



केंद्रीय भूमि जल बोर्ड

जल संसाधन, नदी विकास और गंगा संरक्षण मंत्रालय

भारत सरकार

Central Ground Water Board

Ministry of Water Resources, River Development and Ganga

Rejuvenation

Government of India

Report on

AQUIFER MAPPING AND MANAGEMENT PLAN

Ranjal Mandal, Nizamabad District, Telangana

दक्षिणी क्षेत्र, हैदराबाद

Southern Region, Hyderabad



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GOVERNMENT OF INDIA
MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT AND
GANGA REJUVENATION

REPORT ON
AQUIFER MAPS & MANAGEMENT PLANS
RANJAL MANDAL, NIZAMABAD DISTRICT, TELANGANA STATE

CENTRAL GROUND WATER BOARD
SOUTHERN REGION
HYDERABAD
JULY-2016

**REPORT ON
AQUIFER MAPS & MANAGEMENT PLANS
RANJAL MANDAL, NIZAMABAD DISTRICT, TELANGANA STATE**

SALIENT FEATURES		
1	Name of the Mandal/Area Revenue Division Location (Fig-1)	: RANJAL/114 Km² NIZAMABAD NL77 ⁰ 51'49.59" - 78 ⁰ 0'25.46" EL18 ⁰ 42'8.33" - 18 ⁰ 49'46.37"
2	No. of Revenue villages	: 10
3	District/State	: Nizamabad/Telangana
4	Population /Density (2011 Census)	: 38880/341 per Km ²
5	Normal Rainfall (mm) Actual Rainfall(2014-2015)	: 1037.2 -Monsoon: 871.8 mm (84%) -Non-Monsoon:165.40 mm (16%) 584.2
6	Agriculture (Ha) (2014-15):	: Kharif season 1. Gross area sown: 5437 2. Paddy: 2666 (49%) 3. Total oil seeds: 2025(37%) 4. Total pulses: 194(4%) 5. Cotton 389(7%) 6. Other crops: 157(3%) Rabi season 1. Gross area sown: 2049 2. Paddy: 891 (43%) 3. Total pulses: 257 (13%) 4. Total oil seeds: 76(4%) 5. Maize: 149(7%) 6. Other crops: 672(33%)
7	Irrigation (2014-15) (Ha)	: 1. Gross irrigated area: 4603 2. Net irrigated area: 2829 3. Area irrigated more than once: 1714 • Ground water: 3953 • Surface water (Tanks):650
8	Existing and future water demands (MCM)	Domestic & Industrial • Existing:0.34 • Future (year 2025): 1.45 Irrigation (Existing): 8.97
9	Water level behaviour	: 13-22 m (Pre-monsoon) 15-25 m (Post-monsoon)
AQUIFER DISPOSITION		:
10	No of Aquifers	: 2
11	3-D aquifer disposition and basic characteristics of each aquifer (3D: Fig-2a Section Layout:2b Sections: 2c & 2d)	: Geology-Granites Aquifer-1 (Weathered Zone): Weathering varies from 13-14 m Transmissivity(T): 6-181 m ² /day Specific Yield (Sy):0.2 to 2 % Aquifer-2 (Fractured Zone): Depth of fracturing varies from 15-15 m. Transmissivity (T): 10-117 m ² /day

			Specific storage (S):0.00001-0.02 Cumulative yield (Aq1 and Aq 2) (lps): 1 to 1.5
12	Ground water Issues	:	<ul style="list-style-type: none"> • Anthropogenic contamination by Nitrate. • Sustainability of wells (3-4 hrs).
13	Ground water resource availability and extraction (MCM)	:	<ul style="list-style-type: none"> • Net GW availability :24.09 • Gross Ground Water draft for Irrigation:9.30 • Gross Ground water draft for domestic and industrial supply:0.34 • Gross GW draft:9.64 • Stage of ground water development: 40 % • Category: safe
14	Ground water extraction	:	No of ground water extraction structures:2304 No. of Dug wells :259 No. of Bore Wells :2045
15	Chemical quality of ground water and contamination	:	Pre-monsoon EC ($\mu\text{S}/\text{cm}$) min: 700 max:1000 NO ₃ (mg/L): Min :10 and max :60 F (mg/L): Min 0.5 and Max:1.25 Post-monsoon EC ($\mu\text{S}/\text{cm}$) min: 650 max:1250 NO ₃ (mg/L): Min 15 and max 65 F (mg/L): Min 0.5 and Max 0.75
16	Ground Water Recharge Scenario	:	MCM
16.1	Recharge from Rainfall (Monsoon)	:	9.84
16.2	Recharge from Other sources (Tanks and applied irrigation) (Monsoon)	:	5.91
16.3	Recharge from rainfall (Non-Monsoon)	:	3.13
16.4	Recharge from Other sources (Tanks and applied irrigation) (Non-Monsoon)	:	6.98
16.5	Total annual GW Recharge	:	25.86
16.6	Natural Discharge	:	1.77
16.7	Existing Minor Irrigation Tanks(nos)	:	26
16.8	Storage from existing tanks	:	4.90
16.9	Existing Artificial Recharge Structures (PT, CD and Farm ponds)	:	14/8/200
17	Storage from existing AR Structures	:	0.18

