



Drainage Network of Murshidabad & Related Agricultural activity according to Terrain Character

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Abstract: - The agricultural activity in Murshidabad is affected according to the terrain character and soil structure. The general practice of agriculture depends on Monsson. For the reason most of the land in Rarh Tract remain barren from more than nine month. As the irrigation activity and construction of check Dam has been neglected by the administration and also by the people the agricultural activity is not satisfactory according demand. In brief discussion the data base analysis representing the present situation.

KEYWORD- Bhagirathi, Farakka, Bhairab, Padma.

Drainage of Murshidabad: - It is a well-known fact that the drainage network of any region plays a vital role in agricultural activities as well as its development. The main river system of the District consists of the perennial streams of Bhagirathi, Jalangi and Bhairab. The river Ganges, after entering the study region, bifurcates into two branches, one flowing towards Bangladesh as Padma River while the other flows through the District Murshidabad and is known as Bhagirathi.

The Bhagirathi River: - The Bhagirathi branches off from the Ganges at Nurpur near the Farakka Block. It divides the study region into two parts and has significant influence on agriculture. The regulate the water of theBhagirathi,the government of India has constructed a fee dercanal to link Farakka to Bhagirathi at Suti- II Block. The other streams and rivers join the Bhagirathi from northwest to southwest. The bhagirathi river system has immense influence on agriculture in the District of Murshidabad. The Konloi and Bansloi are the most important tributary of the Bhagirathi influencing agricultural activities there.

The Bhairab: - Another important river of the study region is the river Bhairab. It is a branch of the Ganges and is believed to be the continuation of the river Mahananda. It is intersected by the river Jalangi while flowing eastward. The Bhairab bifurcates towards the north-east and joins the Go bra nullah (canal) at Trimohini. The water of the river Bhairab is highly

utilized in Agriculture.

Jalangi River:- The Jalangi river is another important river which flows through the South eastern part of the district forming the boundary between District Murshidabad and Nadia. It is locally name is Kharia and has much influence agriculture activities of the study region.

The Dwarka (Locally known as Babfa): - The Dwarka or the Babla is a moderate size river which has numerous backwaters and side channels connecting the Bhagirathi. This river has rapid current and cause severe flood during the rainy season adversely affecting agriculture.

The Brahmani: - The Brahmani is a hilly stream and has strong currents. It meets the Dwarka river after entering the study region from the adjacent District Birbhum. It has much influence agriculture activities of study region.

The Mayurakshi: -The Mayura kshii is an important river of the study region and flows through a large part of the Bhagirathi River basin. The river has a number of important tributaries and has much influence of agriculture.

The Kuiya: - The streams Kopai and Bakreswar combine to form the river Kuiya. The flow of the river is monitored by the Farakka Barrage which controls the flow of the river falling into the Bhagirathi. This river causes severe flood during the rainy season and thereby affecting agriculture of the area together with other rivers. (Table No.-4 and Figure No.-6)

Table No.-1

Name of the Major Rivers and its course is given below for better understanding the influence of the river in the region

Source: From Drainage Map

Name of the Rivers	Name of the Blocks
The Ganga and Bhagirathi	Farakka, Suti-1, Raghunathgan j-I, Raghunathgan j-II, Murshidabad-Jiaganj, Berhampore, Beldanga-1, Beldanga-11, Sagardighi
Padma	Suti-11, Raghunathganj-11, Lalgola, Bhagwangola-1, Samsanganj- I, Suti-I Bhagwangola-11, Raninagar-1, Raninagar-11, Jalangi.
Mahurakshi	Burwan, Kandi
Dwarka	Khargram, Nabagram, Kandi.

Bramhani	Khargram,Nabagram.
Babla	Kandi,Bharatpur-I
Kuiya	Bharatpur-1
Bhairab	Raninagar-1, Raninagar-11, Murshidabad:Jiaganj, Berhampur, Hariharpara, Nowda.
Jalangi	Jalangi,Domkal,Nawda

TableNo.-2

Blockwise Textural Classification of Soil in Murshidabad District

Name of the Blocks	Clay	Loam	Clay Loam	Sandy Loam	Sandy Clay	Sandy
Farakka	2180	218	1526	436		
Samsanganj	1200	0	1200	1600		
Suti-I	2453	701	701	3154		
Suti-II	2147	613	613	2760		
Raghunathganj-I		270	8550	180		
Raghunathganj-II		1800	600	1000	600	
Sagardighi		2760	12650	1380	5520	690
Lalgola		3640	8484			
Bhagwangola-I		5500	4500			
Bhagwangola-II		6600	5400			
Raninagar-I	420	5775	4200			105
Raninagar-II	458	6308	4588			114
Murshidabad-Jiaganj	5820	4365	727	3637		
Nabagram	2350	2350	18800			
Khargram	4560	14400	4800		240	
Burwan	8736	182	7644			
Kandi	2670	1068	10680	3385		
Bharatpur-I	5958	397	4832	1986		66

Bharatpur-II	5350	356	4399	1783		
Beldanga-I	10881	9188		4110		
Beldanga-II		2012	2683	3622	5038	
Noada	17000	2600		400		
Hariharpara	4556	10934		2733		
Berhampur	10881	9188		4110		
Domkal	450	25		21825		
Jalangi	32234	9702	1617	1617		

Source:PrincipalAgriculturalOffice,Berharnpur,MurshidabadDistrict,GovernmentofWestBengal,India

Soil pH: - Soil pH directly influences agriculture. In the study region, soil pH tends to be more or less alkaline innaturerangingfrom6.4to7.5.TheBlockwisedistributionofsoilpHshowsthesoilreactionofdifferent areas of the District. On the whole the soil pH is favourable for the growth of major crops (Table No.-7 and Figure No.-8).

Soil Nutrients: - Crop production of any region is highly affected by soil nutrients, mainly by Nitrogen (N), Phosphorus (P) and Potassium (K). The Nutrient Index (NI) of Notrogen, Phosphorus and Potassium has been prepared based on Parker's technique (1951) as per the formula,

$$NI = \frac{Lx1 + Mx2 + Hx3}{T}$$

where,

NIistheNutrientIndex;

L, M and H are different samples of low, medium and high categories based on the nutrient contents in the soil and Tisthetotalnumberofsamples.

It is observed that the western and southern parts of the study area have high nitrogen contents and the eastern part with few areas in the northern part show low nitrogen content. The rest of the study area has medium nitrogen content. The range of nitrogen content varies from 1. 65 to 2. 65. The phosphorus content of the soil also important from the viewpoint of agriculture. In the Murshidabad District it varies from 1.51 to 2.91. High Phosphorus content in the soil is observed in the eastern, south-eastern and south-western parts while the restof

the region has low phosphorus content. Regarding potassium content in the soil, the study region reveals a variation from 0.84 to 2.49. The potassium content is not high in the district. (Table No.-8, 9, 10 and Figure No.-9, 10, 11)

TableNo.-3

Block wise Average (1992-93 to 2002-03) Depth of Ground Water (in metre) Table in Murshidabad District.

