

CHAPTER ONE

GEOGRAPHICAL BACKGROUND OF BAGERHAT DISTRICT

INTRODUCTION

The present chapter gives an overall background of the Bagerhat district and helps to identify the role of market centres in the development of police stations. The chapter has been divided into five sections : The location of the study area has been discussed in the first section. The physical character i.e., relief has been discussed in the second section. The major drainage and climate of the district have been discussed in the third and fourth section of the chapter respectively and the last section of the chapter deals with soil character of the district.

1.1 STUDY AREA

The study area, the sanctuary of Hazrat Khanjahan Ali was formerly a part of Khalifastabad Pargona, during the Mugal period. It is situated at plentiful bounties of Sunderbans. In pre-historic times, the area now forming the district was part of the deltaic tract known as Bongaon. Ptolemy's map of the second century A.D. showed the region as the southern portion of the delta formed by the two great branches of the Ganges, the Bhagirathi and the Padma. The early history of the district is surrounded in obscurity. It is however, most probable that in the fourth century A.D. the district of Bagerhat, as part of the kingdom of Hangaon, come under the authority of Samudragupta (C340 - 380 A.D.), the Imperial Gupta monarch of Northern India. This is evident from the Allahabad Pillar's Inscription of the monarch. His successors like Chandra Gupta II (C 380 - 421 A.D.), Kumara Gupta (C 413 - 455 A.D.), Skandra Gupta (C 455 - 468 A.D.) and others probably exercised their authority over this district till the first quarter of the sixth century A.D. At the early stage, Bagerhat district became a Police Station under Khulna Sub-Division of Jessore district in 1842. Bagerhat was upgraded to Sub-Division under the same district in 1863 with the recommendation of the Deputy Magistrate, Poet Bangkim Chandra Chattapadhyay. Bagerhat Sub-Division was upgraded to district in 1985. It is bounded by Pirojpur district on the east, Barguna district on the south-east, Bay of Bengal on the south and on the west by the Khulna district. It lies between 21^o.49' and 22^o.59' North latitudes and between 89^o.32' and 89^o.98' East longitude (Fig-1.1). The total area of the district is 3959.11 km². Of which 404.6 Km² are riverine and 1868.91 km² are under forests. The percentage share of

