Chapter - I

GEOGRAPHY OF THE STUDY AREA

1.1 STUDY AREA:

The study area (Map 1.1) comprises the south-eastern part of West Bengal (Map 1.2 inset) and extends between latitudes 22°44'S and 24°32'N and longitudes 87°59'E and 88°59'E. It is bounded by the river Padma as well as the international boundary in the north and east, the Padma bil in the south and districts of Birbhum, Bardhaman and Hugli in the west. The tract thus extends over 31 police stations (P.S.) and three districts, viz., Murshidabad, Nadia and Twentyfour Parganas which are partly or wholly included within it. There are 12 P.S. of eastern Murshidabad, 14 P.S. of entire Nadia and 5 northermost P.S. of Twentyfour Parganas. There are 9 sub-divisions, either partly or fully within this study area. The northermost sub-division, viz., Jangipur is represented by Raghunathganj P.S.; east of Jangipur is Lalbagh and further south, Berhampur. Lalbagh includes P.S. Lalgola, Bhagwangola, Raminagar, Jiaganj and Murshidabad, while the whole sub-division of Berhampur lies within the study area. The fourth, fifth and sixth subdivisions are Krishnagar, Ranaghat and Kalyan respectively, covering all of Nadia district. In Twentyfour Parganas there are three
subdivisions, of which Bangaon, Gaighata and Bagdah P.S. are in Bangaon, Habra in Barasat and Swarupnagar in Basirhat subdivisions (Map 1.1).

There are 27 urban centres, viz., Jangipur, Lalgola (NM), Jiganj-Azimganj, Murshidabad, Kasimbazar (NM), Beldanga of the Murshidabad district; Jagadanandapur (NM), Krishnagar, Nabadwip, Gadigachha (NM), Saptipur, Phulia (NM), Birnagar, Taherpur (NM), Ramaghat, Aistala (NM), Bagula (NM), Chakdah, Madanpur (NM), Gayespur (NA), Harimghata Dairy Farm Town (NM) of the Nadia district; Bangaon, Gobardanga, Habra, Asokenagar - Kalyangarh of the Twentyfour Parganas district (Map 1.2).

The 8250.7 sq.km. of the study area have a population strength of 5,251,430 (1981) of which 10,97,026 are urban. Density of population is 636 per sq.km., rural density being 505 per sq.km. and urban density 4,453 per sq.km. There are two main religious groups in the population, viz., Hindu, 63% of the total population and Muslims 36%, the rest are Jains, Christians, Buddhists and Sikhs (Appendix I.1).

Geographically, the region shows striking contrasts in certain respects like hydrology, agriculture and cultural landscape. The mighty river Padma is a contrast to the dead or decaying distributaries elsewhere within the region. Land building and land erosion

1. NM denotes non-municipal towns, NA, notified area.
Map 1.2 Administrative map showing district headquarters, towns and major roads; inset (left) showing location of the study area in West Bengal; inset (right) showing subdivisions of the delta:

I - Moribund, II - Mature, III - Active (After Bagchi, K., op. cit.).

Districts: 1 - Murshidabad, 2 - Nadia, 3 - Twenty-four Parganas (West Bengal), 4 - Kustia, 5 - Jessore, 6 - Khulna, 7 - Faridpur, 8 - Bakherganj (Bangladesh).
...common phenomena along the river Padma while in the area served by the dead rivers, such activity has come to a standstill. The unproductive and barren parts stand in contrast to the black, clayey and fertile soil of the Kalantar region. The region also presents a contrasting cultural landscape. Northern part, i.e., Murshidabad district was ruled by the Muslim rulers and the southern part, i.e., the rest of the study area, by the Hindu chieftains. This may explain predominance of Muslim population in the northern part and of Hindu population in the southern part (Appendix I.1). However, temples and mosques are to be found standing side by side all over the region. The Murshidabad town itself is a unique example in this respect.

It may be observed that the economic and social life of the study area is largely the product of riverine environment. Towns and business centres sprang up along the river banks and with the decay of the rivers and allied economic activities, they dwindled in importance. Thus, both the historical events and geographical factors have played a part severally and together in etching out the cultural landscape in this region.

