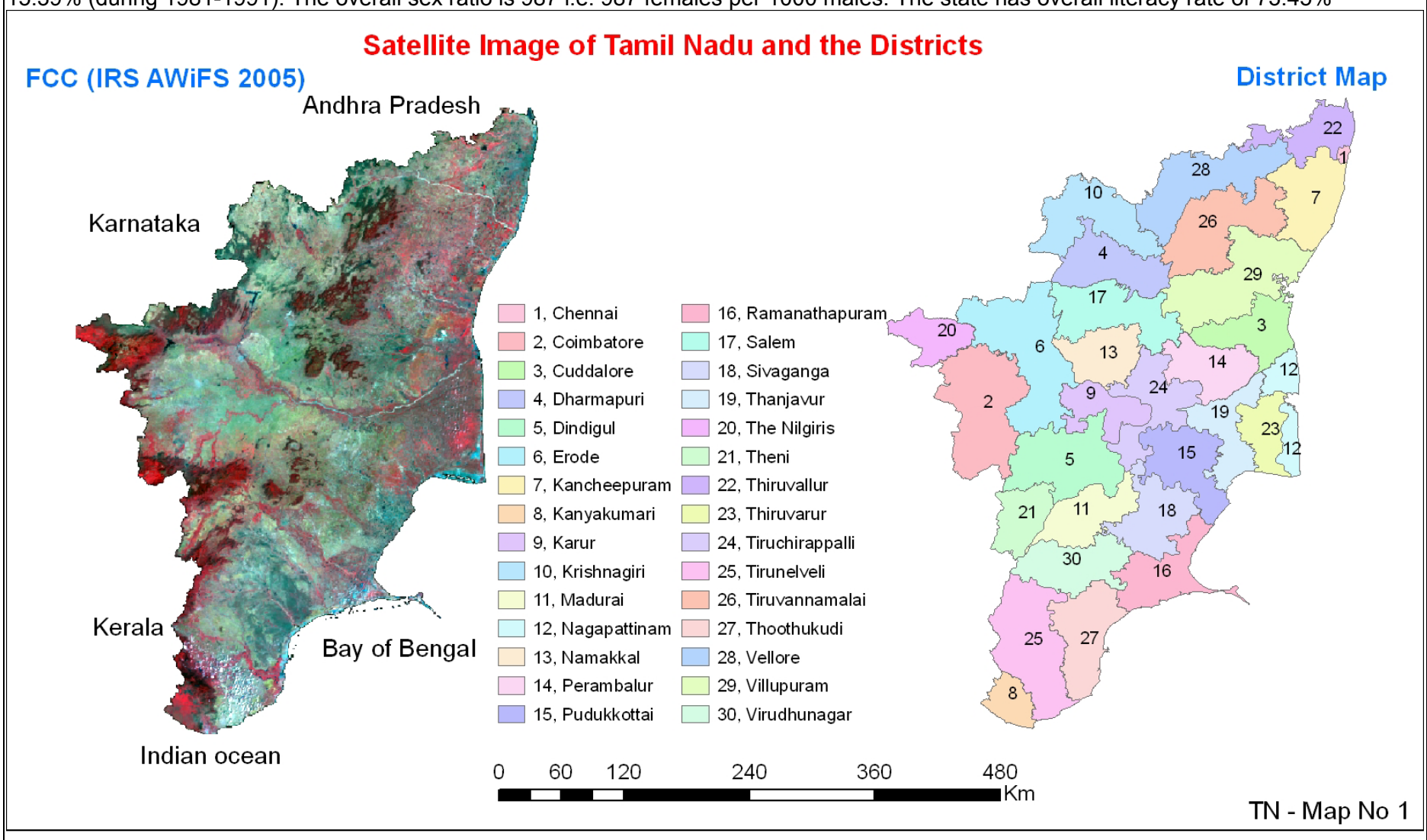
TAMIL NADU

INTRODUCTION

Location and Administrative Setup: Tamil Nadu, the southernmost state of India, is located between 8° 05' and 13° 34' N latitude and 76° 14' and 80° 21' E longitude. The state covers an area of 13005.800 Th. ha (130058 sq. km) which accounts for about 4 % of total area of country. It is bounded by Andhra Pradesh on the north, Karnataka on the northwest, and Kerala on the west. The eastern coast has the Bay of Bengal whereas the southern coast has the Indian Ocean as boundaries. The coast is nearly 1000 km long. The state has 30 administrative districts (Map 1) with 201 sub-districts, 186 tehsils, 386 CD blocks, 832 towns and 16317 villages. Chennai is the state capital.
According to 2001 census total population of the states stood at 6,24,05,679 out of which 3,14,00,909 (50.31%) are males. The rural population comprises of about 55.96% of total population. The higher percentage of rural population indicates agriculture as mainstay of livelihood. The state has population density of 478 persons per sq. km. Decadal growth rate of population has decreased to 11.19% (during 1991-2001) from 15.39% (during 1981-1991). The overall sex ratio is 987 i.e. 987 females per 1000 males. The state has overall literacy rate of 73.45%



Climate: Tamil Nadu has an equatorial, tropical climate in the inlands and an equatorial, maritime climate in its coastal regions. By and large, the average temperature for most parts of the state ranges between 28˚C to 40˚C during summer and 18˚C to 26˚C during short-lived winter season. The temperature may go to extremes in some places in the inlands while it tends to be moderate in the coastal areas. In the hilly terrain, the maximum and minimum temperatures vary between 23˚C and 12˚C. Temperature variation in plain areas is between 33˚C and 21˚C. Average annual rainfall is around 911.6 mm.

