

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

Makloor Mandal, Nizamabad District, Telangana

दक्षिणी क्षेत्र, <mark>हैदराबाद</mark> Southern Region, Hyderabad



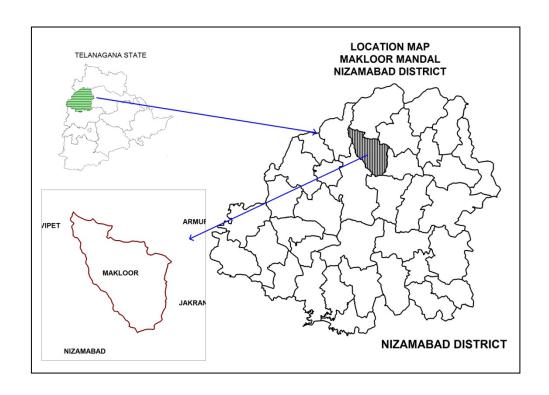
भारत सरकार जल संसाधन नदी विकास एवम् गंगा संरक्षण मंत्रालय केंद्रीय भूमिजल बोर्ड

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

REPORT ON

AQUIFER MAPS & MANAGEMENT PLANS

MAKLOOR MANDAL, NIZAMABAD DISTRICT, TELANGANA STATE



CENTRAL GROUND WATER BOARD SOUTHERN REGION HYDERABAD AUGUST-2016

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

	SALIENT FEATURES		
1	Name of the Mandal/Area	:	MAKLOOR/189 Km ²
-	Revenue Division	ľ	NIZAMABAD
	Location		EL78 ⁰ 3'42.75" - 78 ⁰ 13'32.23"
	(Fig-1)		NL18 ⁰ 39'41.44"-18 ⁰ 51'15.02"
2	No. of Revenue villages		22
3	District/State		Nizamabad/Telangana
4	Population /Density (2011 Census)	:	58588/310 per Km ²
5	Normal Rainfall (mm)	:	1043.4 -Monsoon: 864.1 mm (83%)
3	Normai Kamian (mm)		-Non-Monsoon: 179.30 mm (17%)
	Actual Rainfall(mm)(2014-2015)		760.8
6	Agriculture (Ha) (2014-15):	:	Kharif season:
U	Agriculture (11a) (2014-13).	•	1. Net area sown: 5864
			2. Paddy: 4027 (69%)
			3. Total oil seeds: 1609(27%)
			4. Total spices: 46(1%)
			5. Maize: 52(1%)
			6. Other crops: 104(2%)
			Rabi season:
			1. Net area sown: 3132
			2. Paddy: 1607(51%)
			3. Maize: 570(18%)
			4. Total oil seeds: 274(9%)
			5. Total pulses: 107(3%)
			6. Other crops :559(18%)
7	Irrigation (2014-15) (Ha)	:	1. Gross irrigated area: 7907
			2. Net irrigated area: 4798
			3. Area irrigated more than once: 3109
			Ground water: 7820
			• Surface water (Tanks):87
8	Existing and future water demands		Domestic & Industrial
	(MCM)		• Existing:0.61
			• Future (year 2025): 2.21
			Irrigation (Existing): 25.01
9	Depth to water level behaviour	:	8-17 m (Pre-monsoon)
	(m bgl)		8-19 m (Post-monsoon)
	AQUIFER DISPOSITION	:	
10	No of Aquifers	:	2
11	3-D aquifer disposition and basic	:	Geology-Granites
	characteristics of each aquifer		Aqufer-1 (Weathered Zone):
	(3D: Fig-2a		Weathering varies from 7-16 m
	Section Layout:2b		Transmissivity(T): 6-181 m ² /day
	Sections: 2c & 2d)		Specific Yield (Sy):0.2 to 2 %
	·		Aquifer-2 (Fractured Zone):
			Depth of fracturing varies from 10-40 m.
			Transmissivity (T): 10-117 m ² /day
	·		Aquifer-2 (Fractured Zone): Depth of fracturing varies from 10-40 m.