1.2 GEOLOGY:

The geological history of the Bengal delta is marked by repeated marine transgressions and regre-
The present drainage pattern of West Bengal clearly reveals a regional southeasterly slope which is apparently the shallower expression of the slope of the Tertiary geological horizons. According to Chakraborty, this region is a product of riverine silt. This had also been corroborated during the investigations for ground water. Most parts of the study area are completely blanketed under a monotonous cover of fluviatile alluvium of recent age completely obscuring the subsurface geology of the area. Study of the drill cuttings indicates that the alluvium, in general, consists of a succession of sand, clay, silt and gravel. Sometimes, thin patches of cemented sand and kankar have also been recorded. At the surface, generally fine to silty sand and silt occur. Coarse clastics, represented by sand and gravel, are the predominating components of alluvium down to depths of 90 m to 100 m below the land surface. Generally below this depth, a


dark grey clay occurs\(^6,7\).

1.2 **GEOMORPHOLOGY**:

The study area, a part of the Ganga delta, was raised from the sea-face of the earth, but there has been an unequal development of land. This is corroborated from the vast lowlying depression in the central part of the region. Further, the swinging behaviour of the streams has produced innumerable cut-offs, marshes etc. Moreover the embankments, partly riverine and considerably man-made, impede the drainage of the country. Marshes and stagnant pools have increased. These embankments have also contributed to the rise of sub-soil water, resulting in the formation of numerous marshes.

1.2.1 **Physiographic divisions** - The study area lying to the east of the Bhagirathi river is known as the **Bagri** or Bakdwip\(^8\). The whole area of the **Bagri** lies between

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8. It was Bakdwip, because the shape of the island was like the throat of a crane, i.e., **Bak**, a bird of Bengal. In the Buddhist period, it was called **Bagdi**, a corruption of Bakdwip and finally known as **Bagri** during the Sena period. **Bagri** was a physiographic sub-division under the Sena period. (Mitra, S., 1963: Jessore-Khulnar Itihasa (Bengali), Dasgupta & Co. Pvt. Ltd., Cal., p. 141.).
24m and 5m above sea level and slopes from north-north-west to south-south-east. In regard to the differences in relief features, drainage and ground-water level, the region can be tentatively divided into the following four physiographic units (Map 1,3):

1. The Padma riverine tract
2. The levee tracts of the Bhagirathi and the Jalangi
3. The intervening plain
4. Vast lowlying depressions

1. Padma riverine tract - This tract lying along the river Padma and bounded by the Bhagwangola-Dadmati embankment in the south and Bangladesh in the north, has a maximum width of about 8km. It runs in a north-west to south-east direction. This tract is built up of huge silt deposits of the river Padma. It has experienced various stages of river shifting of the Padma during the last one hundred and fifty years. This swinging nature of the Padma as well as its flood have governed the destiny of the settlements lying in this tract (Plate 1).

2. The levee tracts of the Bhagirathi and the Jalangi - The land raised by the spill action of the rivers Bhagirathi and the Jalangi along their courses is defined as the Bhagirathi levee tract and the
Map 1.3 Physiographic divisions of the study area.
Jalangi levee tract. Spilling action of the Bhagirathi has, however, been prevented by the construction of an embankment, known as the Lalitakuri or Naltakuri embankment which extends from Bhagwangola to Jiaganj and then turns southward along the course of the Bhagirathi. Besides this embankment, there are many fragmentary embankments to protect the country from inundation.

This country is also protected from the floods by a road, i.e., National Highway No. 34 and a railway embankment, two run more or less parallel to each other. The tract varies from 3km to about 16km in breadth with a maximum height of 23m near Jangipur town and a minimum of 5m at Mayapur, opposite the town of Nabadrup. Numerous bils and marshes exist in this area, most of which are abandoned river courses, the best one known as the Notihil or Pearl lake, a fine horse-shoe cut-off, about 2km south-east of Murshidabad town. East of the town of Baharampur lie three bils, of which Bistupur, Chaltia and Chanda are very important from the point of pisciculture. There are many small bils, of which Bangar and Sinduri, north of Bel-danga, are worth mentioning. This part of Murshidabad is highly urbanised, containing five towns and in the

9. The Jalangi levee tract is not very prominent as in the case of the Bhagirathi levee (see also National Atlas of India's plate no. 33). It has not abandoned its course as much as that of the river Bhagirathi. This is probably due to the stiffer materials of its banks which are less susceptible to erosion.
south considerable mulberry cultivation is carried on in Beldamga and Berhampur P.S. The number and size of the bilg increase in the downstream section of the Bhagirathi particularly at Nakasipara of Nadia district. The maximum width of this physiographic unit is observed at Debagram-Matiari area of Nadia district. The swinging nature of the river Bhagirathi has left many ox-bow lakes particularly at Kaliganj, Nakasipara as well as Muragacha, of which Chapra bil, Arpara khal and Gurguria khal are worth mentioning. During rainy season flood discharges enter the country through the abandoned courses. The levee tracts, though relatively high, are not uniform in disposition and can be subdivided on the basis of micro-relief. A number of micro-relief features are observed along the Bhagirathi levee tract. The higher elevations away from the river may be termed as older terraces. The elevations lower than the above and along the present course may be termed as newer terraces, while the intervening depressions may be termed as inter-terrace swamps. The older terraces are preferred for construction of communication lines, building settlements etc.