NameoftheBlocks	PerMonsoon	PostMonsoon
Farakka	8.77	4.15
Samsorganj	6.80	2.06
Suti-I	6.49	2.32
Suti-II	5.67	2.47
Raghunathganj-I	12.27	5.76
Raghunathganj-II	6.30	2.80
Sagardighi	11.21	6.21
Lalgola	4.37	1.94
Bhagwangola-I	3.65	2.02
Bhagwangola-II	5.86	2.26
Raninagar-I	5.97	2.98
Raninagar-II	4.49	2.18
Murshidabad-Jiaganj	4.45	2.54
Nabagram	15.18	12.69
Khargram	12.76	7.91
Burwan	13.06	5.42
Kandi	11.72	4.33
Bharatpur-I	11.51	5.64
Bharatpur-II	12.21	6.52
Beldanga-I	4.11	1.61
Beldanga-II	5.25	2.48
Noada	5.95	2.90
Hariharpara	5.22	2.32
Berhampur	4.69	1.97
Domkal	4.84	2.29
Jalangi	5.61	2.73

Source Water Investigation and Development Department, Berhampur, Murshidabad District, Government of West Bengal, India.

TableNo.-4

Average Monthly Temperature (10 years average 1992-93 to 2002-03) in °C of Murshidabad District.

Months	Rainfallinmm	RainfallinPercentage(%)
January	10.34	0.75
February	20.70	1.49
March	23.97	1.73
April	42.70	3.08
May	94.19	6.80
June	222.12	16.04
July	310.42	22.42
August	285.51	20.62
September	247.75	17.89
October	100.99	7.29
November	23.05	1.66
December	2.92	0.21

Source Principal Agricultural Office, Berhampur, Murshidabad District, Government of West Bengal, India.

Humidity: - Humidity together with temperature and rainfall highly influences the cropping pattern of the region. It remains high through the year ranging from 61.16% to 84.63%. (Table No.-14) The xeric period with the characteristics of moisture situations and the agricultural situations are shown the inserted graph. (Figure No.-13A) The analysis of the physical characteristics of the study region, covering topographical features, soil conditions, ground water fluctuations and climate reveal that they are quite favourable for agricultural activities the region. The agriculture profile of the region provided in the next chapter would throw more light on the relationship.

TableNo.-5

Maximum, Minimum and Mean Humidity in Murshidabad District. (10 years average 1992-93 to 2002-03)

Months	Humidity in Percentage		
	Maximum	Minimum	Mean
January	92.50	43.63	68.07
February	88.00	41.13	64.57
March	85.13	37.38	61.26
April	87.88	46.50	67.19
May	89.00	53.13	71.07
June	91.88	66.75	79.32
July	94.00	73.38	83.69
August	94.38	74.88	84.63
September	93.13	73.13	83.13
October	92.00	76.63	84.32
November	91.25	50.88	71.07
December	90.88	42.50	66.69

Source:Principal Agricultural Office, Berhampur, Murshidabad District, Government of West Bengal, India.

THE PHYSICAL CHARACTERISTICS OF THE MURSHIDABAD DISTRICT IN RELATION TO AGRICULTURAL DEVELOPMENT

Agriculture and its development primarily depend on the existing physical resource base of any region. Hence an account of the nature of the physical features of the study area is of high significance in understanding the theme. The study area, the Murshidabad District, is more or less favourable region for agriculture though there are some variations in its structural conditions revealed between the eastern and the western parts.

Geology: - The Murshidabad District is essentially an alluvial plain formed of the Ganga-Padma and Bhagirathi River system and has been divided into three parts, namely,

Pleistocene Sediments characterized by a preponderance of clay and calcareous materials, which show signs of calcareous nodules and laterisation. It is seen in the western part of the study region covering major part of Raghunathganj-1, Sagardighi, Nabagram, Kandi, Khargram, Bharatpur-1, Bharatpur-11 and small part of Farakka, Suti-1, Burwan.

Quaternary Sediments deposited in the wide deltaic flood plain found mainly in the Block Samserganj, Suti- 11, Raghunathganj-11, Lalgola, Bhagwangola-1, Bhagwangola 11, Raninagar-1, Raninagar-11, Murshidabad Jiaganj, Berhampur, Domkal, Jalangi, major part of Farakka, Suti-1, Burwan, Beldanga-1, and small part of Raghunathganj-1, Sagardighi, Nabagram, Kandi, Khargram, Bharatpur-1, Bharatpur-11 and Hariharpara.

Recent Fluvial Deposits consisting of clay, silt and sand which are located in the riverine flood plain of N oada, major part of Hariharpara, Beldanga-1 and Beldanga-11. Blocks. Geologically the eastern part is more favourable for agriculture than the western part. (Figure No.-2)

Relief: - In the study region, the river Bhagirathi, flowing from north to south, plays an important role, which divides the district into two topographical divisions showing contrasting physical characteristics (Figure NO.- 6). The western part of the river reveals rugged terrain (locally known as Rarh) and a flat and rolling plain (locally known as Bagri) in the eastern side. The Blocks Farakka, Samserganj, Suti-1, Suti-II, Raghunathganj- 1, Nabagram, Khargram, Burwan, Kandi, Bharatpur-1, Bharatpur-II, greater part of Sagardighi, western part of Murshidabad-Jiaganj, Berhampur and Beldanga fall in the western part while the rest of the blocks are in the side of the eastern region.

The western part of the study region, that is, the Rarh represents undulating and rugged nature of terrain and intercepted by a number swamps and beds of old rivers. Elevation rises towards the western edge forming the boundary of the Districts Birbhum and Santai Parganas. The maximum height of the Rarh region rises of 45 metres passing through the northern part the Farakka Block.

The eastern part, as has been already mentioned is a flat plain, the height of which varies between 12.5 metres to 24 metres. The average slope of the region is from the west and northwestern sides towards the east and southeastern sides (Table No.-1 and Figure No.-3).

To see whether there is any relationship between relief and net cropped area, a super imposed map has been drawn for the year 1992-1993 and 2002-2003. It is observed that most of the net cropped areas are located in the areas having 15 metres to twenty-five metres of height (Table No.-2&3 and Figure No.-4&5)

Soil: - There are three soil associations in the study region, namely, soil of the Rahr, which is composed of lateritic clay and calcareous nodules; soil of Bagri which is composed of riverine alluvium and soil of the flood affected areas composed of clay to clayey loams.

Soil Texture: - Regarding the soil texture there are varieties ranging from small and porous to coarse and non-porous. As agricultural yield is highly influenced by the existing textural conditions, a description of the soil textures needs mention. The textural classes of soil of the Blocks of the Murshidabad District reveal much diversity which is clear from the Table No.-5 and 6.

Table No.-6

Textural classification of Soil in Murshidabad District

Textural Classification of Soil	Area in hectares under different textural classes	Percentage (%) of area under different textural classes
Clay	91,304	24.44
Loam	1,00,952	27.02
Clay Loam	1,09,204	29.23
Sandy Loam	59,718	15.98
Sandy Clay Loam	11,458	3.07
Sandy	975	0.26

Source: Principal Agricultural Office, Berhampur, Murshidabad District, Government of West Bengal, India.

TableNo.-7

SoilpH(Blockwise)inMurshidabadDistrict

NameoftheBlocks	AverageSoilpH
Farakka	7.00
Samserganj	6.90
Suti-I	7.10
Suti-II	7.30
Raghunathganj-I	7.20
Raghunathganj-II	7.20
Sagardighi	7.10
Lalgola	7.20
Bhagwangola-I	7.10
Bhagwangola-II	7.10
Raninagar-I	7.30
Raninagar-II	7.00
Murshidabad-Jiaganj	7.20
Nabagram	6.80
Khargram	6.40
Burwan	6.50
Kandi	6.80
Bharatpur-I	6.80
Bharatpur-II	6.90
Beldanga-I	7.50
Beldanga-II	6.90
Noada	7.20
Hariharpara	7.40
Berhampur	7.20
Domkal	7.40
Jalangi	7.40

Source: Laboratory of Soil Testing Laboratory, Berhampur, Murshidabad District, Government of West Bengal, India

TableNo.-8

Soil Nitrogen Status and Nitrogen Index of Murshidabad District.