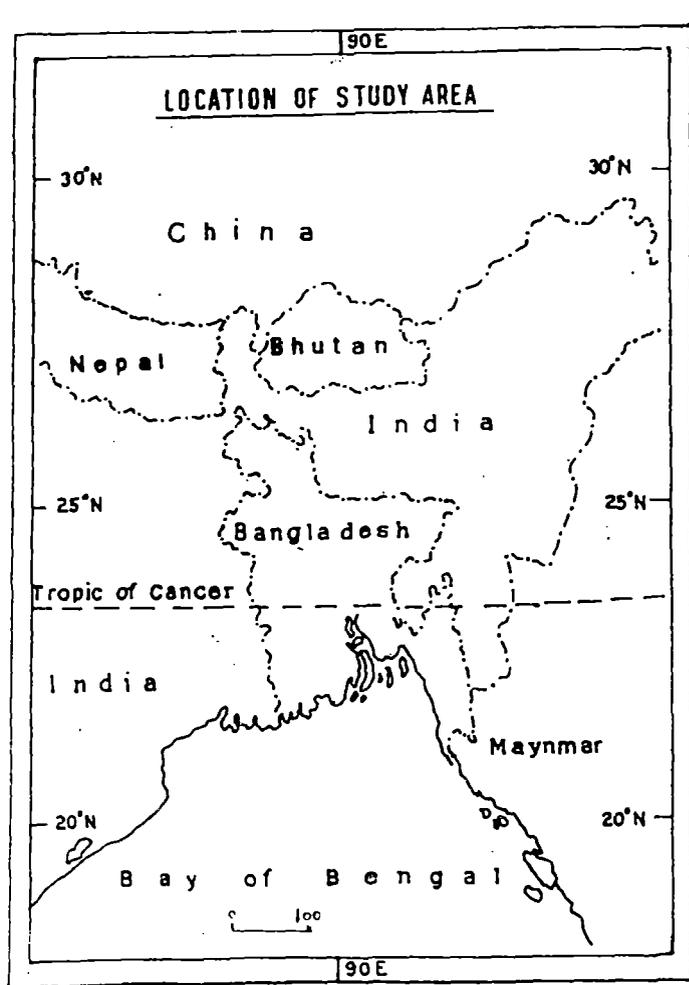
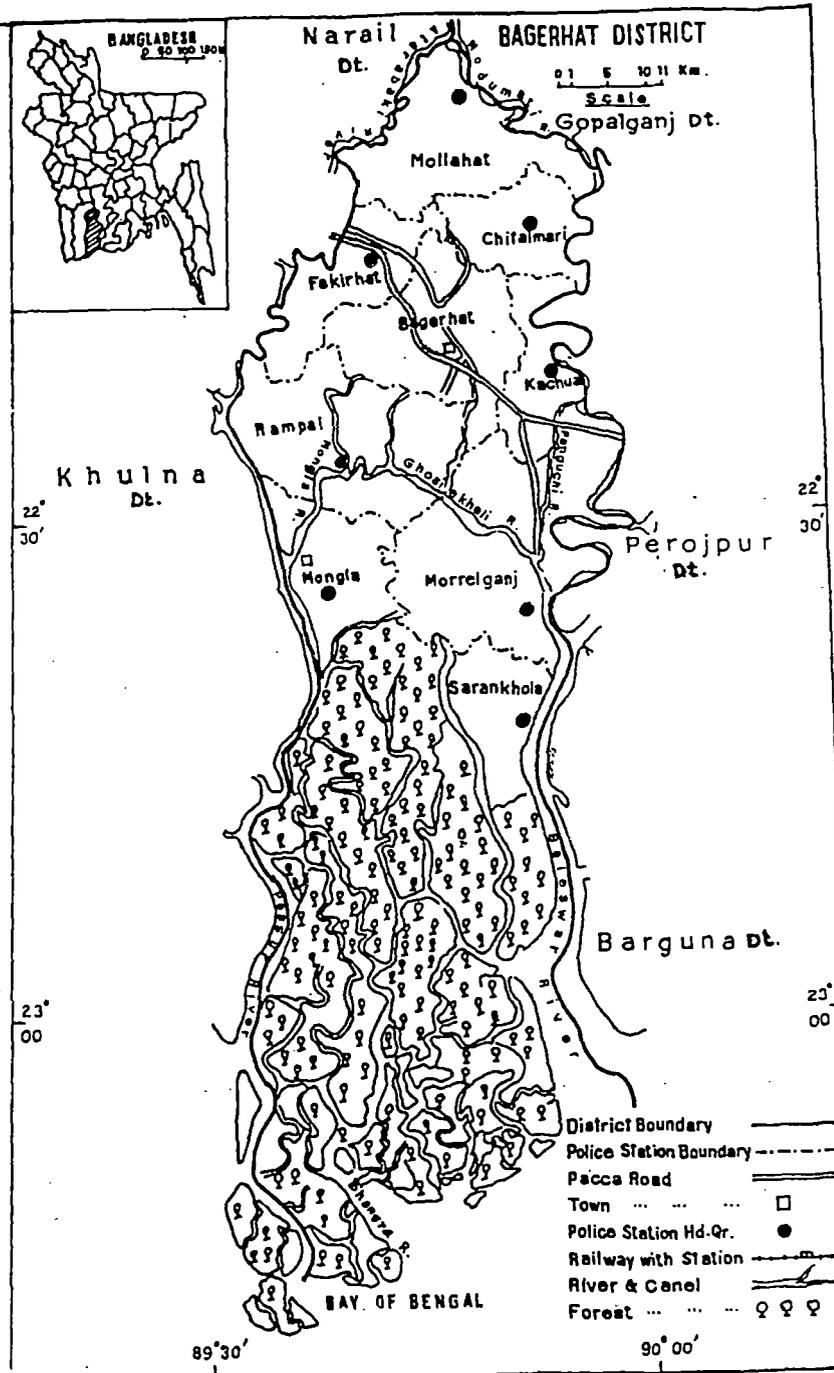


Fig -1-1



the district is 2.7% of the total area of the country. In area, it ranks 2nd among the districts of Khulna Division and 6th among the districts of the country.