Land use: Land use statistics for the year 2003–'04 and 2005–'06 is given in Table 1.

Table 1: Major Land Use (Th ha)

PARTICULARS	2003-'04	2005-'06
Forest	2122.000	2111.000
Not Available for Cultivation		
A-Land put to Non Agriculture Uses	2113.000	2138.000
B-Barren and Uncultivable Land	509.000	503.000
Other Uncultivable Land Excluding Fallow Land		
A-Permanent Pastures & Grazing Land	1134.000	1103.000
B-Land under Misc. Tree Crops & Groves	282.000	247.000
C-Cultivable Wastelands	379.000	368.000
Fallow Land		
A-Current Fallow	954.000	758.000
B-Old Fallow	1662.000	1518.000
Cropped Area		
A-Net Area Sown	4689.000	5244.000
B-Area Sown More Then Once	626.000	789.000
Gross Cropped Area	5316.000	6033.000
Cropping Intensity (%)	113.30	115.04

(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 Tamil Nadu.

WATER RESOURCES AND COMMAND AREAS

Water Resources: Tamil Nadu state has 34 river basins divided into 17 major river basins, all flowing eastwards from the Western Ghats and Deccan plateau. Many areas fall in rain shadow regions receiving less than or around 400mm rainfall making them drought prone. Surface water potential in Tamil Nadu is about 852 TMC including 261 TMC from neighbouring states. Ground water potential is assessed about 790 TMC. Surface water resources have been fully harnessed by impounding the available water in large dams, small dams, drinking water reservoir and tanks. Rivers, tanks and tubewells are major source of surface irrigation.

Command Areas: There are 83 irrigation commands in Tamil Nadu. Number of major and medium irrigation commands are 3 and 80, respectively (Map 2).

