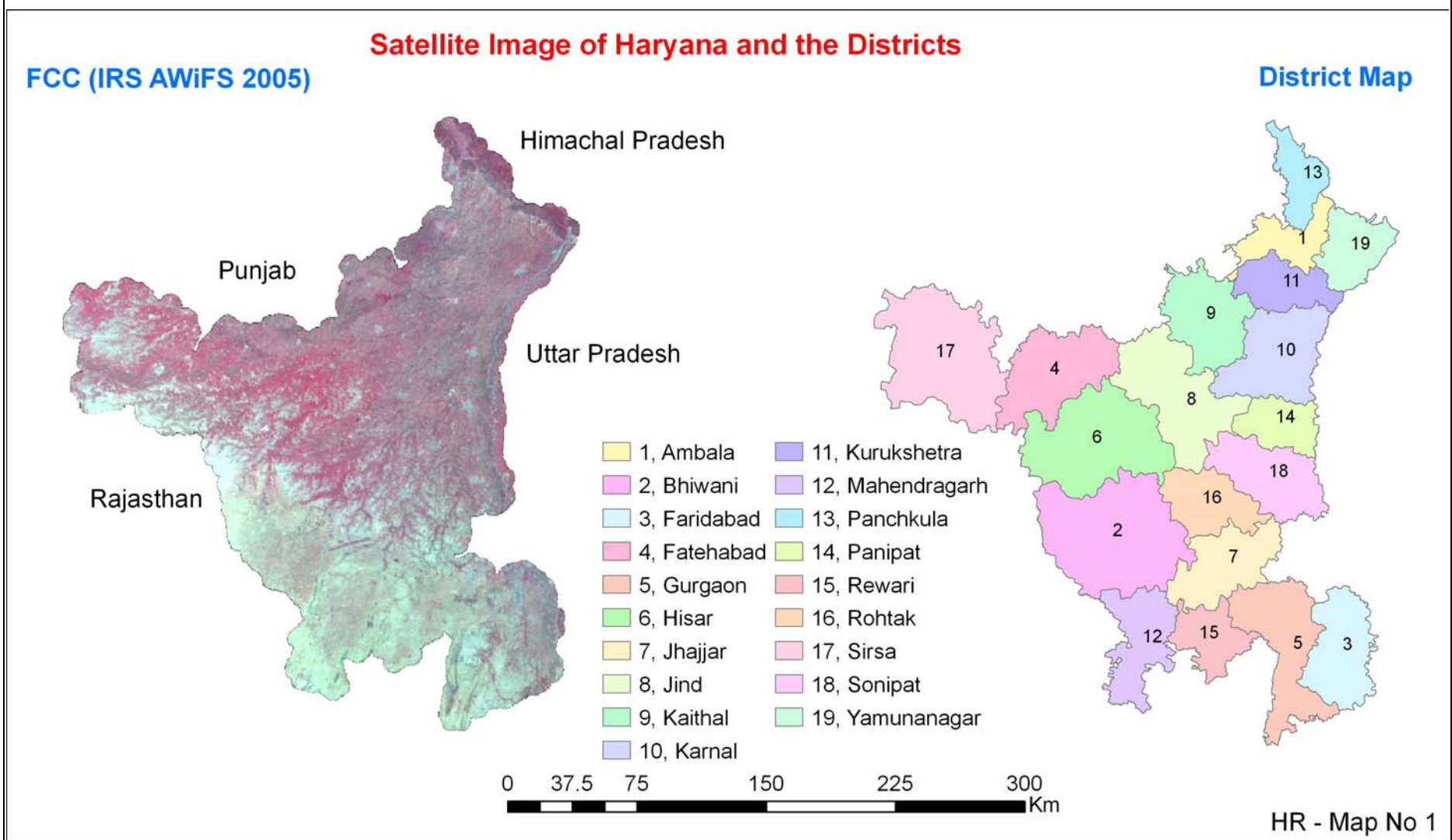
HARYANA

INTRODUCTION

Location and Administrative Setup: Haryana State extends between 27°39' to 30°55' North latitudes and 74°27' to 77°36' East longitudes. It covers a total geographic area of 4421.200 Th ha (44212 sq. km) forming about 1.35% of the total area of India. Punjab and Himachal in the North, Rajasthan in the South and West and Uttar Pradesh in the East bound the state. The state comprises of 19 districts(Map 1), 67 tehsils, 116 blocks and 6759 villages. Chandigarh is the state capital.