			Specific storage (S):0.00001-0.02 Cumulative yield (Aq1 and Aq 2) (lps): 2 to 5.5
12	Ground water Issues	:	 Anthropogenic contamination by Nitrate. Sustainability of wells (3-4 hrs).
13	Ground water resource availability and extraction (MCM)	:	 Net GW availability:36.34 Gross Ground Water draft for Irrigation:24.26 Gross Ground water draft for domestic and industrial supply:0.61 Gross GW draft:24.87 Stage of ground water development: 68 % Category: Safe
14	Ground water extraction	:	No of ground water extraction structures:5406 No. of Dug wells: 449 No. of Bore Wells: 4957
15	Chemical quality of ground water and contamination	:	Pre-monsoon EC (μS/cm) min: 600 max:1700 NO ₃ (mg/L): Min :10 and max :90 F (mg/L): Min :0.5 and Max:1.5 Post-monsoon EC (μS/cm) min: 950 max:1500 NO ₃ (mg/L): Min 10 and max :85 F (mg/L): Min 0.75 and Max 1.5
16	Ground Water Recharge Scenario	:	MCM
16.1	Recharge from Rainfall (Monsoon)	:	14.32
16.2	Recharge from Other sources (Tanks and applied irrigation) (Monsoon)	:	9.90
16.3	Recharge from rainfall (Non-Monsoon)	:	3.98
16.4	Recharge from Other sources (Tanks and applied irrigation) (Non-Monsoon)	:	12.05
16.5	Total annual GW Recharge	:	40.24
16.6	Natural Discharge	:	3.90
16.7	Existing Minor Irrigation Tanks(nos)	:	35
16.8	Storage from existing tanks	:	1.65
16.9	Existing Artificial Recharge Structures (PT, CD and Farm ponds)	:	21/12/460
17	Storage from existing AR Structures	:	0.36

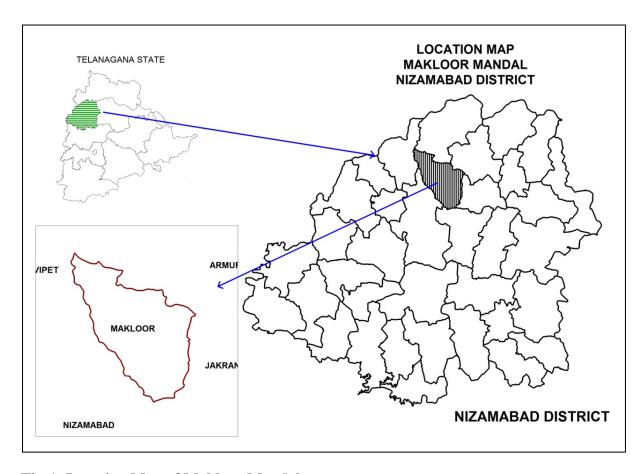


Fig-1: Location Map of Makloor Mandal.