The district consists of nine police stations, Rampal P.S. is the largest covering an area of 1734 km² which is 44.5% of the total area of the district. Kachua P.S. has the lowest area of 123.3 km² sharing about 3.2% of the total area of the district. All the police stations are similar in character. Only three police stations namely, Mongla, Sarankhola and Morrelganj are located in Sunderbans covering an area of 1637.5 km² together.

The study area is traversed by a number of rivers, rivulets and streams. Of which Shalla, Bhola, Modumoti, and Beleshwar are to be mentioned. A scrutiny of drainage system shows that the pattern is mostly rectangular which is evidenced by the tributary channels, which meet the main streams perpendicularly and this is pronounced in the northern to southern part of the district. The rivers are tidal and navigable throughout the year. Topographical and climatological conditions together given the district's proneness to severe cyclonic risks. These cyclonic storms occur in the early part of summer and later part of monsoon. But the district is protected sometimes by the forest of Sunderbans, which is located in the south (Fig. 1.1)

The study area, Bagerhat district is producing a large variety of agricultural products, due to its flat topography and fertile soils. Among the crops, paddy, potatoes, chillies, mustard, onions, vegetables and spices are to be mentioned. All the commodities have been sold in the local markets. The district has 156 markets, distributed unevenly in different police stations. Out of 156 market centres, 45 markets have been selected for the study because 80% villagers depend on their necessary goods on these local markets. The highest number of markets is found at Morrelganj P.S., which has 37 markets. Bagerhat and Sarankhola P. S. have 19 markets, Mollahat P. S. has 20 markets. Kachua P.S. has 7 unions, with 14 markets and Fakirhat has eight unions with 11 markets. Primarily Mongla, Chitalmari & Rampal Police Stations have 11, 14 & 12 markets respectively. Each police station headquarter has a market (Fig - 1.2). All these markets have played an important role in the selling of agriculture goods in rural areas.

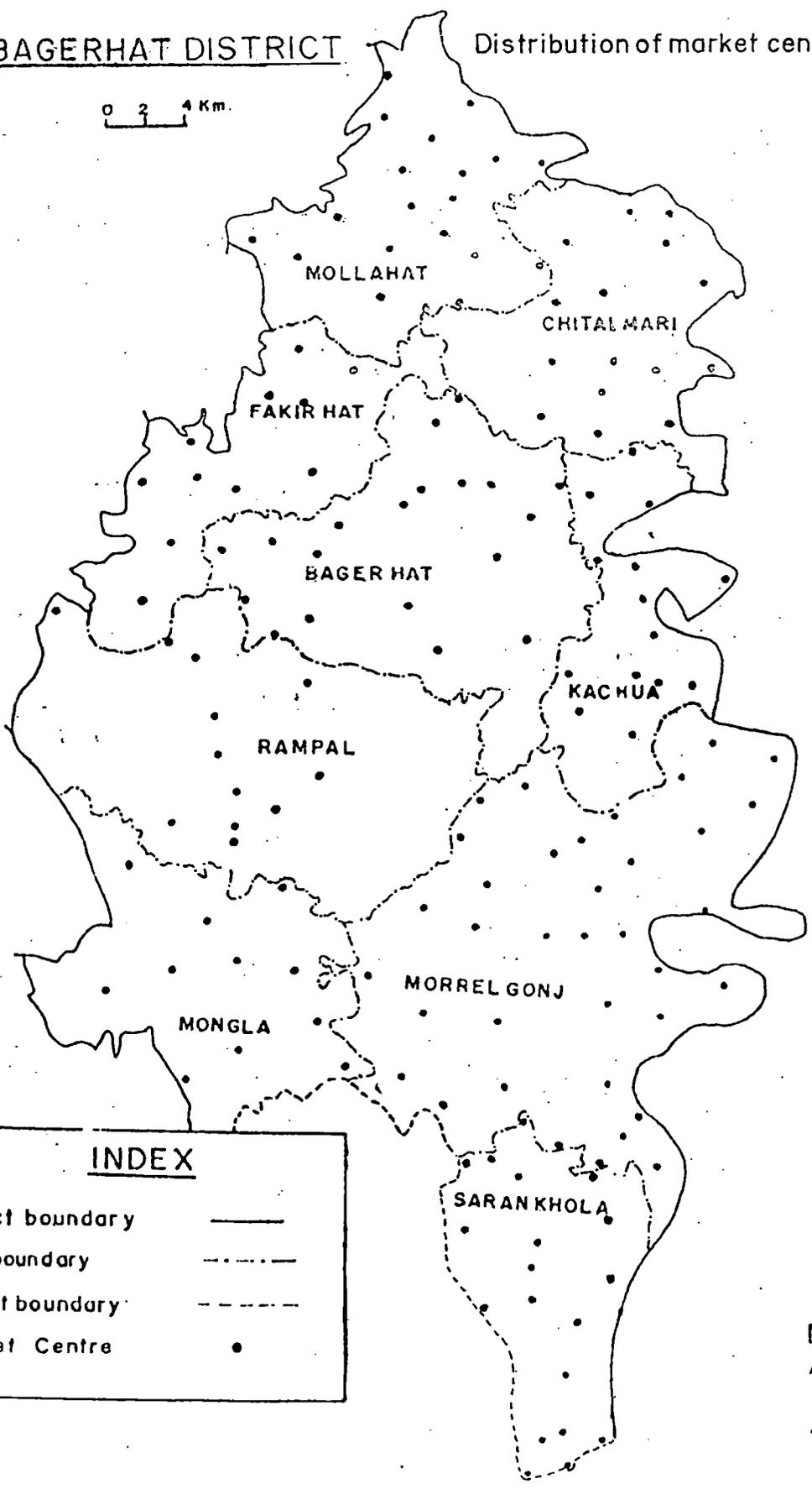
1.2 RELIEF :