3. The intervening plain - Northern boundary of this plain is demarcated by the Padma riverine tract.

the southern boundary by the Padma bil, the eastern and western boundaries by the Jalangi and Bhagirathi levee tracts respectively. It excludes the central low lying tract, known as kalantar and the vast depressions in the police stations of Tehatta and Chapra. This is an aggradational plain of the rivers Bhagirathi, Sialmari, Jalangi, Ichhamati and their numerous redistributaries. The physical character of this plain is almost uniform, only to be interrupted by bils, baors or ox-bow lakes and marshy tracts. Such depressions increase in number as one proceeds southward. The river Bhairab has left several long and narrow bils in the north. South of the Nadia district and its adjacent Twentyfour Parganas district contain a number of ox-bow lakes, locally known as baors, deserted by the Jamuna and Ichhamati (Plate 2). They are best developed in Haringhata, Bagdah, Bangaon and Gaighata police stations. The height of the plain ranges between 22 m in the north and 6 m in the south. The drainage lines indicate that the general slope of the land is from north-west to south-east.

4. Vast low lying depressions - There are several depressions in the study area, of which the
best is known as kalantar\textsuperscript{11}, covering the southern parts of the Murshidabad district in the police stations of Beldanga, Nawda (parts) and north-western part of Nadia. Others cover parts of Tehatta, Krishnanagar, Chapra, Haringhata and Habra police stations.

Kalantar is studded with several bils, of which Pat, Salmari and Kumri may be mentioned. During the rainy season the region looks like a vast lake in which the villages appear as islands (Plate 3). There is no proper outlet, the river Suti is the only outlet, but due to its narrow channel it cannot draw the excess water of monsoon rainfall. In both the areas, the need for drainage excavations is urgently felt. Some progress in this direction is on the card and marshy tracts have considerably shrunk in size. During the field work, it was noted that water remains accumulated in the central depressions for a considerable period, but in the peripheral areas, only from a few days to a few weeks.

\textsuperscript{11} Regarding the origin of this vast depressed area, the analysis of Mukherjee (1938) was accepted by Strickland (1940). According to Mukherjee, kalantar means "outside the region of God of death". However, the origin of the name is not very clear. It was probably once a marshy land and devoid of habitation. \textsuperscript{5} \textsuperscript{6} \textsuperscript{17} \textsuperscript{18} \textsuperscript{19} \textsuperscript{20} Mukherjee, R.K., op. cit., pp. 5-6; Strickland, C., 1940: Deltaic Formations with Special Reference to the Hydrographic Processes in the Ganges and the Brahmaputra, Longmans, Green & Co., Cal., pp. 116-17; Mukharji, B.B., 1938: Final Report on the Survey and Settlement Operations in the District of Murshidabad, Ben. Sec. Bk. Depot., Cal., p. 2.
However, communication remains an eternal problem due to the sticky nature of the soil.

According to Chatterjee, there is a local subsidence around Habra. This is corroborated from a study of spot heights, other than railway embankments, at Bira (9.5m) and Bergham (7.3m), north-east of Bira. The Padma, now known as Padma bil, changes its course from south to north in a broad meandering curve and flows towards this subsided area.

1.3 RIVERS:

The river systems of the study area, such as the Bhagirathi, the Bhairab, the Gobra Nala, the Salmari, the Jalangi, the Mathabhanga, the Churni, the Ichhamati and the Jamuna, are all off-shoots of the Padma. As previously mentioned, the present river Padma in the north is the most active river, while the others are decadent. Decay of the distributaries in a deltaic tract is a natural sequence, but it may be noted that all the distributaries of this area were not active simultaneously to the delta formation. The diversion of the Ganga from the Bhagirathi to the Padma through


