIL NADU**

दक्षिण पूर्वी तटीय क्षेत्र, चेन्नई

South Eastern Coastal Region, Chennai

**REPORT ON  
AQUIFER DISPOSITION & MANAGEMENT PLAN  
PENNAGARAM FIRKA, DHARMAPURI DISTRICT, TAMILNADU STATE**

By  
**Dr.K.Rajarajan**  
Scientist-B

<b>SALIENT FEATURES</b>			
1	Name of the Firka/Area  Revenue Division  Location <b>(Fig-1)</b>	:	<b>PENNAGARAM / 123.48 sq.km</b>  <b>PENNAGARAM TALUK</b>  N 77° 44' 16" to 77° 59' 02" E 11° 59' 34 " to 12° 17' 01"
2	No. of Revenue villages	:	<b>10</b>
3	District/State	:	<b>Dharmapuri / Tamilnadu</b>
4	Population (2011 Census)	:	78536
5	Normal Rainfall (mm)	:	868 Monsoon: 664 Non-Monsoon: 204
6	Agriculture (2012-13)(Ha)	:	1. Gross irrigated area: 1333.05 2. Paddy: 170.41 3. Sugar cane: 97.41 4. Banana: 12.15 5. Other crops: 1053.09 6. Ground water: 1333.05 7. Surface water (Tanks): NIL
7	Existing and future water demands (HaM)		Domestic & Industrial • Existing: 75.01 • Future (year 2025): 85.25 Irrigation • Existing: 1983.00
8	Water level behaviour (m bgl)	:	Pre-monsoon: 5.05 - 11.30 Post-monsoon: 3.75 – 7.30
	<b>AQUIFER DISPOSITION</b>	:	
9	No of Aquifers	:	2
10	3-D aquifer disposition and basic characteristics of each aquifer  <b>Fig.2: 3 D map and 2D - Sections</b>	:	<b>Geology – Charockites/Gneisses</b> <b>Aquifer-1 (Weathered Zone):</b> Thickness varies from 9 - 20 m Transmissivity(T): 3 - 45 m <sup>2</sup> /day Specific Yield (Sy): 0.01to 0.015 <b>Aquifer-2 (Fractured Zone):</b> Depth of fracturing varies from 20-190 m. Transmissivity (T): 10 -75 m <sup>2</sup> /day Specific storage (S): 0.00001- 0.0002 Cumulative yield (Aquifer 1 and Aquifer 2)

			0.1 to 2.5 lps.
11	Ground water Issues	:	Sustainability of wells (1-2 hrs).
12	Ground water resource availability and extraction-2012-13 (MCM)	:	<ul style="list-style-type: none"> <li>• Net GW availability : 12.28</li> <li>• Gross Ground Water draft for Irrigation: 19.83</li> <li>• Gross Ground water draft for domestic and industrial supply: 0.75</li> <li>• Gross GW draft: 20.58</li> <li>• Stage of ground water development: 168 %</li> <li>• Category: Over Exploited</li> </ul>
13	Ground water extraction	:	Ground water extraction structures: 4651 no's <ul style="list-style-type: none"> <li>• Bore wells: 1286 no's</li> <li>• Dug wells: 3365no's</li> </ul>
14	Chemical quality of ground water, contamination and its suitability	:	EC ( $\mu\text{S}/\text{cm}$ ) min: 529 and max: 2910 NO <sub>3</sub> (mg/L): Min: 12 and max 90 F (mg/L): Min 0.46 and Max: 0.92  All chemical constituents are within the permissible limit of BIS drinking water standards (IS: 10500:2012) except Nitrate having High values.
15	<b>Ground Water Recharge Scenario</b>	:	<b>MCM</b>
15.1	Recharge from Rainfall (Monsoon)	:	7.33
15.2	Recharge from Other sources (Tanks and applied irrigation) (Monsoon)	:	2.75
15.3	Recharge from rainfall (Non-Monsoon)	:	1.88
15.4	Recharge from Other sources (Tanks and applied irrigation) (Non-Monsoon)	:	1.68
15.5	Total annual GW Recharge	:	13.64
15.6	Natural Discharge	:	1.37
15.7	Existing Minor Irrigation Tanks (Area in ha)	:	71.07
15.8	Storage from existing tanks (MCM)	:	0.71
16	Storage from existing AR Structures (MCM)	:	4.11