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

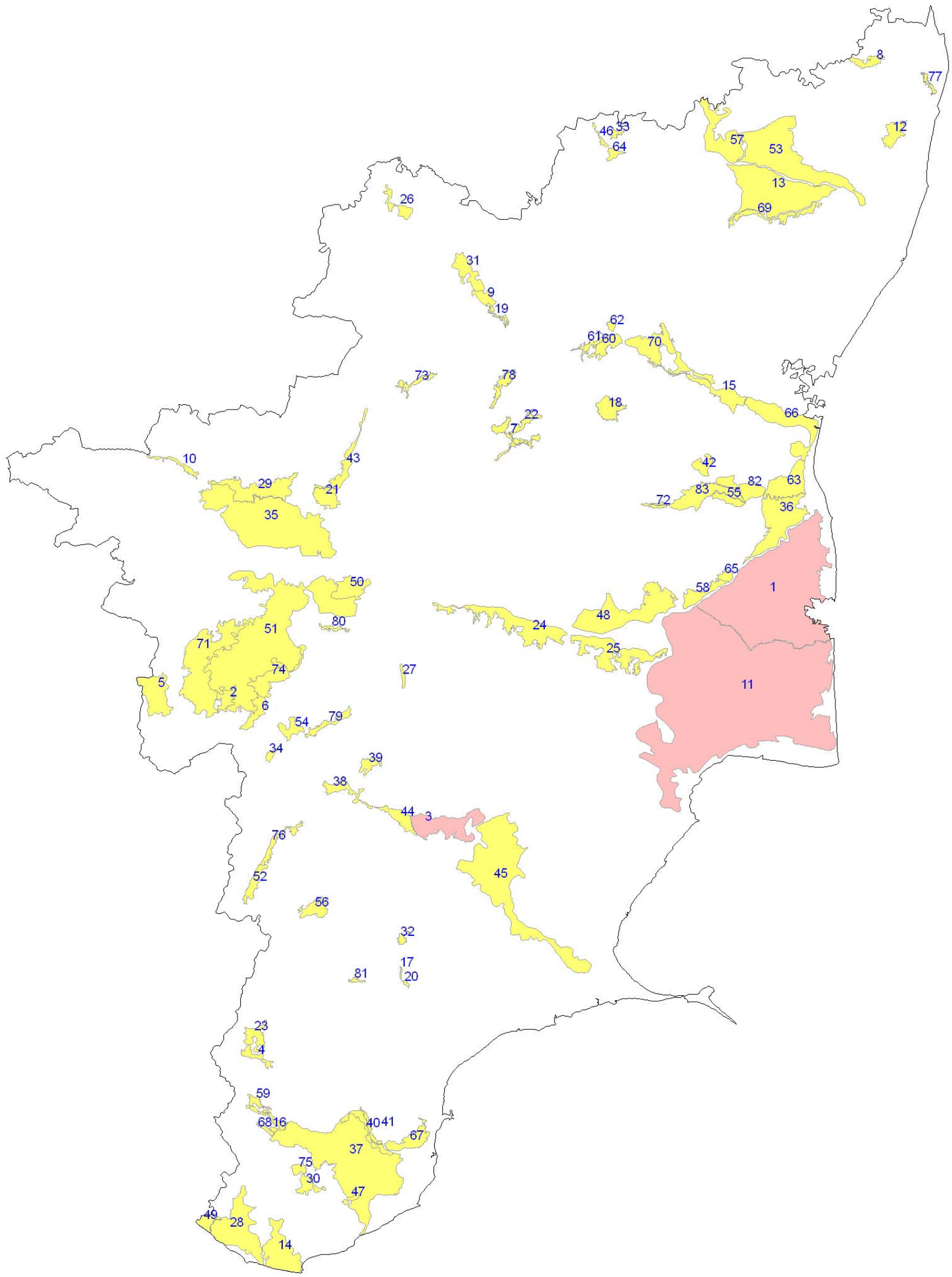
Total waterlogged area in the state is 32.518 Th ha out of which 1.290 Th ha is perennial and 31.228 Th ha is seasonal. Out of 83 irrigation commands, waterlogging does not exist in 46 commands. Cauvery Mettur command followed by Kattalai High Level canal system has maximum area under waterlogging. Total 424 soil samples were collected to check the salinity / alkalinity in the command. Total salt affected area in the state is 30.696 Th ha. Lower Bhavani 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 Tamil Nadu state.