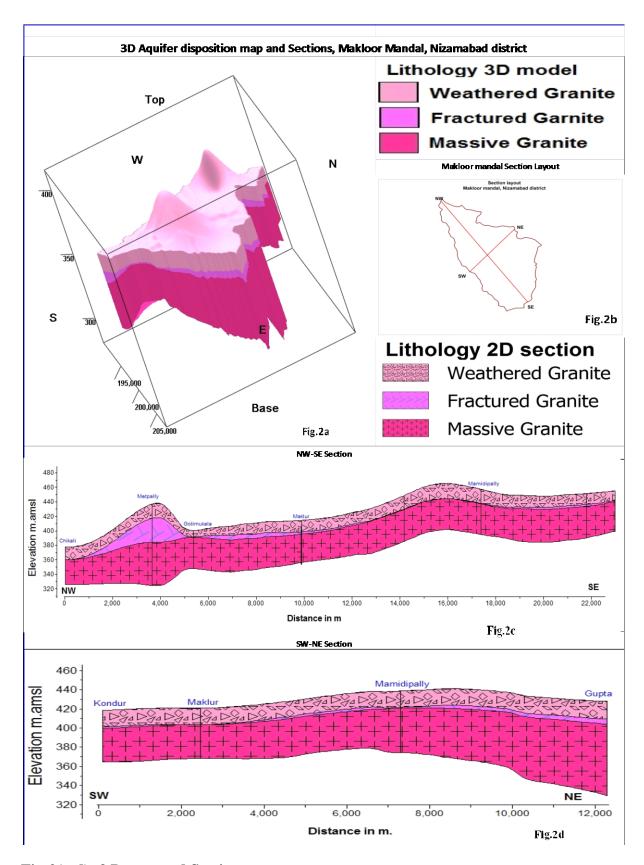


Fig-2(a-d): 3 D map and Sections.