**Fig-1: Location Map of Pennagaram Firka.**

Fig -

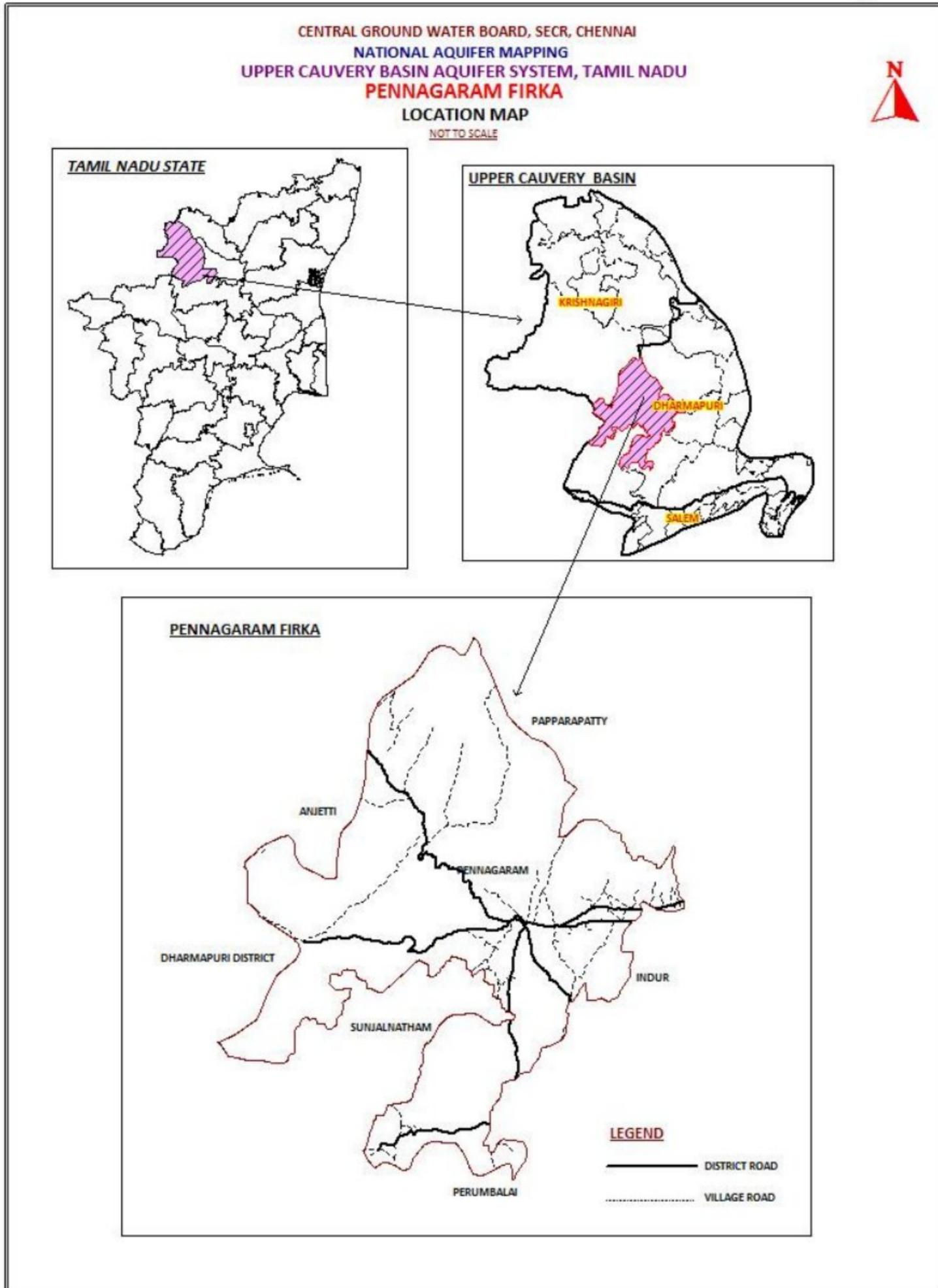
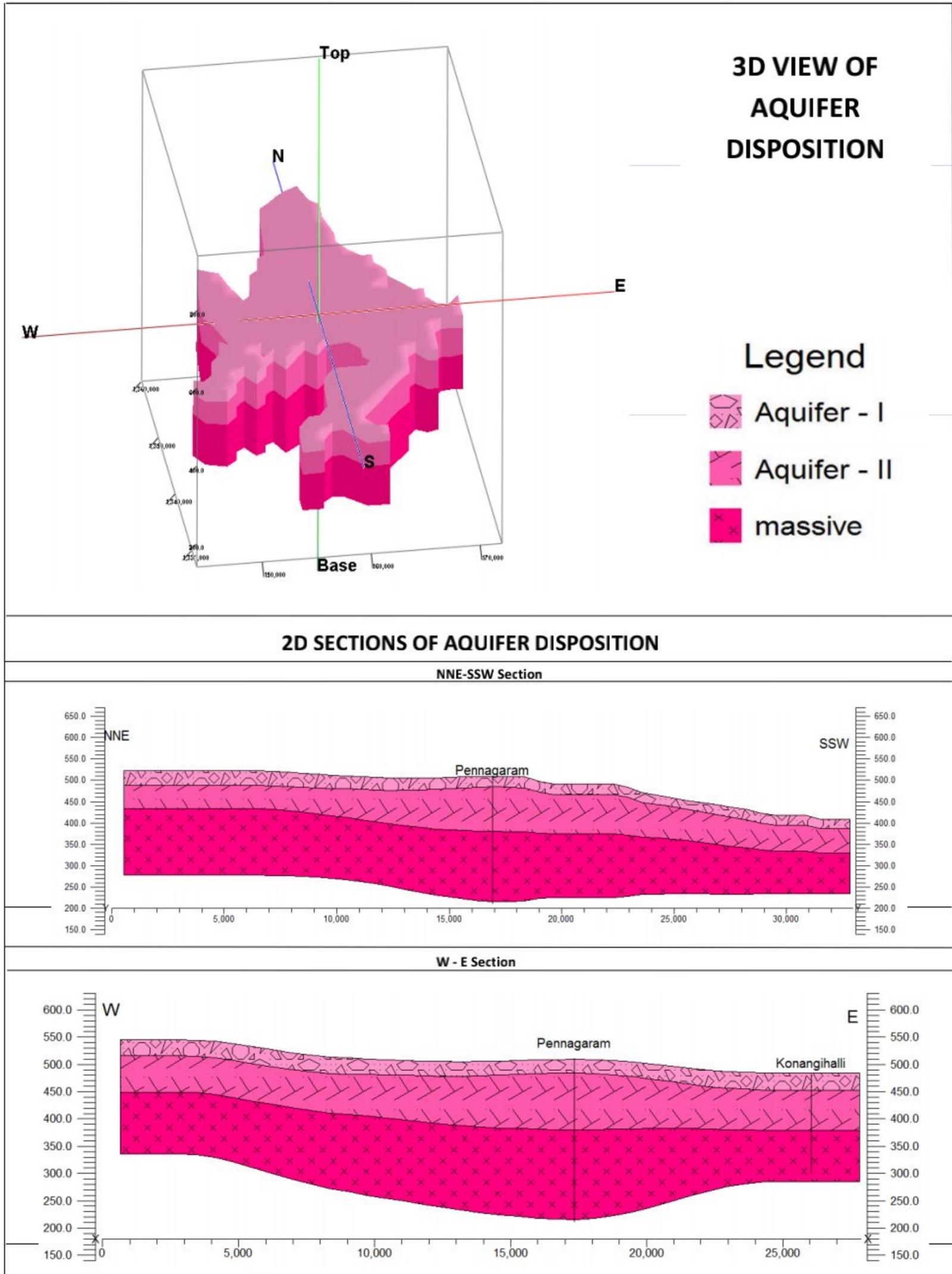


