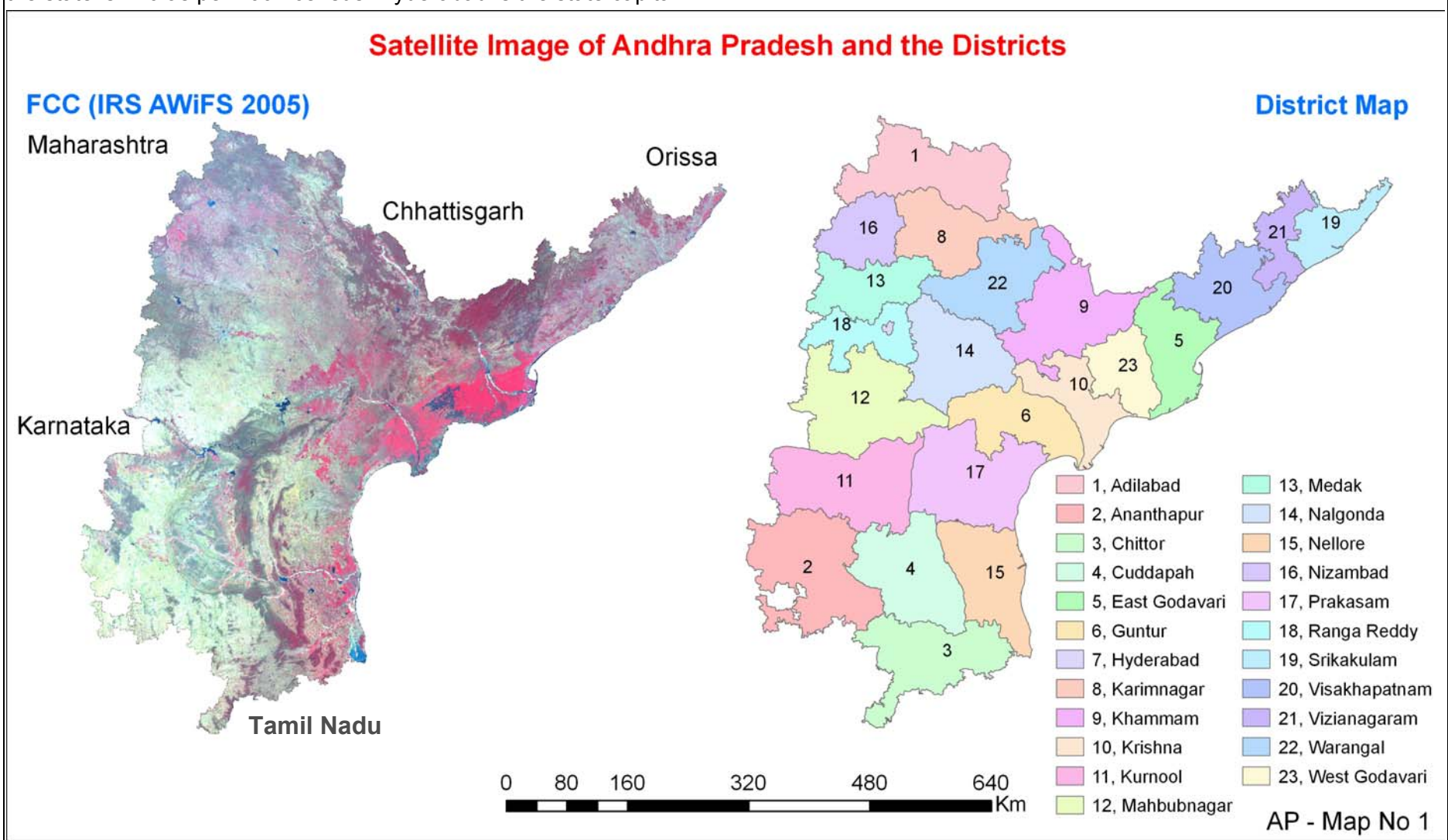
ANDHRA PRADESH

INTRODUCTION

Location and Administrative Setup: Andhra Pradesh situated in the southern part of India is the fifth largest state and was formed on 1st November 1956. It has longest coast line (972 km) amongst all states in India. The state is bounded by Tamil Nadu in the south, Karnataka and Maharashtra in west and Chhattisgarh and Orissa in the north. It is located between 12° 37' to 19° 54' N latitude and 76° 46' to 84° 46' E longitude covering an area of about 27504.500 Th ha (275045 sq. km) which is 8.4% of the total area of the country. The state has 23 districts (Map 1), 79 revenue divisions, 1125 sub-districts and 28123 total villages out of which 26586 villages are inhabited. Total number of towns in the state is 210 as per 2001 census. Hyderabad is the state capital.



Andhra Pradesh is the seventh most populous state in the country. According to 2001 census, total population of the state is 7,57,27,460 out of which 3,82,86,000 (50.56%) are male. Decadal growth in population is 13.86%. The state has population density of 277 persons/sq km. The overall sex ratio is 978 i.e. 978 females per 1000 males showing an increase from previous census. The state has overall literacy rate of 61.11%

Climate: The state has a tropical climate. The average temperature during the cooler months of December and January is 28° C, and in the summer months of May and June the temperature reaches 40°C. Most parts of the state in summer are hot and humid. Hyderabad, the state's capital however, can be hot and dry in the peak summer month of May. The annual average temperature is 31.5°C. The state is principally fed by the southwest monsoon while the northeast monsoon contributes about one-third of rainfall. The east coast region has been prone to disastrous cyclonic storms, which have destroyed much life and the livelihood of the villagers in the area. Rainfall mainly occurs during the monsoon period of June to September (an average of 57 cm) while it is only 3 cm between December and March. About two thirds of rain, falls in the northeastern part of the state.

Land use: Land use statistics for the year 2004–'05 and 2005–'06 is given in Table 1.