GW MANAGEMENT STRATEGIES, MAKLOOR MANDAL, NIZAMABAD DISTRICT

Surface Water (as per GEC 2012-13) : 36.34 MCM Surface Water (as per 2014-15 irrigation data) Total water availability : 37.04 MCM Ground Water Resource Enhancement (Table-1) Supply side Interventions Aquifer wise space available for recharge and proposed interventions Volume of Un-saturated zone (upto 3mbgl) : 1928.7 MCM Recharge Potential (Sy 2%) 38.6MCM Utilizable Yield available for ARS : 7.82 MCM No. of Check dams (CD's)/ Mini percolation tanks (MPT's) recommended Total Cost of ARS : 19.65 Cr Expected Ground Water Recharge through ARS Water Conservation Measures (WCM) (Farm Ponds) Mission Kakatiya- Repair & Renovation of existing Tanks Mission Kakatiya- Repair & Renovation of existing Tanks Mission Bhagiratha (Providing drinking water needs to the entire population) @ 100 lpcd/person (urual) and 135 (urban) from surface water source from outside the mandal area (From River Krishna) Net Saving of Ground water from Mission Bhagiratha Momental Mission Intervention & Gross area irrigated Proposed Micro Irrigation Intervention & Gross area irrigated Proposed Micro Irrigation Intervention & Gross area irrigated Expected ground water saving from micro-irrigation Expected From River Krishna) Regulation and control WALTA-Act to be implemented in true spirit. Regulation of power supply in 2 seells @ 4 hours/snell to increase	A	WATER RESOURCE AVAILABILITY		
Irrigation data Irrigation		• Ground water (as per GEC 2012-13)	:	
Total water availability 37.04 MCM		` 1	:	0.70 MCM
(a) Ground Water Resource Enhancement (Table-1) Supply side Interventions 1 Aquifer wise space available for recharge and proposed interventions 2 Volume of Un-saturated zone (upto 3mbgl)				25.04.15(3).5
Cable-1 Supply side Interventions			:	37.04 MCM
Supply side Interventions Aquifer wise space available for recharge and proposed interventions 1	(a)			
Aquifer wise space available for recharge and proposed interventions 1928.7 MCM 2 Volume of Un-saturated zone (upto 3mbgl) 2 1928.7 MCM 38.6MCM 38.6MCM 4 Utilizable Yield available for ARS 7.82 MCM 265 (CDs:137+PTs:128) 265 (C				
proposed interventions 2 Volume of Un-saturated zone (upto 3mbgl) 1 1928.7 MCM 38.6MCM 4 Utilizable Yield available for ARS 2 7.82 MCM 38.6MCM 4 Utilizable Yield available for ARS 2 7.82 MCM 265 (CDs:137+PTs:128) 265 (CDs:137+PTs:128} 265 (CDs:137+PTs:128) 265 (CDs:137+PTs:128) 265 (CDs:137+PTs:128} 265 (CDs:137+PTs:128) 265 (CDs:137+PTs:128} 265 (CDs:137+PTs:128) 265 (CDs:137+PTs:128} 265 (CDs:137+PTs:128} 265 (CDs:137+PTs:128} 265 (CDs:137+PTs:128}	1			5-16 m
Volume of Un-saturated zone (upto 3mbgl) 3 1928.7 MCM 38.6MCM 38.6MCM 38.6MCM 5 10.00	1			3-10 III
3 Recharge Potential (Sy 2%) 4 Utilizable Yield available for ARS 5 No. of Check dams (CD's) / Mini percolation tanks (MPT's) recommended 6 Total Cost of ARS 7 Expected Ground Water Recharge through ARS 8 Water Conservation Measures (WCM) (Farm Ponds) 9 Total Cost of WCM 10 Mission Kakatiya- Repair & Renovation of existing Tanks 11 Proposed tanks to be taken up in phased manner 12 Expected GW Recharge under Mission Kakatiya 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) 14 Net Saving of Ground water from Mission Bhagiratha (b) DEMAND SIDE INTERVENTION 15 Existing Micro Irrigation Intervention & Gross area irrigated 16 Proposed Micro Irrigation 17 Cost for micro-irrigation 18 Expected ground water saving from micro-irrigation 19 Regulation and control 10 Water Saving of power supply in 2	2		:	1928.7 MCM
4 Utilizable Yield available for ARS 5 No. of Check dams (CD's) / Mini percolation tanks (MPT's) recommended 6 Total Cost of ARS 7 Expected Ground Water Recharge through ARS 8 Water Conservation Measures (WCM) (Farm Ponds) 9 Total Cost of WCM 10 Mission Kakatiya- Repair & Renovation of existing Tanks 11 Proposed tanks to be taken up in phased manner 12 Expected GW Recharge under Mission Kakatiya 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 ara (From River Krishna) 14 Net Saving of Ground water from Mission Bhagiratha (b) DEMAND SIDE INTERVENTION 15 Existing Micro Irrigation Intervention & Gross area irrigated 16 Proposed Micro Irrigation 17 Cost for micro-irrigation 18 Expected ground water saving from micro-irrigation 19 Regulation and control 19 Regulation and control 10 Water Recharge under Mission Production of the proposed water saving from micro-irrigation of power supply in 2		` 1		
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6 Total Cost of ARS 7 Expected Ground Water Recharge through ARS 8 Water Conservation Measures (WCM) (Farm Ponds) 9 Total Cost of WCM 10 Mission Kakatiya- Repair & Renovation of existing Tanks 11 Proposed tanks to be taken up in phased manner 12 Expected GW Recharge under Mission Kakatiya 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) 14 Net Saving of Ground water from Mission Bhagiratha (b) DEMAND SIDE INTERVENTION 15 Existing Micro Irrigation Intervention & Gross area irrigated 16 Proposed Micro Irrigation 17 Cost for micro-irrigation 18 Expected ground water saving from micro-irrigation 19 Regulation and control 10 WALTA-Act to be implemented in true spirit. 2 Regulation of power supply in 2	5	No. of Check dams (CD's) / Mini percolation	:	265 (CDs:137+PTs:128)
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11 Proposed tanks to be taken up in phased manner 12 Expected GW Recharge under Mission Kakatiya 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) 14 Net Saving of Ground water from Mission Bhagiratha (b) DEMAND SIDE INTERVENTION 15 Existing Micro Irrigation Intervention & Gross area irrigated 16 Proposed Micro Irrigation 17 Cost for micro-irrigation 18 Expected ground water saving from micro-irrigation (c) REGULATION & COMMUNITY INTERVENTIONS 19 Regulation and control 4 tanks (@0.01 MCM) 5 0.11 MCM(30 % of capacity) 1 2.14 MCM/year 1.28 MCM/year 4 tanks (@0.01 MCM)	10	Mission Kakatiya- Repair & Renovation of	:	0.38 MCM (31 tanks)
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Kakatiya	10			0.11.14(2).6(20.0)
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) 1.28 MCM/year	12	_ =	:	0.11 MCM(30 % of capacity)
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) 14 Net Saving of Ground water from Mission Bhagiratha (b) DEMAND SIDE INTERVENTION 15 Existing Micro Irrigation Intervention & Gross area irrigated 16 Proposed Micro Irrigation 17 Cost for micro-irrigation 18 Expected ground water saving from micro- irrigation (c) REGULATION & COMMUNITY INTERVENTIONS 19 Regulation and control 10 WALTA-Act to be implemented in true spirit. • Regulation of power supply in 2	13	·		2.14 MCM/year
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Bhagiratha		area (From River Krishna)		
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17 Cost for micro-irrigation : * 18 Expected ground water saving from micro-irrigation : * (c) REGULATION & COMMUNITY INTERVENTIONS 19 Regulation and control : • WALTA-Act to be implemented in true spirit. • Regulation of power supply in 2	15		:	44 Micro irrigation units/37.02 ha
18 Expected ground water saving from micro- irrigation : * (c) REGULATION & COMMUNITY INTERVENTIONS : • WALTA-Act to be implemented in true spirit. Property of the property			:	*
irrigation (c) REGULATION & COMMUNITY INTERVENTIONS 19 Regulation and control : • WALTA-Act to be implemented in true spirit. • Regulation of power supply in 2			:	
(c) REGULATION & COMMUNITY INTERVENTIONS 19 Regulation and control : • WALTA-Act to be implemented in true spirit. • Regulation of power supply in 2	18		:	*
INTERVENTIONS 19 Regulation and control : • WALTA-Act to be implemented in true spirit. • Regulation of power supply in 2				
19 Regulation and control : • WALTA-Act to be implemented in true spirit. • Regulation of power supply in 2	(c)			
in true spirit. • Regulation of power supply in 2	10		-	• WAITA Act to be implemented
• Regulation of power supply in 2	17	Regulation and control	•	<u> </u>
				±
				spells @ 4 hours/spell to increase