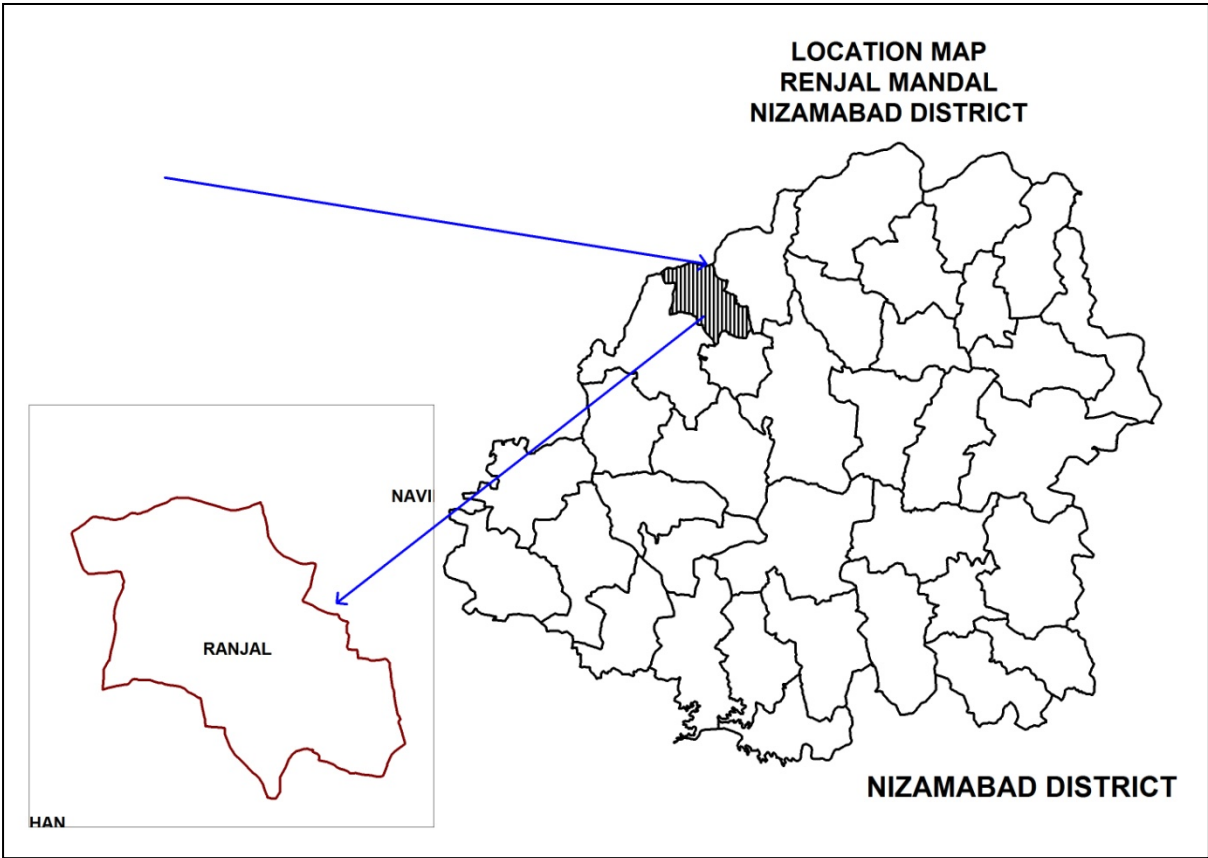


Fig-1: Location Map of Ranjal Mandal.

