
**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

## NALLAMPALLI FIRKA, DHARMAPURI DISTRICT, TAMIL NADU

दक्षिण पूर्वी तटीय क्षेत्र, चेन्नई

South Eastern Coastal Region, Chennai

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

**By**
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**Scientist-B**

| | **SALIENT FEATURES** | | |
|---|---|---|---|
| 1 | Name of the Firka/Area<br><br>Revenue Division<br><br>Location<br>**(Fig-1)** | **:** | **NALLAMPALLI / 91.01 sq.km**<br><br>**DHARMAPURI**<br><br>N 78° 03' 20" to 78° 11' 00"<br>E 11° 59' 00 " to 12° 07' 40" |
| 2 | No. of Revenue villages | : | **10** |
| 3 | District/State | : | **Dharmapuri / Tamilnadu** |
| 4 | Population (2011 Census) | : | 64797 |
| 5 | Normal Rainfall (**mm**) | : | 1012<br>Monsoon: 796<br>Non-Monsoon: 216 |
| 6 | Agriculture (2012-13)(Ha) | : | 1. Gross irrigated area: 1722.93<br>2. Paddy: 205.55<br>3. Sugar cane: 262.78<br>4. Banana: 36.88<br>5. Other crops: 1217.74<br>6. Ground water: 1722.93<br>7. Surface water (Tanks): NIL |
| 7 | Existing and future water demands (HaM) | | Domestic & Industrial<br>• Existing: 90.31<br>• Future (year 2025): 102.65<br>Irrigation<br>• Existing: 882.65 |
| 8 | Water level behaviour (m bgl) | : | Pre-monsoon: 3.45 – 14.13<br>Post-monsoon: 1.75 – 12.7 |
| | **AQUIFER DISPOSITION** | : | |
| 9 | No of Aquifers | : | 2 |
| 10 | 3-D aquifer disposition and basic characteristics of each aquifer<br><br>**Fig.2**: **3 D map and 2D - Sections** | : | **Geology – Charockites/Gneisses**<br>**Aqufer-1 (Weathered Zone):**<br>Thickness varies from 9 - 20 m<br>Transmissivity(T): 3 - 45 $m^2$/day<br>Specific Yield (Sy): 0.01to 0.015 %<br>**Aquifer-2 (Fractured Zone):**<br>Depth of fracturing varies from 20-190 m.<br>Transmissivity (T): 10 -75 $m^2$/day<br>Specific storage (S): 0.00001- 0.0002<br>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 : 10.54<br>• Gross Ground Water draft for Irrigation: 8.83<br>• Gross Ground water draft for domestic and industrial supply: 0.90<br>• Gross GW draft: 9.73<br>• Stage of ground water development: 92 %<br>• Category: Critical |
| 13 | Ground water extraction | : | Ground water extraction structures: 2484 no's<br>• Bore wells: 395 no's<br>• Dug wells: 2089 no's |
| 14 | Chemical quality of ground water, contamination and its suitability | : | EC (µS/cm) min: 650 and max: 2200<br>$NO_3$ (mg/L): Min: 12 and max 112<br>F (mg/L): Min 0.65 and Max: 2.2<br><br>All chemical constituents are within the permissible limit of BIS drinking water standards (IS: 10500:2012) except Nitrate and Fluoride are having High values. |
| 15 | **Ground Water Recharge Scenario** | : | **MCM** |
| 15.1 | Recharge from Rainfall (Monsoon) | : | 5.95 |
| 15.2 | Recharge from Other sources (Tanks and applied irrigation) (Monsoon) | : | 2.50 |
| 15.3 | Recharge from rainfall (Non-Monsoon) | : | 1.41 |
| 15.4 | Recharge from Other sources (Tanks and applied irrigation) (Non-Monsoon) | : | 1.84 |
| 15.5 | Total annual GW Recharge | : | 11.70 |
| 15.6 | Natural Discharge | : | 1.17 |
| 15.7 | Existing Minor Irrigation Tanks (Area in ha) | : | 84.86 |
| 15.8 | Storage from existing tanks (MCM) | : | 0.84 |
| 16 | Storage from existing AR Structures (MCM) | : | 3.02 |