14. Whether this is mainly due to alluviation at the heads of successive main spillways or to tectonic changes, or to shifts in the balance of the delta due to the changes of course elsewhere (e.g., the great shift of the Tista) or to secular swing are questions which admit of large and inconclusive debate (Spate, O.K.H., A.T.A. Learmonth and B.H. Farmer, 1967: India and Pakistan, Mathuen & Co., London, p. 573).
intermittent channels was probably completed by 1564 A.D. After diversion the seasonal flood discharge during the monsoon was reduced due to the closing and shifting of the off-takes. Due to this, the distributaries have now become merely spill channels and carry the Ganga freshets for about five months of the year. In the rest of the year, they carry very sluggish currents and during this period, they are fed, to a certain extent, by ground water seepage derived from rainfall absorbed in ground. Being deprived of sufficient discharge, these distributaries with sluggish currents cannot carry large quantities of silt, which are thus deposited within their beds leading to formation of shoals. Moreover, the high levees formed by

15. The earliest reference to the closing of the Bhagirathi off-take is obtained from Tavernier (1666), followed by Rennell, Colebrook (1797), Stewart (1813), Lang (1851). For details, see Ray, B., 1967: Census 1961, West Bengal, District Census Handbook, Nadia, Government of India, Cal., pp. 8-15.

16. This depends on the position of the off-take. For details, see Selections from the records of the Government of Bengal relating to the Nuddea Rivers, 1848 to 1926 and Bengal Administrative Report (1915-16): The general conclusion that can be drawn from these observations is that the rivers passed through successive phases of deterioration and improvement and while the general tendency is probably towards deterioration, the process so far has been very gradual and is difficult to establish with precision the periods of decay and regeneration.

these rivers prevent them from inundating the country. The silt, thus heaped up on the river beds and the country suffers for want of river-borne silt.

The following characteristics are observed in the deltaic streams: (1) Their off-takes are higher than the parent river Ganga or Padma and as such, except during the rainy season, the Ganga freshets cannot enter the distributaries. (2) The Ganga or Padma is the principal feeder of these distributaries, hence supply of water to them depends on the position of the former. For instance, when the Ganga throws large shoals at their entrances, water cannot enter them. On the other hand, in the year when the Ganga is cutting away its bank at the off-take points, large quantities of water pass down these channels. (3) The distributaries have died in a natural way, but their decay has been further accentuated by human interference (Plate 4). In the following, the drainage system of the study area has been described.

1.3.1 The Ganga or Padma - The river Ganga or Padma forms the northern boundary of the Ganga delta. It touches the district Murshidabad at its extreme northern boundary and bifurcates into two streams. The main flow, known as Padma after bifurcation, flows due south-east forming the northern and eastern boundaries of the Murshidabad district. The other branch, known as Bhagirathi, flows southward. It carries
an immense volume of discharge and is very wide at places. Except where it is confined by high banks, the main channel is constantly shifting, whereby many large islands are continually rising in the channel, some of them are many miles in length. These islands are inhabited, cleared and cultivated by people and disputes are often raised as to the ownership of the chars. The people along its bank live in temporary huts, for the banks are subjected to floods almost every year.

1.3.2 The Bhagirathi - The Bhagirathi, at present, takes off from the Ganga at Giria and after a very winding course, it finally debouches into the Bay of Bengal. Near Swarupganj in the Nadia district, it receives from the left bank the river Jalangi whenceforth it is known as the river Hoogly. The general line of the drainage is not from north to south along the channel of the Bhagirathi, but from north-west to south-east. Moreover, due to this condition, the main volume of water of the

20. After the construction of the Farakka Barrage Project (1971), the river has been turned into an artificial drainage. The original flow from Giria has been dammed by artificial embankment at Ahiron feeder canal site and the river is fed by a canal which takes off from Farakka. Before the construction of the Farakka Barrage, there remained meagre water in the river, but presently a steady flow passes down the river.
Ganga displays a greater inclination to proceed in the Padma channel rather than to turn into the Bhagirathi.

1.3.3 The Bhairab - The name Bhairab means the "Terrible" and its past activities amply justify the name. The river takes off from the Padma about 16km west of Akheriganj in the Murshidabad district and after a tortuous course across the district, loses itself in the Jalangi. During the greater part of the nineteenth century there was very little current in this river, as its intake from the Padma was closed; but it is now the main feeder of the Jalangi. The two main streams are commonly known as the Bhairab-Jalangi.