The Bagerhat district is a part of Khulna Division, which forms the extreme southwestern portion of the country. Its average height is 25 m. above mean sea level. As a

BAGERHAT DISTRICT

Distribution of market centres

0 2 4 Km.



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- District boundary ———
- P.S. boundary - - - - -
- Forest boundary - - - - -
- Market Centre •

Fig-1:2

whole, Bagerhat district is a low-laying fen region and part of southern delta of the country between Hugly and the Meghna estuary (Bari 1978). The large tracts are swampy in the rainy season. It is intersected by a large number of rivers and estuaries, which again are connected by innumerable inter-lacing cross channels. Its physical features are much the same as those of other deltaic districts. The region is flat. The surface being only slightly raised above flood level. The banks of the rivers are higher than the adjacent area. So the land is sloping away from them on either side. The villages are clustered along the bank of rivers.

Though the general appearance of the district is that of a low alluvial plain. It may for practical purposes, the district is divided into two parts north and south. The northern part is high and the bank of the rivers is suitable for human dwelling. The southern part is covered by thick forests of mangroves. This forest is known as Sunderbons. The eastern boundary of the Sunderbons is formed, by Baleshwar river and the western boundary is formed by the river Pashur, the boundary of Khulna district. No definite line can be drawn for the southern boundary because delta formation goes on. So the distance of sea from the coast running inland varies to a distance from 100 to 130 km. The total area of the forests of the Sunderbons in Bagerhat district is 1847.26 km² (Census 1991).

The Sunderbons constitutes the largest single block of forests in Bangladesh. The forest occupies a flat deltaic swamp. Most of which goes under water during the high tides. It is intersected by a network of channels and creeks. The ebb and flow tides control, the formation of the Island. The tidal water sweeps over the area twice a day. The Sundarban forms the lower part of the Ganges delta. The most important rivers in Sunderbons is being the Raimahgal, the Malancha, the Haringhata, the Baleshwar and the Buriswar. The tract through, which they flow is alluvial plain where the process of land making has not yet ceased and where morasses and swamps are now gradually filling about. The rivers are connected with each other by an intrinsic series of branches and the latter in their turn by innumerable small channels. So that the whole tract is a tangled network of streams, rivers and water courses, enclosing a large number of islands of various slopes and sizes.