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

Fig -

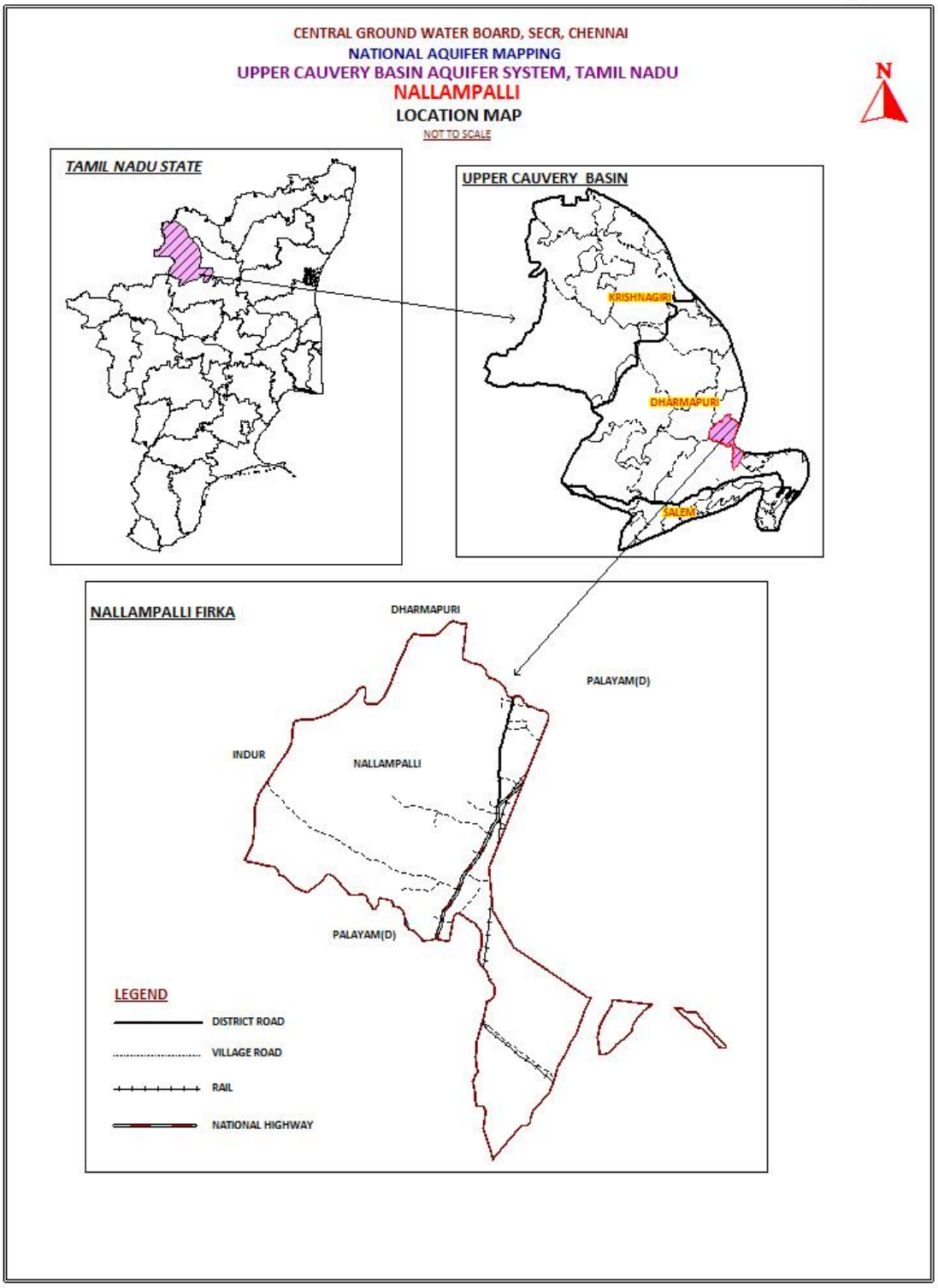