Table 1: Major Land Use (Th ha)

PARTICULARS	2004-'05	2005-'06
Forest	6199.225	6199.225
Not Available for Cultivation		
A-Land put to Non Agriculture Uses	2607.795	2615.245
B-Barren and Uncultivable Land	2083.664	2083.664
Other Uncultivable Land Excluding Fallow Land		
A-Permanent Pastures & Grazing Land	676.062	676.062
B-Land under Misc. Tree Crops & Groves	277.805	278.403
C-Cultivable Wastelands	694.418	692.042
Fallow Land		
A-Current Fallow	2818.639	2434.001
B-Old Fallow	1650.702	1623.324
Cropped Area		
A-Net Area Sown	10327.000	10745.000
B-Area Sown More Then Once	2191.078	2617.043
Gross Cropped Area	12518.080	13362.040
Cropping Intensity (%)	121.220	124.360

(Source: www.indiastat.com)

Satellite Data: IRS P4 LISS III data of two different seasons namely, pre monsoon (April-May, 2005) and post monsoon (November-December, 2004) were used for delineation of waterlogged and salt affected areas of various commands of Andhra Pradesh.

WATER RESOURCES AND COMMAND AREAS

Water Resources: Andhra Pradesh state is rich in water resources. River Godavari is the largest and broadest river in the southern India, which originates at Triambakeshwar near Nasik in Maharashtra. River Krishna enters the state at Alampur after having originated at Mahabaleshwar in Maharashtra. Tungabhadra is an important tributary of the river Krishna. Nagarjunasagar Dam at Nandi Konda, Srisailam project at Srisailam and Prakasam barrage at Vijayawada, are constructed on this river. Pennar, Vamsadhara and Nagavali are other important rivers. All the rivers are rain fed and of great economic significance because they are the source for hydropower and irrigation. The two major lakes in the state are the Kolleru and Pulicat. While the Kolleru lake lies in the delta between the rivers Krishna and the Godavari, the Pulicat lake is located in the southern tip of Nellore district, close to the sea.

Total availability of surface and ground water in the state is 10.82 M Ha m. Current utilisation of surface water resources is 4.963 M Ham. Surface water is major sources of irrigation and accounts for about 38% of the entire irrigated area of the state. Andhra Pradesh state is rich in reservoirs and tank resources.