According to 2001 census total population of the states stood at 2,10,83,000. The state has population density of 478 persons per sq. km. Decadal growth rate of is 28.06%. The overall sex ratio is 861 i.e. 861 females per 1000 males. The state has overall literacy rate of 57.36%



Climate: The climate of the state is subtropical, semi-arid to sub humid, continental and monsoon type. The state has three distinct climatic regions namely hot arid region, hot semi arid region and hot sub-humid region. The average annual rainfall is about 650mm, which ranges from less than 300mm in the south-western parts to more than 1000 mm in the hilly tracts of Siwaliks hills.

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

Table 1: Major Land Use (Th ha)

PARTICULARS	2004-'05
Forest	44.000
Not Available for Cultivation	
A-Land put to Non Agriculture Uses	429.000
B-Barren and Uncultivable Land	96.000
Other Uncultivable Land Excluding Fallow Land	
A-Permanent Pastures & Grazing Land	25.000
B-Land under Misc. Tree Crops & Groves	6.000
C-Cultivable Wastelands	35.000
Fallow Land	
A-Current Fallow	146.000
B-Old Fallow	4.000
Cropped Area	
A-Net Area Sown	2321.000
B-Area Sown More Then Once	1927.000
Gross Cropped Area	4248.000
Cropping Intensity (%)	183.10

(Source: www.indiastat.com)

Satellite Data: IRS 1D LISS III data of two different seasons namely, pre monsoon (April-May, 2003) and post monsoon (November-December, 2002) were used for delineation of waterlogged and salt affected areas of various commands of Haryana.

WATER RESOURCES AND COMMAND AREAS

Water Resources: River Yamuna flows along eastern boundary of the state. The river Ghaggar is its main seasonal river. Markand river is another seasonal river which originates from lower Shivalik hills. Annual replenishable ground water resources are 9.31 BCM and stage of ground water development is 109%.

Command Areas: There are 9 irrigation commands in Haryana and all are major commands (Map 2).