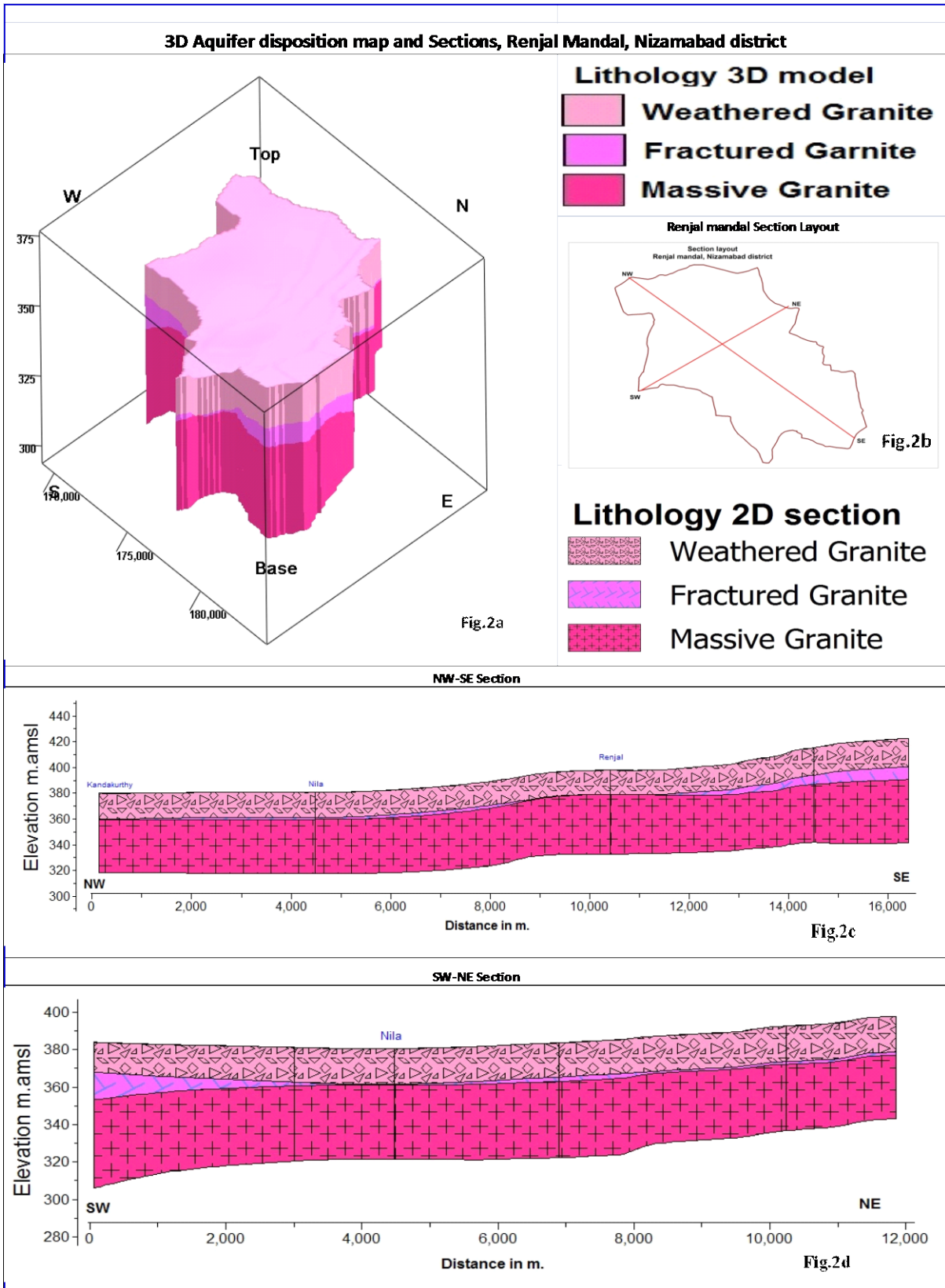


Fig-2(a-d): 3 D map and Sections.