Command Areas: There are 166 irrigation commands in Andhra Pradesh. Number of major and medium irrigation commands are 54 and 112, respectively (Map 2).

WATER LOGGING AND SALT AFFECTED AREAS IN MAJOR AND MEDIUM IRRIGATION COMMANDS BASED ON SATELLITE REMOTE SENSING

Total waterlogged area in the state is 28.267 Th ha, out of which 25.812 Th ha perennial and 2.455 Th ha seasonal. Out of 166 irrigation commands, 13 commands have area under waterlogging category with highest in Krishna and Pennar delta commands. Salt affected area covers 12.933 Th ha. Total 1397 soil samples were collected to check the salinity / alkalinity in the command. Tungabhadra command has maximum salt affected area. Table 2 and Map 3 show the salt affected area and waterlogged areas in major and medium irrigation commands in Andhra Pradesh state.

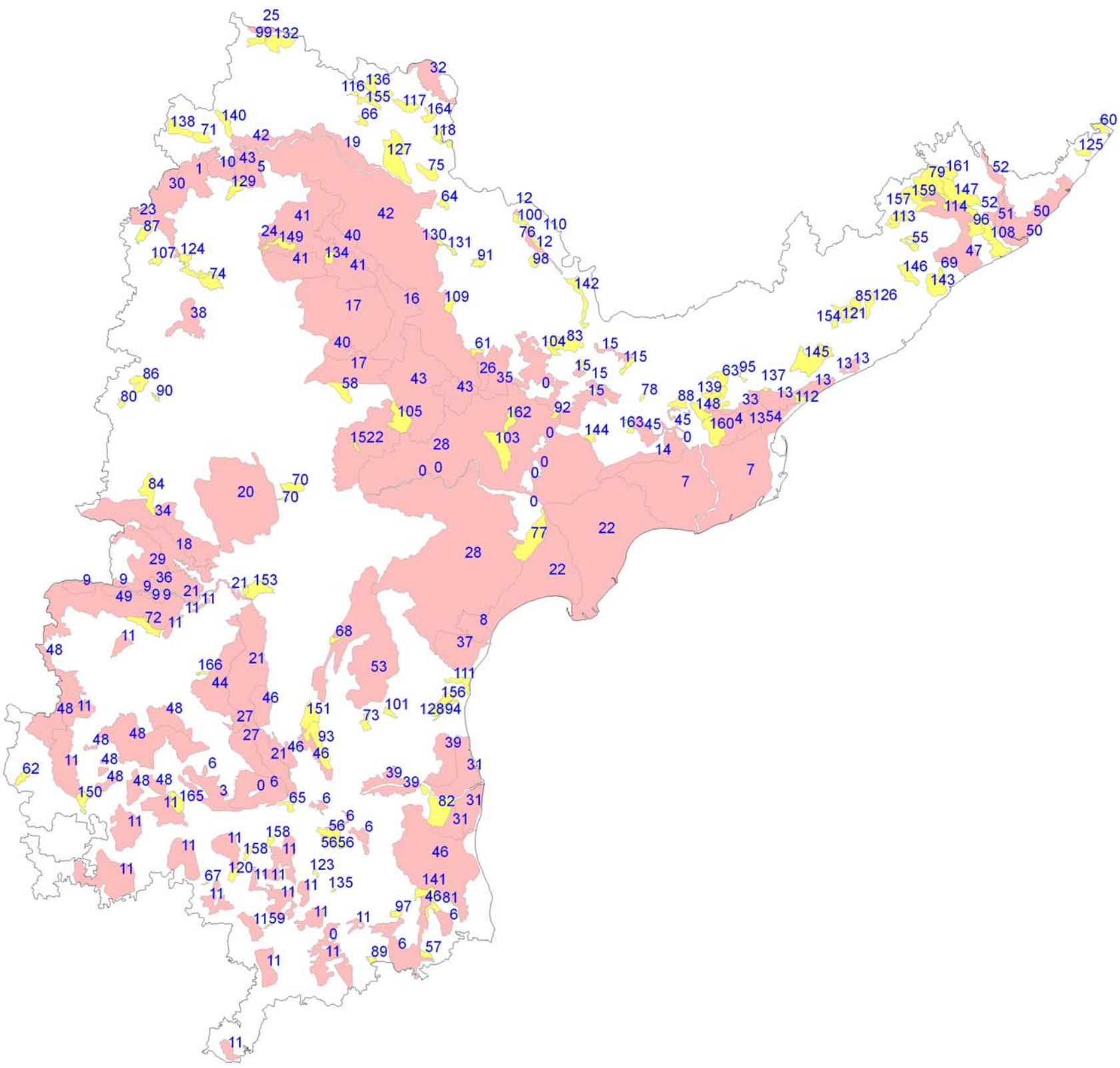
Table 2: Waterlogged and Salt Affected Area in major and medium irrigation commands of state