Fig:2 3D and 2D View of Aquifer Disposition, Pennagaram Firka, Dharmapuri District



**AQUIFER MANAGEMENT PLAN  
PENNAGARAM FIRKA,  
DHARMAPURI DISTRICT, TAMILNADU STATE**

	<b>WATER RESOURCE AVAILABILITY (MCM)</b>		
1	Ground water (as per GEC 2013)	:	12.28
2	Surface Water (as per 2012-13irrigation data)	:	4.82
3	Total water availability	:	17.10
	<b>Ground Water Resource Enhancement (MCM)</b>		
4	Uncommitted surface runoff available for the Firka	:	37.25
5	Total volume of weathered zone	:	44.88
6	Total volume of aquifer available for recharge, considering 3m below Ground Level.		97.37
(a)	<b>Supply side Interventions</b>		
<b>ARTIFICIAL RECHARGE/CONSERVATION MEASURES</b>			
7	Structures Proposed (nos)  Masonry Check dam Revival, repair of pond, tanks with recharge haft Percolation Pond with Recharge Shaft Farm Pond:	:	Based on spatial integration Fig-3 Area suitable for GW recharge Fig-4 Location of ARS 03 (Table -1) 08+08 (Table -2) 05+05 (Table -3) 150 units
8	Excepted total groundwater recharge (MCM)	:	2.132
9	Tentative total cost of the project (Rs. In Cr)		5.679
10	Irrigation Potential in sq.km		0.355
(b)	<b>Demand side Interventions</b>		
11	Existing total Groundwater Draft (MCM)	:	2058
12	Proposed Micro Irrigation in Ha	:	150
13	Cost for micro-irrigation (Rs in Lakhs)	:	90
14	Expected ground water saving from micro-irrigation (MCM)	:	0.45
	<b>REGULATION &amp; COMMUNITY INTERVENTIONS</b>		
15	Regulation and control	:	Systematic monitoring in groundwater contaminated area particularly Fluoride. Planning of alternate source for drinking water purposes.  The systematic development of groundwater is suggested to sustain the available and recharged groundwater.