Name of the Blocks	Nitrogen Status of the samples in percentage(%)			Nitrogen Index
	Low	Medium	High	
Farakka	52.00	31.00	17.00	2.35
Samserganj	71.00	20.00	9.00	2.62
Suti-I	64.00	22.00	14.00	2.50
Suti-II	61.00	30.00	9.00	2.52
Raghunathganj-I	28.00	30.00	42.00	1.86
Raghunathganj-II	60.00	21.00	19.00	2.41
Sagardighi	70.00	22.00	8.00	2.62
Lalgola	25.00	55.00	20.00	2.05
Bhagwangola-I	68.00	14.00	18.00	2.50
Bhagwangola-II	118.00	49.00	33.00	1.65
Raninagar-I	17.00	64.00	19.00	1.98
Raninagar-II	22.00	54.00	24.00	1.98
Murshidabad-Jiaganj	68.00	15.00	17.00	2.51
Nabagram	69.00	19.00	12.00	2.57
Khargram	68.00	18.00	14.00	2.54
Burwan	47.00	28.00	25.00	2.22
Kandi	20.00	62.00	18.00	2.02
Bharatpur-I	34.00	36.00	30.00	2.04
Bharatpur-II	56.00	29.00	15.00	2.41
Beldanga-I	61.00	28.00	11.00	2.50
Beldanga-II	22.00	51.00	27.00	1.95
Noda	26.00	64.00	10.00	2.13
Hariharpara	61.00	30.00	9.00	2.52
Berhampur	52.00	27.00	21.00	2.31
Domkal	46.00	42.00	12.00	2.34
Jalangi	38.00	40.00	22.00	2.16

Source: Principal Agricultural Office, Berhampur, Murshidabad District, Government of

WestBengal, India.

TableNo.-9

Soil Phosphorus Status and Phosphorus Index of Murshidabad District.

Name of the Blocks	Phosphorus Status of the Samples in percentage(%)			Phosphorus Index
	Low	Medium	High	
Farakka	22.00	37.00	41.00	1.81
Samsorganj	14.00	38.00	48.00	1.66
Suti-I	18.00	43.00	39.00	1.79
Suti-II	18.00	52.00	30.00	1.88
Raghunathganj-I	17.00	51.00	32.00	1.85
Raghunathganj-II	33.00	54.00	13.00	2.20
Sagardighi	20.00	57.00	23.00	1.97
Lalgola	32.00	58.00	10.00	2.22
Bhagwangola-I	18.00	55.00	27.00	2.91
Bhagwangola-II	40.00	28.00	32.00	2.08
Raninagar-I	12.00	27.00	61.00	1.51
Raninagar-II	20.00	33.00	45.00	1.75
Murshidabad-Jiaganj	16.00	32.00	52.00	1.64
Nabagram	20.00	48.00	32.00	1.88
Khargram	17.00	53.00	30.00	1.87
Burwan	16.00	70.00	14.00	2.02
Kandi	27.00	38.00	35.00	1.92
Bharatpur-I	35.00	31.00	37.00	2.01
Bharatpur-II	22.00	71.00	7.00	2.15
Beldanga-I	18.00	53.00	29.00	1.89
Beldanga-II	18.00	65.00	16.00	2.02
Noda	16.00	59.00	25.00	1.91
Hariharpara	22.00	38.00	40.00	1.92
Berhampur	22.00	65.00	13.00	2.09
Domkal	14.00	27.00	59.00	1.55
Jalangi	33.00	55.00	12.00	2.21

