



## **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**

**Bodhan Mandal, Nizamabad District, Telangana**

दक्षिणी क्षेत्र, हैदराबाद

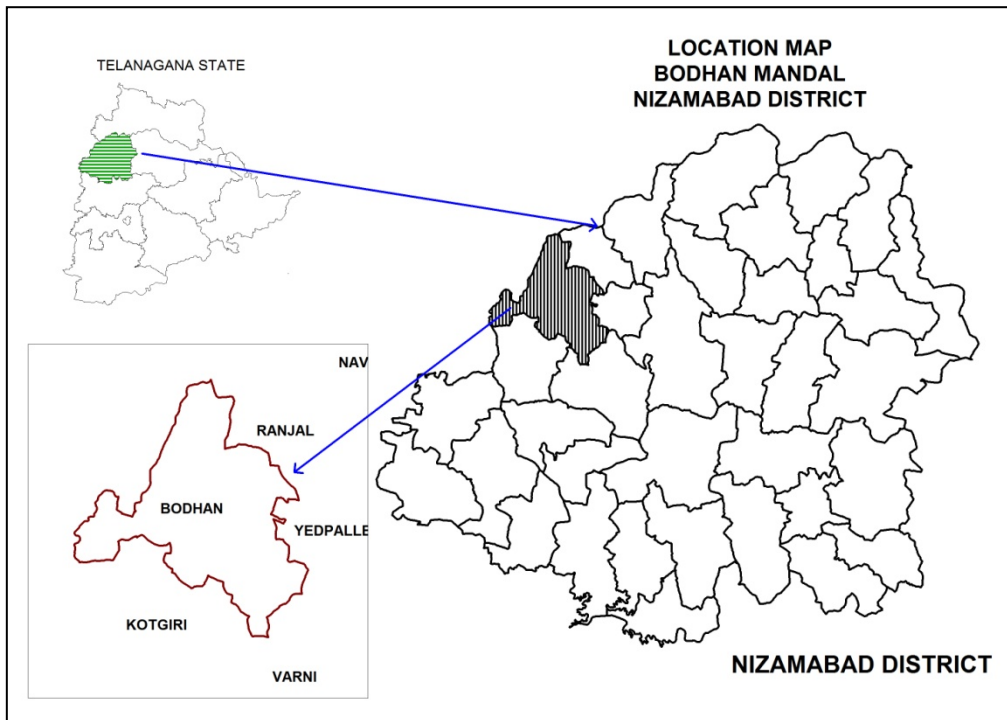
Southern Region, Hyderabad



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**  