Code	Command name	Type	Waterlogged area (Th ha)	Salt affected area (Th ha)
1	Ali sagar lift	Major	0.000	0.086
2	Alimineti Madhava Reddy(SLBC)	Major	0.000	0.000
3	CBR+PBC (Chitravathi balancing reservoir (Pulivendla branch canal))	Major	0.000	0.022
4	Chagalndu lift	Major	0.000	0.000
5	Choutaplly Hanuman Reddy lift	Major	0.000	0.187
6	GNSS (Galeru Nagari Sujala Sravanthi)	Major	0.000	0.234
7	Godavari delta	Major	2.877	1.131
8	Gundalakamma	Major	0.414	0.300
9	Guru Raghanvendra lift	Major	0.000	0.108
10	Guthpa (Argul Rajaram) lift	Major	0.000	0.000
11	HNSS (Handri Neeva Sujala Sravanti)	Major	0.000	2.448
12	Inchampally	Major	0.000	0.000
13	Indira sagar	Major	0.000	0.000
14	Indira sagar (Polavaram) lift	Major	0.000	0.000
15	Indirasagar RNC (Polavaram)	Major	0.000	0.000
16	JCR Godavari lift phase I	Major	0.000	0.000
17	JCR Godavari lift phase III	Major	0.000	0.005
18	Jurala (Priyadarshini)	Major	0.000	0.000
19	Kaddam Narayan Reddy	Major	0.039	0.000
20	Kalvakurthi (Mahatma Gandhi) lift	Major	0.000	0.216
21	KCC (Kurnool Cuddapah canal)	Major	0.000	0.199
22	Krishna delta	Major	13.160	0.480
23	Lendi	Major	0.000	0.093
24	Lower Manair	Major	0.000	0.000
25	Lower Penganga	Major	0.000	0.000
26	Munneru	Major	0.000	0.000
27	Mylavaram	Major	0.000	0.000
28	Nagarjun sagar	Major	0.067	1.396
29	Nattampadu (Jawahar) lift	Major	0.000	0.086
30	Nizam sagar	Major	0.042	0.078
31	Pennar delta	Major	4.837	0.103
32	Pranahita lift	Major	0.000	0.000
33	Pushkaram lift	Major	0.000	0.000
34	Rajeev sagar (Bheema) lift I & II	Major	0.000	0.050
35	Rajiv sagar (Dummagudem) lift	Major	0.000	0.000
36	Rajolibanda diversion	Major	0.000	0.047
37	Ramathirtham	Major	0.000	0.102
38	Singoor	Major	0.000	0.175
39	Somasaila	Major	0.000	0.000
40	Sri Ram Sagar flood flow	Major	0.000	0.000
41	Sripad sagar (Yellampalli)	Major	0.000	0.471
42	Sriram sagar stage I (Pochampad)	Major	0.000	0.459
43	Sriram sagar stage II	Major	0.000	0.017
44	Sriseilam RBC	Major	0.249	0.000
45	Tadipudi lift	Major	0.000	0.000
46	Telugu Ganga	Major	1.559	0.128
47	Thotapalli barrage	Major	0.000	0.000
48	Tungabhadra HLC	Major	0.000	1.584
49	Tungabhadra low level canal	Major	0.000	1.279
50	Vamsadhara stage I	Major	3.850	0.000
51	Vamsadhara stage II phase I	Major	0.000	0.000
52	Vamsadhara stage II phase II	Major	0.000	0.000
53	Veligonda (Polsubbarai)	Major	0.097	0.518
54	Yeleru	Major	0.000	0.101
55	Andra	Medium	0.000	0.000
56	Annamayya (Cheyyeru)	Medium	0.000	0.000
57	Araniar	Medium	0.000	0.000
58	Asifnahar	Medium	0.000	0.000
59	Bahuda	Medium	0.000	0.000
60	Bahuda barrage	Medium	0.000	0.000

