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

MARANDAHALLI FIRKA, DHARMAPURI DISTRICT, TAMIL NADU

दक्षिण पूर्वी तटीय क्षेत्र, चेन्नई

South Eastern Coastal Region, Chennai

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

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	SALIENT FEATURES		
1	Name of the Firka/Area Revenue Division Location **(Fig-1)**	**:**	**MARANDAHALLI / 132.69 sq.km** **PALACODE TALUK** N 77° 54' 00" to 78°02' 19" E 12°21' 56 " to 12° 23'06"
2	No. of Revenue villages	:	**17**
3	District/State	:	**Dharmapuri / Tamilnadu**
4	Population (2011 Census)	:	66727
5	Normal Rainfall (**mm**)	:	762 Monsoon: 653 Non-Monsoon: 109
6	Agriculture (2012-13)(Ha)	:	1. Gross irrigated area: 3687.61 2. Paddy: 790.94 3. Sugar cane: 3177.74 4. Banana:94.26 5. Other crops: 2484.68 6. Ground water: 3234.22 7. Surface water (Tanks): 453.04
7	Existing and future water demands (HaM)		Domestic & Industrial • Existing: 53.56 • Future (year 2025): 60.88 Irrigation • Existing:2373.80
8	Water level behaviour (m bgl)	:	Pre-monsoon: 4.45 – 20.30 Post-monsoon: 2.30 – 8.75
	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 – Charnockite /Gneiss** **Aqufer-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 20-153.28 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)	:	• Net GW availability : 12.54 • Gross Ground Water draft for Irrigation: 23.74 • Gross Ground water draft for domestic and industrial supply: 0.54 • Gross GW draft: 24.28 • Stage of ground water development: 193 % • Category: Over Exploited
13	Ground water extraction	:	Ground water extraction structures: 4844 no's • Bore wells: 198 no's • Dug wells: 4646 no's
14	Chemical quality of ground water, contamination and its suitability	:	EC (µS/cm) min: 898 and max: 2650 NO_3 (mg/L): Min: 25 and max 100 F (mg/L): Min 0.65 and Max:2.3 All chemical constituents are within the permissible limit of BIS drinking water standards (IS: 10500:2012) except Nitrate .and Fl are having High values.
15	**Ground Water Recharge Scenario**	:	**MCM**
15.1	Recharge from Rainfall (Monsoon)	:	4.87
15.2	Recharge from Other sources (Tanks and applied irrigation) (Monsoon)	:	6.30
15.3	Recharge from rainfall (Non-Monsoon)	:	0.67
15.4	Recharge from Other sources (Tanks and applied irrigation) (Non-Monsoon)	:	2.10
15.5	Total annual GW Recharge	:	13.94
15.6	Natural Discharge	:	1.40
15.7	Existing Minor Irrigation Tanks (Area in ha)	:	51.65
15.8	Storage from existing tanks (MCM)	:	0.52
16	Storage from existing AR Structures (MCM)	:	1.42

Fig-1: Location Map of Marandahalli Firka.