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

Code	Command name	Type	Waterlogged area (Th Ha)	Salt affected area (Th Ha)
1	Cauvery delta system	Major	8.500	0.086
11	Cauvery Mettur	Major	7.812	0.720
3	Periyar system	Major	1.845	0.231
4	Adavinainarkoil project system	Medium	0.000	0.141
5	Aliyar reservoir	Medium	0.000	0.012
6	Amaravathy	Medium	0.000	0.037
7	Anaimaduvu reservoir	Medium	0.195	0.011
8	Arniar	Medium	0.097	0.000
9	Barur tank system	Medium	0.011	0.001
10	Bhavanisagar reservoir	Medium	0.000	0.017
12	Chembarambakkam tank	Medium	0.275	0.000
13	Cheyyar anicut system	Medium	0.181	0.000
14	Chittar pattanamkal	Medium	0.000	0.000
15	Ellis choultry anicut	Medium	0.564	0.246
16	Gatana project system	Medium	0.000	0.606
17	Golwarpatti reservoir project	Medium	0.000	0.001
18	Gomukhi reservoir	Medium	0.248	0.001
19	Ichambadi anicut	Medium	0.046	0.012
20	Irukankudi reservoir	Medium	0.000	0.018
21	Kalingarayan anicut system	Medium	0.000	1.590
22	Kariakoil reservoir project system	Medium	0.294	0.000
23	Karuppanadi	Medium	0.000	0.060
24	Kattalai	Medium	0.231	0.015
25	Kattalai high level canal system	Medium	3.269	0.981
26	Kelavarapolli reservoir	Medium	0.000	0.000
27	Kodaganar reservoir	Medium	0.000	0.000
28	Kodayar system	Medium	0.000	0.000
29	Kodivery anicut system	Medium	0.000	0.375
30	Kodumudiar project system	Medium	0.000	0.320
31	Krishnagiri	Medium	0.000	0.000
32	Kullursandi reservoir project	Medium	0.000	0.061
33	Kuppanatham reservoir	Medium	0.025	0.000
34	Kuthiraiyar reservoir	Medium	0.000	0.000
35	Lower bhavani	Medium	0.000	7.378
36	Lower Coleroon anicut system	Medium	1.948	0.033
37	Manimuthar	Medium	0.000	6.491
38	Manjalar project system	Medium	0.000	0.008
39	Marudhanadi	Medium	0.000	0.000
40	Marudur anicut system	Medium	0.000	0.146
41	Maruthur system	Medium	0.000	0.237
42	Meh-Mathur	Medium	0.071	0.103
43	Mettur canal system	Medium	0.068	0.126
44	Mod.of periyar-Vaigai irrigation system stage 1	Medium	0.482	0.020
45	Mod.of periyar-Vaigai irrigation system stage ii	Medium	0.880	2.802
46	Mordhana project system	Medium	0.003	0.000
47	Nambiyar project system	Medium	0.000	0.005
48	Nandhiyar channel	Medium	1.551	0.607
49	Neyyar	Medium	0.000	0.000
50	Noyyal reservoir	Medium	0.000	0.033
51	P.a.p.ayacut extension	Medium	0.000	1.081
52	P.t. rajan channel scheme	Medium	0.000	0.000
53	Palar anicut system	Medium	1.254	0.000
54	Palar porandalar	Medium	0.000	0.000
2	Parambikulam Aliyar	Medium	0.000	0.007
55	Pilandhurai anicut system	Medium	0.058	0.264
56	Pilavukkal	Medium	0.000	0.156
57	Poiney anicut system	Medium	0.339	0.000
58	Pullambadi canal	Medium	0.000	0.000
59	Ramanadhi reservoir	Medium	0.000	1.396
60	Sathanur rbc	Medium	0.000	0.000
61	Sathanur reservoir	Medium	0.002	0.050
62	Sathanur reservoir - stage 1	Medium	0.000	0.000
63	Sethiathope anicut system	Medium	0.598	0.558
64	Shenbagathoppu reservoir	Medium	0.007	0.000
65	Sidhamalli reservoir project system	Medium	0.000	0.000