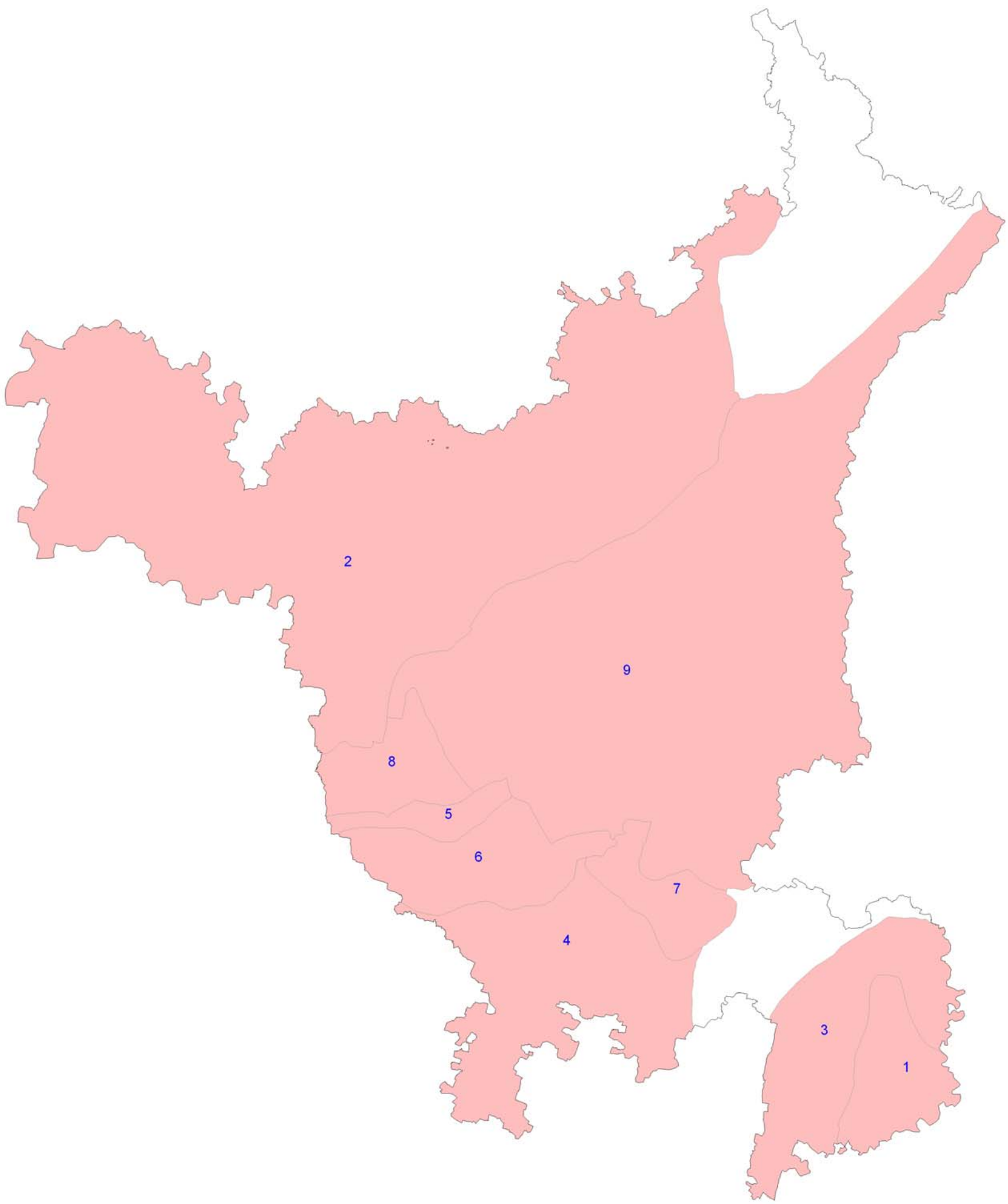
WATER LOGGING AND SALT AFFECTED AREAS IN MAJOR AND MEDIUM IRRIGATION COMMANDS BASED ON SATELLITE REMOTE SENSING

Total waterlogged area in the state is 16.459 Th ha, out of which 3.287 Th ha is perennial and 13.172 Th ha is seasonal. Except Jui command system, waterlogging exists in all remaining commands. Gurgaon canal system followed by Yamuna canal system have maximum area under waterlogging. Total 1149 soil samples were collected to check the salinity / alkalinity in the command. Total salt affected area in the state is 19.393 Th ha. Yamuna 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 Haryana state.

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

Code	Command names	Type	Waterlogged area (Th ha)	Salt affected area (Th ha)
1	Agra canal command system	Major	0.311	3.011
2	Bhakra canal command system	Major	0.467	3.218
3	Gurgaon canal command system	Major	7.011	2.096
4	J.L.N. canal command system	Major	0.199	0.624
5	Jui canal command system	Major	0.000	0.018
6	Loharu canal command system	Major	0.031	0.349
7	Rewari cannal command system	Major	2.350	0.240
8	Siwani canal command system	Major	0.026	0.007
9	Yammuna canal command system	Major	6.064	9.830
	Total		**16.459**	**19.393**