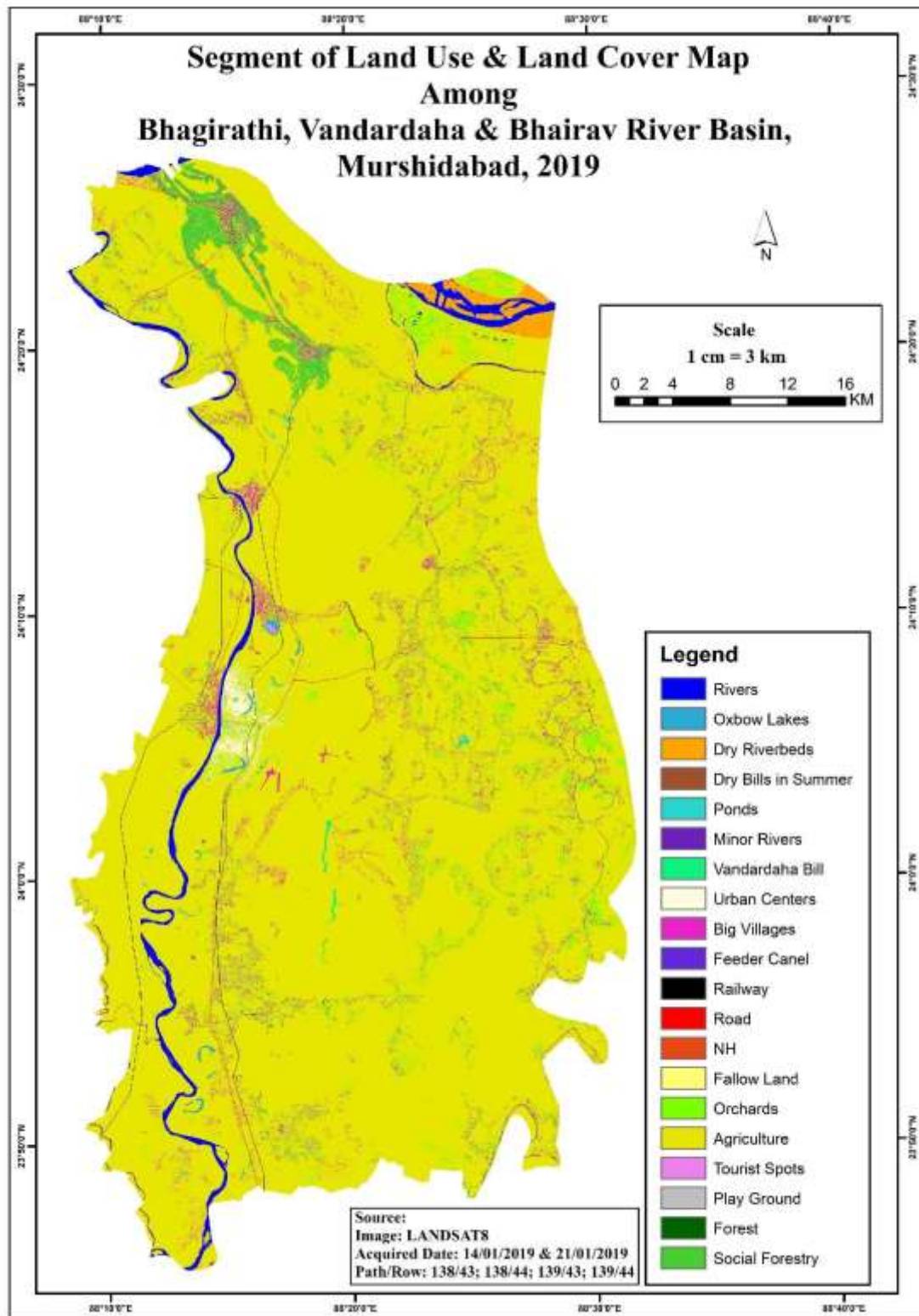
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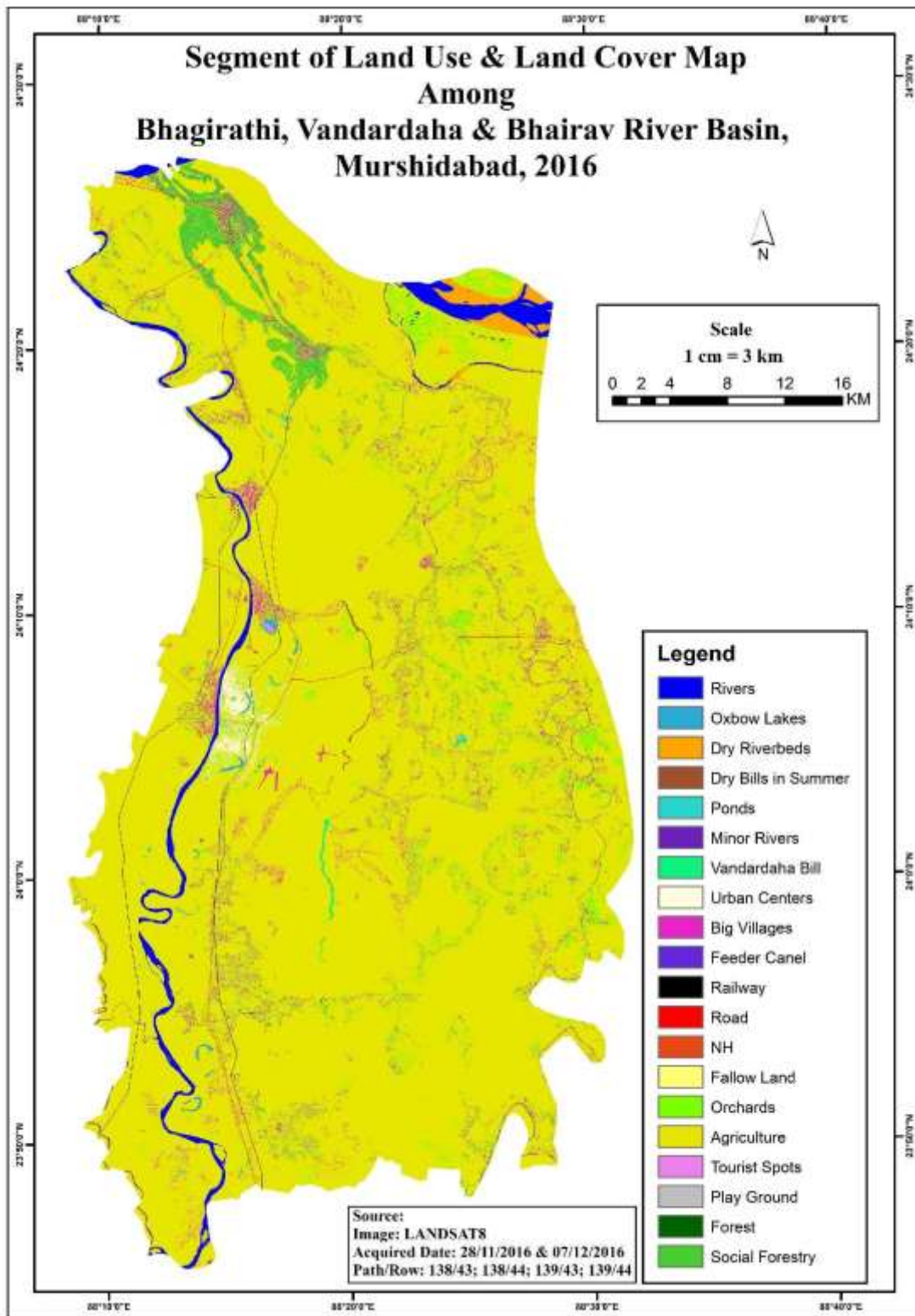
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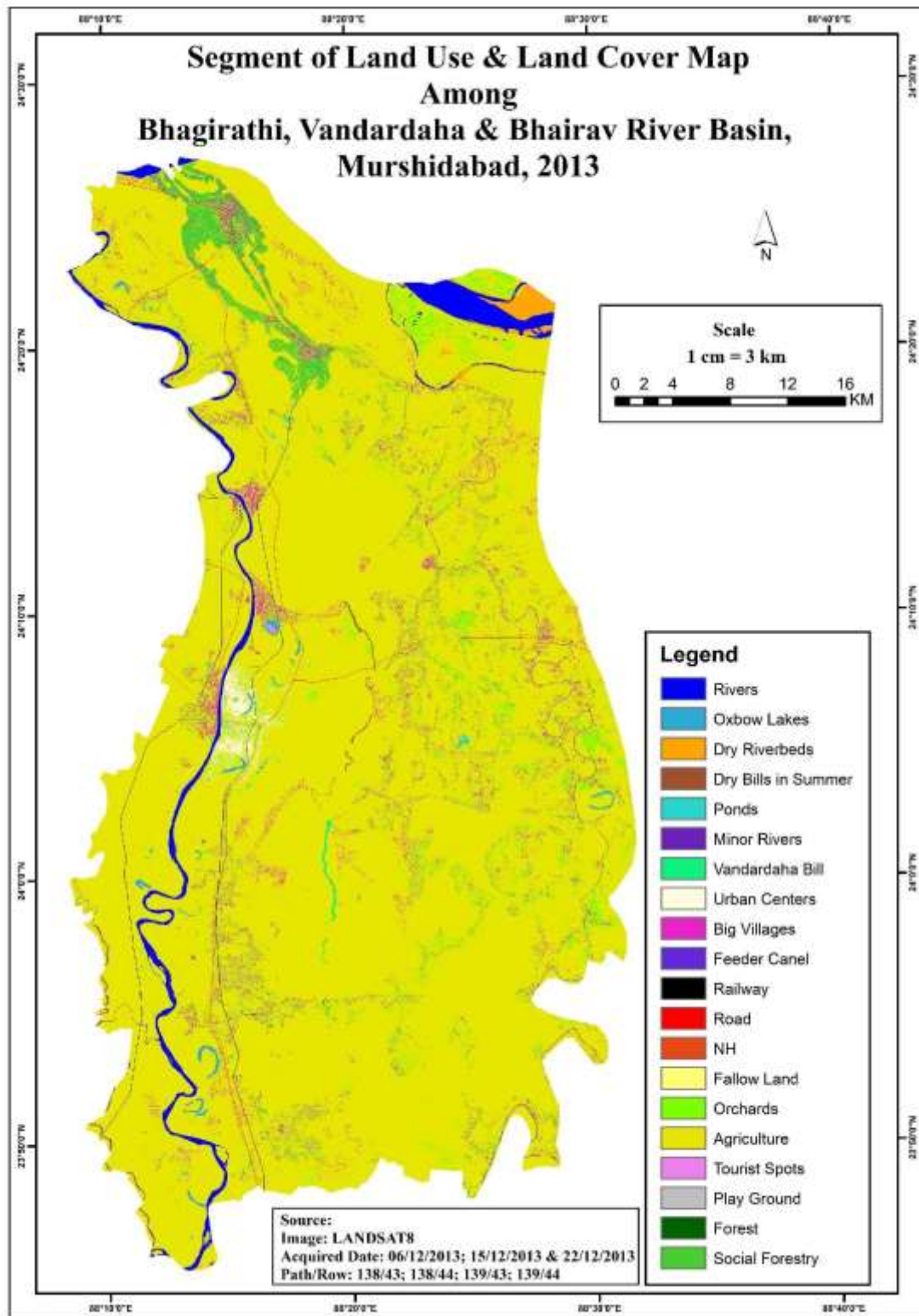
Soil Potassium Status and Potassium Index of Murshidabad District.