Fig-3 Area suitable for GW recharge

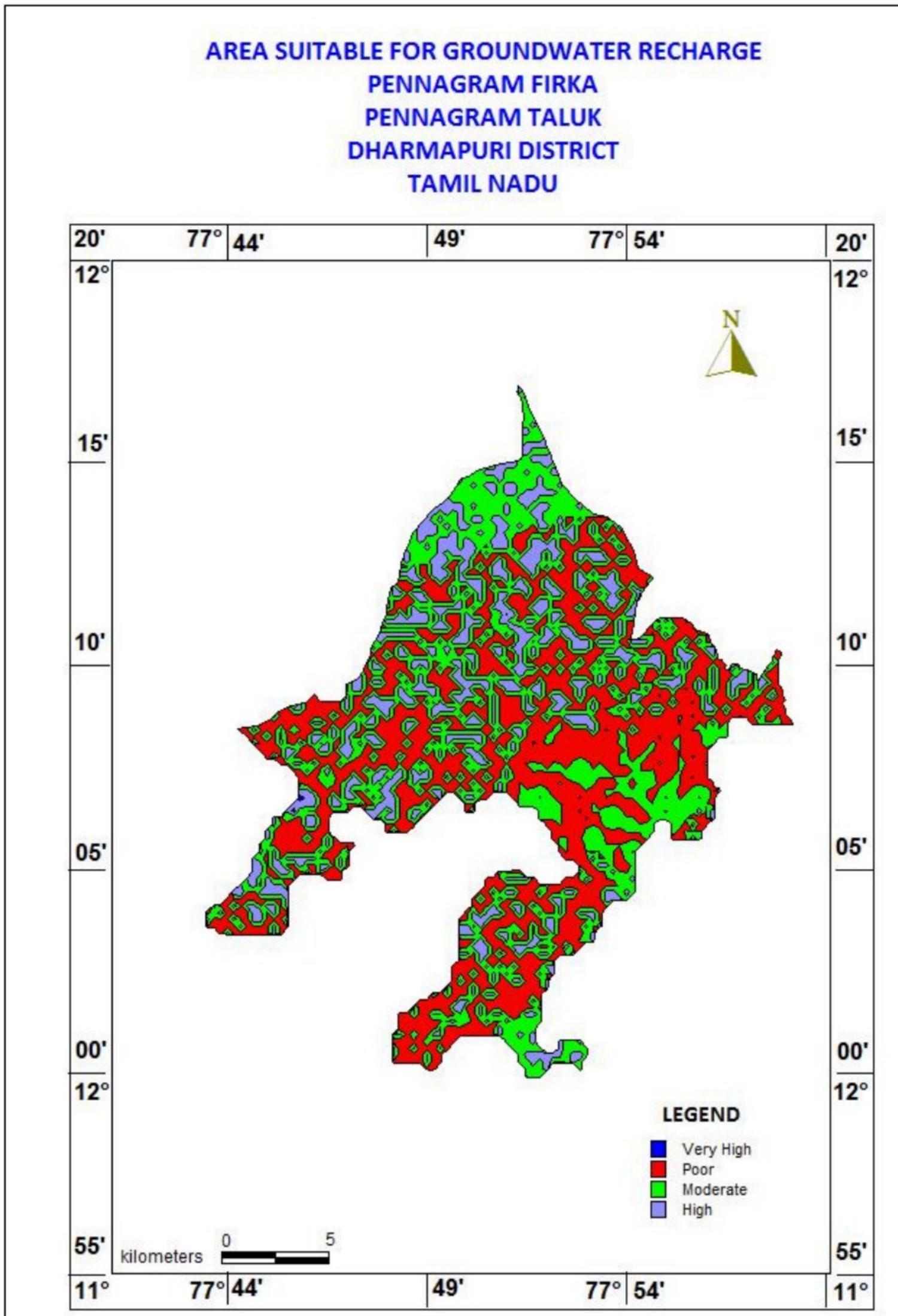
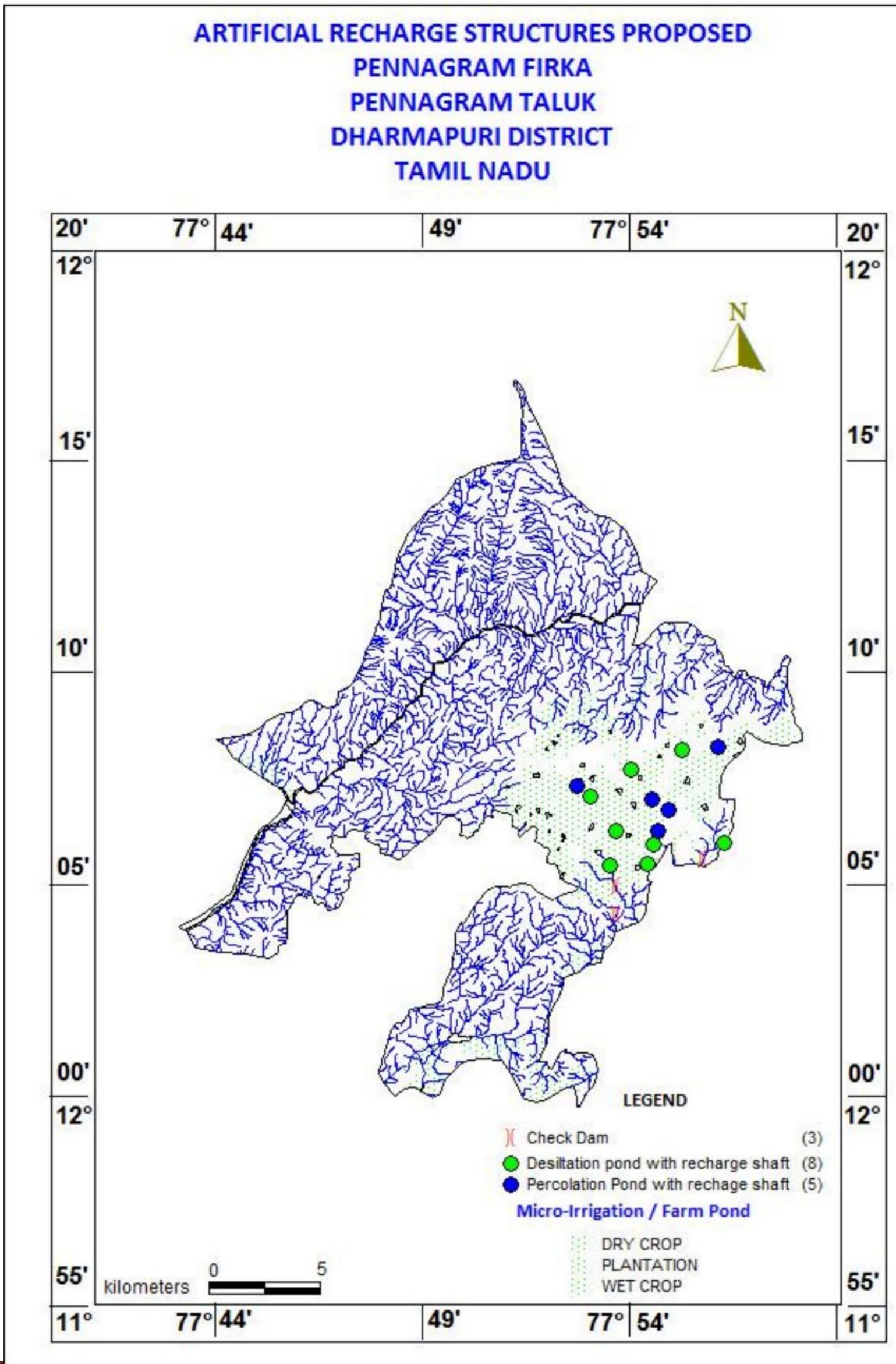