GW MANAGEMENT STRATAGIES, RANJAL MANDAL, NIZAMABAD DISTRICT

A	WATER RESOURCE AVAILABILITY	
	• Ground water (as per GEC 2012-13)	: 24.09 MCM
	• Surface Water (as per 2014-15 irrigation data)	: 5.20 MCM
	• Total water availability	: 29.29 MCM
(a)	Ground Water Resource Enhancement (Table-1)	
	Supply side Interventions	
1	Aquifer wise space available for recharge and proposed interventions	: 12-22 m
2	Volume of Un-saturated zone (upto 3mbgl)	: 2248 MCM
3	Recharge Potential (Sy 2%)	45 MCM
4	Utilizable Yield available for ARS	: 4.88 MCM
5	No. of Check dams (CD's) / Mini percolation tanks (MPT's) recommended	: 168 (CDs:86+PTs82)
6	Total Cost of ARS	: 12.5 Cr
7	Expected Ground Water Recharge through ARS	: 2.4 MCM
8	Water Conservation Measures (WCM) (Farm Ponds)	: 0
9	Total Cost of WCM	: 0 Cr
10	Mission Kakatiya- Repair & Renovation of existing Tanks	: 0.31 MCM (10 tanks)
11	Proposed tanks to be taken up in phased manner	16 tanks (@0.01 MCM)
12	Expected GW Recharge under Mission Kakatiya	: 0.16 MCM(50 % of capacity)
13	Mission Bhagiratha (Providing drinking water needs to the entire population) @ 100 lpcd/person (rural) and 135 (urban) from surface water source from outside the mandal area (From River Krishna)	: 1.42MCM/year
14	Net Saving of Ground water from Mission Bhagiratha	: 1.1 MCM/year
(b)	DEMAND SIDE INTERVENTION	
15	Existing Micro Irrigation Intervention & Gross area irrigated	: 196 Micro irrigation units/5.8 ha
16	Proposed Micro Irrigation	: 0 ha in 0 Villages @ 100 ha in each non command village.
17	Cost for micro-irrigation	: 0 Cr@ 0.60 lakhs per ha.
18	Expected ground water saving from micro-irrigation	: 0 MCM of water is expected to be conserved.
(c)	REGULATION & COMMUNITY INTERVENTIONS	
19	Regulation and control	: <ul style="list-style-type: none"> • WALTA-Act to be implemented in true spirit. • Regulation of power supply in 2

			<p>spells @ 4 hours/spell to increase bore well/GW sustainability.</p> <ul style="list-style-type: none"> • As mandatory measures power connection may be given to only those farmers who are adopting micro irrigation for all new bore well to be constructed.
(d)	OTHER INTERVENTIONS SUGGESTED	:	<ul style="list-style-type: none"> • Participatory Ground Water Management with community and women participation. • Paddy cultivation during rabbi season should be reduced and to be shifted to ID Crops and drought resistant crops. If necessary some regulatory rules may be framed and implemented. • In the existing ground water areas sharing of ground water amongst the users to be encouraged to increase the sustainability of wells by reducing well interference. • The bore well owner should be suitably compensated for the cost of well by funding to farmers for adopting micro irrigation practices by the Govt.
(e)	EXPECTED RESULTS AND OUTCOME		
20	Total Cost of Interventions (Excluding Mission Kaktiya and Bhagiratha)	:	12.5 Cr
21	Likely benefit of Interventions	:	~3.66 MCM ground water can be saved from the above interventions. The stage of Ground water development may likely to be come down by 5 % (from 40 % to 35%).

Table-1: Village wise list of Artificial Recharge Structures Recommended.

S.No	Village	Unsaturated thickness upto 3 m. bgl (m.)	Village Recharge potential MCM (upto 3 m.bgl)	20% of Runoff for AR MCM	Proposed CD's	Proposed PT's	Total cost	Expected GW Recharge in MCM
	Priority-1	m	MCM	MCM	NO.	NO.	Lakhs	MCM
1	Kunepalle	15	1.1	0.1	2	2	30	0.07
2	Satapur	22	1.6	0.2	2	1	20	0.08
	Priority-1(Total)				4	3	50	0.15
	Priority-2							
1	Bhagepalle	12	1.1	0.2	3	3	45	0.09
2	Boregaon	19	4.0	0.4	7	8	115	0.21
3	Dupalle	19	3.1	0.3	5	5	75	0.17
4	Kalyapur	19	2.4	0.3	4	3	50	0.13
5	Kandakurthi	20	7.3	0.7	14	12	190	0.37
6	Neela	22	8.6	0.8	14	13	200	0.40
7	Ranjal	21	10.5	1.0	20	19	290	0.51
8	Tadbilolli	13	5.4	0.8	15	16	235	0.41
	Priority-2 (Total)				82	79	1200	2.29
	Total (P-1&P-2)				86	82	1250	2.44