1.3.4 The Gobra Nala - Between the Bhagirathi and the Bhairab, the Gobra Nala formerly took spill from the Bhagirathi through breaches in the embankment which at times allowed as much as 30,000 cusecs to pass for a week at a time. This was discharged through the kalantar and its waters flowed into the Jalangi. The Gobra Nala has been beheaded by the railway line and new embankment from Jiaganj to Bhagwangola. It now generally carries only surface water and has become a sluggish drainage, though 6 to 15m deep in places. It is called the Bhandardaha Nāla at its lower end and it chiefly drains into the Suti Nadi.

1.3.5 The Salmari - The Salmari, an off-shoot of the river Padma, takes off from the latter opposite to Rampur-Boalia (Bangladesh). After a meandering course, it
empties itself into the Jalangi below Kopila. It is also heavily silted up and receives some water from the Padma during the rainy season.

1.3.6 The Jalangi - The Jalangi is the easternmost distributary of the river Padma. For a considerable length along its course, it forms the district boundary between Nadia and Murshidabad and finally joins the river Bhagirathi at Nabadwip. For the few days of the rainy season, when the discharge in the river Padma is abnormally high, some freshets come down the bed of the river, but with the fall of the Padma, it continues to dry up. Hence, it is observed that its course for about 3 km from its off-take point remains dry. From this point to its unification with the river Salmari, it is fed by local drainage (bil) and underground seepage.

1.3.7 The Mathabhanga - The Mathabhanga or Hauli leaves the Padma about 16 km below the point where the Jalangi diverges from it (Plate 5), forming the boundary between India (Karimpur P.S.) and Bangladesh (Daulatpur P.S.). Re-entering Krishnanganj P.S. in Nadia district, it bifurcates into two branches and the original name of the river is thus lost. The western branch under the name of Churni flows westwards across Hanskhali, Ranaghat, and Chakdaha P.S. and finally discharges into the Hoogly at Chakdaha (Plate 6). The eastern branch under the name Ichhamati forms the eastern boundary of Nadia district till it enters Bangaon P.S. in the district of
Twentyfour Pargamas. This re-distributary meets the Jamuna at Tibi in the Twentyfour Pargamas and then co-jointly with the latter flows through the Sundarbans to discharge into Kalindri.

1.3.8 The Jamuna - It branches off from the Hoogly near Tribeni and passing through Nadia and Twentyfour Pargamas enters Khulna along with the Ichhamati to fall into the Kalindri. The river enters the district of Twentyfour Pargamas through Mallickpur mauza in Habra P.S. It takes a south-easterly course for 6 to 7 km until it is joined by the Padma bil from the south at Charghat.

1.3.9 The Padma (south) - Popularly known as Padma bil, it is an absolutely dead river which in older days carried a large amount of trade. At some places, on its banks, remains of large country boats have been found embedded in silt. In places, the bed of the river is now cultivated. It starts near Habra station of the Eastern Railway and runs southward to Bijpur and Chaurasi in Deganga P.S. and gradually turning easterly and northward in a circle, runs almost due north to Dakshin Chatra where it crosses Baduria in an easterly direction to meet the Jamuna river near Charghat.

1.4 CLIMATE:

Human habitation as well as agrarian economy of the study area are considerably influenced by climatic elements like humidity, temperature etc. The effects of
the above elements are particularly observed in the construction of roofs, houses and crop production. The latitudinal situation of the area indicates its tropical location. Concentration of two-third of the total rainfall in a particular period of the year, i.e., June to September, is indicative of the typical monsoon climate. According to Chatterjee\textsuperscript{21}, the study area is characterised by eastern temperature regime, with a uniform temperature during summer months, the typical curve having a flat top.

The temperature records of the two stations, viz., Baharampur (24°8'N, 88°16'E) and Krishnanagar (23°24'N, 88°31'E) show that January is the coldest month of the year. The normal annual mean winter temperature is around 19.3° centigrade and May is the hottest month. The normal annual summer mean is around 30.4° centigrade. There are variations in temperature conditions both spatially and temporally. It has been observed that temperature decreases from south to north.

Rainfall gradually decreases from south to north. It is around 1,450 mm in the north and 1,150 mm in the south. Norwester rainfall during April-May is of particular importance for the cultivation of aus paddy and jute. The winter rainfall is negligible in this region. However, its timely downpours help in rabi crops.