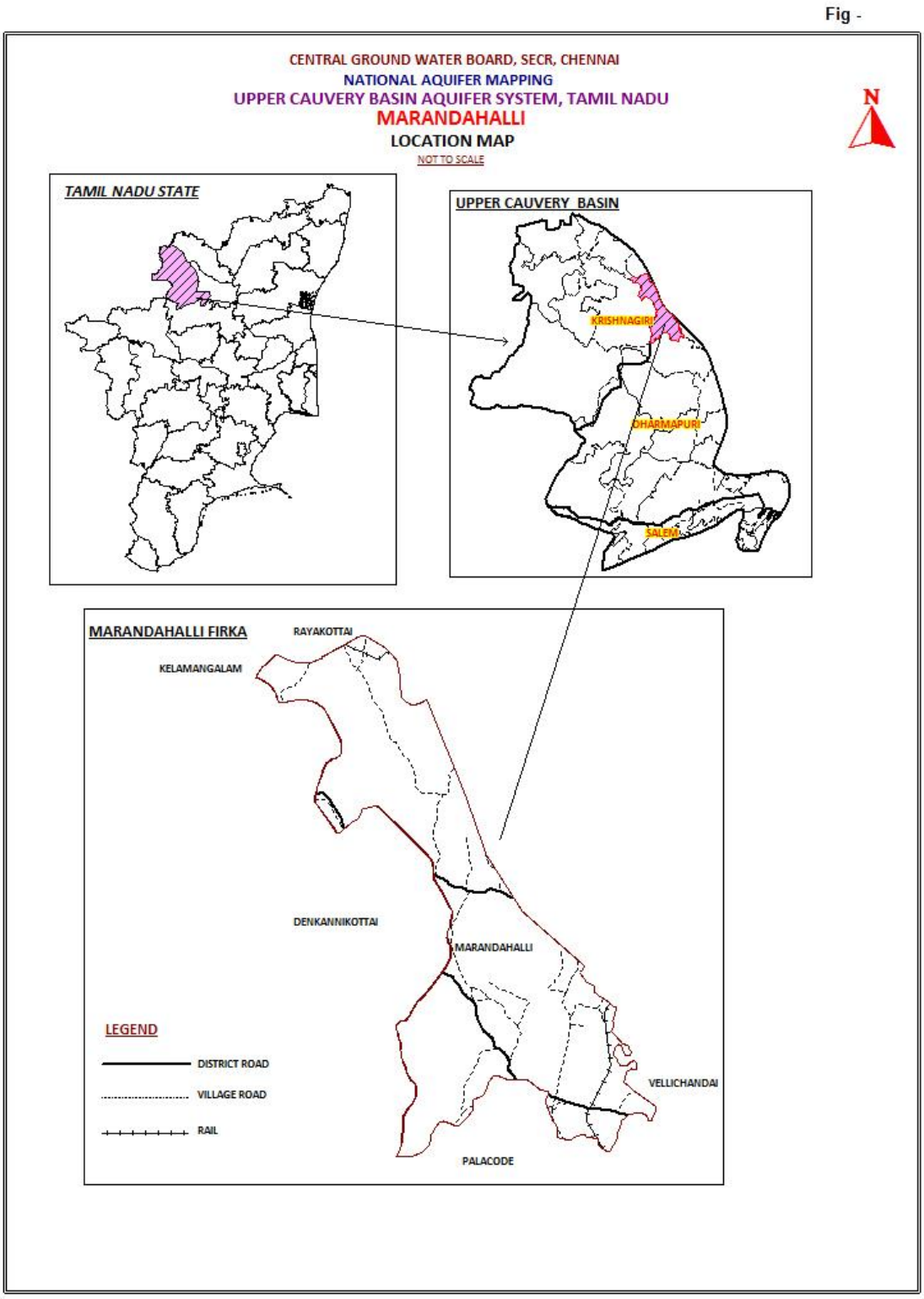
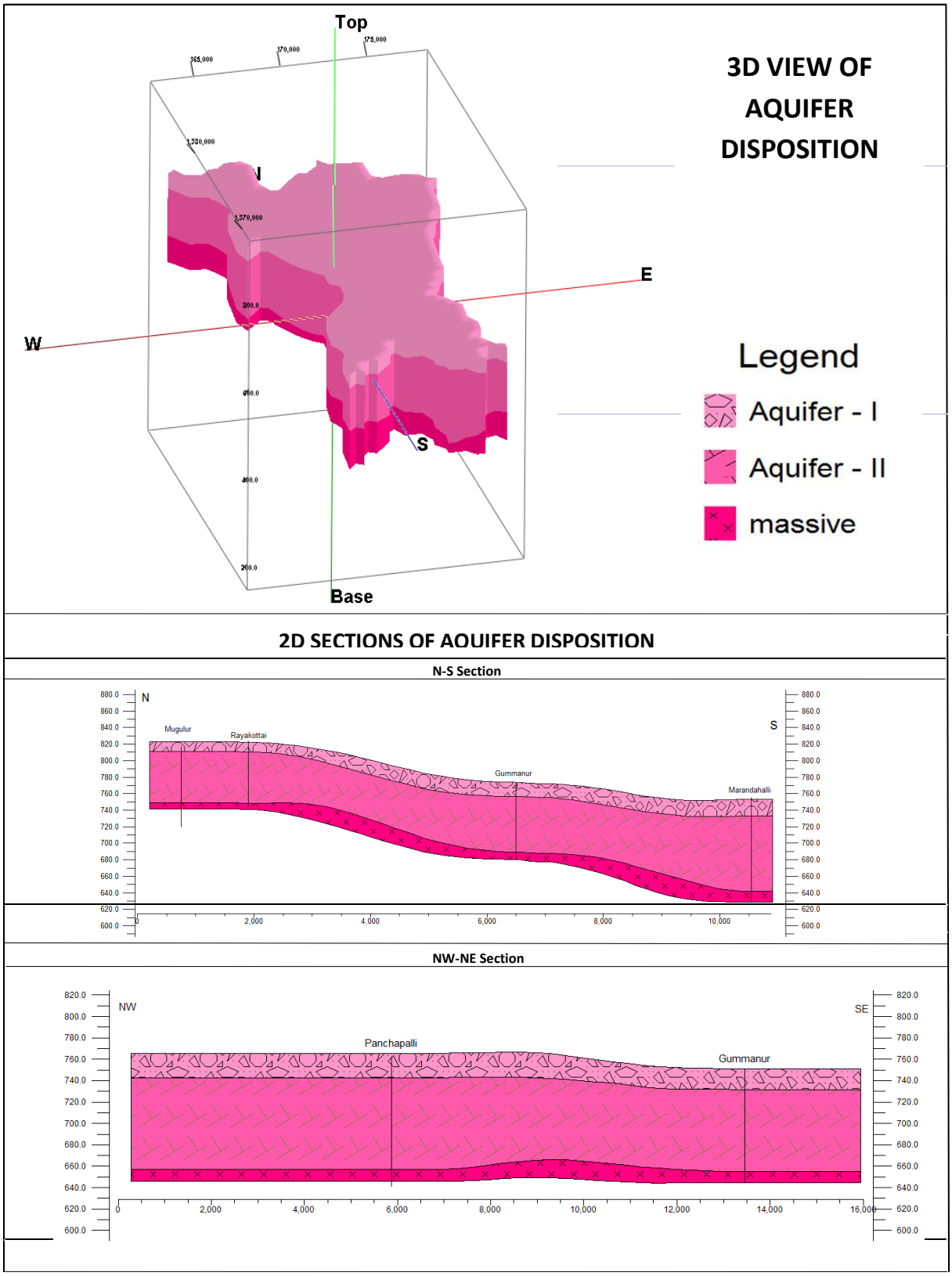