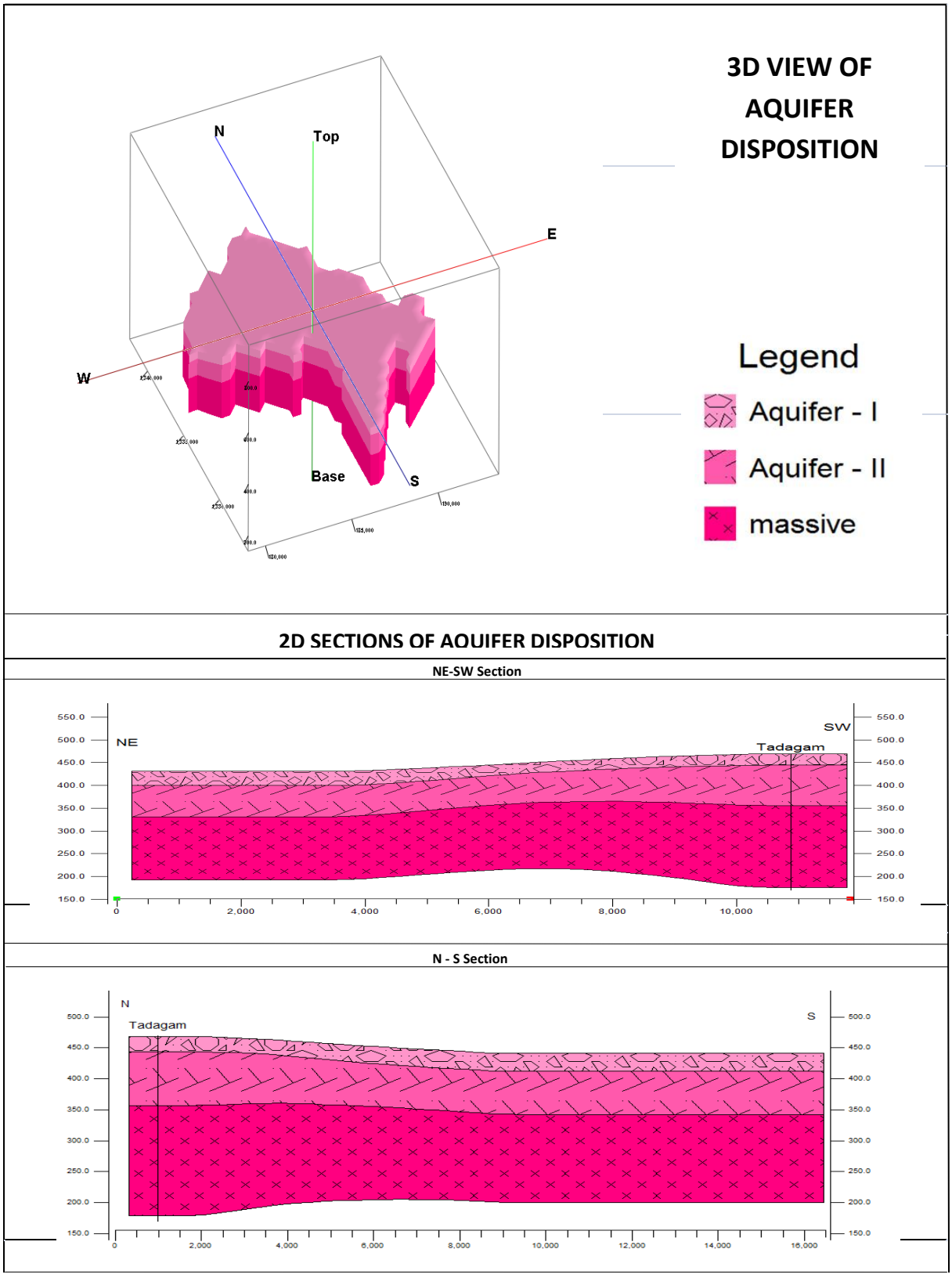
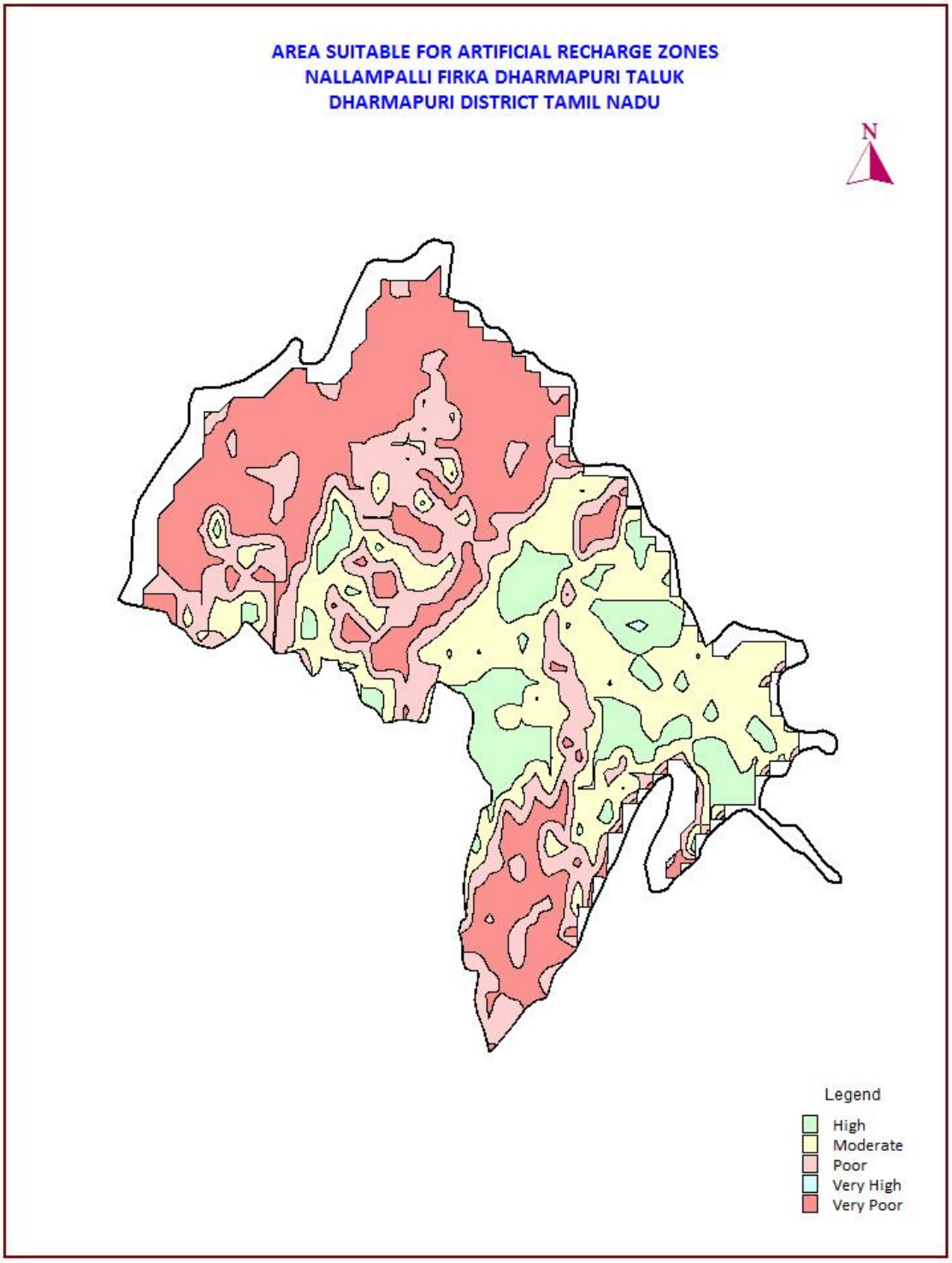