Code	Command name	Type	Waterlogged area (Th ha)	Salt affected area (Th ha)
61	Bayyaram	Medium	0.000	0.000
62	Bhairavanithippa	Medium	0.000	0.010
63	Bhupathipalem	Medium	0.000	0.000
64	Boggulavagu	Medium	0.000	0.000
65	Buggavanka	Medium	0.000	0.000
66	Chelmelavagu (N.T.R.Sagar)	Medium	0.000	0.000
67	Chennarayaswamy gudi	Medium	0.000	0.000
68	Cumbum	Medium	0.000	0.071
69	Denkada	Medium	0.000	0.000
70	Dindi	Medium	0.000	0.000
71	Gaddanavagu	Medium	0.000	0.000
72	Gajuladinne	Medium	0.000	0.000
73	Gandipalem	Medium	0.000	0.000
74	Ghanapur	Medium	0.000	0.032
75	Gollavagu	Medium	0.000	0.000
76	Gundlavagu	Medium	0.000	0.000
77	Guntur channel	Medium	0.000	0.000
78	Jalleru	Medium	0.000	0.000
79	Janjavathi	Medium	0.000	0.000
80	Jutpally	Medium	0.000	0.000
81	Kalangi	Medium	0.000	0.000
82	Kanupur canal	Medium	0.000	0.000
83	Kinnerasani	Medium	0.000	0.000
84	Koil sagar lift	Medium	0.000	0.176
85	Konam	Medium	0.000	0.000
86	Kotepally vagu	Medium	0.000	0.000
87	Koulasanala	Medium	0.000	0.119
88	Kovvadakalva	Medium	0.000	0.000
89	Krishnapuram	Medium	0.000	0.000
90	Lakhnapur	Medium	0.000	0.000
91	Lakhnavaram	Medium	0.000	0.000
92	Lankasagar	Medium	0.000	0.000
93	Lower Sagileru	Medium	0.000	0.000
94	Lower Upputeru	Medium	0.000	0.000
95	Maddigedda	Medium	0.000	0.000
96	Madduvalasa	Medium	0.000	0.000
97	Mallimadugu	Medium	0.000	0.000
98	Malluruvagu	Medium	0.000	0.000
99	Mathadivagu	Medium	0.000	0.000
100	Modikuntavagu	Medium	0.000	0.000
101	Mopadu	Medium	0.000	0.000
102	Mukkamamidi	Medium	0.000	0.000
103	Muniyeru	Medium	0.000	0.000
104	Murredivagu	Medium	0.000	0.000
105	Musi	Medium	0.000	0.000
106	Musurumilli	Medium	0.000	0.000
107	Nallavagu	Medium	0.000	0.000
108	Narayanapuram	Medium	0.000	0.000
109	Pakhal	Medium	0.000	0.000
110	Palemvagu	Medium	0.000	0.000
111	Paleru Bitragunta	Medium	0.268	0.000
112	Pampa	Medium	0.000	0.000
113	Peddagedda	Medium	0.000	0.000
114	Peddankalam	Medium	0.000	0.000
115	Peddavagu	Medium	0.000	0.000
116	Peddavagu (Dasnapur)	Medium	0.000	0.000
117	Peddavagu (Jagannadhapur)	Medium	0.000	0.000
118	Peddavagu (Neelwai)	Medium	0.000	0.000
119	Peddavagu	Medium	0.000	0.000

