

Chapter II: Salient Features of the Study Area

2.1 Introduction

The district of North 24 Parganas is situated at the apex of the funnel-shaped active delta areas just to the north of the Bay of Bengal and is serving as the main hinterland of Kolkata, the administrative & commercial capital of WB and more broadly the gateway to Eastern India. It has artificial land frontiers as well as natural water boundary. In the south-eastern parts particularly where Indo-Bangladesh border runs along the river-channels and distributaries sometimes occur border-demarcation-problems due to shifting of water-paths. The district has to bear a heavy load of migrated population from East Bengal.

The district has a good accessibility through waterways by the river Hooghly, by roads with NH 34, NH 35 and several state high ways, on the rail-paths of Eastern Rail Ways which extend up to Kanchrapara in the north, Bongaon in the north-east and Hasnabad in the east. According to the WB Human Development Report, 2004 (Development and Planning Department, Govt. of WB) it is the 3rd (HDI value: 0.66) most developed district in WB just after Kolkata (0.78) and Howrah (0.68). It is also considered to be the most economically evolved and the 9th largest district in the state. It is one of the most industrialized districts in WB as well as in India and has urban parts of about 12% of total geographical area.

However, this sensitive border-district commands as a vital strategic area in respect of the entire India and always takes a pivotal role in war as well as in peace and all through development not only for WB but also for the country.

2.2 Origin of the District

The district has its origin linked with a great historical event in India i.e., the Battle of Plassey in Bengal (1757). On the 20th December 1757 (corresponding to Paush 1164 of Bengal era or the 5th Rabi-us-Sani, in the fourth year of the reign of the Mughal Emperor, Alamgir II) Mir Jafar, the

new Nawab of Bengal designated as the Nawab Nazim of Bengal ceded to the East India Company the rights of a tract of Bengal i.e. of 24 numbers parganas covering an area of 882 square miles as '24 Parganas Zamindari' (Hunter, 1875). During that period 'Pargana' was used to mean the fiscal division or unit under the control of the Company. The 882 square miles land thus conferred was situated on the east bank of the river Hooghly and was under the 'Chaklah' (an administrative circle) of Hooghly. That is, the then 24 Parganas district comprised of 24 Mahals or parts and the name '24 Part Parganas' was perhaps found very much cumbrous and the name was elided into '24 Parganas' for convenient use.

Later on the 1757 treaty was vested by a jagir sanad granted to Lord Clive on 13 July 1759 by which assignment of all the royalties, dues and rents was made over to him. At that time most parts of the district were terra incognita inaccessible, under dense forest, tidal swamps and a maze of channela.

But the "revenue and civil jurisdictions of the district did not coincide for many years, owing to the facts that, at that time of the Decennial Settlement of 1787, the landed property in this part of the country was chiefly held by the Rajas of Burdwan, Nadia and Jessore. Originally the district contained only 444 estates, but in 1816, when some estates were transformed from Burdwan, the number had risen 564; these estates were transferred to Burdwan in 1862" (17th All India Livestock Census Implements & Machinery, Fishery Statistics, WB, North 24 Parganas District, Volume-I). Mr. Tillman Henckell who was appointed as the first English Judge and Magistrate of Jessore in 1781 had taken up considerable steps consistently for reclamations of the areas during 1780s towards conversion of forests into immense rice cultivation (Hunter, 1876).

However, the territorial jurisdiction of "24 Parganas" vis-à-vis Calcutta, Nadia, Jessore etc was subsequently delimited, adjusted and divided on several occasions based on Zilla, Division etc. by the British as well as by the Government of India until the 1st March 1986 when the present day's 'North 24 Parganas' district officially emerged as a separate and new district bi-furcating the undivided '24 Parganas' with its northern areas, Barasat serving the administrative headquarter. However, it is the 3rd newest district in the state.

2.3 Administrative Set up

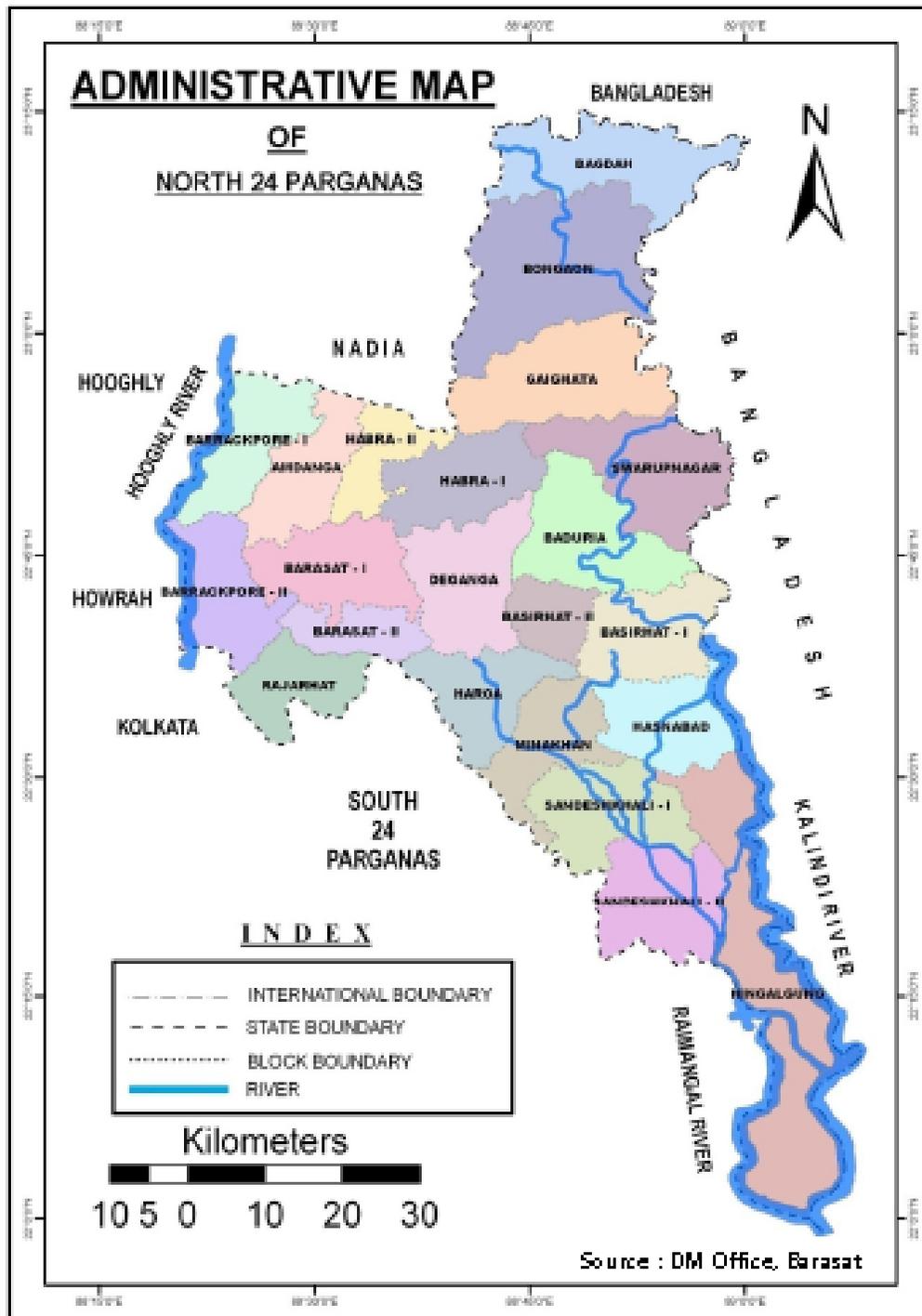
The district comprises of 218 Gram Panchayets, 22 Community Development blocks & 22 Panchayet Samities viz. Bagdah, Bongaon, Gaighata, Habra I & II, Barrackpur I & II, Amdanga, Barasat I & II, Rajarhat, Baduria, Swarupnagar, Bashirhat I & II, Hasnabad, Minakhan, Sandeshkhali I & II, Hingalgunj, Haroa and Deganga, 39 police stations viz. Bagdah, Gopalnagar, Bongaon, Gaighata, Swarupnagar, Habra, Ashokenagar, Amdanga, Barasat, Deganga, Baduria, Bashirhat, Haroa, Minakhan, Hasnabad, Sandeshkhali, Hingalgunj, Hemnagar(Coastal), Bijpur, Naihati, Jagaddal, Noapara, Barrackpur, Titagarh, Khardah, Ghola, Nimta, Belgharia, Baranagar, Airport, Dumdum, Baguiati, Newtown, Rajarhat, Lake Town, North Bidhannagar, East Bidhannagar, South Bidhannagar and Electronics Complex, 5 sub-divisions viz. Bongaon, Barrackpur, Barasat, Bashirhat and Bidhannagar and 1 Zilla Parisad consisting of 1571 inhabited villages, 1581 mouzas and 61 towns of different sizes & categories. Total number of urban units is 48, out of which 28 are statutory towns and of them 27 are municipalities and 1 is a cantonment board. Barasat is the district head quarter and is situated almost at the centre of the district and is highly urbanized.