Code	Command name	Type	Waterlogged area (Th Ha)	Salt affected area (Th Ha)
66	Sornavur anicut	Medium	0.214	0.352
67	Srivaikuntam anicut system	Medium	0.000	0.329
68	Tambraparni anicut system	Medium	0.000	0.082
69	Thandarai anicut system	Medium	0.017	0.000
70	Thirukoilur anicut system	Medium	0.468	1.623
71	Thirumurthi reservior	Medium	0.000	0.136
72	Tholudur project system	Medium	0.003	0.014
73	Thoppaiyar reservoir	Medium	0.027	0.264
74	Upper dam erode	Medium	0.000	0.426
75	Vadakupachaiyar project system	Medium	0.000	0.004
76	Vaigai reservoir	Medium	0.000	0.038
77	Vallur anicut system	Medium	0.101	0.000
78	Vaniar reservoir	Medium	0.127	0.003
79	Varadamanadi	Medium	0.000	0.000
80	Vattamalai Karai Odai reservoir	Medium	0.000	0.007
81	Vembakottai reservoir	Medium	0.000	0.026
82	Virudhachalam anicut system	Medium	0.227	0.081
83	Wellington reservoir	Medium	0.477	0.270
	Total		**32.518**	**30.696**

Distribution of Major and Medium Irrigation Commands in Tamil Nadu



1 Major comamnd areas with code

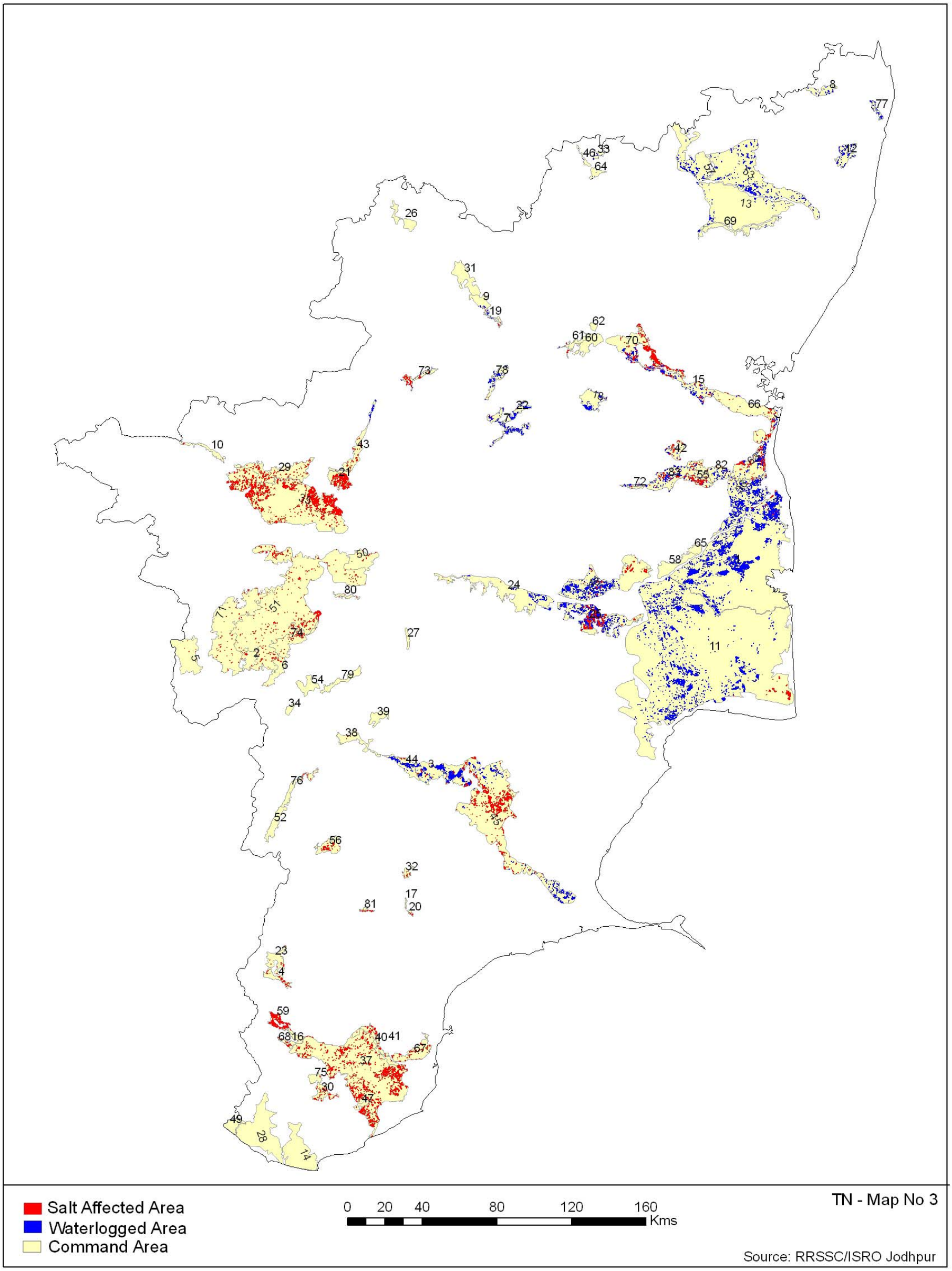
4 Medium comamnd areas with code

0 20 40 80 120 160 Kms

TN - Map No 2

Source: WRO, Tamil Nadu

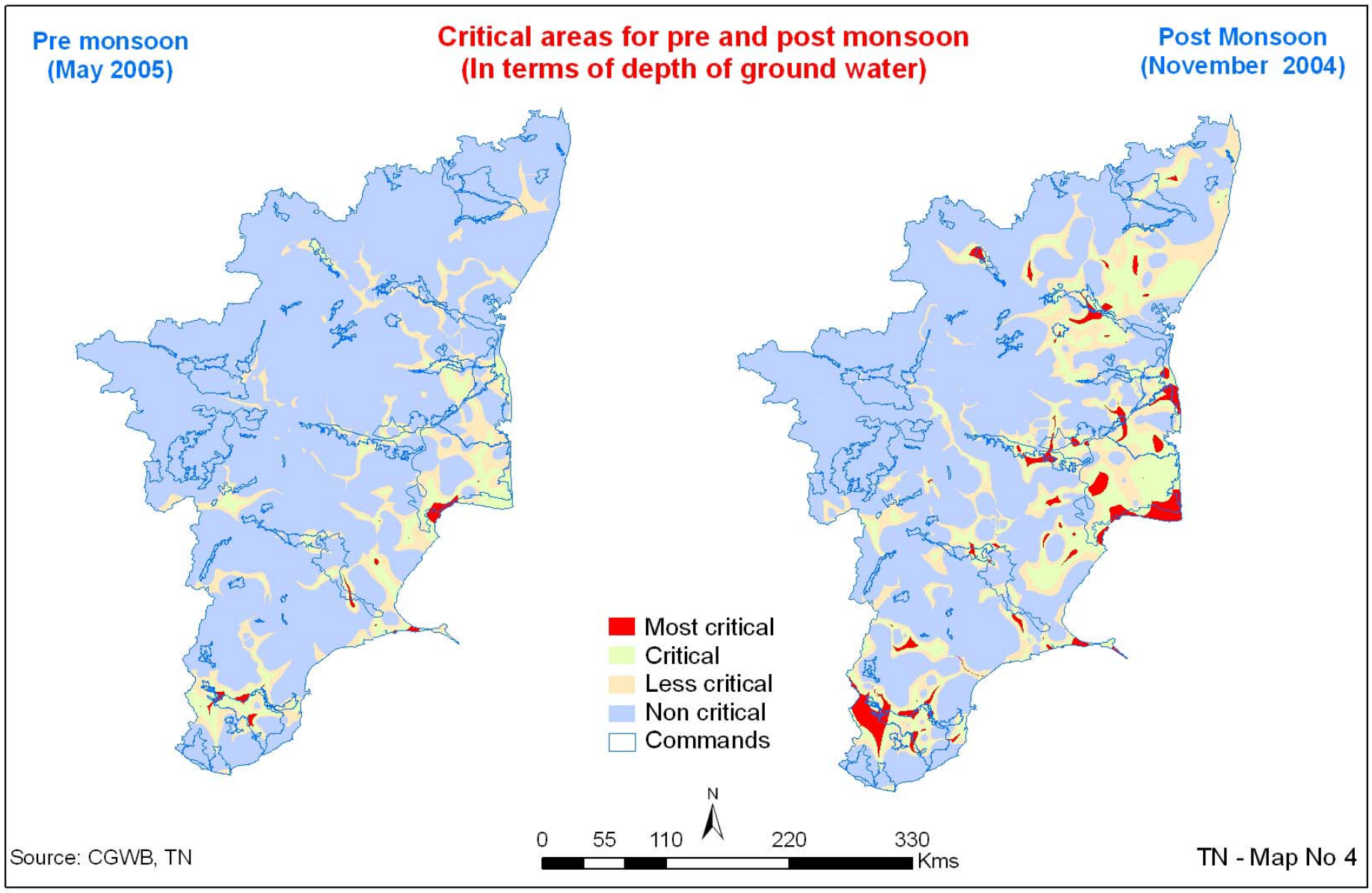
Waterlogged and Salt Affected Areas in the Commands of All Major and Medium Irrigation Projects of Tamil Nadu Using Satellite Remote Sensing