**Fig:2 3D and 2D View of Aquifer Disposition, Nallampalli Firka, Dharmapuri District**



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

| | | | |
|---|---|---|---|
| | **WATER RESOURCE AVAILABILITY (MCM)** | | |
| 1 | Ground water (as per GEC 2013) | : | 10.54 |
| 2 | Surface Water (as per 2012-13irrigation data) | : | 3.86 |
| 3 | Total water availability | : | 14.40 |
| | **Ground Water Resource Enhancement (MCM)** | | |
| 4 | Uncommitted surface runoff available for the Firka | : | |
| 5 | Total volume of weathered zone | : | |
| 6 | Total volume of aquifer available for recharge, considering 3m below Ground Level. | | |
| **(a)** | **Supply side Interventions** | | |
| **ARTIFICAIL RECHARGE/CONSERVATION MEASURES** | | | |
| 7 | Structures Proposed (nos)<br>Masonry Check dam<br>Revival, repair of pond, tanks with recharge haft<br>Percolation Pond with Recharge Shaft<br>Farm Pond: | :<br>:<br>:<br>: | <br>11 (Table -1)<br>05 (Table -3)<br>20 (Table -4)<br>150 units |
| 8 | Excepted total groundwater recharge (MCM) | : | |
| 9 | Tentative total cost of the project (Rs. In Cr) | | |
| 10 | Expected raise in water level by recharging/saving (m) | | |
| **(b)** | **Demand side Interventions** | | |
| 11 | Existing total Groundwater Draft (MCM) | : | |
| 12 | Proposed Micro Irrigation in Ha | : | |
| 13 | Cost for micro-irrigation (Rs in Lakhs) | : | |
| 14 | Expected ground water saving from micro-irrigation (MCM) | : | |
| | **REGULATION & COMMUNITY INTERVENTIONS** | | |
| 15 | Regulation and control | : | Systematic monitoring in groundwater contaminated area particularly Fluoride. Hogenakal drinking water scheme implemented..<br><br>The systematic development of groundwater is suggested to sustain the available and recharged groundwater. |