Table 2.3.1: Assembly and Parliamentary Constituency in the district:

Year	Constituency	Un-reserved	Reserved for SC	Reserved for ST	Total
2002	Assembly	23	5	-	28
	Parliamentary	4	-	-	4
2009	Assembly	25	7	1	33
	Parliamentary	4	-	-	4

Source: Election Department, North 24 Parganas

Map 2.3.1



2.4 Demography

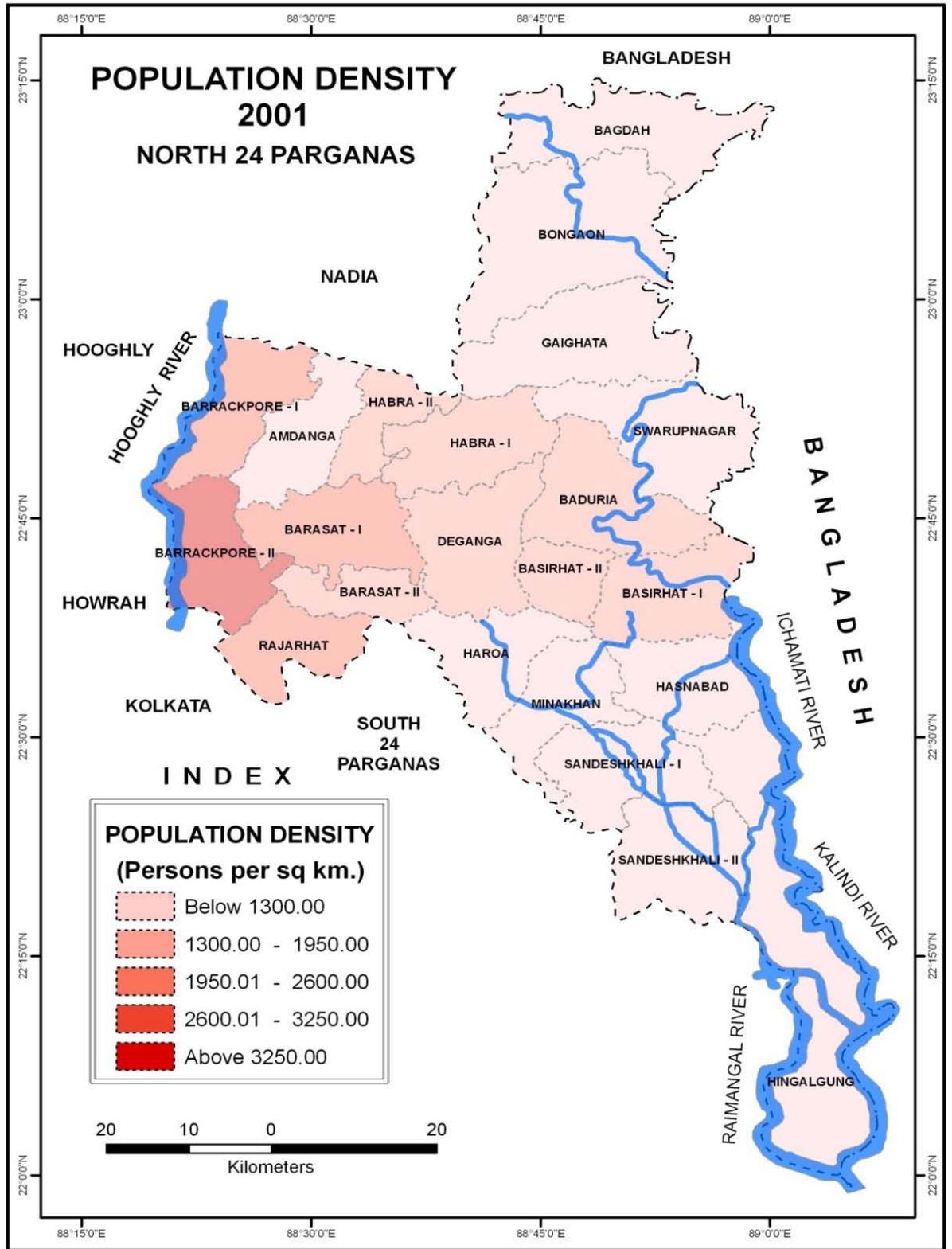
To know a district well it is very essential to be aware of the demographic features of the same. It is the most populous district in the state, but ranks 9th in terms of area and bears the population density more than 2.42 times of the state-average. Of course the density is not evenly distributed all over. It becomes maximum in the urbanized-industrialized parts dominated by Kolkata, gradually decreases beyond these areas and gets minimum in the remote rural parts. The district has 10 uninhabited villages, 15 villages with more than 10,000 populations. Banglani of Swarupnagar CD block is the most populated (20,443) village and Khamarpara of Bashirhat-II block is the least populated (36 persons) village. The major demographic composition of the district is migrants particularly from present Bangladesh during partition in 1947 and during riots in 1971.

Table 2.4.1: Some demographic Data in North 24 Parganas

Population: Total	89,34,286 nos.
Total Male Population & %	46,38,756 nos. & 51.92
Total Female Population & %	42,95,530 nos. & 48.08
Decadal growth	22.69% (1991 to 2001) 31.69% (1981 to 1991) 31.42% (1971 to 1981)
Population density	2,182 nos. per sq. Km
Rural population and %	40,83,339 nos. and 45.70%
Urban population and %	48,50,947 nos. and 54.30%
Literacy in %: Total	78.07%
Male	83.92%
Female	71.72%
Scheduled Caste Population: Total	18,40,397 nos.

	Rural & % Urban & %	12,08,661 nos. & 65.67% 6,31,736 nos. & 34.33%
Scheduled Tribe Population: Total	Rural & % Urban & %	1,98,936 nos. 1,68,686 nos & 84.79% 30,250 nos. & 15.21%
Sex Ratio : Total		926 female per 1000 male
Rural		942 female per 1000 male
Urban		912 female per 1000 male

Source: Census of India, 2001.



2.5 Geology

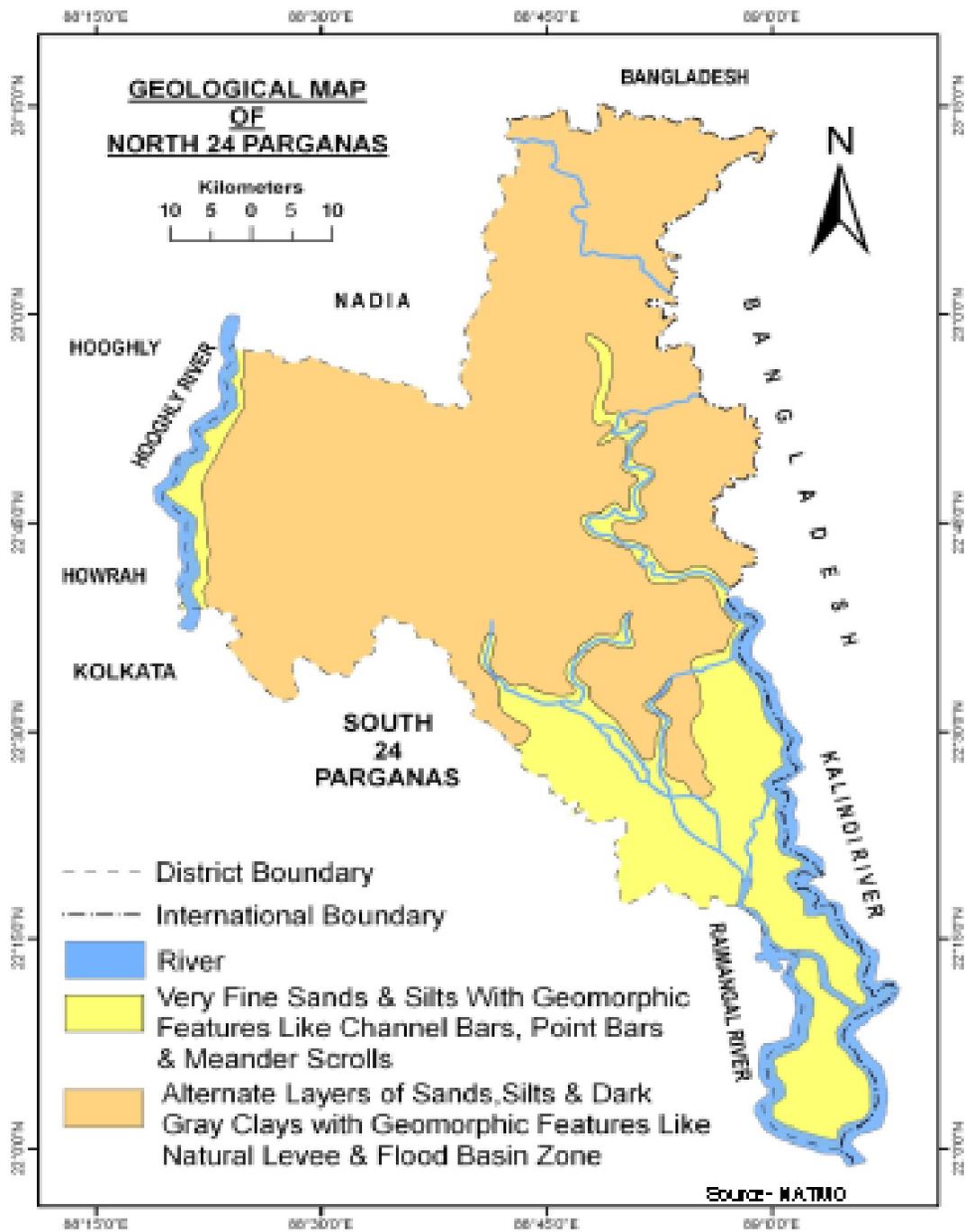
In the upper Cretaceous or early Eocene times the Bay of Bengal continued even upto Assam as Assam Gulf. Afterwards the sea began to retreat southward as a result of gradual sedimentation under shallow water which was being sandwiched by the increasing pressure from the upper and the subsidence at the bottom. Thus the lower Ganga Deltaic Range or the Bengal Basin was formed only 6000-7000 years back as a result of siltation carried down by different river systems from Himalayas and even from Chhotonagpur Hill (Naskar et. al., 1987). That is the oscillation of sea-level had a considerable effect on this part and sedimentation took place essentially under flood-plain environment though the rate of subsidence was not uniform in spacio-temporal perspective. The district is a part of South Bengal Basin or lower Gangetic Basin thus formed during Pleistocene and Holocene times by the processes of accumulation of deposition, auto-compaction, subsidence, marine transgression etc. The vast thickness of the Tertiary sediments indicates that these accumulated in a subsidiary tectonic trough. However, it is amongst the youngest deltaic districts in WB and is stretching out in the vast alluvial plain deposited during recent and sub-recent geological era. On the basis of thickness of sediments and structural characters the Southern Bengal Basin may be divided in to a) marginal zone, b) stable shelf zone and c) deeper basin area. The last two constitute the floor of 24 Parganas.