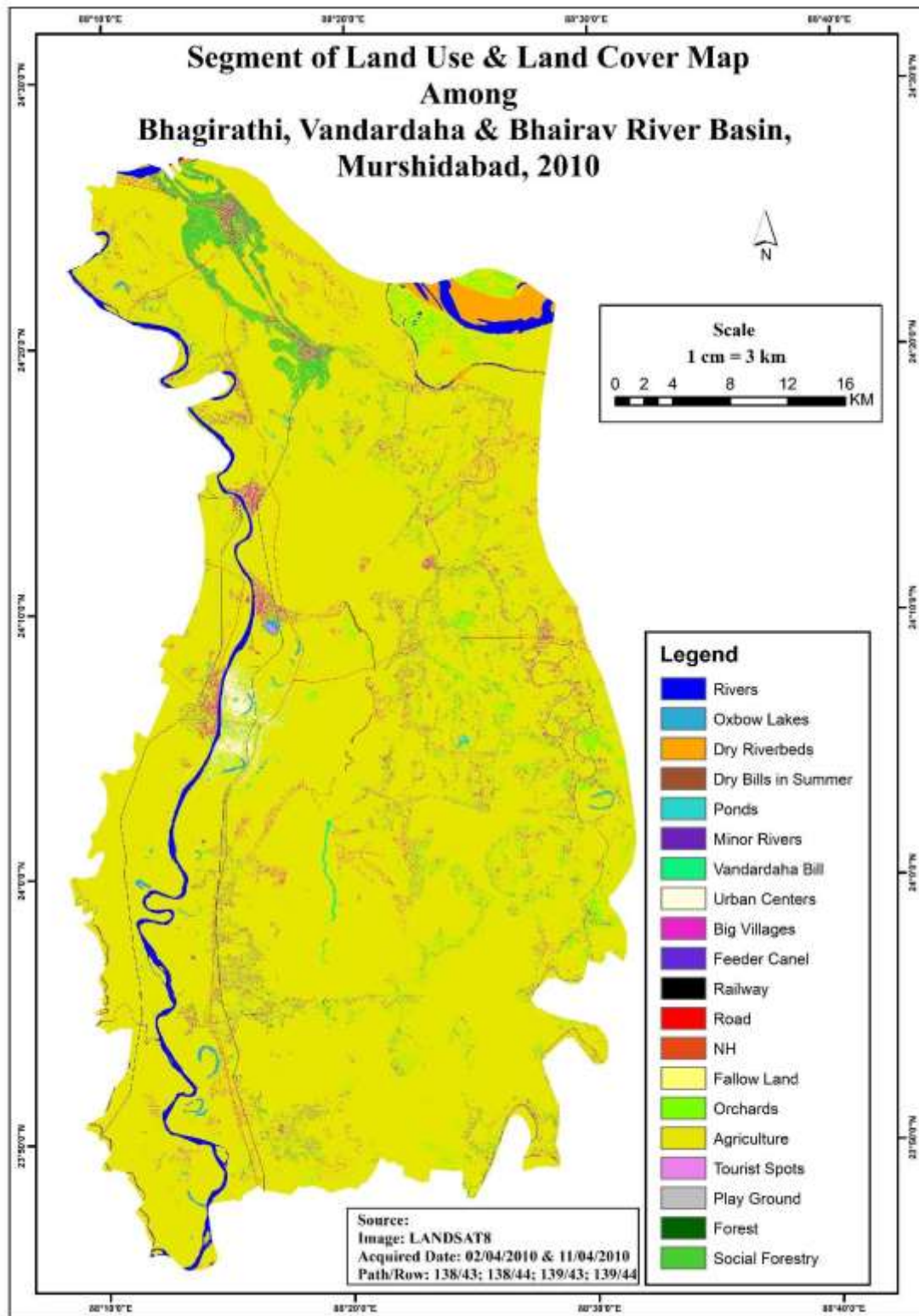
Name of the Blocks	Soil Potassium Status of the Samples in percentage(%)			Potassium Index
	Low	Medium	High	
Farakka	31.00	54.00	15.00	2.16
Samsanganj	20.00	48.00	32.00	1.88
Suti-I	50.00	40.00	10.00	2.40
Suti-II	45.00	38.00	17.00	2.28
Raghunathganj-I	14.00	59.00	17.00	1.97
Raghunathganj-II	63.00	23.00	14.00	2.49
Sagardighi	25.00	65.00	10.00	2.15
Lalgola	37.00	50.00	13.00	2.24
Bhagwangola-I	40.00	36.00	24.00	2.16
Bhagwangola-II	49.00	27.00	24.00	2.25
Raninagar-I	46.00	23.00	31.00	2.15
Raninagar-II	18.00	68.00	14.00	2.08
Murshidabad-Jiaganj	30.00	47.00	23.00	2.07
Nabagram	38.00	42.00	20.00	2.18
Khargram	31.00	57.00	12.00	2.19
Burwan	20.00	69.00	11.00	2.09
Kandi	20.00	59.00	21.00	1.99
Bharatpur-I	22.00	63.00	15.00	2.07
Bharatpur-II	64.00	20.00	16.00	2.18
Beldanga-I	33.00	49.00	18.00	2.15
Beldanga-II	12.00	60.00	28.00	1.84
Noda	43.00	38.00	19.00	2.24
Hariharpara	18.00	53.00	29.00	1.89
Berhampur	38.00	47.00	15.00	2.23
Domkal	11.00	51.00	38.00	1.73
Jalangi	49.00	39.00	12.00	2.37