In the extreme south of district between the forests and the sea lie the open grassy tracts with rows of sandunes. The vast area of the forest is undoubtedly protection against the destruction of the cyclone or storms and storm waves which from time to time sweep in the equinoctial periods with devastating force.

The average elevation of the district varies from 4m to 20m and the general slope is from north to south with some minor variations. Due to this topographical characteristics, the district suffers from floods and tides in the rainy season. So the area is always liable saline water inundation. The district is sparsely populated compared to other districts of the country and the places, suitable for dwelling are the high land along the bank of rivers.

There are no important and remarkable beels and marshes in any police station of the district. Only the largest 'beel' in Fakirhat and Mollahat police stations is situated on the western part of the district. It's focal name is 'Jeel' and 'Baors'. Mainly this 'beel' is a deserted channel of a river. On the characteristics of landform there are physiographic homogeneity in the district. Micro feature in the physical landscape is found in the area. The level of landforms can be divided into three types. There are : (i) Area rarely flooded (ii) Area occasionally flooded (iii) Area frequently flooded. (Table -1.1).

TABLE -1.1 Percentage of area occupied by microphysiographic divisions in the P.S.

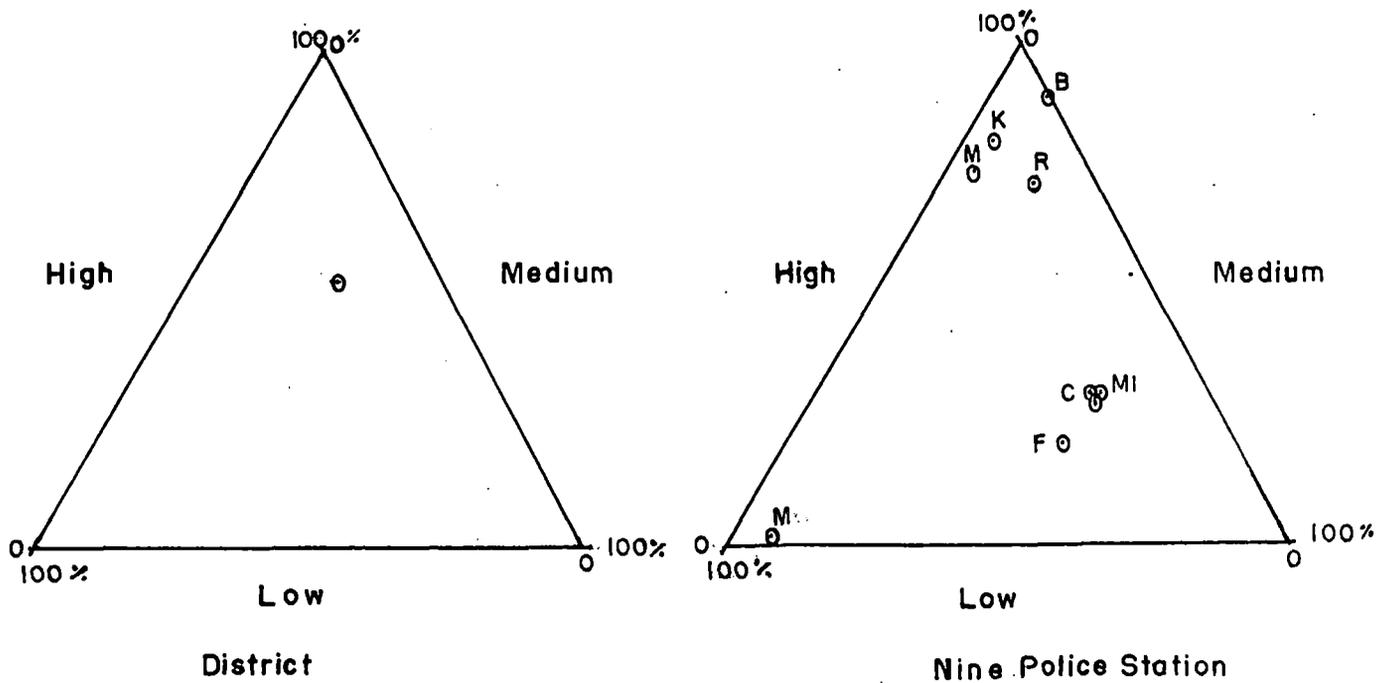
(Percentage to total area of each P.S.)				
Name of the Police Station	Never flooded	Occational flooded	Frequently flooded	Total
Bagerhat	10	80	10	100
Chitalmari	20	30	50	100
Fakirhat	30	20	50	100
Kachua	13	81	6	100
Mollahat	20	30	50	100
Mongla	na	na	na	na
Morrelgonj	20	75	5	100
Rampal	11	79	10	100
Samakhola	20	30	50	100
Average	18	53	29	100