Fig:2 3D and 2D View of Aquifer Disposition, Marandahalli Firka, Dharmapuri District



AQUIFER MANAGEMENT PLAN
MARANDAHALLI FIRKA,
DHARMAPURI DISTRICT, TAMILNADU STATE

	WATER RESOURCE AVAILABILITY (MCM)		
1	Ground water (as per GEC 2013)	:	12.54
2	Surface Water (as per 2012-13irrigation data)	:	1.94
3	Total water availability	:	14.48
	Ground Water Resource Enhancement (MCM)		
4	Uncommitted surface runoff available for the Firka	:	9.35
5	Total volume of weathered zone	:	11.46
6	Total volume of aquifer available for recharge, considering 3m below Ground Level.		16.62
(a)	**Supply side Interventions**		
ARTIFICAIL RECHARGE/CONSERVATION MEASURES			
7	Structures Proposed (nos) Masonry Check dam Revival, repair of pond, tanks with recharge shaft Percolation Pond with Recharge Shaft Farm Pond:	: : : : 	Based on spatial integration Fig-3 Area suitable for GW recharge Fig-4 Location of ARS 14 (Table-1) 02+02 (Table-2) 02+02 (Table-3) 100 units
8	Excepted total groundwater recharge (MCM)	:	1.6
9	Tentative total cost of the project (Rs. In Cr)		5.5
10	Additional Irrigation potential (ha)		0.26
(b)	**Demand side Interventions**		
11	Existing total Groundwater Draft (MCM)	:	24.28
12	Proposed Micro Irrigation in Ha	:	100
13	Cost for micro-irrigation (Rs in Lakhs)	:	60
14	Expected ground water saving from micro-irrigation (MCM)	:	0.15
	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 ARS in Marandahalli Firka.