Fig-4 Location of ARS



**Table-1 location of proposed 3 Check dam in the firka**

S. No.	Longitude	Latitude	Structures
1	77.91	12.08	Check Dam
2	77.91	12.07	Check Dam
3	77.95	12.09	Check Dam

**Table-2 Location of proposed de-siltation of pond/tanks with recharge shaft**

S. No.	LONGITUDE	LATITUDE	STRUCTURE	ACTION
1	77.90	12.12	TANK / RESERVOIR	DE-SILTATION AND RECHARGE SHAFT
2	77.92	12.13	TANK / RESERVOIR	DE-SILTATION AND RECHARGE SHAFT
3	77.94	12.14	TANK / RESERVOIR	DE-SILTATION AND RECHARGE SHAFT
4	77.93	12.10	TANK / RESERVOIR	DE-SILTATION AND RECHARGE SHAFT
5	77.91	12.10	TANK / RESERVOIR	DE-SILTATION AND RECHARGE SHAFT
6	77.91	12.09	TANK / RESERVOIR	DE-SILTATION AND RECHARGE SHAFT
7	77.92	12.09	TANK / RESERVOIR	DE-SILTATION AND RECHARGE SHAFT
8	77.95	12.10	TANK / RESERVOIR	DE-SILTATION AND RECHARGE SHAFT

**Table-3 Location of proposed Percolation pond/tanks with recharge shaft**

SI.NO	LONGITUDE	LATITUDE	STRUCTURE	ACTION
1	77.90	12.12	TANK / RESERVOIR	Percolation Tank with shaft
2	77.93	12.12	TANK / RESERVOIR	Percolation Tank with shaft
3	77.93	12.11	TANK / RESERVOIR	Percolation Tank with shaft
4	77.93	12.10	TANK / RESERVOIR	Percolation Tank with shaft
5	77.95	12.14	TANK / RESERVOIR	Percolation Tank with shaft

## monitor elephant movement in Dharmapuri forests

👤 IANS 📅 April 6, 2025 👁 442 views

The Tamil Nadu Forest Department has innovatively deployed AI-powered cameras to monitor wild elephant movements in Dharmapuri's forests. These solar-powered cameras can detect elephants from a kilometer away, providing real-time alerts to prevent potential conflicts. The technology aims to protect both human settlements and wildlife by enabling swift interventions. With 827 human-wildlife conflict incidents in the past fiscal year, this technological solution represents a critical step in coexistence.

"Early detection enables forest teams to take timely action" - Forest Department Official



Chennai, April 6: In a major step to mitigate human-wildlife conflict, the Tamil Nadu Forest Department has installed 12 AI-based, solar-powered cameras across four key locations in the Dharmapuri forest range.

### Key Points

- 1 AI cameras detect elephants from 1 km away
- 2 12 cameras installed across four forest locations
- 3 Real-time monitoring reduces human-wildlife conflicts

827 conflict incidents recorded in 2024-25

These smart cameras are designed to detect and monitor the movement of wild elephants, especially in regions frequently impacted by elephant incursions.

The Cauvery Wildlife Sanctuary, which lies within Dharmapuri, is known for having one of the highest rates of human-wildlife conflicts in the state.

According to forest department officials, each AI-powered camera costs around Rs 15 lakh. Despite the cost, the technology has significantly helped reduce confrontations between humans and wild elephants.