Source : District Statistical Buletine, Khulna. 1983.

(i) **Area rarely Flooded (Low)** ^{High}: It covers the northern part of the district with the general height of above 20m. It accounts for about 18 percent of the total area of the district. Relief is being comparatively high and is rarely flooded in the year.

(ii) **Area occasionally flooded (Medium)** : Medium land covering 29 percent of the area in the district It covers the middle part of the district. The general height is

LEVEL OF FARM LAND OF BAGERHAT DISTRICT



B - Bagerhat. C - Chitalmari. K - Kachua. F - Fakirhat. MI - Mollahat.
 Mo - Morrelgonj. S - Sarankhola. R - Rampal. M - Mongla.

Fig - 1.3

between 12 and 20m. This part is susceptible to flood particularly after heavy rain and storms.

(iii) **Area frequently flooded (Low High)** : The lower plain is the southern part of the district. It covers about 53 percent of area of the district and it is below 12m from the sea level. It is flooded frequently during heavy rainfall. This part is always submerged by the tides of saline water. This zone is criss-crossed by many rivers and channels. This plain land is gradually being filled up by alluvium and is reclaimed for agricultural crops. (Fig-1.3).

1.3 RIVER SYSTEM :

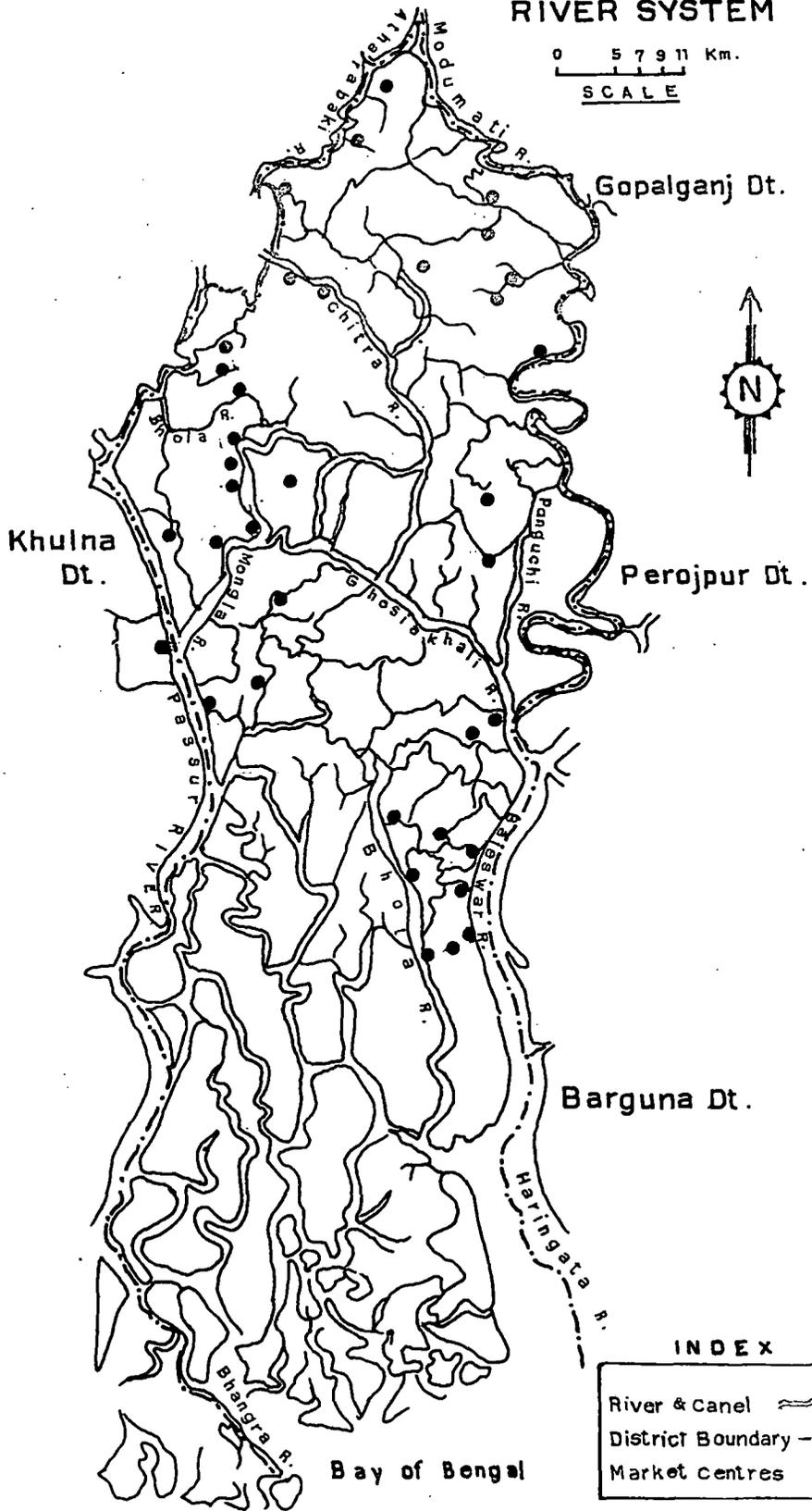
It is a region of many rivers. The varied physical and geological characteristics have profound influence on the drainage pattern of the region. The dendritic drainage pattern is observed in the region. Bagerhat district is drained by a number of large rivers, like the Bhairab, the Chitra, the Modumoti and the Pasur with their number of tributaries and distributaries. (Fig - 1.4). The rivers of the district rise from the Himalaya of India. Some rivers become feeble or dry in dry season. There is a different flow of saline water in the rivers of the district. All important rivers flowing through the district fall into the Bay of Bengal. Most of the rivers are tidal and navigable throughout the year. The riverine area is 404.6 Km² which is 10.4% of total area of the district. Total length of the rivers in the district is 370 Km.

