



केंद्रीय 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**

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SALIENT FEATURES		
1	Name of the Firka/Area Revenue Division Location (Fig-1)	: PENNAGARAM / 123.48 sq.km PENNAGARAM TALUK N 77° 44' 16" to 77° 59' 02" E 11° 59' 34 " to 12° 17' 01"
2	No. of Revenue villages	: 10
3	District/State	: Dharmapuri / Tamilnadu
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
AQUIFER DISPOSITION		
9	No of Aquifers	: 2
10	3-D aquifer disposition and basic characteristics of each aquifer Fig.2: 3 D map and 2D - Sections	: Geology – Charockites/Gneisses Aquifer-1 (Weathered Zone): Thickness varies from 9 - 20 m Transmissivity(T): 3 - 45 m ² /day Specific Yield (Sy): 0.01to 0.015 Aquifer-2 (Fractured Zone): Depth of fracturing varies from 20-190 m. Transmissivity (T): 10 -75 m ² /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"> • Net GW availability : 12.28 • Gross Ground Water draft for Irrigation: 19.83 • Gross Ground water draft for domestic and industrial supply: 0.75 • Gross GW draft: 20.58 • Stage of ground water development: 168 % • Category: Over Exploited
13	Ground water extraction	:	Ground water extraction structures: 4651 no's <ul style="list-style-type: none"> • Bore wells: 1286 no's • Dug wells: 3365no's
14	Chemical quality of ground water, contamination and its suitability	:	EC ($\mu\text{S}/\text{cm}$) min: 529 and max: 2910 NO ₃ (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	Ground Water Recharge Scenario	:	MCM
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 -