Code	Command name	Type	Waterlogged area (Th ha)	Salt affected area (Th ha)
120	Pedderu (Chittor)	Medium	0.000	0.000
121	Pedderu (Vishakhapatnam)	Medium	0.000	0.000
122	Pennar Kumudvathi(DS)	Medium	0.000	0.000
123	Pincha	Medium	0.000	0.000
124	Pocharam	Medium	0.808	0.140
125	Pydigam	Medium	0.000	0.000
126	Raiwada	Medium	0.000	0.000
127	Ralivagu	Medium	0.000	0.000
128	Rallapadu	Medium	0.000	0.000
129	Ramadugu	Medium	0.000	0.000
130	Ramappa	Medium	0.000	0.000
131	Salivagu	Medium	0.000	0.000
132	Sathanala	Medium	0.000	0.000
133	Seethanagaram	Medium	0.000	0.000
134	Shanigaram	Medium	0.000	0.000
135	Siddalagandi	Medium	0.000	0.000
136	Sri Komarambheem	Medium	0.000	0.000
137	Subbareddy	Medium	0.000	0.000
138	Suddavagu	Medium	0.000	0.000
139	Surampalem	Medium	0.000	0.000
140	Swarna	Medium	0.000	0.090
141	Swarnamukhi	Medium	0.000	0.000
142	Taliperu	Medium	0.000	0.000
143	Tarakarama Thirtha Sagaram	Medium	0.000	0.000
144	Thammileru	Medium	0.000	0.005
145	Thandava	Medium	0.000	0.000
146	Thatipudi	Medium	0.000	0.000
147	Thotapalli regulator	Medium	0.000	0.000
148	Torrigedda	Medium	0.000	0.000
149	Upper Maniar	Medium	0.000	0.000
150	Upper Pennar	Medium	0.000	0.116
151	Upper Sagileru	Medium	0.000	0.000
152	Utkoor Marepally	Medium	0.000	0.000
153	Varadarajaswamy gudi	Medium	0.000	0.000
154	Varaha	Medium	0.000	0.000
155	Vattivagu	Medium	0.000	0.000
156	Veera Raghavani Kota	Medium	0.000	0.000
157	Vegavathi	Medium	0.000	0.000
158	Veligallu	Medium	0.000	0.025
159	Vengalarayasangram	Medium	0.000	0.000
160	Venkatnagaram	Medium	0.000	0.000
161	Vottigedda	Medium	0.000	0.000
162	Wyra	Medium	0.000	0.012
163	Yerrakalva	Medium	0.000	0.000
164	Yerravagu (P P Rao)	Medium	0.000	0.000
165	Yogivemana(Maddileru)	Medium	0.000	0.031
166	Zurreru	Medium	0.000	0.000
	TOTAL		**28.267**	**12.933**