1.5 SOILS:

The soils of the study area are of azonal type with little or no profile development\textsuperscript{22} and are derived from alluvia brought down by the Ganges and its distributaries like the Bhagirathi, Jalangi and Mathabhanga. Texturally, they belong to sandy to sandy clay soils. These textural formations are strewn all over the area. Moreover, clay soil is found in the lowlying pockets, such as in the kalantar. The Directorate of Agriculture, Government of West Bengal\textsuperscript{23,24,25} has classified the soils into sub-regional groups which more or less coincide with the physiographic divisions in the following manner:

1. Ganga Riverine lands (Meadow soils) - mainly Padma riverine tract and similar low lands (division no. 1)
2. Ganga Flatlands (Automorphous leptoferralic soil) - synonymous with intervening plain (division no. 3)
3. Ganga Lowlands (Hydromorphous meadow soils) - synonymous with lowlying areas (division no. 4)
4. Ganga Uplands (Automorphous Quasi-ferralitic soils) - synonymous with levee tract, but particularly noted in the western bank of the Bhagirathi.

\textsuperscript{22} Chatterjee, S.P., op. cit., p. 14.
\textsuperscript{24} Ibid, Vol. II, Nadia District, pp. 3-37.
1.6 VEGETATION:

There is very little of natural vegetation left in the area. In recent years, some forests have been planted. Unproductive sandy soils have been used for this purpose. Some of these forest covers are used as recreational grounds with a natural environment for wild animals, viz., 'Parmadan' forest of Bagdah P.S. and 'Deer Park' of Bethuadahari, Nakasipara P.S.

The vegetational characteristics of the area are the same as those of other parts of Central Bengal. Besides fruit trees like mango, jackfruit, coconut, lichi, pineapple, other trees such as pipal, babul, tamarind are also grown. Murshidabad is famous for her mangoes, while Nadia and North Twentyfour Parganas for preparation of gur from date palm trees.

1.7 ECONOMY:

This has been dealt with in three sections:
(i) agriculture, (ii) occupational pattern and (iii) industrial landscape.

1.7.1 Agriculture - The study area is predominantly agricultural and 74.91 per cent of her population are engaged in agriculture, of which 38.23 per cent are cultivators and 36.68 per cent are agricultural labourers. Of the total geographical area, 70.89 per cent is under cultivation, of which more than three-fourths are double-cropped and 0.33 per cent, current fallow (Table 1.1).
Table 1.1

Trend of land utilisation: acreages of 1977-78 to 1980-81 (% of the total geographical area)

<table>
<thead>
<tr>
<th>Net area sown</th>
<th>Current Orchard</th>
<th>Cultivable Forest</th>
<th>Area not fallow</th>
<th>Waste and available Jungle for cultivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>70.89</td>
<td>0.33</td>
<td>2.61</td>
<td>0.59</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1.2 gives an idea of the cropping pattern of the study area. It shows that though paddy covers a considerable area, second or cold weather crops are also important. Crops like jute, wheat, boro paddy and sugarcane also cover considerable acreage. In recent years, aus paddy has shrunk in acreage, while jute shows an upward trend. However, jute acreages also vary according to market demand. Similarly, owing to low profit from wheat, farmers have switched over to pulses and oilseeds instead of wheat for the last few years. Demand for vegetable products has accelerated its cultivation.

Table 1.2

Cropping pattern: acreages of 1977-78 to 1980-81 (% of the total cropped area)

<table>
<thead>
<tr>
<th>Aus</th>
<th>Aman</th>
<th>Boro</th>
<th>Wheat</th>
<th>pulses</th>
<th>Oilseeds</th>
<th>Jute</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.82</td>
<td>17.52</td>
<td>6.43</td>
<td>12.76</td>
<td>17.28</td>
<td>5.76</td>
<td>14.84</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>Tobacco</td>
<td>Vegetables</td>
<td>Miscellaneous</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.02</td>
<td>0.02</td>
<td>2.42</td>
<td>2.14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Study of agriculture would remain incomplete without reference to irrigation. Old literatures tell us that except for the growth of special crops such as sugarcane, irrigation was practically unknown. The chief reason for absence of irrigation is that the surface is so uniformly flat as to afford little or no scope for canals and distributaries. Table 1.5 gives an idea of the irrigated area of the tract which remains