The district is underlain by huge thickness of Quaternary alluvium deposited by the Bhagirathi-Hooghly and its major tributaries. The recent alluvium consists of grey sand, silt and grey (semi plastic) clay. Older alluvium sediment occurs beneath the recent alluvium comprising of grey to brown sand fine to coarse grained, gravel, clay (grey to yellow) with kankar and ferrogenous concretions. The top surface clay is occurring down to 5 to 12m below the ground level in northern and central parts of the district where as in the south and south-eastern parts average thickness of the top clay layer is in the range of 25m below the ground level.

Geologically, the district can broadly be divided in two clear divisions and they are shortly described below:

1) The Northern and Western Parts: Here exist loose Quaternary sediments with semi-consolidated to un-consolidated characteristics in nature. The sediments consist of alternate

Map 2.5.1



layers of sands, silts and clays in various grades and colours. Some geo-morphic features like natural levee and flood basins cover these parts. 'Kankar' is occasionally available and hence is called 'Panskura/Chinchura' formation and gravels are more common as compared in south and eastern parts of the district. Thick coarse sand and gravel horizons are found particularly near Salt Lake City and New Town areas at a depth of about 67 to 168 m below the ground level.

2) The South and Eastern Parts: This part is formed by active estuarine deposits consisting of well-sorted fine white sands and salts with geomorphic features like channel bars, point bars and meander scrolls. The delta region, as a part of the greater Bengal Basin, is covered by recent and sub-recent alluvium. The existence of a succession of Tertiary sediments and basic lava flow of Late Jurassic to Cretaceous indicate that these accumulated in a subsidiary trough, though the rate of subsidence was not uniform in space and time frame.

2.6 Physiography

From physiographic points the district can be considered as a unique one appearing as a flat and almost featureless monotonous alluvium expanse. It encompasses moribund or mature delta from adjoining Nadia district on the north to the Amdanga-Swarupnagar plains on the south characterized with beheaded distributaries and sub-distributaries which are seasonally fed. Along the moribund river channels there exist higher lands which form natural levee, the lower parts are featured with swamps and lakes acting as the local drainage basins and sinks, the rest parts being the fertile plains.

The areas down to these parts prevail from Barasat-Bashirhat region up to the active delta of Sundarban. The entire area is web-crossed by innumerable rivers charged with monsoonal runoff and tidal inflow and thereby not taking any role in siltation and land-raising from upstream.

The transition zone between moribund to active deltas is marked by a long course of marshy and brackish tract stretching from eastern part of Kolkata to Barishal in Bangladesh. A greater part of this tract has shrunk due to anthropological activities. One such recent instance is the reclaimed salt water lake presently called Bidhannagar or Salt Lake city at the south-west corner of the district.

However, based on the above mentioned variations the district can broadly be divided into following three physiographic zones:

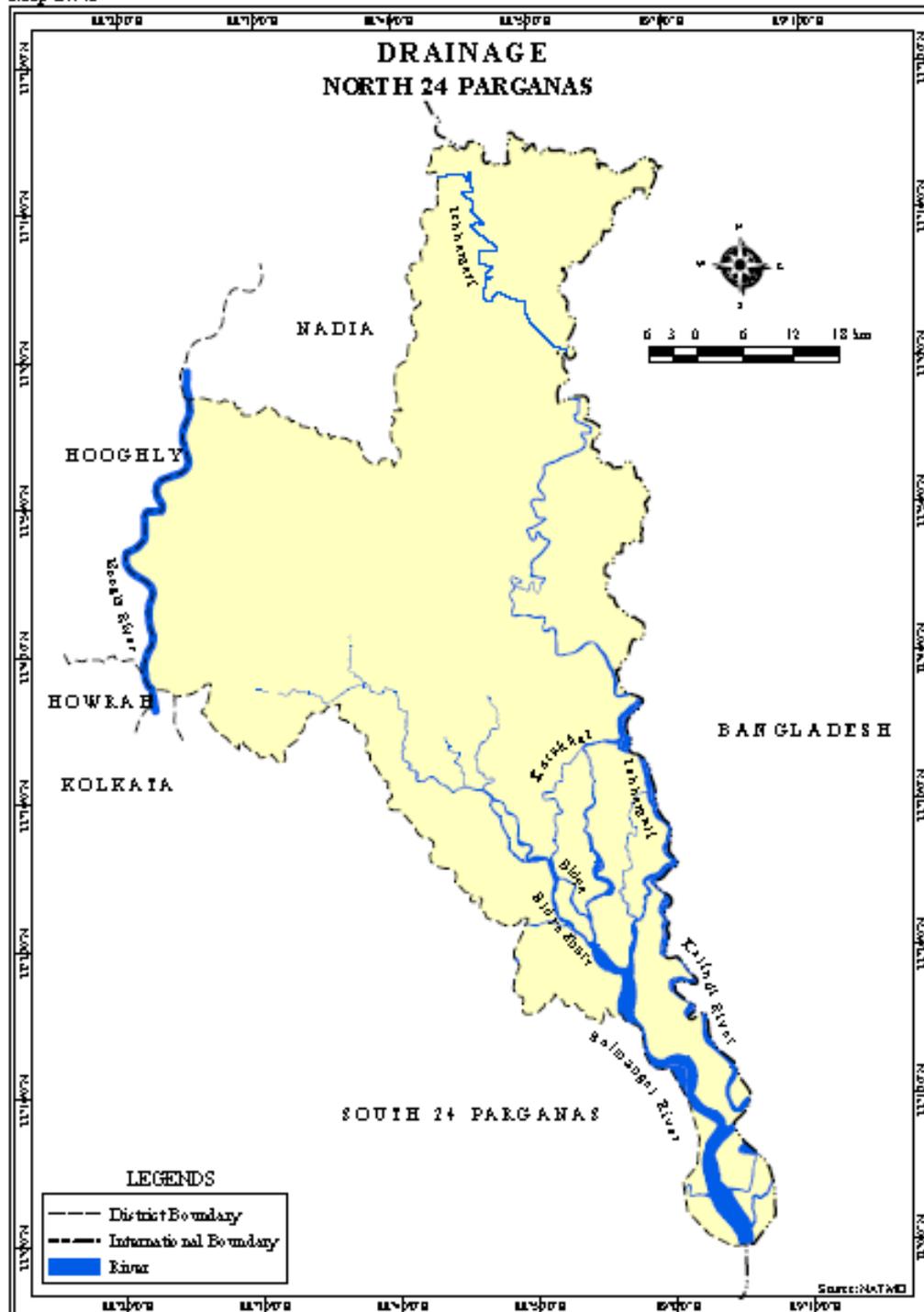
- a) **Ichhamati-Raimangal Plain** occupies the north-eastern part of the district having a local southern slope. The soil character varies from relatively mature black or brownish loam to recent alluvium.
- b) **North Hooghly Flat:** This zone stretches along the east side of the river Hooghly in the western part of the district and is formed by the silts gradually deposited by the river. In this region the major physiographic features are natural levee, swamp, floodplain etc.
- c) **North Bidyadhari Plain** is bounded by the above mentioned first region on the east and second region on the west. This part is characterized by more number of swamps and marshes with salt water lake particularly in the extreme south as compared to the other two adjoining zones.

2.7 Drainage

Mode of drainage system in the district is an important controlling factor in production scenario in general and in agriculture along with bheri-fishery in particular. Since the district is tilted towards south and south-east from the north, the rivers follow the same directions in their course. Almost all the rivers have got disconnected from the source-rivers and hence they are fed by local precipitational water and/or tidal inflow. The southern part is criss-crossed with a network of tributaries, distributaries, minor creeks and channels etc. A brief account of the principal rivers of the district is presented here.

The Hooghly: It is the lowest course of the Ganga in India and is the main and mother river of almost all the tributaries in the district. It passes along the western boundary of the district of approximately 35km in a southerly direction past Garifa, Naihati, Bhatpara, Kankinara, Jagaddal, Shyamnagar, Ichhapur, Palta, Barrakpur, Titagarh, Khardah, Sodepur, Panihati, agarpara, Kamarhati, Ariadaha, Dakshineswar, Baranagar and then between Kolkata and Howrah.