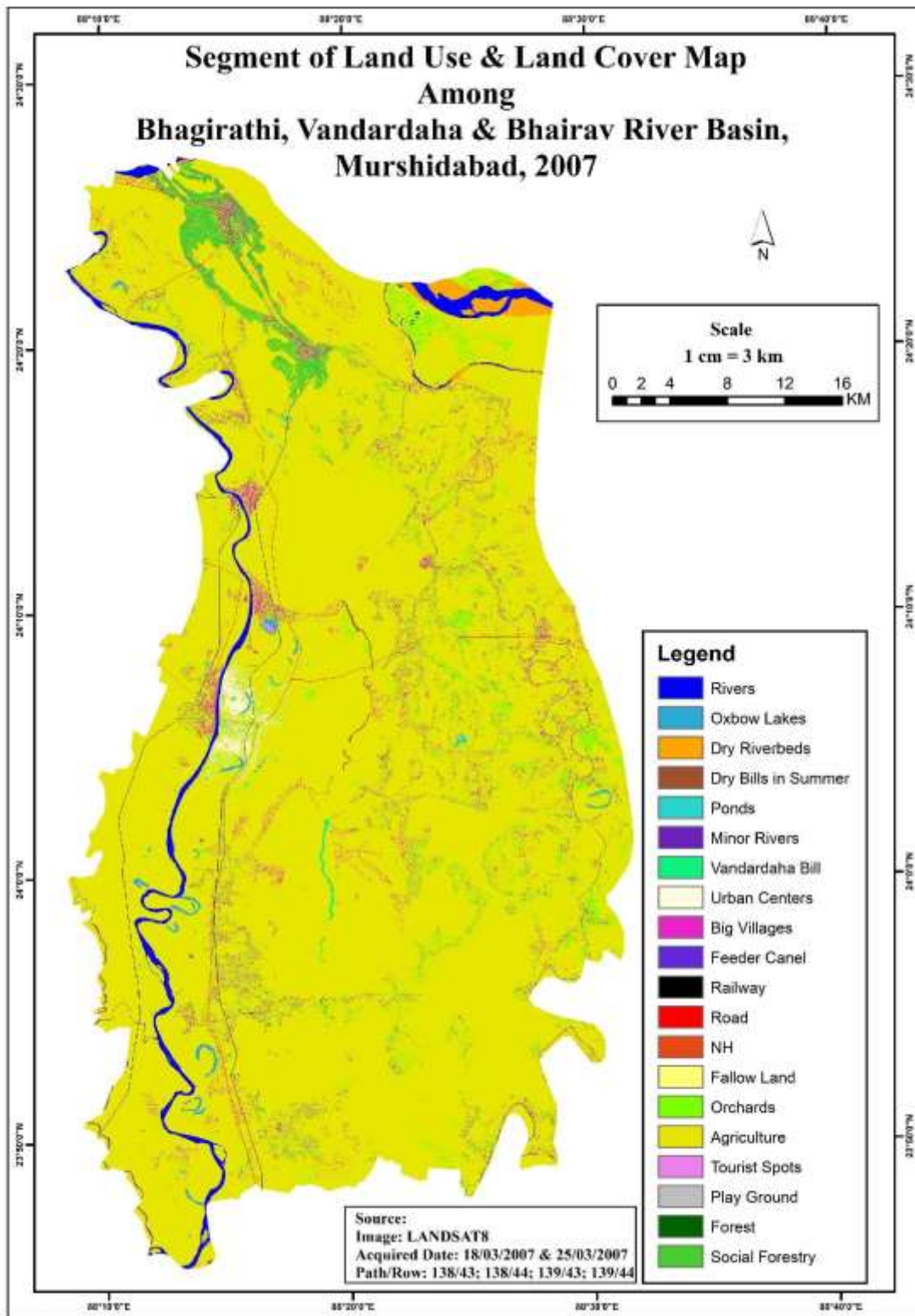
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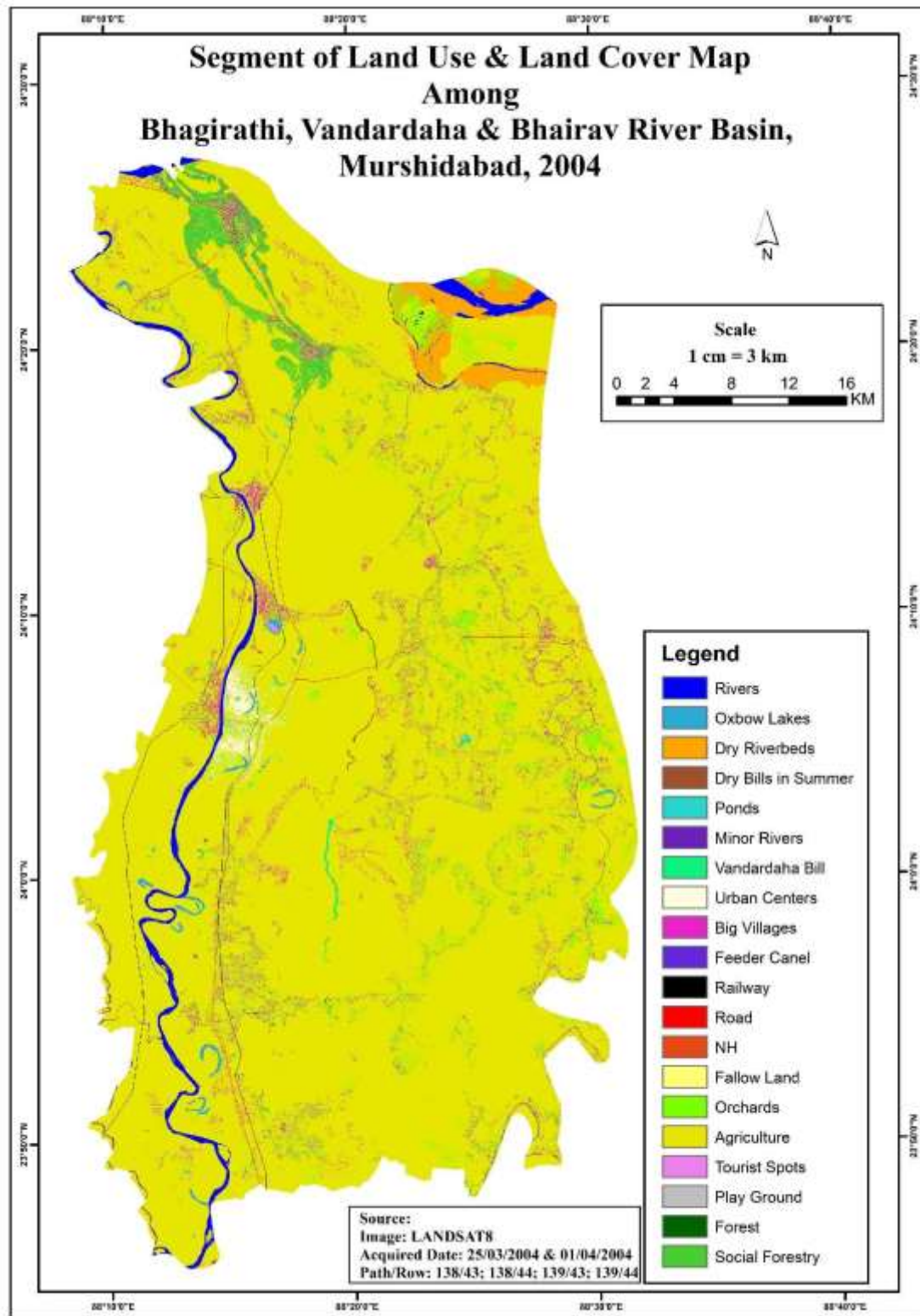