(d)	OTHER INTERVENTIONS SUGGESTED		 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. Participatory Ground Water Management with community and women participation. Paddy cultivation during rabi 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 Kakatiya and Bhagiratha)	:	19.65 Cr
21	Likely benefit of Interventions	:	~5.29 MCM ground water can be saved from the above interventions. The stage of Ground water development may likely to be come down by 8 % (from 68 % to 60%).

^{* -}All villages fall in command area

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	Borgaon (Kalan)	12	1.81	0.33	5	5	75	0.17
2	Dharmora	8	0.49	0.12	1	0	5	0.06
3	Gotmukkala	6	0.80	0.29	5	5	75	0.15
4	Gunjali	7	1.18	0.36	7	6	95	0.18
5	Gutpa	15	2.51	0.60	11	10	155	0.30
6	Kalladi	16	4.29	0.89	16	16	240	0.45
7	Mamdapur	7	0.24	0.08	0	1	10	0.04
8	Manik Bhandar	14	3.02	0.45	9	8	125	0.23
9	Metpalle	6	0.59	0.20	4	3	50	0.10
10	Mullangi (Binsla)	6	0.40	0.14	2	2	30	0.07
11	Singampalle	11	0.69	0.14	2	2	30	0.07
12	Vaddatipalle	15	0.87	0.13	2	1	20	0.06
13	Vallabhapur	5	0.13	0.06	0	0	0	0.03
14	Venkatapur	10	0.26	0.05	0	0	0	0.03
	Priority-1(Total)				64	59	910	1.92
	Priority-2							
1	Amrad	15	5.41	0.72	14	13	200	0.36
2	Bonkanpalle	6	1.01	0.38	7	6	95	0.19
3	Chikli	6	0.80	0.28	4	5	70	0.14
4	Chinnapur	13	2.45	0.38	7	7	105	0.19
5	Lakmapur	10	0.33	0.07	0	0	0	0.04
6	Madanpalle	15	5.05	0.70	13	12	185	0.35
7	Makloor	8	3.13	0.87	17	16	245	0.43
8	Mamidipalle	13	3.12	0.58	11	10	155	0.29
	Priority-2 (Total)				73	69	1055	1.99
	Total (P-1&P-2)				137	128	1965	3.91