Map 2.7.1



The Ichhamati: It is the most important river in the north and east of the district. The river enters the district from the north at the tri-junction of Bangladesh, Nadia and North 24 Parganas districts and then flows with a south-easterly meandering course passing through Bagdah, Bongaon, Swarupnagar, Arbelia, Baduria, Bashirhat and Hingalgunj. It traverses a long path along the territorial boundary between Bangladesh and West Bengal (India) several times. The river carries water discharged by several other rivers. From Hingalgunj it gives off various tidal distributaries, the chief of which are the Raimangal, Bidya, Jhilla, Kalindia and Jamuna and ultimately fan out wide estuaries through the Sundarban. It is the longest river in the district and bears a pivotal role both from navigational and strategic point of views.

The Bidyadhari: The beheaded Bidyadhari River begins in the north-east of Dogachia in Habra-II block as a drainage channel with the name Nona Gang and occupies low interfluves between the Sunti and Padma. It flows through a roundabout course. After passing through Habra-I block it takes the name Bidyadhari and then traverses southerly bifurcating Barasat-I, II and Deganga blocks. Then it passes crossing the Barasat-Bashirhat rail track near Beliaghata and traverses further southward. The Nowai flows through Rajarhat block and meets the north-south flowing Sunti Nadi near Bishnupur and the combined stream flows south-easternly until it is captured by the Bidyadhari Khal which then goes north-easternly along the border of Haroa and Barasat-II blocks with the name Haroa Gang and meets the Bidyadhari River near Tehata. Then the Bidyadhari river flows south-easterly along the border of Deganga and Haroa blocks and turns south near Haroa Bazar. Then in further south the river receives Bagjola Khal & Bhangar Kata Khal on the right bank and Chaumuha Gang or Kulti on the left bank. After this confluence near Kulti the river flows southwardly and then south-easternly as tidal river and ultimately mixes with Matla River in Sundarban after receiving several other rivers. The Krishnapur Canal, Circular Canal, New-cut Khal, Bagjola Khal, Bhangor Kata Khal, Tolly Nullah etc drain the effluents of the major parts of Kolkata city to the Bidyadhari River and hence its upper streams are almost drying though once upon a time it was an important water way joining Kolkata, Port Canning, Khulna and Barishal (present Bangladesh). Almost all the saline water bheri-fisheries in North 24 Parganas district have emerged either in its silted portions near Kolkata or on the both sides of the river or near its tributaries and sub-tributaries.

The Jamuna: The Jamuna River finds her way into the district from the north-west border with adjoining Nadia district and flows passing Gobardanga, Gaighata, Baduria, Swarupnagar, Itinda Ghat etc until it meets Ichhamati near Diara. On its south-eastern course the river throws out a small distributary calling the Padma.

2.8 Climate

The climatic variables like duration, distribution and intensity of rainfall, temperature, wind velocity and directions etc play vital role in agriculture, pisciculture etc prevailing in the district. The district enjoys tropical monsoon type climate characterized by an oppressive hot summer, high humidity almost all the year long. Rainfall is mainly concentrated during the south-west monsoon period which usually lasts from June to September when more than 70% (1,565mm) of the normal annual rainfall occurs corresponding with a higher temperature and very high relative humidity. Hence, this is the period of sultry weather, flood & water logging. Some short of thunder-shower is seen during the latter half of the season, even in October. Of course, the plenty monsoonal precipitation attributes to a productive year for the dominantly agrarian economy of the district.

Table 2.8.1: Some Weather Parameters of North 24 Parganas

Months	Average Temperature in Degree Celsius	Average Rainfall in mm	Average Humidity in %
January	17.5	12	67
February	23.5	19	65
March	26	38	68
April	31	53	70
May	31.5	139	75
June	31	267	81
July	30	348	86

August	30	202	85
September	29.5	282	85
October	28.5	166	77
November	24	57	65
December	20.5	14	67

Source: Meteorological Department, Government of India.

October to middle of November constitute the post-monsoon season with occasional rains characterized by tropical cyclones and subdued temperature.

Then begins the winter season with north-east monsoon and lasts up to the end of February. No considerable rainfall occurs during this period but a mild and drier weather persists in the district, mean maximum and mean minimum temperature varies between 26°C and 12°C respectively in general.

Then the hot summer follows from March and continues till the outburst of the south-west monsoon. The mean summer temperature varies from 25.5°C to 30.5°C.

Due to north-south elongation (approximately 110Km) a spatial climatic variation persists in the district. The northern parts lie closed to the tropic of cancer (23°30') and hence are characterized by comparatively hotter summer and colder winter. Rainfall decreases from the south-east towards north-west.

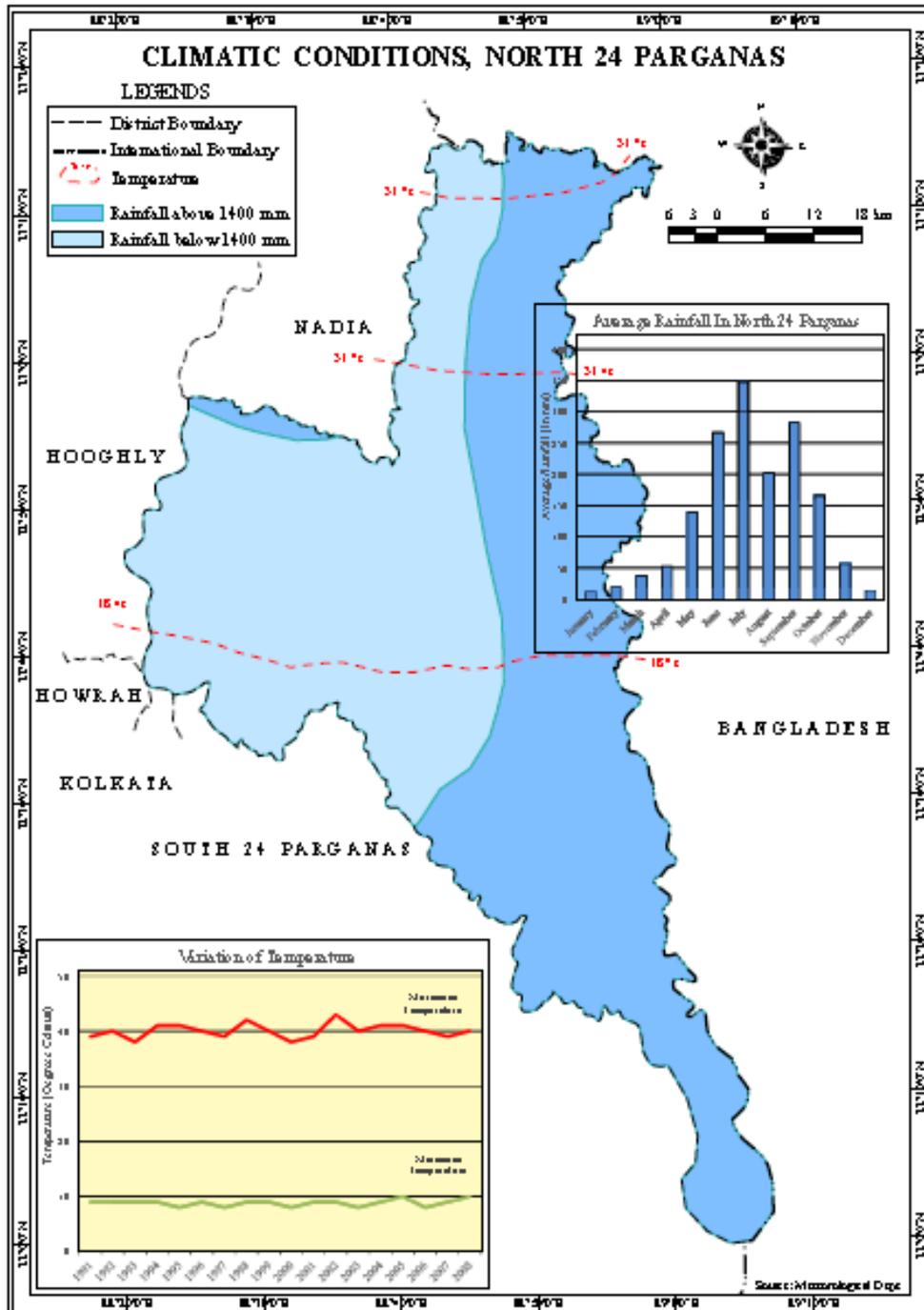
The temperature and humidity conditions near the Sundarban region differ a little from the rest parts of the district and here exists almost all the bheri-fisheries. Heavier rains during south-west monsoons make the marshes, wetlands and bherie-water sweeter and aman paddy gets suitable for cultivation which is the only means for livelihood of a considerable part of the local people particularly in the south-east tract of the district.

Table 2.8.2 Temperature Variations of North 24 Parganas

Year	Maximum Temperature in Degree Celsius	Minimum Temperature in Degree Celsius
1991	39	9
1992	40	9
1993	38	9
1994	41	9
1995	41	8
1996	40	9
1997	39	8
1998	42	9
1999	40	9
2000	38	8
2001	39	9
2002	43	9
2003	40	8
2004	41	9
2005	41	10
2006	40	8
2007	39	9
2008	40	10

Source: District Statistical Hand Book, North 24 Parganas

Map 2.8.1



2.9 Geohydrology

In North 24 Parganas the ground water resources act as a major determining factor for agricultural production since the surface water is not easily accessible and economically affordable all over the rural belts. There is an occurrence of saline water intrusion near the coastal zones. Again the surface water of the bheri-fisheries in the south-east parts has a significant interaction with the ground water. Hence, it will not be irrelevant to shortly discuss the ground water aquifers of the district.

In the district underground water lies in a thick zone of saturation in the alluvium deposited by the riverine systems. The sand and gravel horizons of different texture constitute the main aquifers.