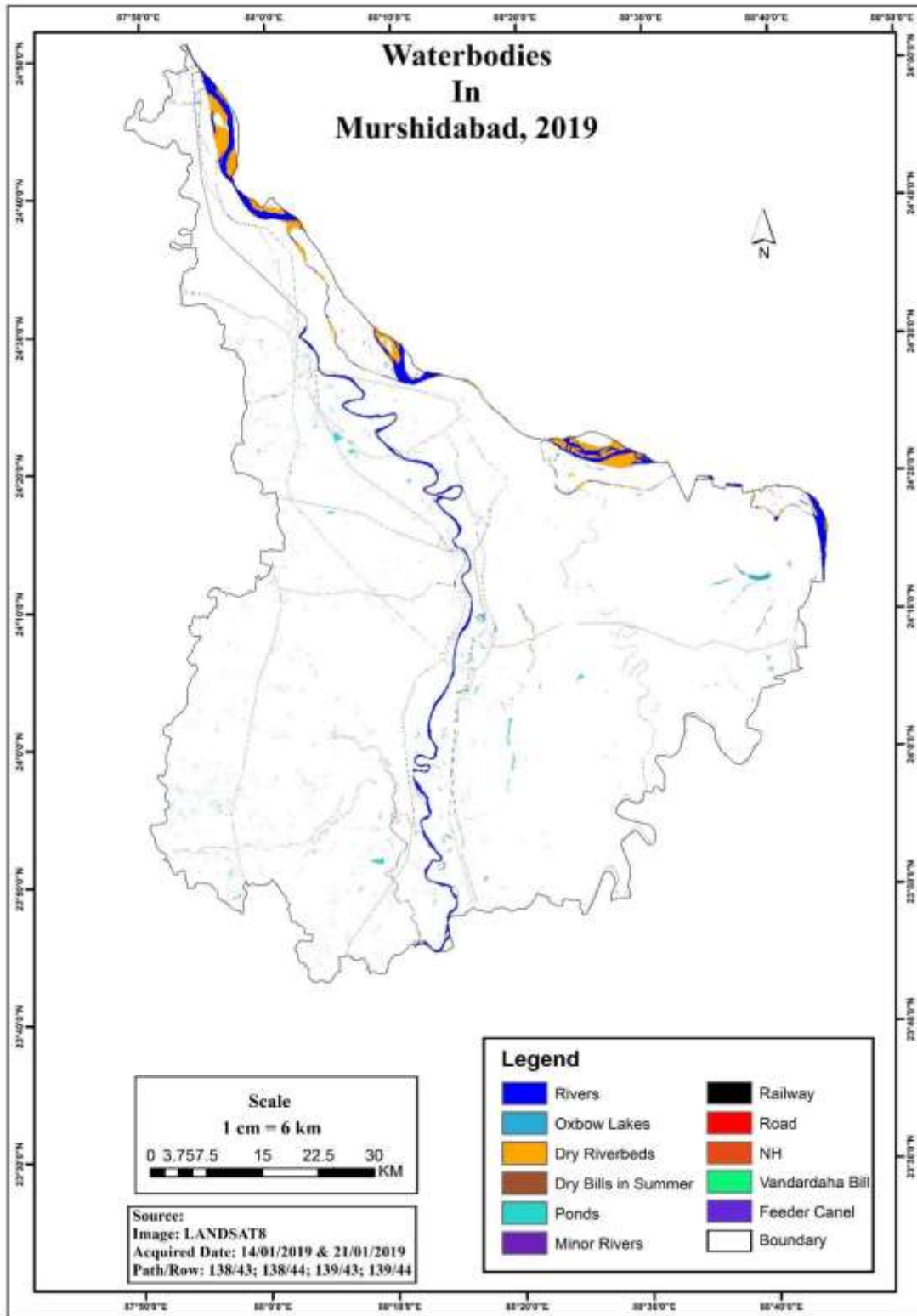


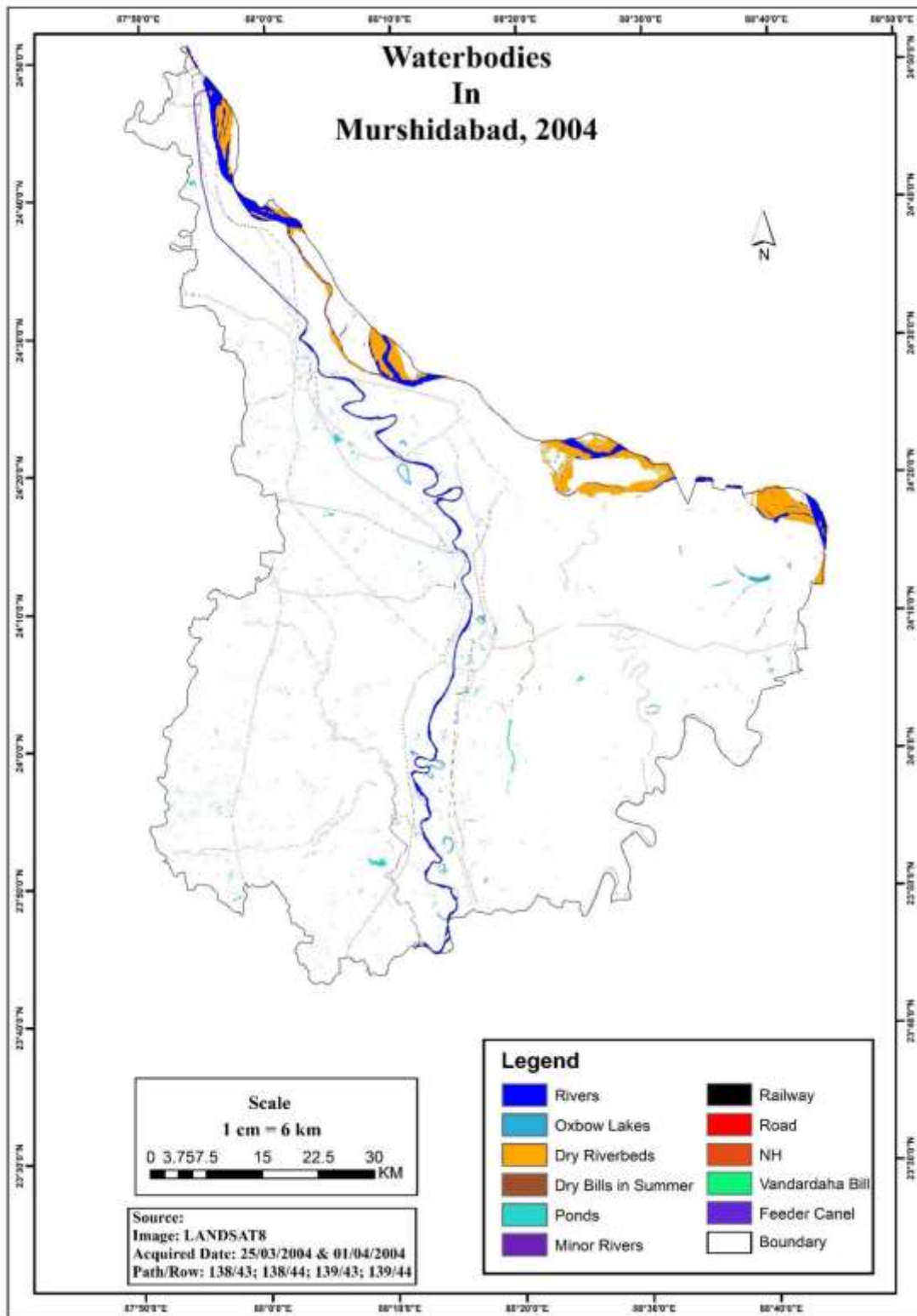


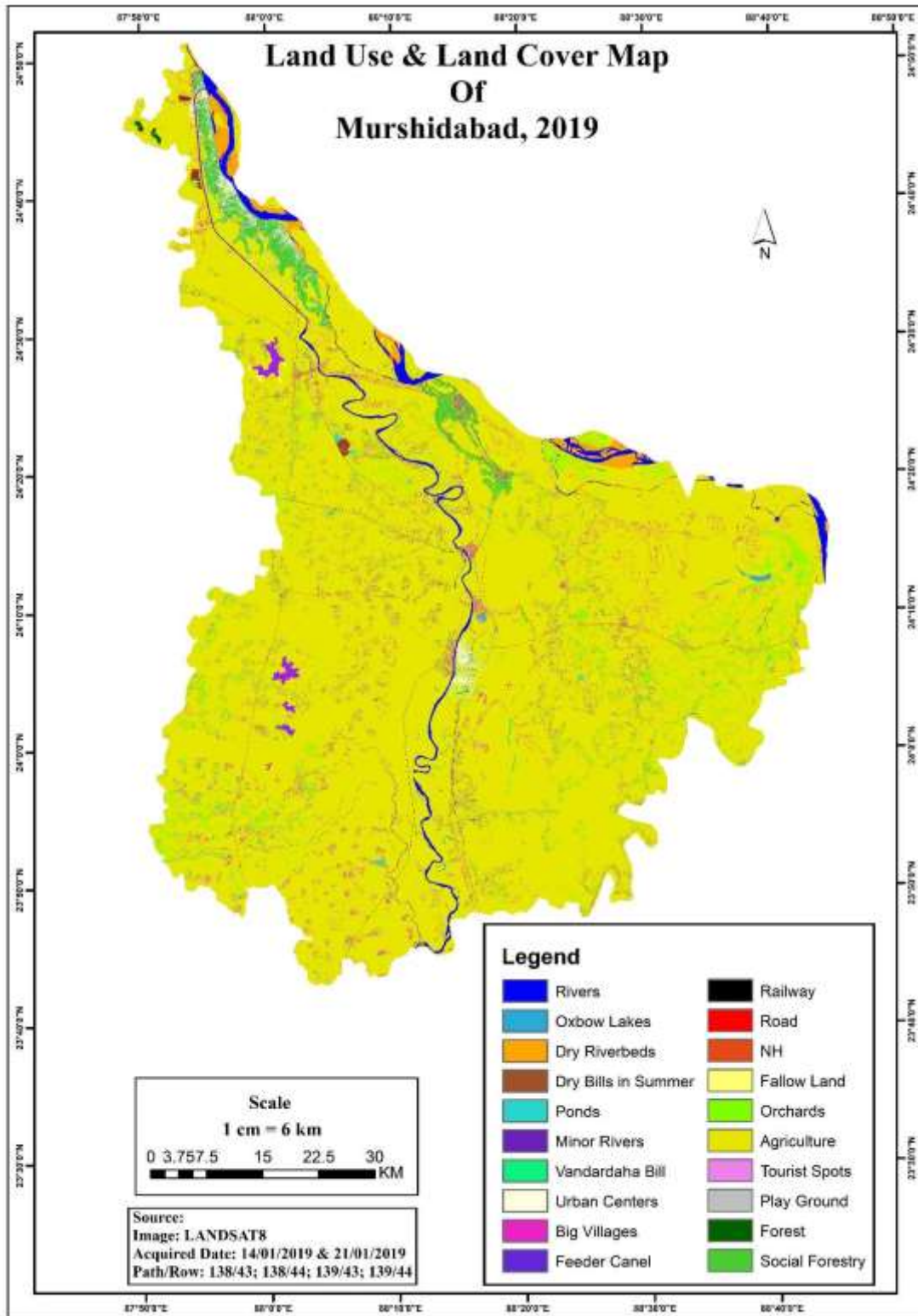


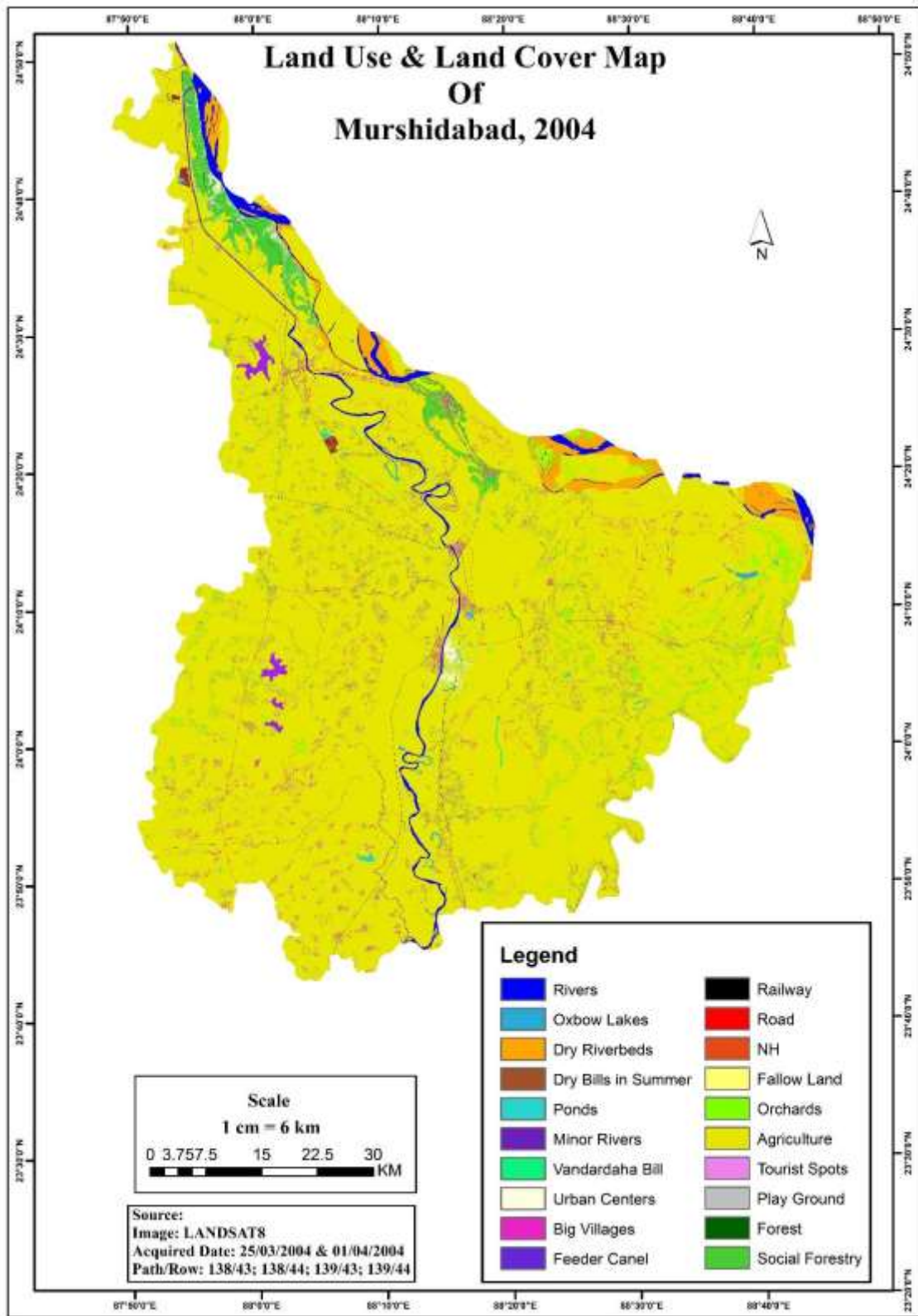












Conclusion: - In view of this presentation it has been revealed that the change of agricultural practice is not evident according to the supervised classification of satellite imagery.