Modhumoti River : The Modhumoti is the largest river of entire Khulna Division. It is a fact that Modhumoti is one of the principal distributaries of the Ganges in Bangladesh. It leaves the parent stream near Kustia where it is called the Garai and is flowing southward (Bari 1978) assumes the name of the Modhumoti meaning the honey-bearing river. It enters the district near its north-east corner at Manikdaha, and from this point it takes the name Baleshwar, meaning the lord of strength and forms the eastern boundary of the district, It crosses the Sunderbans separating the Bagerhat P.S. from the Pirojpur P.S. and enters the Bay of Bengal after a course of 230 km. The Haringhata meaning the watering place of deers forms a fine estuary. It is 15 Km broad, and is navigable partly for the ships and throughout its entire course by native boats of large tonnage.

Atharabanka : Near Khulna, the Bhairab is joined by the Atharabanka i.e., the channel of 18 bends, which carries the surplus water of the Modhumoti into the Bhairab. It forces down into the Bhairab. The latter stream is longer and it flows into the south, the

BAGERHAT DISTRICT RIVER SYSTEM

0 5 7 9 11 Km.
SCALE



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Fig-1.4

Bhairab itself turns backwards at Alaipurduar, till it finds an outlet for its surplus water, in the Rupsha river. The Atharabanka is 182 metres wide in the rainy season and is navigable all the year round by large cargo boats.

Chitra : This is bifurcated into two rivers. Chitra-1 flows from north-west to south-east extending from the Kharogdaha to the Atharabanka river, a distance of 6 Km. It is 60 m wide in the rainy season and is navigable for 3 months of the year by small boats upto Khajuroa. South of this point, it is navigable all the seasons. Chitra II also runs from north-west to south-east, having the Atharabanka at Nagor kandi and emptying itself into the Madhumati at Chitalmari. It is 34 Km. in length, 50 m wide during the rainy season and is navigable all the year round by medium sized passenger cargo boats.