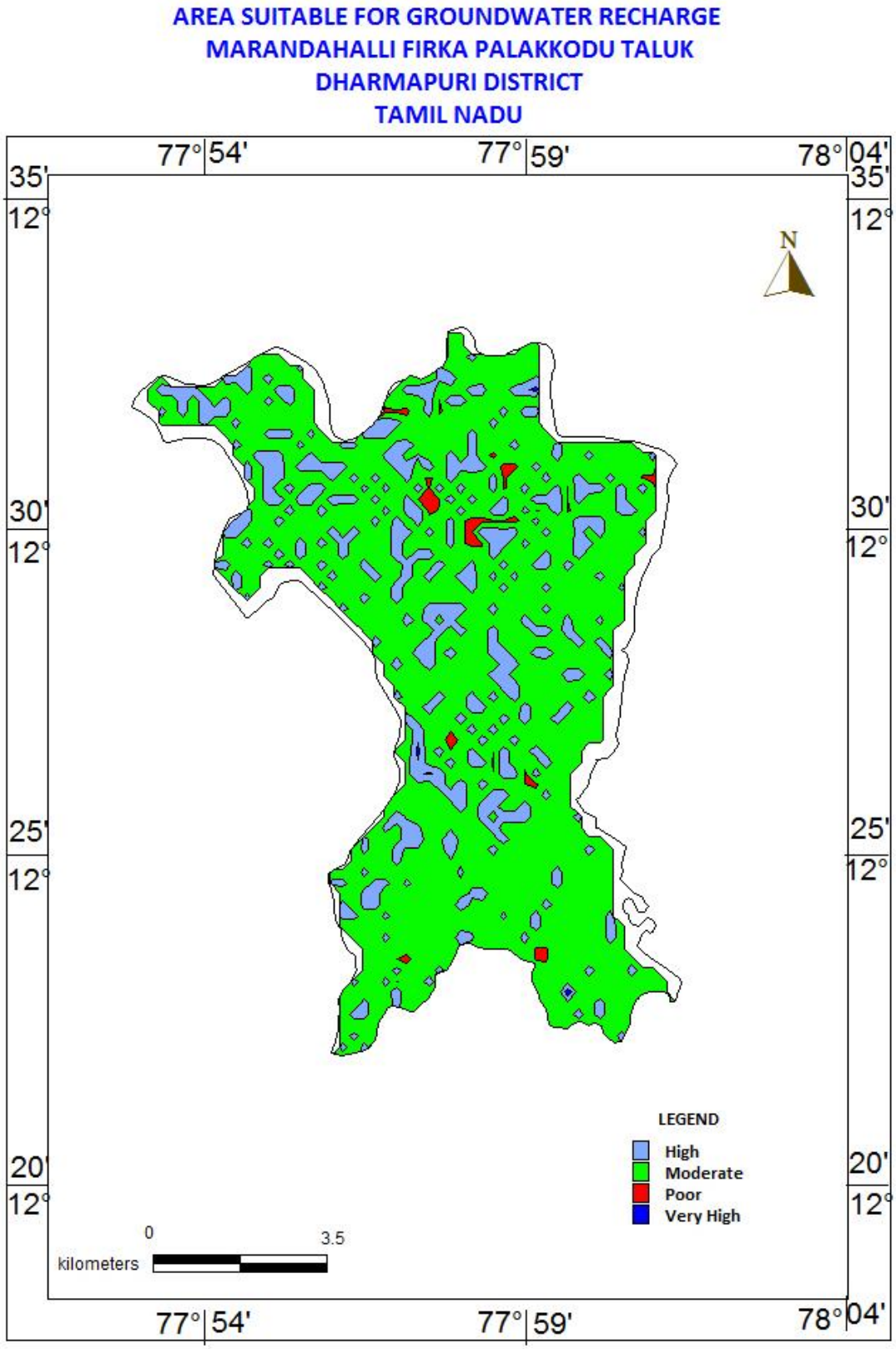


Fig-4. Location of proposed ARS in Marandahalli Firka.