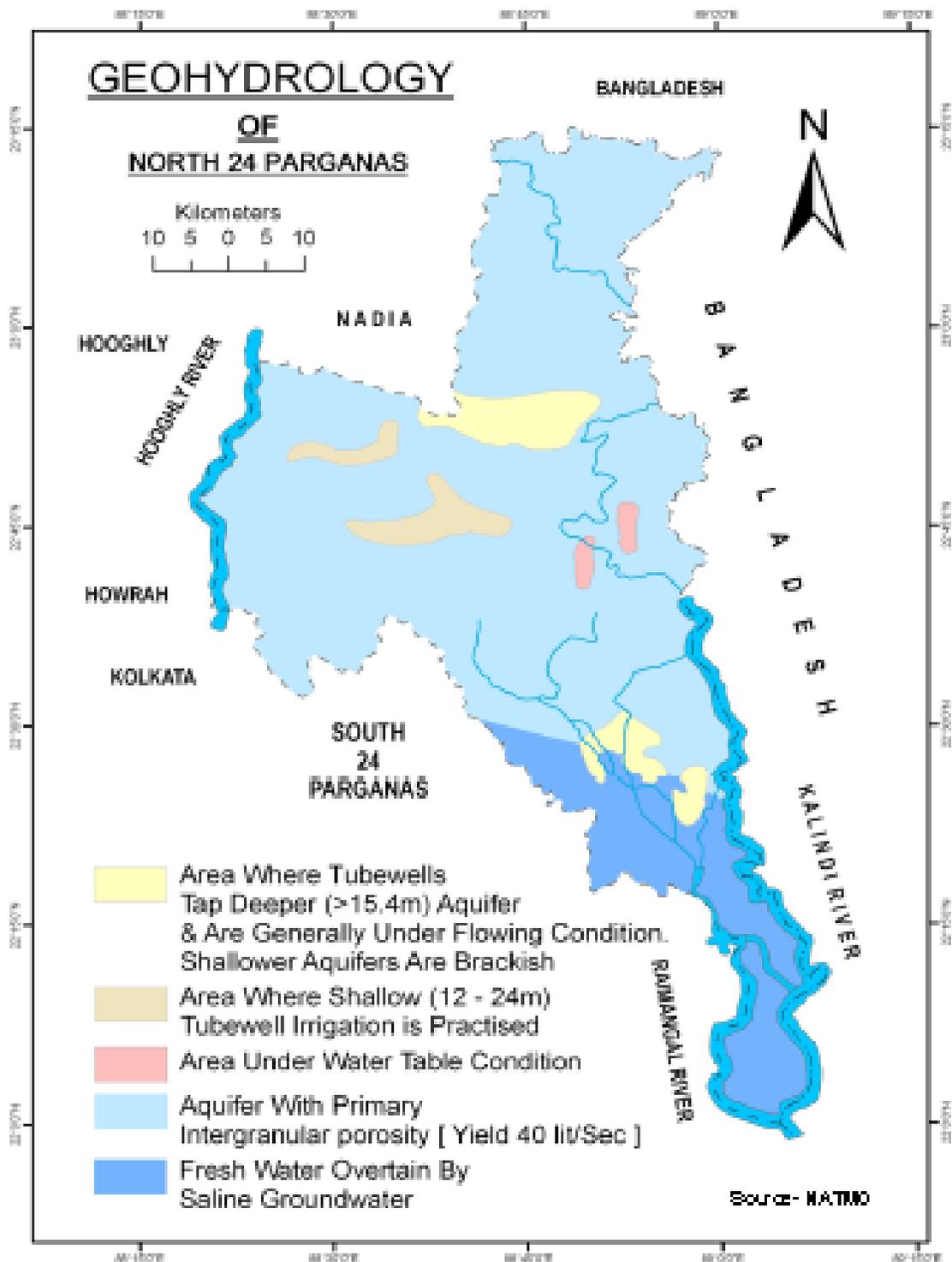
Both confined and unconfined aquifer conditions prevail in the district. In northern and central parts ground water occurs under water table conditions. On some natural levees open wells ranging from 7 to 15m bgl are used mainly for domestic purposes where depth to water (dtw) table varies from 1 to 3m bgl. The repositories of unconfined ground water in the areas are aggraded channel fills and natural levee deposits. However, in some isolated patches of Barrackpore, Amdanga, Habra-II and Rajarhat blocks the top clay and sandy clay are locally thick (20 to 30m) imparting semi-confined aquifers in nature.

In some blocks in south and south-eastern parts like Hasnabad, Hingalgunj, Sandeshkhali, Minakhan etc ground water occurs in confined aquifers where the aquifers are overlain by a thick impermeable layers of clay and hence rain water recharging is hardly possible. Some areas here fresh water is overlain by saline ground water.

In the unconfined aquifers depth to water (dtw) level usually varies from 2 to 13.6m bgl during pre-monsoon, from 1.64 to 10.66m bgl during post-monsoon. In confined aquifers the piezometric water varies from 3.47 to 6.25m bgl during pre-monsoon and from 1.91 to 5.89m bgl during post-monsoon.

Long term water level trend in the district in 10 years (1997 to 2006) shows that in case of 10 wells water level rises from 0.02 to 1.46 m/yr and falls from 0.16 to 5.95 m/yr in 29 wells (CGWB).

Map 2.9.1



Aquifer Characteristics: The shallow tube wells installed in unconfined and confined aquifers are capable of lifting 50 to 150 m³/hr with a nominal draw down of about 4 to 5 m and those are capable to yield 20-40m³/hr with a draw down of less than 4m. Transmissivity values range from 699 to 8127 m²/day and the storativity ranges from 1.05x10⁻³ to 1.45x10⁻⁴.

Quality: Chemical quality is generally bicarbonate type and major problems are due to presence of arsenic and salinity.

Table 2.9.1: Some Features Related to Ground Water Contamination in the District:

Northern and central part	chloride content is low(18-234mg/l)
South and eastern part:: Bashirhat I & II, Haroa, Hasnabad, Hingalgunj, Sandeshkhali I & II and Minakhan block.	Brackish to saline with chloride content 300 to 1241mg/l
Arsenic affected and patient recorded	Barasat I&II, Deganga, Bashirhat II, Baduria, Swarupnagar, Habra I&II, Gaighata, Hasnabad, Bongaon, Haroa, Amdanga and Barrackpur II block
Arsenic affected but patient not recorded	Minakhan, Sandeshkhali I, Hingalgunj, Rajarhat and Barrackpur I block.

Source: Central Ground Water Board and State Water Investigation Department

Table 2.9.2: Ground Water Status

Parameter	Quantum
Total Reservoir	1,57,640 ham
Net annual availability:	1,41,876 ham
Existing draft for irrigation:	94,066 ham/yr
Existing draft for domestic and industrial:	
Existing draft for all uses:	6,939ha/yr 1,01,005 ham/yr
Stage of ground water development:	71.19%

Allocation for domestic and industrial water supply requirement up to 25yrs:	10,859ham
Net GW availability for future irrigation development:	36,951ham
Categories of blocks:	All blocks are under 'safe' category

Source: Central Ground Water Board and State Water Investigation Department, Govt. of WB.

2.10 Flora and Fauna

Over the moribund, mature and active delta regions the North 24 Parganas district endows a wide and typical variety of flora and fauna depending on climate, soil etc.

In the district the vegetations are broadly classified as:

1) Agricultural vegetation of the moribund and mature delta areas: Agricultural crops cultivated by the local people have replaced the natural cover in the north and north-west moribund and mature delta areas. Major cultivated crops are various kinds of cereals (rice has the lion's share), pulses, fibre plants, oil-seed crops and other food accessories like vegetables etc. A wide variety of weeds grow in the paddy fields, various algae and angiosperms are also available in low lands. Many indigenous and exotic varieties of fruits, bamboo groves, flowering plants and low scrubs are available in the cultivable tracts.

2) Vegetation on the fresh water pools, ponds and rivers: Different uncultivated vegetation like various pteridophytes and angiosperms are abundantly found in the different fresh water bodies all over the district.

3) Vegetation on the active delta: Somewhat degraded mangrove forest with species like

Sundari, Garan, Garjan, Keora, Bain, Hental etc are found in this part along with some salt tolerant indigenous paddy variety.

However, only reported forest or sanctuary areas are present in Bagdah police station in the north and in Sandeshkhali & Hingalgunj police stations in the extreme south.

Among the important land fauna surviving in the district spotted deer, Royal Bengal Tiger, wild boar etc are mentionable. Among birds (both native and migratory) duck, fowl, stork, spoon bill, whistling teal etc are worth mentioning. The aquatic fauna like large saltwater alligators, gangetic dolphin, monitor lizard, turtle, crocodile, numerous edible fishes etc are found in the district. Amphibious mudskipper, scab of different species like mud scab, ghost scab (*Ocypode planty torsia*, Lal Kankra), samudra kankra (*sokailo cereta*), chiti kankra (*portonus peladicus*), Lal kankra (*Ucca, Acuta, uccadu sumieri* etc) etc, a lots varieties of shrimp like bagda (*P. mondan*), galda (*macrobrakium rosenbergi*), chapra (*p. Indicus*), mocha (*m. rudy*), chamne (*metapinius brevicornis*), hone (*metapinius monoceros*), lal chingri (*parapinius sculoptilis*), techo chingri (*parapiniopsis stilifera*), rasna chingri (*pelimon stiliferous*), fool chingri (*Esetis Indicus*) etc are some typical fauna inhabiting in the south-eastern parts of the district.