**BODHAN MANDAL, NIZAMABAD DISTRICT, TELANGANA STATE**

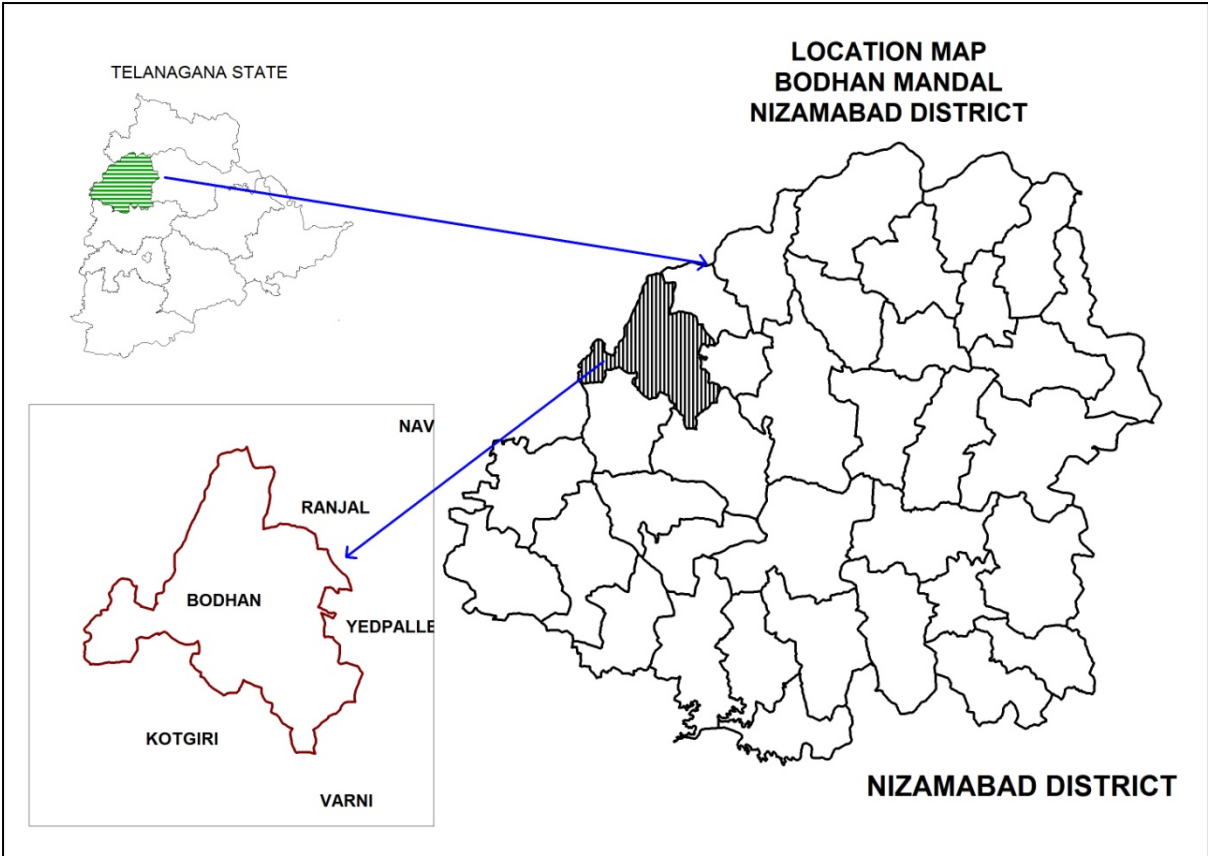


**CENTRAL GROUND WATER BOARD**  
**SOUTHERN REGION**  
**HYDERABAD**  
**AUGUST-2016**

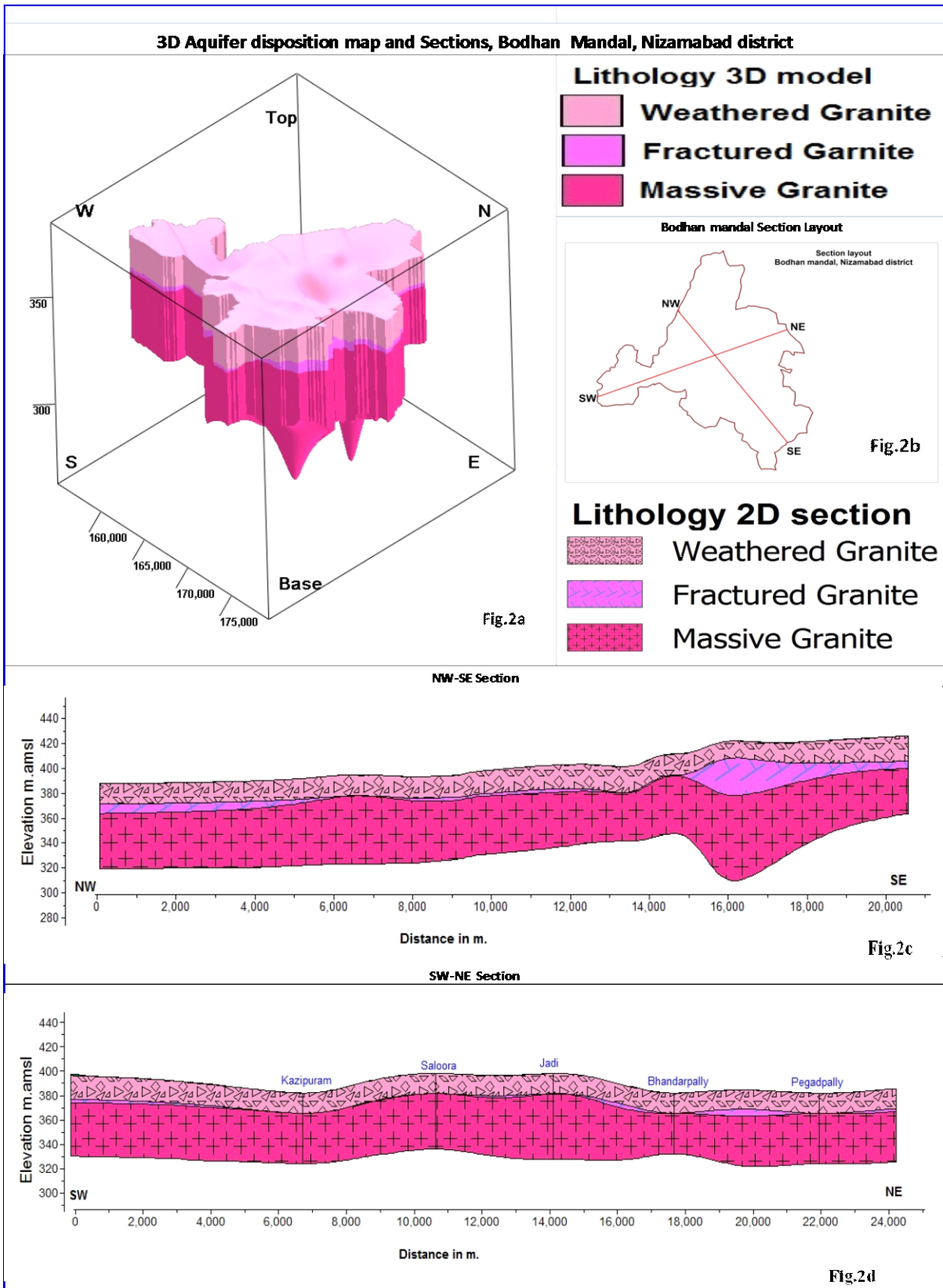
**REPORT ON  
AQUIFER MAPS & MANAGEMENT PLANS  
BODHAN MANDAL, NIZAMABAD DISTRICT, TELANGANA STATE**