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)	17.970	0.83	254.180	11.70	432.507	19.91	1467.228	67.56
Post Monsoon (November, 2004)	132.540	6.10	536.168	24.69	380.915	17.54	1122.263	51.67



Project Team

Dr. A.K. Bera (PI), RRSSC, Jodhpur
Dr. S. Ramasubramoniam, RRSSC, Jodhpur
Ms. A. Vijaya Banu, RRSSC, Jodhpur
Dr. D. Gowrishankar, RRSSC-CMO, Bangalore
Shri S.K. Singh, CWC, New Delhi

Soil Sample Collection and Analysis support by IN-RIMT, Hyderabad

Acknowledgements

Er. K. Rangaraju Gupta, Engineer-in-Chief, W.R.D
Chief Engineer (General), P.W.D
Er. K. Rajendran, Chief Engineer, Operation & Maintenance and Inter State Water
Er. K. Padmanabhan, Asst. Executive Engineer O/O the Chief Engineer (O & M and ISW)
Agricultural Engineering Department, Chennai
Er. P. Mahalingam, Chief Engineer, State Ground and Surface Water Resources Data Centre
Shri Thiru G. Chandru, Asst. Geologist, State Ground and Surface Water Resources Data Centre
Er. G.J. Kandaswamy, Chief Engineer & Director, Institute of Water Studies, Chennai
Department of Agriculture, Govt. of Tamil Nadu and NBSS & LUP
Dr. N.K. Tyagi, Director, Central Soil Salinity Research Institute, Karnal
Dr. R.C. Sharma, Central Soil Salinity Research Institute, Karnal
Dr. Madhurama Sethi, Central Soil Salinity Research Institute, Karnal
Dr. A.K. Mandal, Central Soil Salinity Research Institute, Karnal
Dr. H. Chandrasekharan, IARI, New Delhi
Dr. D.K. Das, IARI, New Delhi
Dr. Himangshu Pathak, IARI, New Delhi
Shri Hiten Mehta