Distribution of Major and Medium Irrigation Commands in Haryana



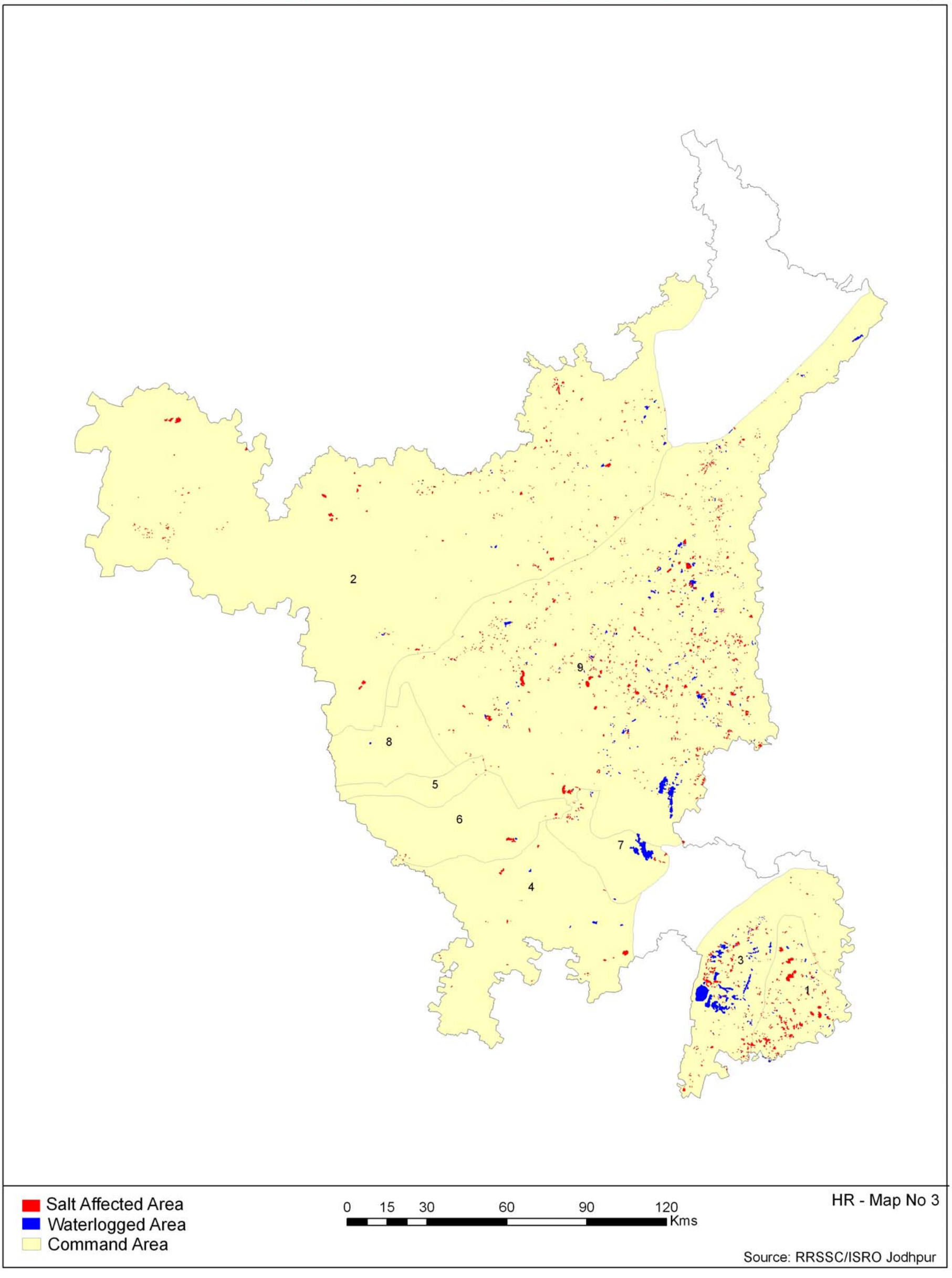
1 Major comamnd areas with code

0 15 30 60 90 120 Kms

HR - Map No 2

Source: Irrigation Department, Haryana

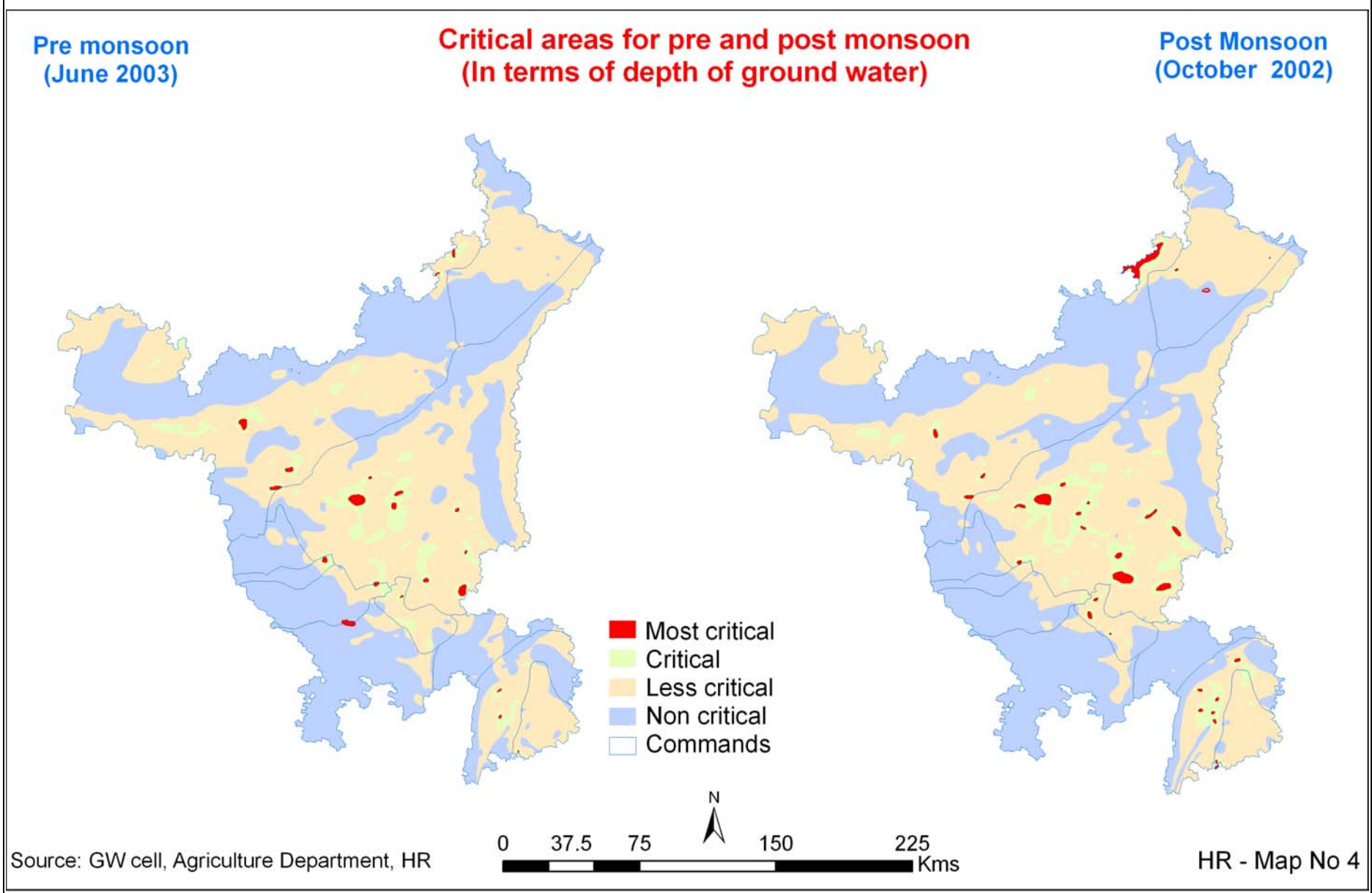
Waterlogged and Salt Affected Areas in the Commands of All Major and Medium Irrigation Projects of Haryana Using Satellite Remote Sensing



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 (June, 2003) and post (October, 2002) monsoon.

Table 3: Critical Area of Depth of Ground Water for Pre (June, 2003) and Post (October, 2002) 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 (June, 2003)	20.430	0.53	205.900	5.32	1925.740	49.78	1716.286	44.37
Post Monsoon (October, 2002)	35.840	0.93	240.150	6.21	1826.660	47.22	1765.706	45.64



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