AREA SUITABLE FOR ARTIFICIAL RECHARGE ZONES
NALLAMPALLI FIRKA DHARMAPURI TALUK
DHARMAPURI DISTRICT TAMIL NADU
N
Legend
High
Moderate
Poor
Very High
Very Poor

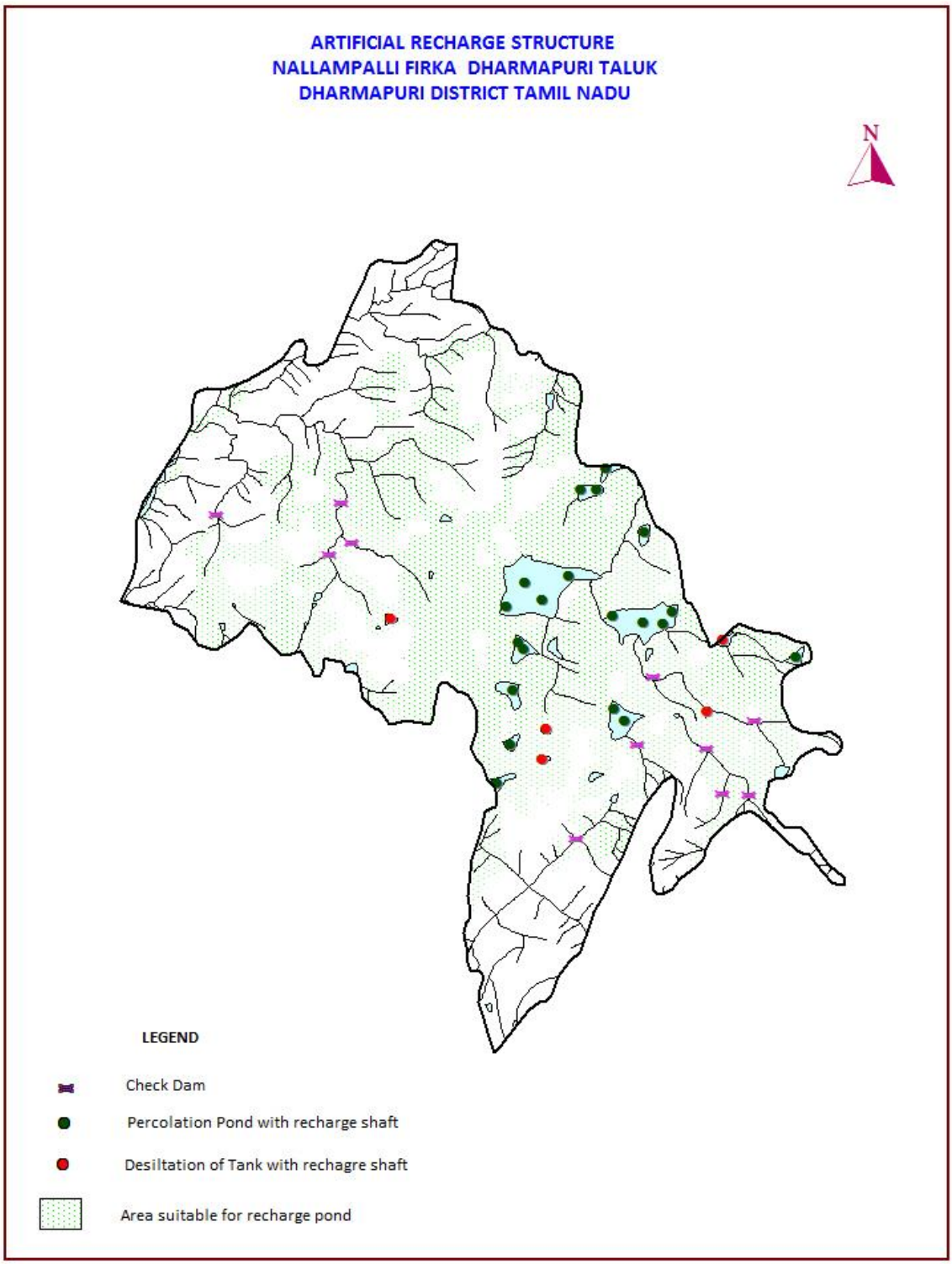

ARTIFICIAL RECHARGE STRUCTURE
NALLAMPALLI FIRKA DHARMAPURI TALUK
DHARMAPURI DISTRICT TAMIL NADU
N
LEGEND
Check Dam
Percolation Pond with recharge shaft
Desiltation of Tank with rechagre shaft
Area suitable for recharge pond

**Table -1 Location of proposed Check dam**

| S. No. | Longitude | Latitude | Structures |
|---|---|---|---|
| 1 | 78.17 | 12.03 | Check Dam |
| 2 | 78.16 | 12.04 | Check Dam |
| 3 | 78.17 | 12.04 | Check Dam |
| 4 | 78.15 | 12.05 | Check Dam |
| 5 | 78.16 | 12.03 | Check Dam |
| 6 | 78.14 | 12.02 | Check Dam |
| 7 | 78.15 | 12.04 | Check Dam |
| 8 | 78.09 | 12.07 | Check Dam |
| 9 | 78.07 | 12.08 | Check Dam |
| 10 | 78.09 | 12.08 | Check Dam |
| 11 | 78.1 | 12.07 | Check Dam |

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

| S. No. | Longitude | Latitude | Structure | Action |
|---|---|---|---|---|
| 1 | 78.16 | 12.04 | Tank / Reservoir | De-siltation And Recharge Shaft |
| 2 | 78.16 | 12.06 | Tank / Reservoir | De-siltation And Recharge Shaft |
| 3 | 78.1 | 12.06 | Tank / Reservoir | De-siltation And Recharge Shaft |
| 4 | 78.13 | 12.04 | Tank / Reservoir | De-siltation And Recharge Shaft |
| 5 | 78.13 | 12.04 | Tank / Reservoir | De-siltation And Recharge Shaft |

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