<b>SALIENT FEATURES</b>		
1	Name of the Mandal/Area Revenue Division Location <b>(Fig-1)</b>	: <b>BODHAN/272 Km<sup>2</sup> NIZAMABAD</b> EL77 <sup>0</sup> 43'56.00"- 77 <sup>0</sup> 57'25.94" NL18 <sup>0</sup> 34'8.96"-18 <sup>0</sup> 48'50.47"
2	No. of Revenue villages	: <b>39</b>
3	District/State	: <b>Nizamabad/Telangana</b>
4	Population /Density (2011 Census)	: 143749/528 per Km <sup>2</sup>
5	Normal Rainfall (mm)  Actual Rainfall (mm)(2014-2015)	: 1075.5 -Monsoon: 891.2 mm (83%) -Non-Monsoon:183.80 mm (17%)  449.8
6	Agriculture (Ha) (2014-15):	: Kharif season : 1. Net area sown: 17313 2. Paddy: 9147(53%) 3. Total oil seeds: 5364(31%) 4. Total pulses: 231 (1%) 5. Cotton 1575(9%) 6. Other crops: 943(5%)  Rabi season : 1. Net area sown: 9662 2. Paddy: 4002 (41%) 3. Total oil seeds: 2979(31%) 4. Total pulses: 696 (7%) 5. Maize: 634(7%) 6. Other crops :1336(14%)
7	Irrigation (2014-15) (Ha)	: 1. Gross irrigated area: 18792 2. Net irrigated area: 10143 3. Area irrigated more than once: 8649 • Ground water: 17404 • Surface water (Tanks):1388
8	Existing and future water demands (MCM)	Domestic & Industrial • Existing:0.62 • Future (year 2025): 2.82 Irrigation (Existing): 40.75
9	Depth to water level (m bgl)	: 7-23 m (Pre-monsoon) 8-27 m (Post-monsoon)
<b>AQUIFER DISPOSITION</b>		
10	No of Aquifers	: 2
11	3-D aquifer disposition and basic characteristics of each aquifer <b>(3D: Fig-2a Section Layout:2b Sections: 2c &amp; 2d)</b>	: <b>Geology-Granites</b> <b>Aquifer-1 (Weathered Zone):</b> Weathering varies from 11-19 m Transmissivity(T): 6-181 m <sup>2</sup> /day Specific Yield (Sy):0.2 to 2 % <b>Aquifer-2 (Fractured Zone):</b> Depth of fracturing varies from 15-30 m. Transmissivity (T): 10-117 m <sup>2</sup> /day Specific storage (S):0.00001-0.02 Cumulative yield (Aq1 and Aq 2) (lps): 1 to 6