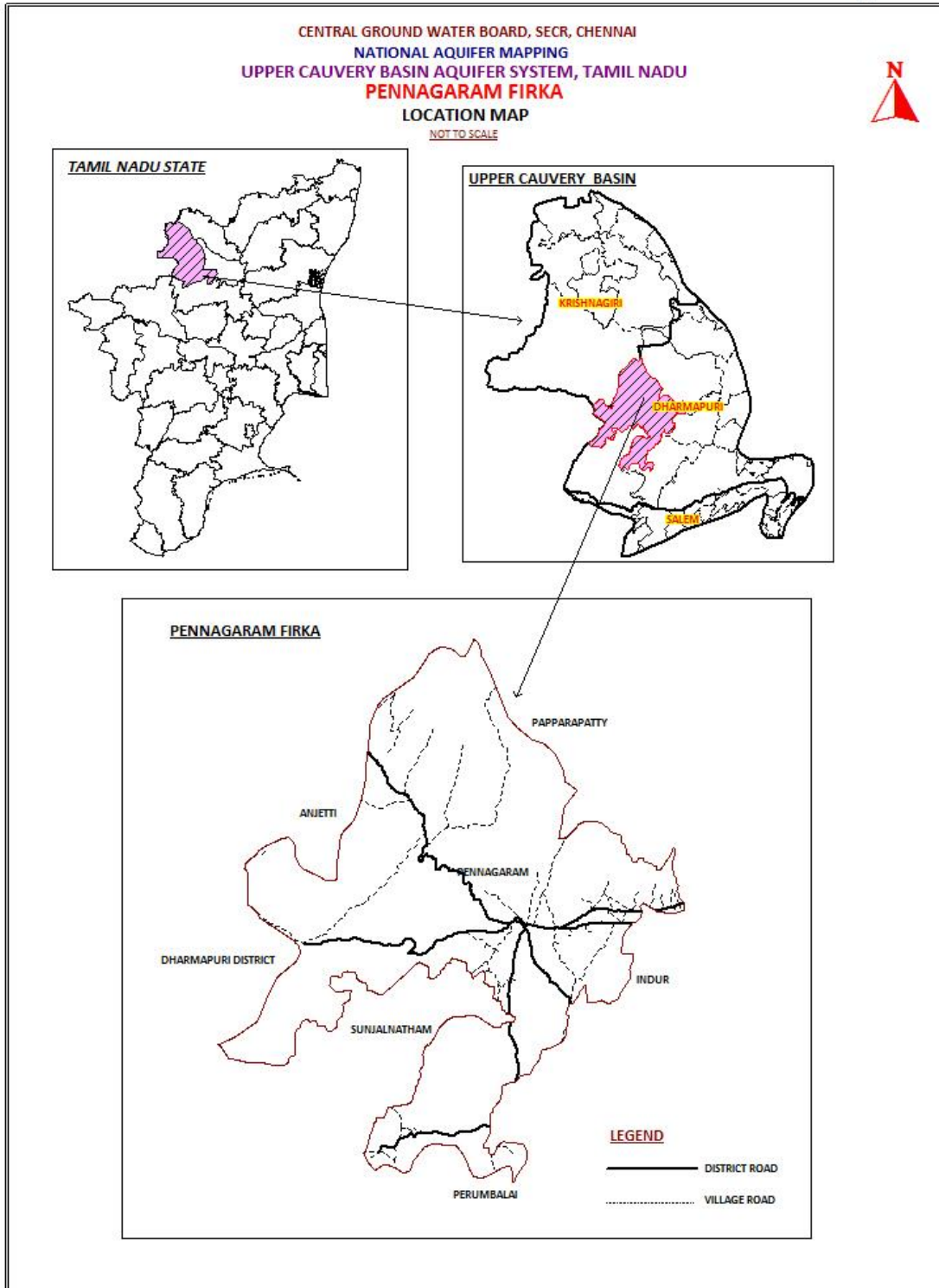
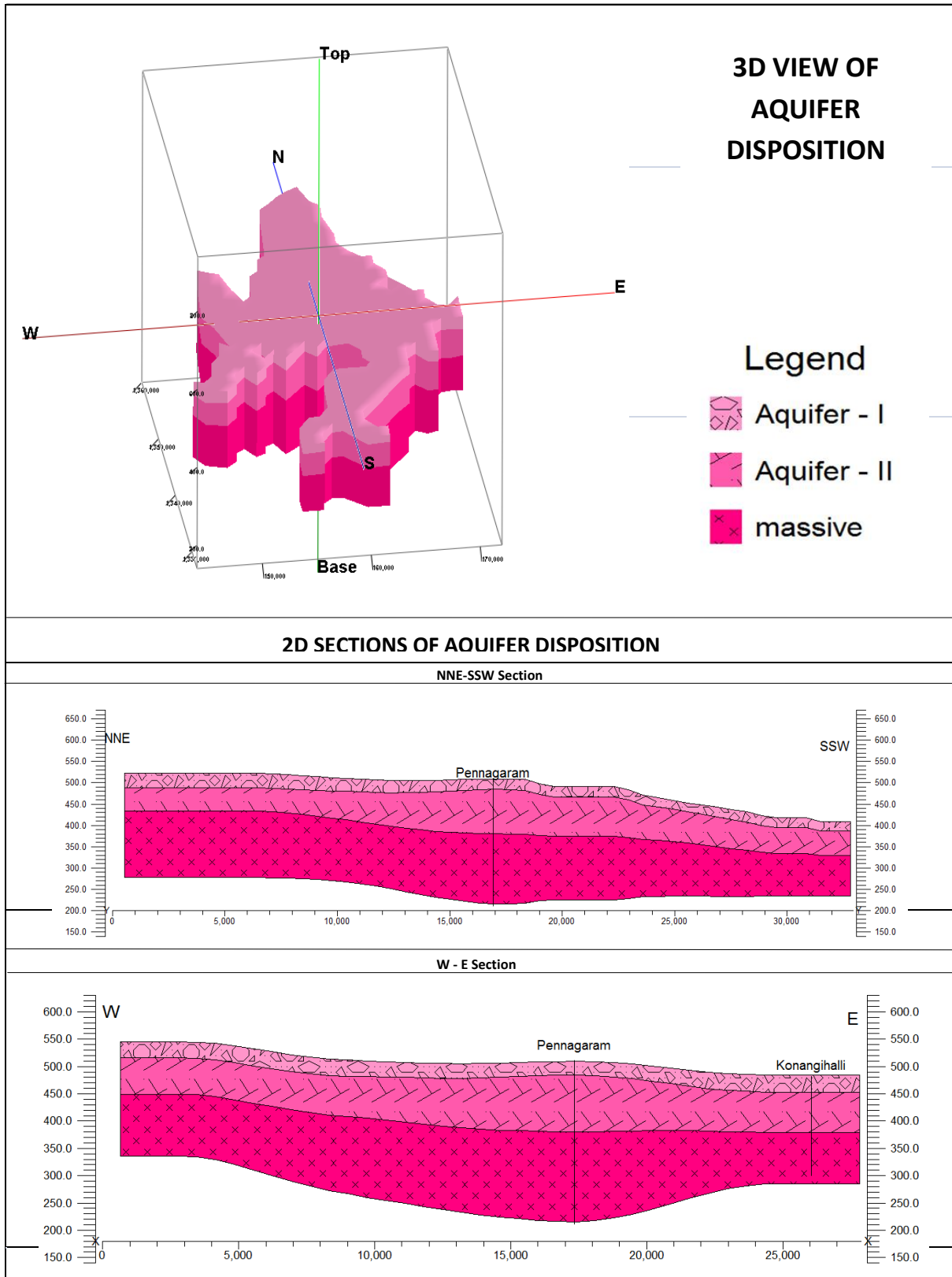