| S. No. | Longitude | Latitude | Structure | Action |
|---|---|---|---|---|
| 1 | 78.14 | 12.06 | Tank / Reservoir | Percolation Tank With Shaft |
| 2 | 78.15 | 12.06 | Tank / Reservoir | Percolation Tank With Shaft |
| 3 | 78.15 | 12.06 | Tank / Reservoir | Percolation Tank With Shaft |
| 4 | 78.12 | 12.06 | Tank / Reservoir | Percolation Tank With Shaft |
| 5 | 78.13 | 12.07 | Tank / Reservoir | Percolation Tank With Shaft |
| 6 | 78.13 | 12.07 | Tank / Reservoir | Percolation Tank With Shaft |
| 7 | 78.13 | 12.05 | Tank / Reservoir | Percolation Tank With Shaft |
| 8 | 78.12 | 12.04 | Tank / Reservoir | Percolation Tank With Shaft |
| 9 | 78.12 | 12.03 | Tank / Reservoir | Percolation Tank With Shaft |
| 10 | 78.14 | 12.04 | Tank / Reservoir | Percolation Tank With Shaft |
| 11 | 78.15 | 12.04 | Tank / Reservoir | Percolation Tank With Shaft |
| 12 | 78.18 | 12.05 | Tank / Reservoir | Percolation Tank With Shaft |
| 13 | 78.15 | 12.08 | Tank / Reservoir | Percolation Tank With Shaft |
| 14 | 78.13 | 12.06 | Tank / Reservoir | Percolation Tank With Shaft |
| 15 | 78.13 | 12.06 | Tank / Reservoir | Percolation Tank With Shaft |
| 16 | 78.14 | 12.08 | Tank / Reservoir | Percolation Tank With Shaft |
| 17 | 78.14 | 12.08 | Tank / Reservoir | Percolation Tank With Shaft |
| 18 | 78.14 | 12.09 | Tank / Reservoir | Percolation Tank With Shaft |
| 19 | 78.13 | 12.06 | Tank / Reservoir | Percolation Tank With Shaft |
| 20 | 78.15 | 12.06 | Tank / Reservoir | Percolation Tank With Shaft |