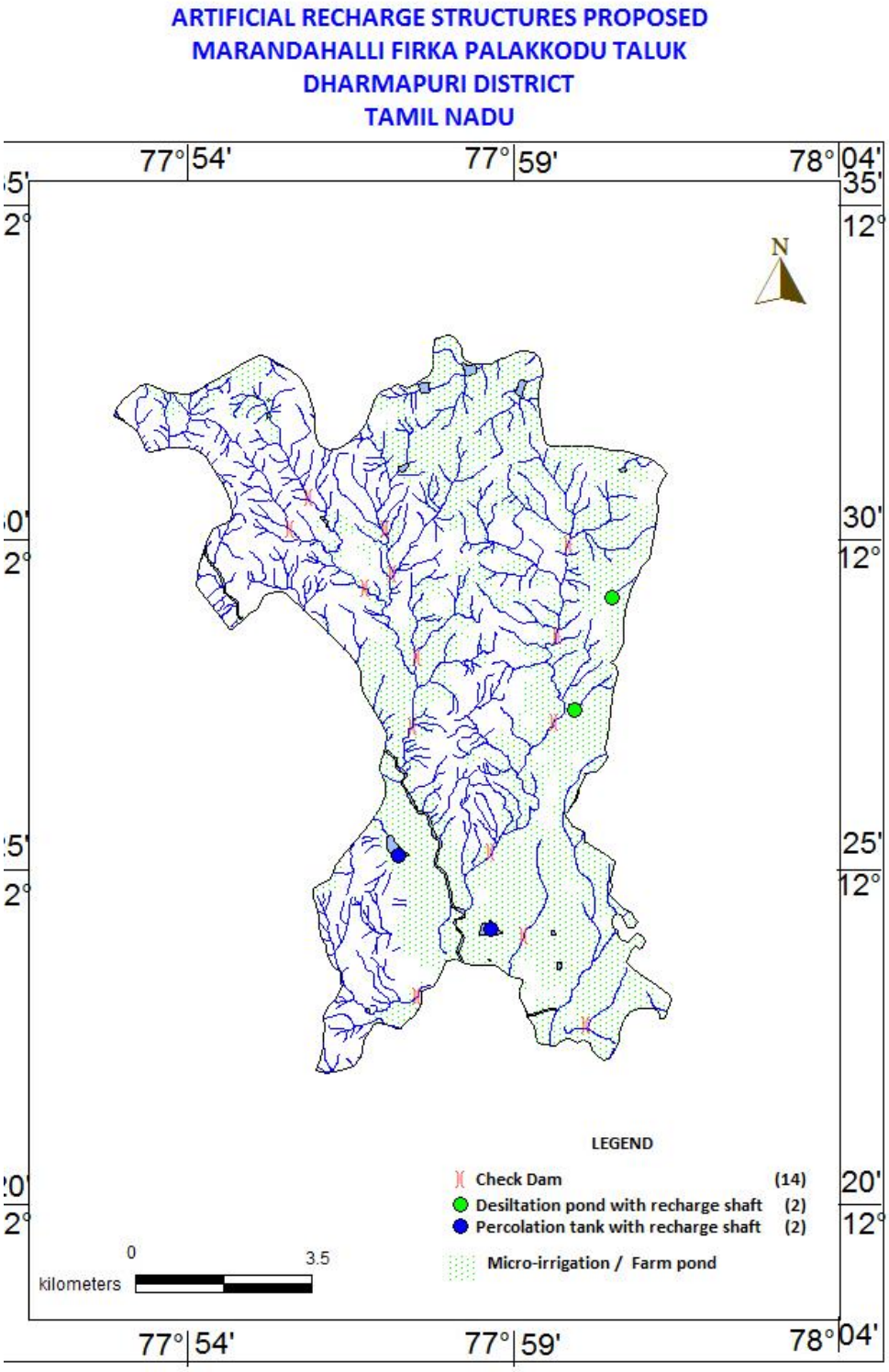


Table-1 Location of proposed Check dam

S. No.	Longitude	Latitude	Structures
1	77.95	12.51	Check dam
2	77.94	12.50	Check dam
3	77.96	12.49	Check dam
4	77.97	12.49	Check dam
5	77.97	12.50	Check dam
6	78.01	12.50	Check dam
7	78.01	12.48	Check dam
8	77.98	12.47	Check dam
9	77.97	12.45	Check dam
10	78.01	12.45	Check dam
11	77.99	12.42	Check dam
12	78.00	12.40	Check dam
13	77.98	12.39	Check dam
14	78.02	12.38	Check dam

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

S. No.	Longitude	Latitude	Structure	Action
1	78.03	12.49	Tank / Reservoir	De-siltation with shaft
2	78.02	12.46	Tank / Reservoir	De-siltation with shaft

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

S. No.	LONGITUDE	LATITUDE	STRUCTURE	ACTION
1	77.97	12.42	Tank / Reservoir	De-siltation with shaft
2	77.99	12.40	Tank / Reservoir	De-siltation with shaft