Table 1.3
Irrigated area, 1980-81

<table>
<thead>
<tr>
<th>Name of the Block</th>
<th>Percentage of irrigated area to the total cropped area</th>
<th>Name of the Block</th>
<th>Percentage of irrigated area to the total cropped area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raghunathganj</td>
<td>33.65</td>
<td>Kaliganj</td>
<td>25.30</td>
</tr>
<tr>
<td>Lalgola</td>
<td>42.72</td>
<td>Nakasipara</td>
<td>22.43</td>
</tr>
<tr>
<td>Bhagwanagola</td>
<td>27.08</td>
<td>Krishnagar</td>
<td>26.75</td>
</tr>
<tr>
<td>Ramnagar</td>
<td>39.25</td>
<td>Nabadwip</td>
<td>17.09</td>
</tr>
<tr>
<td>Murshidabad-</td>
<td>52.48</td>
<td>Santipur</td>
<td>19.05</td>
</tr>
<tr>
<td>Jiganj</td>
<td></td>
<td>Hamakhali</td>
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<td>31.76</td>
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<td>Swarupmagar</td>
<td>22.40</td>
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<tr>
<td>Krishnaganj</td>
<td>26.36</td>
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significantly low. Though this tract is endowed with acquifers\textsuperscript{28}, the exploitations of this source has not been fully utilised\textsuperscript{29}, mainly because of economic backwardness of the people and partly due to lack of provision for electricity and pumping sets.

The main sources of irrigation in this area are shallow tubewells, deep tubewells and river lift pumps. The last two are very important as sources of irrigation because they can cover large areas, while a shallow tube well is operated individually.

1.7.2 Occupational pattern - The age-old economic pattern was subsistence in nature and agriculture formed an important occupation of the bulk of the people. As subsidiary occupation grew handloom industry as in many other areas of Bengal.

At present, agricultural improvement has paved the way for absorption of a large section of population in it. Because of this, the people who were previously engaged in different professions, other than milk trade and weaving, have largely adopted it as their prime means of livelihood. Field study further shows that people belonging to three professional classes are economically better placed, viz., cultivators having at

\textsuperscript{28} Biswas, A.B., 1964, op. cit., pp. 1-5.
\textsuperscript{29} Recently, the danger of tapping underground water has been felt. It has been observed that water table of the Nadia district has fallen in many areas.
least 1.40 ha land, Goala (milkman) and Tanti (weaver). It is also observed that some of the people belonging to the last two professions have agricultural activities as their subsidiary occupations.

The following is a generalised account of primary and subsidiary activities of the people of the study area. Fishing, supplemented by agriculture, are sources of livelihood for a large section of people, locally known as Chai-mondal, along the bank of the Padma. North-eastern and north-western part of Nadia district abound in date palm trees (Plate #). Preparation of gur (jaggery) from juice of date palm in the winter season is a subsidiary occupation of the people belonging to the police stations of Kaliganj, Hanskhali, Krishnaganj. Cultivation and selling of vegetables is a primary occupation in the Beldanga P.S. except its kalantar tract. In transplanting and harvesting of the cereal crops, people belonging to Murshidabad district are regularly employed as agricultural labourers in Nadia district as wage rate is higher there. During the transplanting and harvesting of aman paddy, people belonging to the Bagri region move to the Rarh region, both in Murshidabad district. In recent years, a number of milk, jute and sugarcane collection

30. This gur is exported to Siliguri (Darjiling district) and Assam state. A owner of a tree takes an advance (dadan) of eight to ten rupees in the pre-winter season.
centres have been established in Nadia and Murshidabad districts. By selling respective products, people get cash from the centres and this has given them incentives for regular production. Establishment and improvement of handloom industries have improved the lot of Tanti communities.

Appendix I.2 shows the occupational patterns (1981) of the study area. It reveals that majority of the population are engaged in agriculture, either as cultivators or as agricultural labourers. However, percentage of labourers and cultivators are not equal in three districts. In the Twentyfour Parganas district, percentage of cultivators are higher than agricultural labourers. In Murshidabad and Nadia districts, percentage of agricultural labourers are slightly higher than cultivators. It is interesting to note that in the police stations of Raghunathganj, Nabadvip, Kalyani and Habra, other services are more important than either cultivation or agricultural labour. Probably nearness to urban centres in all these police stations plays a part in the adoption of various services. This is also responsible for high density of population therein. In the police stations of Raghunathganj, Raminagar, Domkal, Nabadvip, Santipur, Ranaghat and Chakdaha, handloom industry as a means of occupation is important and various types of industries, such as
woolen blanket, silk and cotton clothes are carried on there.