Distribution of Major and Medium Irrigation Commands in Andhra Pradesh



1 Major comamnd areas with code

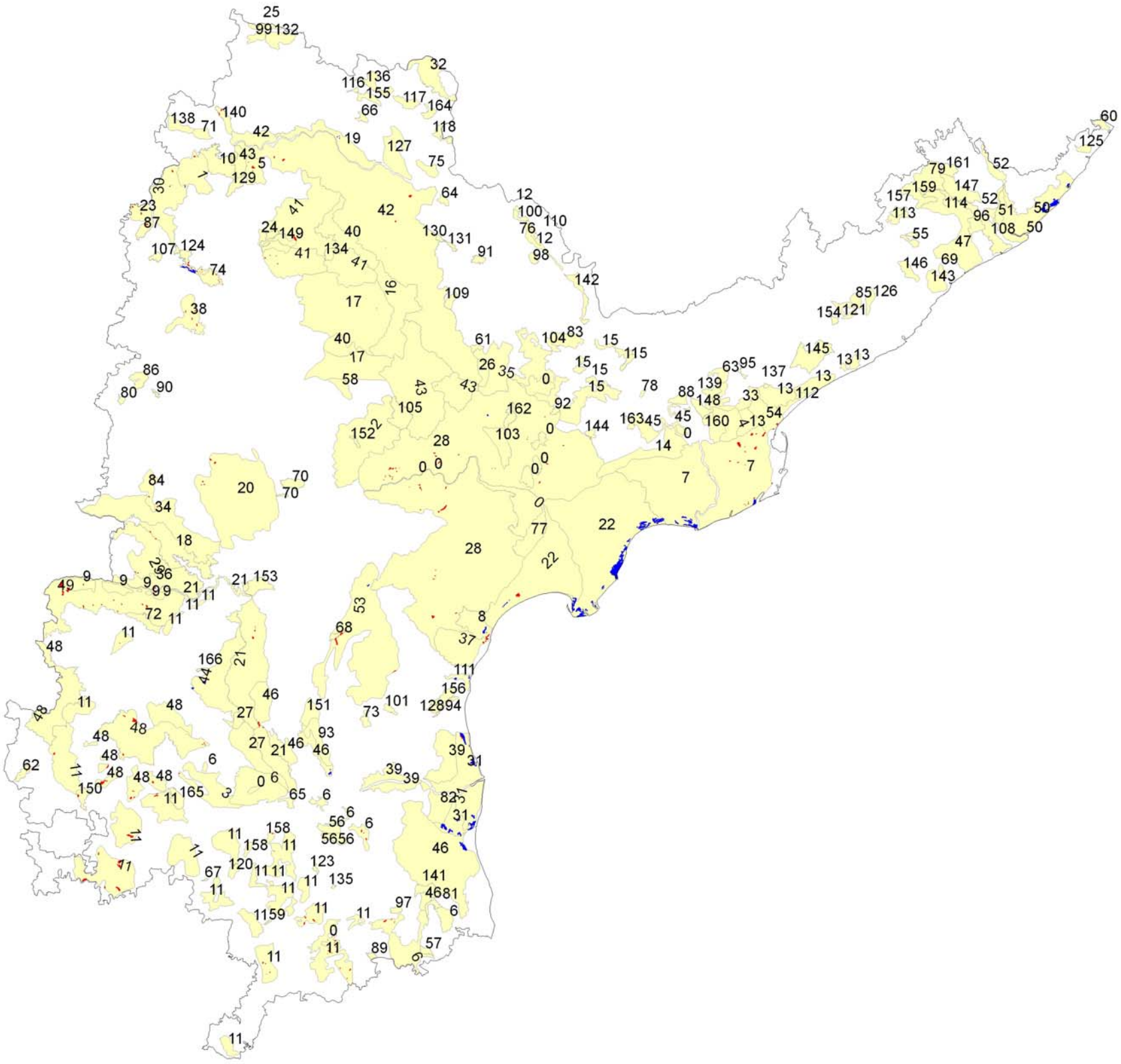
55 Medium comamnd areas with code

0 35 70 140 210 280 Kms

AP - Map No 2

Source: WRD, Andhra Pradesh

Waterlogged and Salt Affected Areas in the Commands of All Major and Medium Irrigation Projects of Andhra Pradesh Using Satellite Remote Sensing