Officials explained that the AI cameras are capable of detecting the presence of elephants well in advance. This early detection enables forest teams to take timely action to drive the animals away before they encroach on farmlands or residential areas.

The cameras can zoom in on movement from up to one kilometre away and are connected to the Internet 24x7. Live footage is monitored from a centralised control room at the Dharmapuri Forest Office.

High elephant activity has been reported in areas falling within the elephant corridor, particularly in Palacode, Pennagaram, and Hogenakkal. Crop damage in these areas has become a frequent issue.

In the fiscal year 2024-25 alone, the Dharmapuri district recorded 827 human-wildlife conflict incidents, prompting the government to disburse Rs 62.67 lakh in compensation.

The newly installed AI-based surveillance system has proven especially effective in Palacode, where real-time alerts from the control room allow rapid response from forest personnel.

In the next phase, the forest department plans to install digital bulletin boards and speakers in nearby villages to provide real-time alerts on elephant movement, enhancing community safety.

Human-wildlife conflicts have been on the rise across Tamil Nadu. The state recorded 80 human fatalities due to such encounters in 2024-25, the highest in five years. Additionally, the Forest Department documented 4,235 cases of crop damage, 259 livestock deaths, 176 property damage incidents, and 138 human injuries during the same period.

Although Tamil Nadu's forest cover is below the national average, the state's forests are rich in biodiversity. The state currently has a stable wild elephant population of 3,063. Its tiger population has also seen a significant increase, rising nearly fourfold since 2005-06 to reach 306 as per the 2022-23 census.

## Reader Comments

---

**P** Priya K.

This is such a smart use of technology! 🐘💡 Finally seeing some proactive measures to protect both wildlife and farmers. Hope they expand this to more forest areas soon.

**R** Rajesh M.

While I appreciate the initiative, Rs 15 lakh per camera seems expensive. Couldn't they have found a more cost-effective solution? The money could've been used for farmer compensation too.

**S** Saranya P.

My cousin lives in Palacode and says these cameras have already made a difference! No more sleepless nights worrying about elephants destroying their crops. Thank you TN government!

**A** Arjun V.

Great initiative, but I hope they're training enough forest staff to monitor these cameras properly. Technology is only as good as the people operating it.

**M** Meena S.

Solar-powered and AI-based? That's brilliant! 🍌 Combining sustainability with cutting-edge tech to solve real problems. Tamil Nadu leading the way in wildlife conservation!

**K** Karthik R.

The digital bulletin boards for villagers is a smart next step. Education and awareness are just as important as the tech solutions. Hope other states take note of this model.

---

We welcome thoughtful discussions from our readers. Please keep comments respectful and on-topic.

### Leave a Comment

 Your Name

 Your Email

Your email won't be published

 Your Comment

 Post Comment

**Disclaimer:**  Comments here reflect the author's views alone. Insulting or using offensive language against individuals, communities, religion, or the nation is illegal.

 Share this article:



 Tags:

[Elephant Conservation](#)   [Tamil Nadu Forest Department](#)  
[AI Wildlife Monitoring](#)   [Human-Wildlife Conflict](#)   [Dharmapuri Forests](#)

[← Previous Article](#)

PM Modi visits Jaya Shri Mahabodhi Temple in Sri Lanka

[Next Article →](#)

Pradhan Mantri Awas Yojana: Nagpur man gets a home, expresses gratitude to PM Modi

 Share this article:



**Search**

**Top 10 Trending Headlines**

[Red Alert Issued for Bengal's Jalpaiguri Alipurduar Amid Heavy Rain](#)

---

[NAREDCO President Hari Babu Urges 18% GST Cap on Building Materials](#)

---

[ISL Stars Who Made Impactful Returns to Indian Football](#)

---

[South Korea's Jung Chung-rae Elected New Democratic Party Leader](#)

---

[Bihar Electoral Rolls See Zero Claims as Political Row Erupts Over Voter Deletion](#)

---

[NF Railway Signs MoUs with Assam Pollution Board and IIT Guwahati](#)

---

[Chhari Mubarak Begins Final Journey to Amarnath Cave for Shravan Purnima](#)

---

[Sudipto Sen Dedicates Kerala Story National Award to Kerala Girls](#)

---

[Ex-CJI Chandrachud Says Constitution Stands Strong Amid Threats](#)