12	Ground water Issues	:	<ul style="list-style-type: none"> <li>• Geogenic contamination by Fluoride.</li> <li>• Anthropogenic contamination by Nitrate.</li> <li>• Sustainability of wells (3-4 hrs)</li> </ul>
13	Ground water resource availability and extraction (MCM)	:	<ul style="list-style-type: none"> <li>• Net GW availability :75.40</li> <li>• Gross Ground Water draft for Irrigation:39.96</li> <li>• Gross Ground water draft for domestic and industrial supply:0.62</li> <li>• Gross GW draft:40.58</li> <li>• Stage of ground water development:54%</li> <li>• Category: Safe</li> </ul>
14	Ground water extraction	:	No of ground water extraction structures :8604 <ul style="list-style-type: none"> <li>• Dug wells :430</li> <li>• Bore wells:8174</li> </ul>
15	Chemical quality of ground water and contamination	:	<b>Pre-monsoon</b> EC ( $\mu\text{S}/\text{cm}$ ) min: 650 max:1800 NO <sub>3</sub> (mg/L): Min :10 and max :80 F (mg/L): Min 0.5 and Max:1.5 <b>Post-monsoon</b> EC ( $\mu\text{S}/\text{cm}$ ) min:450 max:2700 NO <sub>3</sub> (mg/L): Min :10 and max :45 F (mg/L): Min 0.25 and Max 2 1 village are affected with high fluoride( $f > 1.5\text{mg/l}$ )
16	<b>Ground Water Recharge Scenario</b>	:	<b>MCM</b>
16.1	Recharge from Rainfall (Monsoon)	:	27.37
16.2	Recharge from Other sources (Tanks and applied irrigation) (Monsoon)	:	25.89
16.3	Recharge from rainfall (Non-Monsoon)	:	4.41
16.4	Recharge from Other sources (Tanks and applied irrigation) (Non-Monsoon)	:	25.82
16.5	Total annual GW Recharge	:	83.49
16.6	Natural Discharge	:	8.09
16.7	Existing Minor Irrigation Tanks(nos)	:	15
16.8	Storage from existing tanks	:	0.57
16.9	Existing Artificial Recharge Structures (PT, CD and Farm ponds)	:	42/26/800
17	Storage from existing AR Structures	:	0.63



**Fig-1: Location Map of Bodhan Mandal.**



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

**GW MANAGEMENT STRATEGIES,BODHAN MANDAL, NIZAMABAD DISTRICT**

<b>A</b>	<b>WATER RESOURCE AVAILABILITY</b>	
	• Ground water (as per GEC 2012-13)	: 75.40 MCM
	• Surface Water (as per 2014-15 irrigation data)	: 11.10 MCM
	• Total water availability	: 86.5 MCM
<b>(a)</b>	<b>Ground Water Resource Enhancement (Table-1)</b>	
	<b>Supply side Interventions</b>	
1	Aquifer wise space available for recharge and proposed interventions	: 5-24 m
2	Volume of Un-saturated zone (upto 3mbgl)	: 4061.8 MCM
3	Recharge Potential (Sy 2%)	: 81.2 MCM
4	Utilizable Yield available for ARS	: 11.24 MCM
5	No. of Check dams (CD's) / Mini percolation tanks (MPT's) recommended	: 381(CDs:199+PTs:182)
6	Total Cost of ARS	: 28.15 Cr
7	Expected Ground Water Recharge through ARS	: 5.6 MCM
8	Water Conservation Measures (WCM) (Farm Ponds)	: -
9	Total Cost of WCM	: -
10	<b>Mission Kakatiya-</b> Repair & Renovation of existing Tanks	: 0.61 MCM (15 tanks)
11	Proposed tanks to be taken up in phased manner	-
12	Expected GW Recharge under <b>Mission Kakatiya</b>	: 0.18 MCM(30 % of capacity)
13	<b>Mission Bhagiratha</b> (Providing drinking water needs to the entire population) @ 100 lpcd/person (rural) and 135 (urban) from surface water source from outside the mandal area ( <b>From River Krishna</b> )	: 6.09 MCM/year
14	Net Saving of Ground water from <b>Mission Bhagiratha</b>	: 3.15 MCM/year
<b>(b)</b>	<b>DEMAND SIDE INTERVENTION</b>	
15	Existing Micro Irrigation Intervention & Gross area irrigated	: 195 Micro irrigation units/29.67 ha
16	Proposed Micro Irrigation	: *
17	Cost for micro-irrigation	: *
18	Expected ground water saving from micro-irrigation	: *
<b>(c)</b>	<b>REGULATION &amp; COMMUNITY INTERVENTIONS</b>	
19	Regulation and control	: <ul style="list-style-type: none"> <li>• WALTA-Act to be implemented in true spirit.</li> <li>• Regulation of power supply in 2 spells @ 4 hours/spell to increase bore well/GW sustainability.</li> </ul>