2.11 Land Use

Differences in demography, relative elevation, composition and pedagogical aspects of various land form elements etc control the land use pattern of the district to a great extent.

The back swamp areas with clayee soils are mostly used for paddy cultivation including wheat, maize, potatoes and other vegetables. Orchards like guava, banana, supari, coconut and palm are commonly available. Urban areas are dominated by major trading centres, factories and habitation mainly on Hooghly levees. Different rivers and waterbodies are extensively used for fishing and pisciculture.

Map 2.11.1

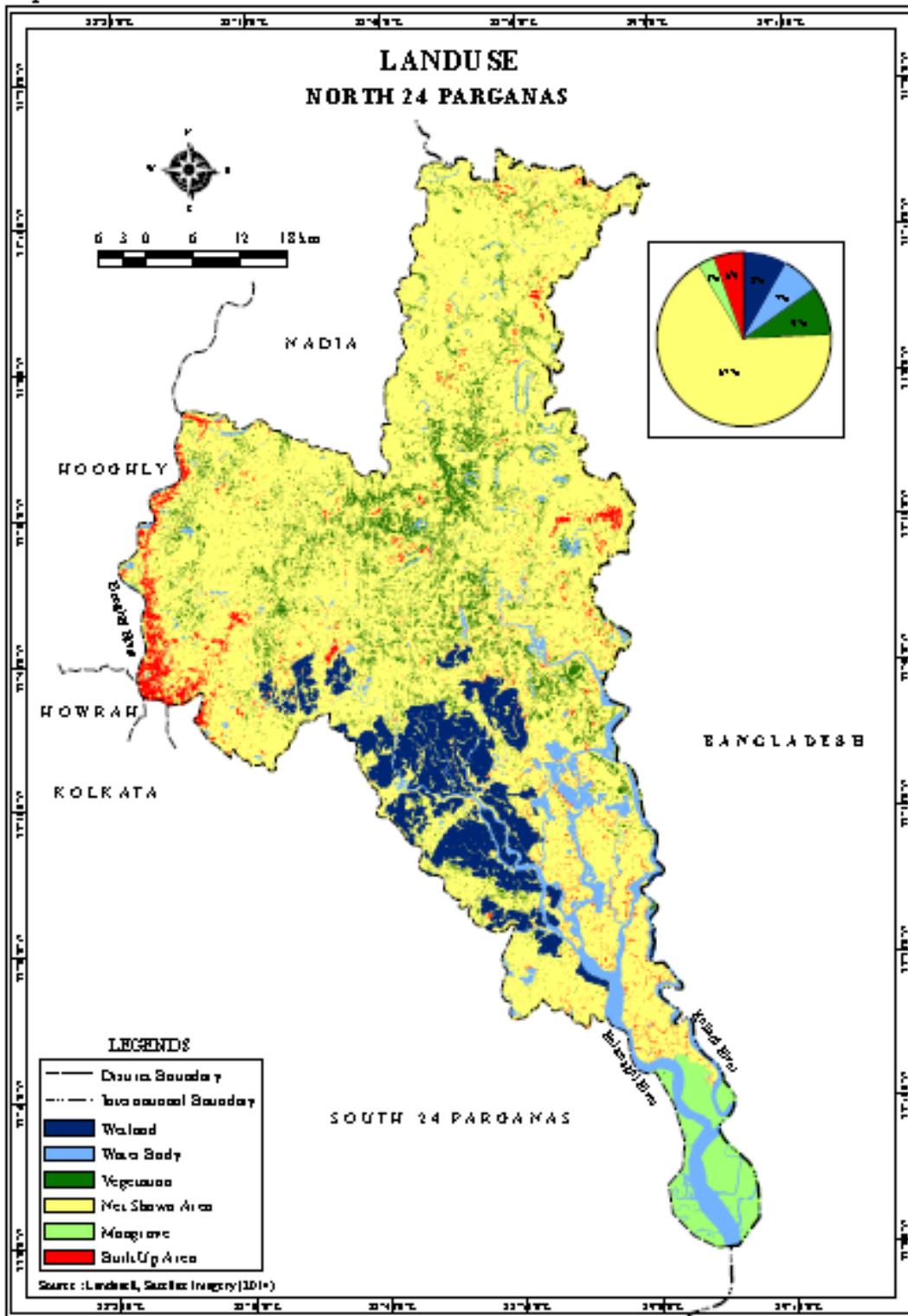


Table 2.11.1: Classification of Land Utilization Statistics (Area in hectares)

Year	Reporting area	Area under non-agricultural use	Net area sown	current fallow	Land under misc. tree groves not included in net area sown
2001-02	3,86,686	1,02,510	2,77,231	3	6,942
2002-03	3,86,685	1,12,039	2,64,381	4,435	5,830
2003-04	3,86,525	1,17,960	2,57,453	2,403	8,708
2004-05	3,86,525	1,14,469	2,65,514	1,778	4763
2005-06	3,86,525	1,20,336	2,60,537	1,334	4,317

Source: District Statistical Hand Book, North 24 Parganas, 2006, Bureau Of Applied Economics & Statistics, Govt. of W.B., Page 58.

2.12 Agro-climatic and Agro-ecological Classifications:

The nature, product and productivity, seed etc vary in different agro-climatic and agro-ecological regions/sub-regions in respect of bheri-culture. Hence, it is imperative to briefly describe the same particularly in WB and North 24 Parganas.

For having scientific management of regional resources and harnessing optimum return from the agricultural and allied sectors the Planning commission, Govt. of India has divided the country into fifteen agro-climatic zones which have further been subdivided into one twenty four sub-zones by the ministry of Agriculture, Govt of India and into 129 sub-zones by the Indian Council for Agricultural Research (ICAR). The entire WB falls only under three (out of those 15) zones namely Eastern Himalayan (Zone-II), Lower Gangetic Plain (Zone-III) and Eastern Plateau & Hill (Zone-VII) and six sub-zones based on soil, topography, climate and cropping pattern for the sake of formulation of more specific agricultural plans (Lenka, 1998). The North 24 Parganas district falls under New Alluvium sub-zone of Zone-III.

Again the district has been divided police station-wise as per the following **table 2.12.1**

Table 2.12.1 Police Station-wise Agro-climatic Regions and Sub-regions

Agro-climatic Regions	Agro-climatic Sub-regions	Police Stations
Lower Gangetic Plain (Zone-III)	Gangetic Flood Plain	Baduria, Swarupnagar, Gaighata, Bijpur, Bongaon, Bagdah, Habrah, Amdanga, Barasat, Deganga, Rajarhat, Dumdum, Baranagar, Belgharia, Khardah, Titagarh, Barrackpur, Noapara-Jaddal and Naihati.
	Coastal Flood Plain	Hingalgunj, Hasnabad, Sandeshkhali, Minakhan and Haroa.

Table 2.12.2 Agro-climatic Sub-regions Characteristics

1. Gangetic Flood Plain

Climatic Features	March to May	June to October	Nov. to February
Rainfall (mm)	233.80	1206.00	67.80
Air Temp. Max. °C	35.50	32.20	27.40
Air Temp. Mini. °C	23.10	25.60	15.60
Relative Humidity %	58.00	80.00	65.00
Dewfall	Not Significant	Not Significant	Not Significant

2. Coastal Flood Plain

Climatic Features	March to May	June to October	Nov. to February
Rainfall (mm)	195.00	1475.20	82.80
Air Temp. Max. °C	34.00	32.00	28.20
Air Temp. Mini. °C	24.80	26.00	16.00

Relative Humidity %	72.00	82.00	68.00
Dewfall	Not Significant	Not Significant	Not Significant

Source: “The 17th All India Livestock Census, Agriculture Implements, & Machinery, Fishery Statistics, WB, North 24 Parganas District, Volume-I”, Published by the Directorate of Animal Resources and Animal Health, Govt. of WB.