---

[Gaza Humanitarian Crisis UN Reveals Cash Aid Challenges](#)

---



Advertisement

| Tamil Nadu

## AI cameras set up to monitor elephants in TN's Palacode

*The cameras zoom up to one kilometre, capturing any wildlife movement, alerting the staff in the control room.*



Cauvery Wildlife Sanctuary has one of the highest human-wildlife conflicts in Dharmapuri. (File Photo | EPS)

### Express News Service

Updated on: 06 Apr 2025, 9:07 am · 2 min read

Follow Us



X

**DHARMAPURI:** Dharmapuri forest department officials have set up 12 AI-based solar-powered cameras in four locations to monitor elephant movement across Palacode.

Cauvery Wildlife Sanctuary has one of the highest human-wildlife conflicts in Dharmapuri. As part of the elephant corridor, Palacode, Pennagaram, and Hogenakkal see increased elephant movement, and in many cases crop damage have also been reported.

In 2024-25, 827 human wildlife conflicts were reported in Dharmapuri, and Rs 62.67 lakh compensation was provided. To tackle this issue, the forest department set up over 12 AI-based cameras to alert residents of elephant movement.

Speaking about the cameras, Divisional Forest Officer (DFO) K Rajangam said, “The AI-based cameras are solar-powered and are connected to the internet 24x7 with live feeds being monitored in the Dharmapuri forest office control room. The cameras zoom up to one kilometre, capturing any wildlife movement, alerting the staff in the control room, who in turn will alert our team. It has greatly reduced Human-Wildlife conflict in Palacode.”

He added, “We have conducted a detailed study and identified three locations where elephant movement is high and have set up these cameras. The AI camera costs about 3 lakh each, and to ensure 360-degree coverage, we have also set up two other cameras in each location. The total setup cost is about Rs 15 lakh. In the next phase, we will set up speakers and digital bulletin boards in the villages close to the forest area, which will alert people about elephant movement.”

NEW



X

Palacode Ranger P Natraj said, “Usually we get reports of elephant movement hours after they enter farmlands, by this time it would have wandered deep into revenue lands. This increases losses and risk to lives. However, through the cameras, we are immediately alerted, and we can chase them away even before they enter any revenue land. The AI cameras are crucial to prevent human-wildlife conflict and reduce losses to farmers. We are currently assessing the requirements. We will be setting up more cameras soon.”

Forest officials said, “In the past week alone, we have identified at least 15 elephant movements through the camera and our team has managed to stop elephants from advancing into farmlands.”

[Follow The New Indian Express channel on WhatsApp](#)

[Download the TNIE app to stay with us and follow the latest](#)

---

Advertisement

Cauvery Wildlife Sanctuary

AI Camera

NEW



X

---

Advertisement

## Related Stories

### **Trailing a tiger, foresters find 30 species in Kamareddy**

MVK Sastry · 03 Aug 2025

### **AI cameras, drones to track leopards in Valparai, Manombolly**

S Senthil Kumar · 17 Jul 2025

### **Leopard spotted thrice in two months in Dharmapuri**

Express News Service · 29 Jun 2025

### **10 camera traps to monitor big cat movement in TN's Coimbatore**

Express News Service · 29 Jun 2025

NEW



X



Contact Us | Privacy Policy | About Us | Terms Of Use | The Morning Standard | Dinamani |  
Kannada Prabha | Samakalika Malayalam | Cinema Express | Indulgexpress | Edex Live |  
E-PAPER

Copyright - newindianexpress.com 2024. All rights reserved.  
Powered by Quintype

NEW



X

**BEFORE THE HON'BLE NATIONAL GREEN  
TRIBUNAL  
SOUTHERN ZONE, CHENNAI**

**Appeal No.61 of 2024 (SZ)**

Thiru. K. Ravikumar,  
S/o. Kandasamy,  
No.3/320, Kottamettupatti Village,  
Mettupatti Post, Omalur Taluk,  
Salem District-363455

**... Appellant**

**Vs**

1. **State Level Environment Impact  
Assessment Authority (SEIAA),**  
Through the Member Secretary,  
& ors.

**... Respondents**

**MEMO FILED BY THE COUNSEL FOR  
RESPONDE NO. 2**

**S. SAI SATHYAJITH  
COUNSEL FOR 2nd RESPONDENT**