1.7.3 Industrial landscape - A majority of population of this region live in rural areas and they depend on agriculture for their survival. Except one sugar mill at Plassey, no large scale industry is found all over the area. Even large scale industries in urban areas are limited here, except in Kasimbazar and around Kalyani and Habra. The study area is, however, fortunate in having some handloom industries, some of which are reputed not only in India, but also in foreign countries. It has been mentioned elsewhere\(^3\)\(^1\) that most of her rural industries are agro-based, and because of the agrarian nature of the landscape there is ample scope for setting up of agro-based industries in this region. Among the agro-based industries, there are (i) sugar plant at Plassey, mini sugar plants at Paglachandi and near Nabadwip and Murshidabad towns, producing sugaf and khandisari sugar. Gur production units are highly concentrated at Hamskhali and Krishmaganj police stations, (ii) jute bailing press at Beldanga, (iii) sericulture industry at (a) Mirzapur-Gankar (Raghunathganj P.S.), (b) Islampur chak (Raminagar P.S.). Murshidabad silk in the 19th

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century was a prime product not only of Bengal, but of India. Silk reeling is carried on at Baharampur and Jiaganj. Thus, while Islampur is famous for Tasar and Motka, Mirzapur for Garad (pure silk) and Jiaganj for Baluchari-Bootidar sarees and Chellies (cloth for marriage). It may be noted that the position of silk industry is now better than what it was in 1950-51 and prior to the days of independence. (iv) Straw package units are located at Phulia (Nadia). About 700 families of this locality are engaged in this industry which has a high demand for packaging of bottles. (v) Bidi (country cigarette) making units are numerous and scattered all over the area, of which particular mention may be made of Raghunathganj, Murshidabad, Santipur, Bagula (Hanskhali P.S.) etc. (vi) Hat (shola) making units are in Kalianganj village (Kalianganj P.S.).

Table 1.4 shows the important cottage industries, other than agro-based, in this region. Wool weaving (blanket) industry and the world-renowned ivory industry, which date back to this time when the Nawabs of Bengal had their courts at Murshidabad, are on the decline.

For instance, woollen blanket industry has been

32. Shola is a water grown weed which is abundant in Kalianganj village.

totally abolished from Domkal. Due to adoption of several measures, brass and bell metal industry has got an impetus. The recent development of cotton textile industry of Nadia is due to influx of highly skilled

<table>
<thead>
<tr>
<th>Name of the Police station</th>
<th>Cotton weaving</th>
<th>Brass and bell metal weaving</th>
<th>Silk weaving</th>
<th>Wool weaving</th>
<th>Ivory weaving</th>
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weavers in this district and high demand of tant-sarees (cotton cloth) among women. Moreover, the government has helped the displaced persons by establishing handloom industries at Taherpur (Rahaghat P.S.), Khosbag Moholla (Chakdaha P.S.) and Gayespur Colony (Kalyani P.S.). There are several other industries such as earthen-ware making, smithy, carpentry and conch-shell which run on cottage basis. The important centres of potteries are at Ghurni (Krishmagar P.S.), Jangipur, Jotkamal (Raghunathganj P.S.), Daulatabad (Berhampur P.S.). Nearly 30,000 people of Jangipur and Lakshminathpur, both under Domkal P.S. 35 and about 150 families of Baliadanga (Karimpur P.S.) 36 are engaged in conch-shell industry.

1.8 CONCLUSION:

Summing up the present chapter, it may be observed that the study area consists of a part of the Ganga delta formed by the filling up of an elongated trough of the Bay of Bengal which receded gradually and there has been a significant negative change in the base level of erosion for the Ganga distributaries in recent time. The tendency of deltas, through sedimentation subsidence and lateral compression is to fill in the central portion.

This has produced some low-lying pockets. A regional southerly tilt has helped the eastern distributaries more vigorously entrench their valleys compared to the western distributaries. It has produced hanging valley relation of the distributaries with the parent river Padma. Consequently, the distributaries have been beheaded from the parent river.

Climatically, the region is characterised by the humid-monsoon type, with high and uniform temperature during summer months and little variability in annual temperature. Soils come under the category of new alluvium, formed by the deposition of Ganga and its distributaries. The vegetational features of the area are similar to other districts of Central Bengal. The country abounds in mango groves, bamboo clumps, banyans, date palm, jack fruits, babul, pinal etc.

Agriculturally, the area is characterised by a high percentage of double cropped area. In recent years, some crops like wheat, jute and sugarcane are increasingly cultivated. Adoption of more modern methods of cultivation and introduction of irrigation are responsible for opening new horizons in agriculture. This improvement in agriculture has paved the way for absorption of a large percentage of working force in this sector. Of cottage industries, handloom weaving is comparatively more important than others.