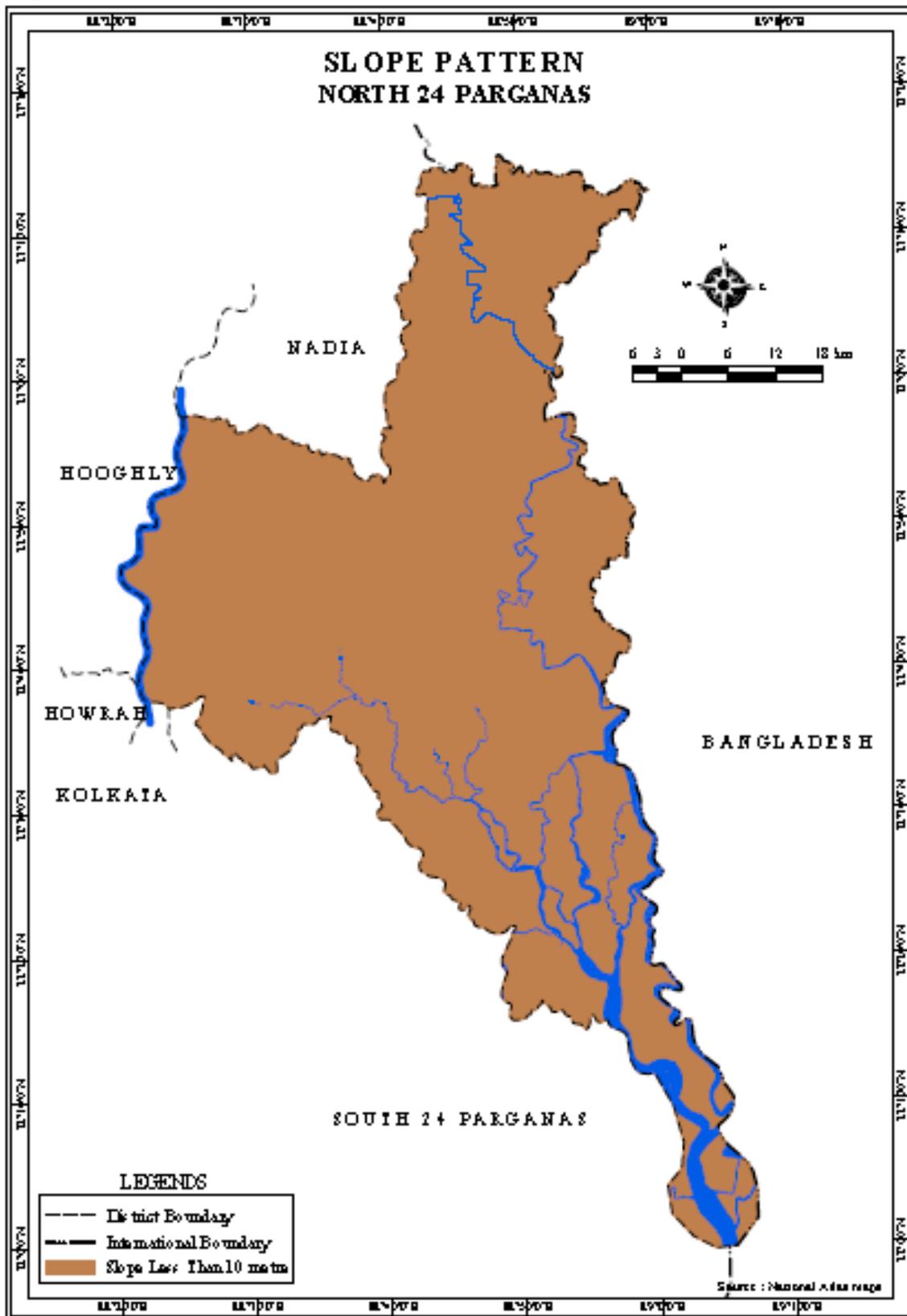
The National Bureau of Soil Survey and Land Use Planning (NBSS&LUP) (ICAR) has divided the country into 20 Agro-ecological Regions based on physiography, soil, bioclimate and length of growing period derived from ecosystems (Lenka, 1998). In North 24 Parganas two distinct agro-ecological situations prevail –Gangetic Alluvial zone and Coastal Alluvial zone. The Gangetic Alluvial Zone comprises of 16 blocks spreading over entire Barasat, Barrackpur and Bongaon subdivisions and 4 blocks (Basirhat I&II, Baduria and Swarupnagar) of Basirhat subdivision. For application of more location-specific technologies the Gangetic Alluvial Zone has further been subdivided into:

- a. Ichhamati Basin comprising of Bongaon, Bagdah, Gaighata and Swarupnagar blocks,
- b. Gangetic Plains comprising of all blocks of Barrackpur and Barasat subdivisions, Basirhat I&II, and Baduria blocks of Basirhat subdivision (District Agricultural Plan, 2010-11, Govt. of WB).

2.13 Topography

The 110 Km north-south long district forms a gentle southerly slope of 0-10m/Km with some local elevations and depressions and the average elevation is 9-10m above mean sea level (msl). In the north-western moribund and mature delta parts there flow so many meandering rivers having no off-take from the feeding streams. The highest natural levee, along the Hooghly River, is densely settled. The Hooghly marginal plain slopes more steeply than the interiors and hence is better drained. The flattish topography exhibits monotonous characteristics and vast fields in different patches remain submerged particularly in rainy seasons.

Map 2.13.1



Another high ground of approximately 8Km strip exists along the course of Sunti Nadi stretching from Haringhata to Duttapukur. The Sunti Plain is succeeded eastward by the Jamuna-Padma (local names) and Ichhamati Plains, each marked by saucer-shaped depressions with numerous crescent-shaped lakes, narrow water channels etc in wide river beds, high river banks and in the river beds which are at higher levels than the adjacent plains. The southern limit of the moribund tract is marked by so many abandoned loops of the Padma just south of Habra-Bongaon Railway line. Another moribund plain i.e. Amdanga-Swarunagar plain stretches upto Barasat-Hasnabad Railway tract.

Then the mature deltaic plain of Barasat-Basirhat stretches southernly up to Sundarban. Here the headless rivers still remain flowing by the local runoff and tidal inflow and they hardly contribute to silt formation. In the south-western parts there are some marshy lands almost converted into paddy-fields and human settlements for both commercial and residential purposes near Kolkata City.

The southernmost 6 blocks were long ago reclaimed from Sundarban keeping very few traces of reclamation. Here the reclaimed plains can be divided into three parts: Hasnabad Plain in the east, Haroa Plain in the middle and Bhangar-Rajarhat Plain in the west. In the reclaimed areas villages have took place near to the sweet water sources with embankment-protection and settlement is more dispersed as compared those in the rest parts of the district.

2.14 Folk Culture

The diversified folk culture is an edifying feature of the cultural life of North 24 Parganas district and they include the folk rituals, folk dances & dramatic performances of daily life. Some of them are jhumur, manasa vasan, Rayani, Austakgan, Banbibi Pala, Tusu, Bhatiali, Charak etc. Some of these customary folk cultures are even famous nation-wide. Some religious festivals like Durga Puja, Kali Puja, Lakshmi Puja, Bonbibi and Dakshin Roy Puja etc are worth mentioning.

2.15 Soil

The features of soils can be best described in terms of climate and vegetation supported it. On such considerations WB can broadly be divided into 6 sub-regions and the district falls under two viz: Hot moist sub-humid (northern parts) and Moist sub-humid (southernmost Part). The northern part consists of younger soils and the southern part comprises deltaic alluvial soil.

The soils are suffering from the problems of erosion, soil depth, poor drainage, salinization etc. Since the soil-fertility is in the declining trend due to depletion of available N, P, K, S and several critical micronutrients, weeds, diseases and pests are multiplying and becoming increasingly uncontrollable particularly in the Ichhamati Basin and in Gangetic alluvial region.

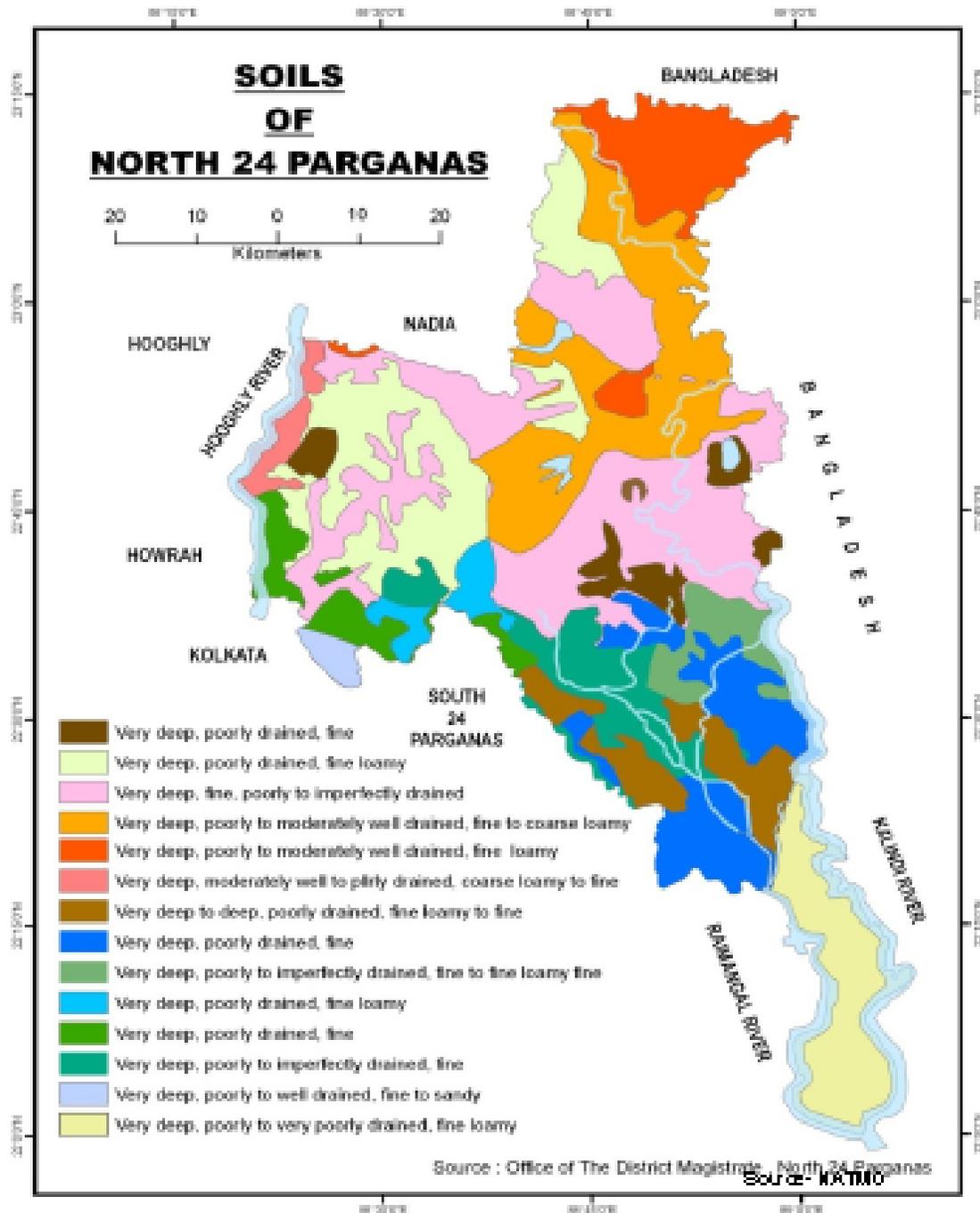
Total area in the district available for cultivation is 2,22,050 ha and the soil compositions are sandy loam: 29.72%, clay: 27.10%, loamy: 20.52%, clay loamy: 19.36% and sandy: 3.30%. (Annual Plan on Agriculture, 1999-2000, Govt. of WB).