Fig:2 3D and 2D View of Aquifer Disposition, Pennagaram Firka, Dharmapuri District



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

	WATER RESOURCE AVAILABILITY (MCM)		
1	Ground water (as per GEC 2013)	:	12.28
2	Surface Water (as per 2012-13 irrigation data)	:	4.82
3	Total water availability	:	17.10
	Ground Water Resource Enhancement (MCM)		
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)	Supply side Interventions		
ARTIFICAIL RECHARGE/CONSERVATION MEASURES			
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)	Demand side Interventions		
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
	REGULATION & COMMUNITY INTERVENTIONS		
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

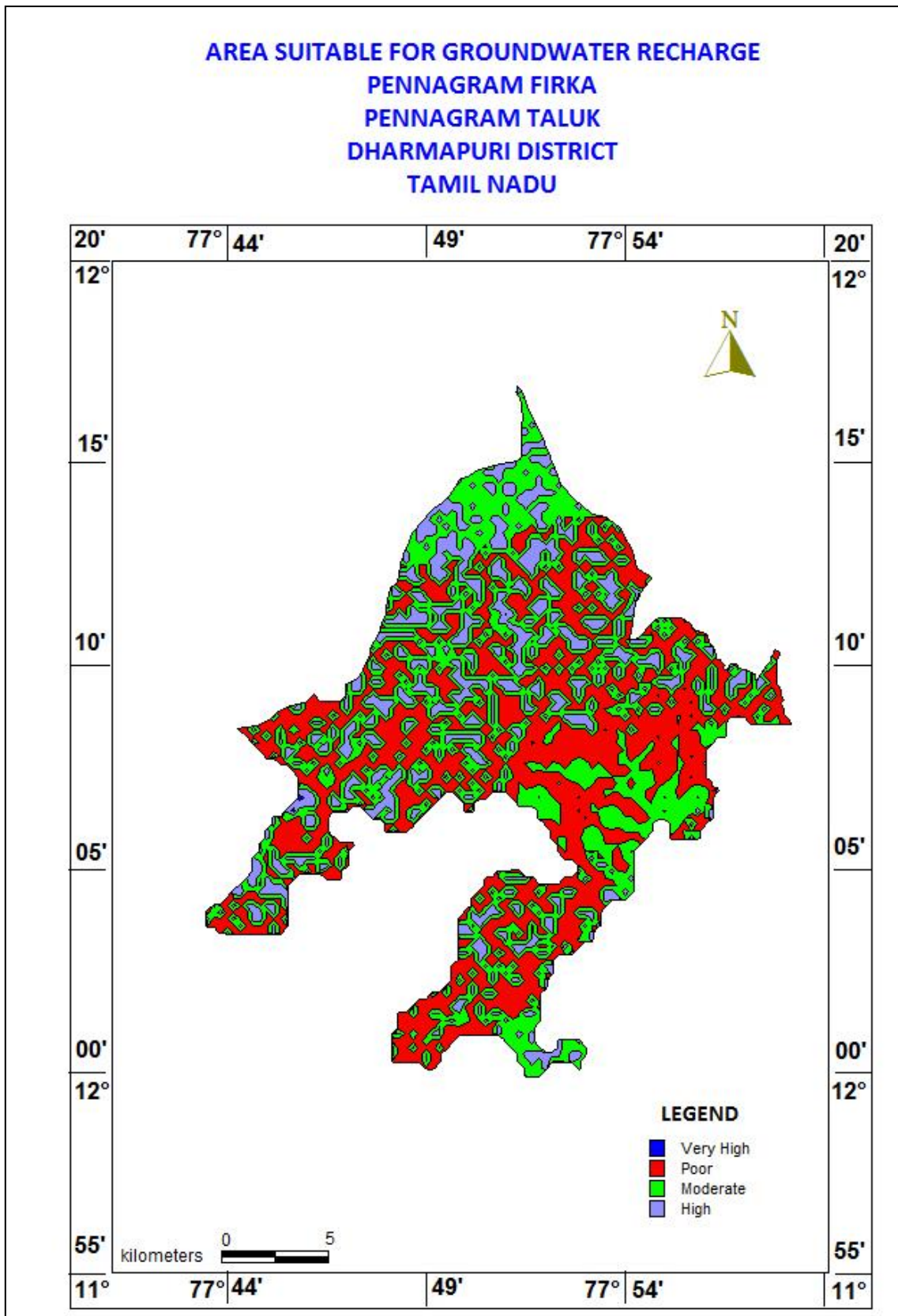


Fig-4 Location of ARS

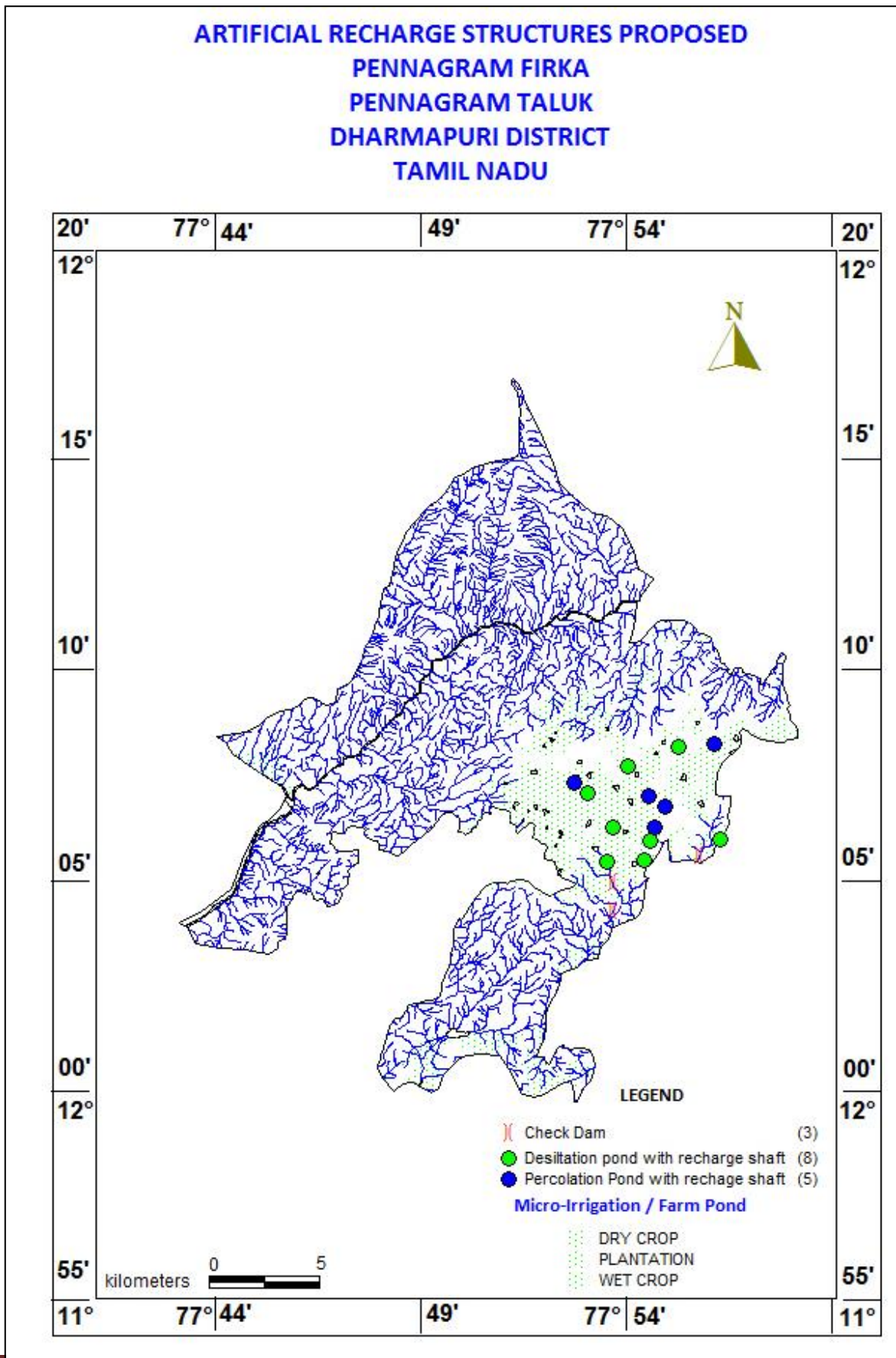


Table-1 location of proposed 3 Check dam in the firka

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