Salt Affected Area
Waterlogged Area
Command Area

0 35 70 140 210 280 Kms

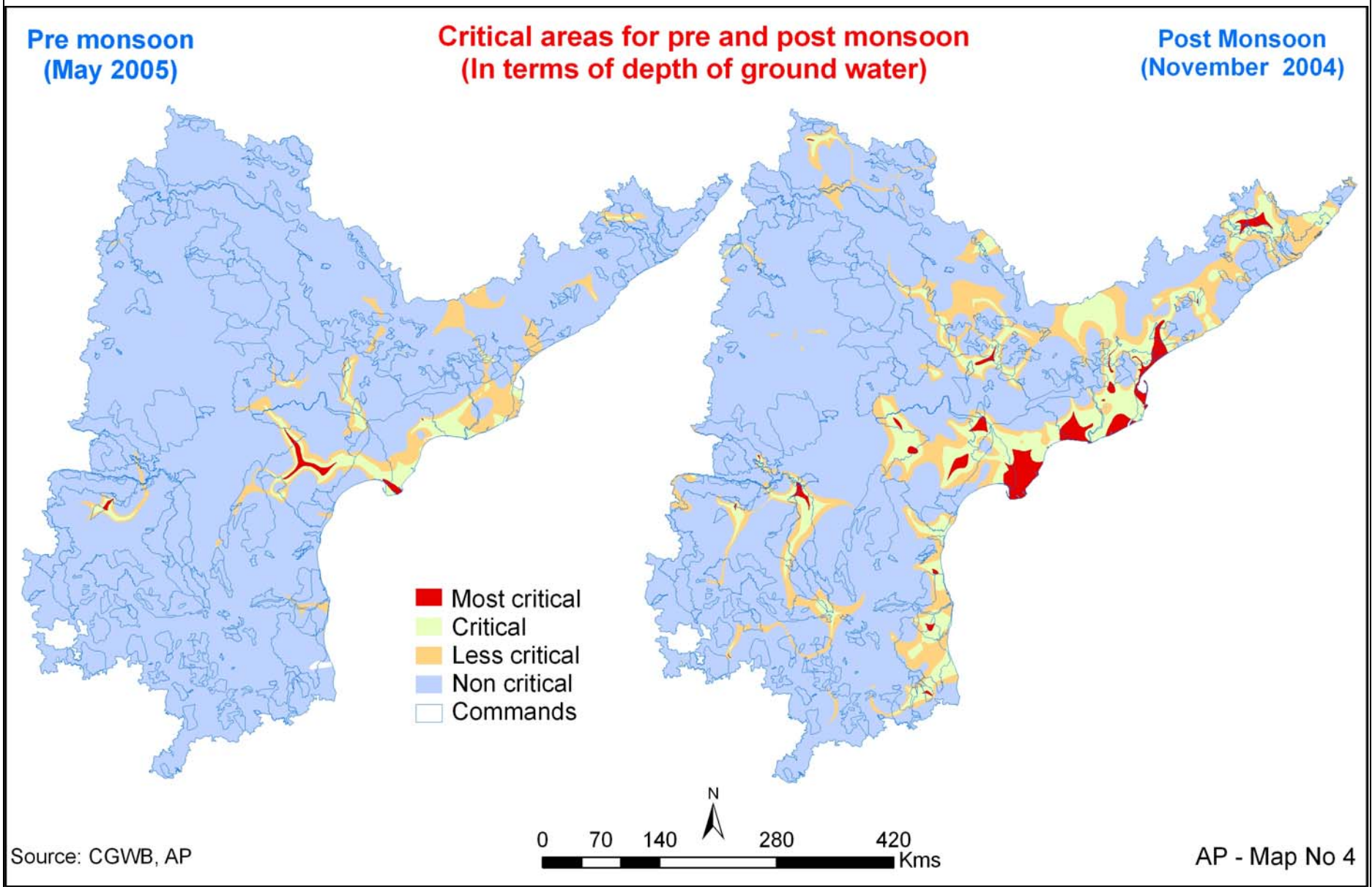
AP - Map No 3

Source: RRSSC/ISRO Jodhpur

For demarcation of critical waterlogged areas due to rise in water table depth, ground water table data of monitoring stations of CGWB were used. Table 3 and Map 4 show the critical area of depth of ground water for pre (May, 2005) and post (November, 2004) monsoon.

Table 3: Critical Area of Depth of Ground Water for Pre (May, 2005) and Post (November, 2004) Monsoon

	Most critical (< 1m)		Critical (1 – 2 m)		Less critical (2 – 3 m)		Non-critical (> 3 m)	
	(Th ha)	(%)	(Th ha)	(%)	(Th ha)	(%)	(Th ha)	(%)
Pre Monsoon (May, 2005)	63.320	0.54	485.390	4.17	830.890	7.14	10251.800	88.15
Post Monsoon (November, 2004)	428.530	3.68	1478.440	12.71	1581.740	13.60	8142.700	70.01



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