2.16 Agriculture and Irrigation

To keep pace with the modern trends the agricultural cultivation is no longer treated with top most priority, though a greater percentage of the people of the district have been depending on this occupation.

However, in the recent past agriculture in the district has witnessed a gradual transformation from previous subsistence to present days' intensive farming. Yet the agriculture has been facing several constraints in respect of its geographical location, insufficient and uneven irrigation facilities, natural calamities, settlement pressure on agricultural lands, soil erosion, salinization, lack of storage and processing unit, poor marketing infrastructure etc. Though more than 10% of the state's population inhabits the district, only 4.30% of state's geographical area and 3.80% of state's agricultural land are available for the purpose. Good qualities of seeds at affordable prices are short in supply particularly in the remote villages. Due to over use of soil there prevails a gap between potential and actual yield. More than 70% of farmers are of small and marginal categories and hence are deprived of implementing modern inputs and machineries. A vast area remains mono-cropped and even fallow due to non availability of irrigation particularly in the

Map 2.13.1
 MAP 2.13.1



south-east tracts of the district. Only aman paddy (and nothing else even vegetables) is cultivated if and only if sufficient and intime monsoonal precipitation takes place in the areas. Some households cultivate vegetables for their own consumptions in their home-yard irrigated by the water collected for drinking purpose.

In the year 1990-91 net cropped area was 5,74,585 ha while in the year 1995-96 it was 3,69,599 ha and presently it is only 2,60,537 ha. That is within last 15 years the lands under agricultural crops have reduced by 3,14,048 ha and presently per capita agricultural land has reduced to only 0.025 ha.

Some salient data related to agriculture are mentioned here under:

Geographic area: 4,094 Sq Km

Net cultivated area: 2,25,000 ha

Area under vegetables and flowers: 65,500 ha

Forest area: 110 ha

Single cropped area: 47,303 ha

Double cropped area: 50,643 ha

Area cultivated more than twice: 1,00,749 ha

Cross-cropped area: 4,62,704 ha

Cropping intensity: 205.6%

Area under irrigation: 1,52,432 ha

Gross irrigated area: 1,95,940 ha

Area irrigated through surface water: 64,056 ha

Area irrigated through sub-surface water: 1,31,883 ha

Net cropped area: 2,60,537 ha

Category-wise number of farmers: Big: 2184, small: 52112, marginal: 362731, Agril. Labour: 394579, Bargadars: 76893, Patta holders: 131190. (District agricultural Plan, 2010-11, Deptt. Of Agriculture, Govt. of WB).

Table 2.16.1: Area under Principal crops in ‘000 ha

Crops	2001-02	2002-03	2003-04	2004-05	2005-06
Rice	331.5	287.4	267.5	265.2	277.1
Total cereals	348.1	297.1	278.7	271.0	284.5
Oil seeds	51.9	37.8	40.1	40.1	44.6
Fibre	62.8	61.7	51.6	51.6	50.1
Misc crops	13.5	12.0	11.4	10.6	9.3

Source: District Statistical Hand Book, 2006, Page 59.

2.17 Aquatic Resources and Aquafarming

In the district there are different types of aquatic body like pond, beel, river, khal, brackish water source etc. The aquatic resources contribute to fisheries, agriculture, maintaining of water table, transport, tourism and recreation, ecological balance and waste recycling, food control etc.

Aquaculture is a dependable source of daily livelihood for a sizable portion of population not only in the rural belts but also in some urban areas. Total aquatic resources in rural areas is 60,159 ha and production is 1,41,923.68 MT (2007-08). About 9% of the district population depends on capture and culture fisheries for their livelihood. A considerable portion of both rural and urban people depends directly on fish-trading and allied businesses.

Highest production rate of fish in the district is in Barrackpur-I by adopting intensive aquatic techniques in sewage-fed water bodies and it is 8-10MT/ha. In terms of total production Haroa is on the leading position producing 19,813.6MT per year(2007-08) of fish, prawn and shrimp.

There are considerable areas of fisheries in all the 27 municipalities and the maximum is in Bidhannagar municipality covering an area of about 1,765 ha producing 11,472.5MT in the year 2007-08 (fish and prawn).

There also exists fish culture by individual entrepreneurship for their own livelihood commercially or for self consumption all over the district including urban areas.

Lot of people particularly near Sundarban make their earnings from collection of different fishes, shrimp-seeds and mud crabs from the rivers, channels, creeks, marshes, khals etc as capture fisheries for own consumption and marketing also.

There are more than 140 nos carp-seed production hatcheries in the district. There are also a good number of pin-nursing pond/hatchery for making the outstation (mainly from Andrapradesh) fingerlings accustomed with local saline water.

There are different stakeholders in different stages associated with aquaculture. In the district there are 30 wholesale markets, 377 retail markets, 14 ice plants and 10 fish processing units.

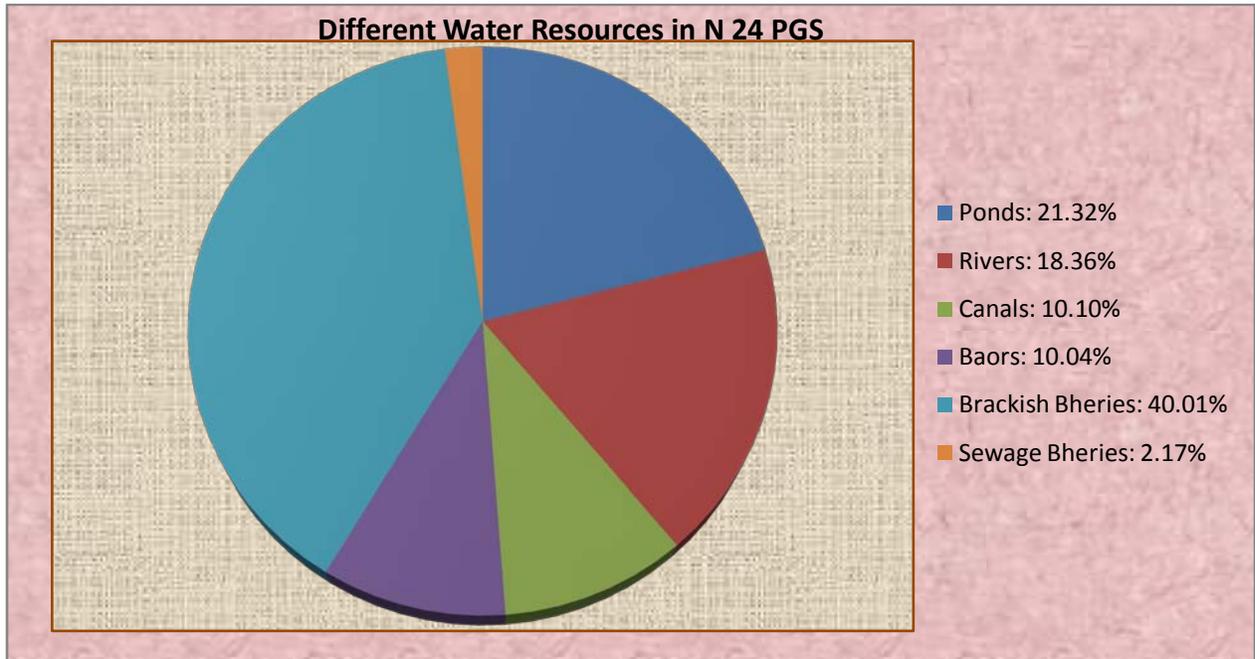
The beels/ baors are mostly located near Bongaon, Bagdah, Gaighata, Kanchrapara, Shyamnagar, Habra, Swarunagar etc and they are Mathura beel, Birati beel etc.

Table 2.17.1: Water Resources in North 24 Parganas

Resources	Area in ha
Fresh water ponds/tanks	18,646.56
Fresh water baor/beels	8,661.19
Brakishwater Bheri	34,000.48
Canals and Creeks	8,712.00
Sewage-fed water bodies	200.77
Rivers	14,229.00

Source: Meen Bhawan, Barasat, Deptt. Of Fisheries, Govt of WB

Diagram 2.17.1: Different Water Resources in North 24 Parganas in 2009-10



Source: Meen Bhawan, Barasat, North 24 Parganas

Some Data as per District Planning Deptt., Barasat, North 24 Parganas are mentioned here under:

Ponds/tanks used for irrigation: 1,294 nos

Ponds/tanks unused : 44,772 nos

Total : 46,066 nos

Fish eater population : 75%

Total fishermen : 4,55,000 nos

Bazar: Dimpona : 6 nos

Paikari : 28 nos

Ice mill : 11 nos

Cold storage : 3 nos

Chingri Processing Center : 4 nos

Fishermen Co-operatives : 74 nos