			<ul style="list-style-type: none"> <li>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.</li> </ul>
(d)	<b>OTHER INTERVENTIONS SUGGESTED</b>	:	<ul style="list-style-type: none"> <li>Participatory Ground Water Management with community and women participation.</li> <li>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.</li> <li>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.</li> <li>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.</li> </ul>
(e)	<b>EXPECTED RESULTS AND OUTCOME</b>		
20	Total Cost of Interventions (Excluding Mission Kakatiya and Bhagiratha)	:	28.15 Cr
21	Likely benefit of Interventions	:	~8.93 MCM ground water can be saved from the above interventions. The stage of Ground water development may likely to be come down by 6 % (from 54 % to 48%).

\* - 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	Bhicknelli	23	0.9	0.1	2	2	30	0.04
2	Bodhan (M)	5	0.4	0.2	3	0	15	0.08
3	Fathepur	19	0.8	0.1	1	2	25	0.05
4	Hunsa	21	3.6	0.4	7	7	105	0.18
5	Jadijamalpur	19	1.5	0.2	3	3	45	0.09
6	Khajapur	20	1.2	0.1	1	1	15	0.06
7	Khandgaon	23	2.1	0.2	4	3	50	0.11
8	Pegadapalle	24	4.7	0.4	6	6	90	0.22
9	Salampad	12	1.0	0.2	3	3	45	0.09
10	Siddapur	23	2.7	0.3	5	5	75	0.13
11	Taggelli	20	1.5	0.2	3	3	45	0.08
12	Bodhan (Rural)	5	3.6	1.6	30	30	450	0.78
13	Langadapur	22	0.8	0.1	1	1	15	0.04
14	Mallepahad	9	0.4	0.1	2	2	30	0.05
15	Mavandi (Kalan)	23	2.6	0.3	5	5	75	0.13
16	Mavandi (Khund)	24	1.7	0.2	3	3	45	0.08
	<b>Priority-1(Total)</b>				<b>79</b>	<b>76</b>	<b>1155</b>	<b>2.20</b>
	<b>Priority-2</b>							
1	Achampalle (Rural)	13	1.0	0.2	2	2	30	0.08
2	Amdapur	10	1.4	0.3	6	5	80	0.15
3	Bandarupalle	22	1.1	0.1	1	1	15	0.05
4	Bardipur	20	1.9	0.2	3	2	35	0.10
5	Bhavanipet	8	0.6	0.2	3	1	25	0.08
6	Hangerga	22	3.0	0.3	5	5	75	0.15
7	Kaldurthi	23	6.7	0.6	12	12	180	0.31
8	Kopperga	23	2.1	0.2	3	3	45	0.10
9	Ladmavandi	7	0.5	0.2	3	2	35	0.08
10	Lakmapur	9	0.4	0.1	1	0	5	0.05
11	Machapur	17	1.0	0.1	2	1	20	0.06
12	Mandharna	21	5.8	0.6	11	11	165	0.30
13	Minarpalle	7	0.5	0.2	3	2	35	0.08
14	Mittapur	11	0.5	0.1	1	1	15	0.05
15	Naganpalle	12	0.9	0.2	2	2	30	0.08
16	Nagora	8	0.6	0.2	2	1	20	0.08
17	Narsapur	11	0.7	0.1	2	1	20	0.07
18	Ootpalle	13	2.4	0.4	7	7	105	0.20
19	Penta Kalan	22	4.1	0.4	7	7	105	0.20
20	Penta Khurd	11	1.6	0.3	6	5	80	0.15
21	Rampur	22	2.8	0.3	5	4	65	0.14
22	Saloor	18	9.6	1.2	22	21	320	0.58
23	Sangam	8	1.1	0.3	6	5	80	0.15

24	Kummampalle	13	1.4	0.2	5	5	75	0.12
	<b>Priority-2</b>				<b>120</b>	<b>106</b>	<b>1660</b>	<b>3.42</b>
	<b>Total (P-1&amp;P-2)</b>				<b>199</b>	<b>182</b>	<b>2815</b>	<b>5.62</b>