Bhaleswar : The Bhaleswar or Haringhata river, the eastern important tributary of Bagerhat is following about 22 Km. north-east of the Bangra. It has a very spacious entrance about 13 Km, wide between two great banks, which project from the land on each side. Although there is sand bar at the mouth with only 7 m depth of water at low tide, the navigation is easier than that of any other rivers at the head of the Bay of Bengal. The river banks or shores, which have formed at each side of the mouth and extended eastward for several kilometres and act as break waters to the swell. The river serves as the outlet of Morrelgonj a town, situated on one of its branches, the Pangashi, about 9 - 10 Km. from the mouth. This town was declared a port in 1863.

Pashur River : The western estuary in Bagerhat is the Pashur, which forms the boundary between this district and the Dakop Police Station of Khulna District. It is formed about 6 Km from the sea by combination of two rivers. It is navigable by small craft all the years round. The length is about 90 km. and the width is 8 km. Mongla river is the principal branch of Pashur river.

Bhola : The Bhola, which originates from the Haringata near the Supoti flows in the southerly direction throughout the Sunderbons. It flows first in the western side of the Sharnakhola P.S and then through Morrelgonj Police Station, then it flows in a westernly till it falls in the Pashur river. The river mouth is almost entirely silted by sand. The river is navigable by large boats all the year round.

Barisal Guns : The Bagerhat district is located on the costal area of Bay of Bengal. Tributaries of main stream falling in Bay of Bengal are frequently hit by squalls and cyclones which make a sound in a costal area. This sound of rivers is known as " Barisal guns". This sound is mainly heard in this district during the rainy season. The

sound of 'Barisal guns' is usually heard distinctly in rainy season on the occasion of squall. generally while the tide is rising. M.H.J. Rainy a zaminder of Khulna, pointed out on serious circumstances that the direction of sound appears to travel invariably along the close of the streams that discharge themselves into the Bay (Bari, 1978).

The rivers and channels of the district are important factor of the study area. The rivers and its distributaries are distributed like a circuit in the entire region. Steamers, launches and thousand of small country boats are a part of water communication, Because the transport cost remains still considerably low in the water route.

1.4 CLIMATE

Bagerhat district enjoys monsoon types of climate with wet summer and dry winter. It has a distinctly different climatic feature as regards temperature and rainfall distribution. Bangladesh has been distinguished into seven climatic sub-zones. Of these seven climate sub-zones, Bagerhat district along with other parts of the Barisal Division, fall in the south-eastern sub-zone, excluding of land in south west Sunderbon (Rashid, 1977). This region is regarded as the small range of mean temperature zone. This is the medium rainfall zone and dewfall winter area of Bangladesh (Rashid, 1977) The mean temperature, rainfall and humidity of Bagerhat station are shown in table - 1.2 and figure 1.5.

Table 1.2. Monthly rainfall temperature and humidity of Bagerhat district (1995)

Name of the Month	Average rainfall (mm.)	Temperature (°C)			Humidity (Percent)		
		Maxi.	Mini.	Mean	00.00 (hours)	03.00 (hours)	12.00 (hours)
January	32	21	13	17.0	85	82	65
February	0	25	13	19.0	91	75	65
March	0	33	18	25.5	92	75	61
April	96	32	25	28.5	94	81	71
May	223	32	27	29.5	93	78	65
June	772	28	26	27.0	95	85	87
July	296	30	27	28.5	96	90	87
August	482	31	27	29.0	95	87	83
September	159	30	26	28.0	96	87	86
October	81	31	26	28.5	95	79	77
November	0	29	18	25.5	92	75	75
December	6	16	13	14.5	94	82	75
Average	179	26	22	25.0	93	81	75

Source : Direct Survey, Khulna Meterological Office, Bangladesh 1995

RAINFALL, HUMIDITY & TEMPERATURE CURVE
BAGERHAT DISTRICT-1994

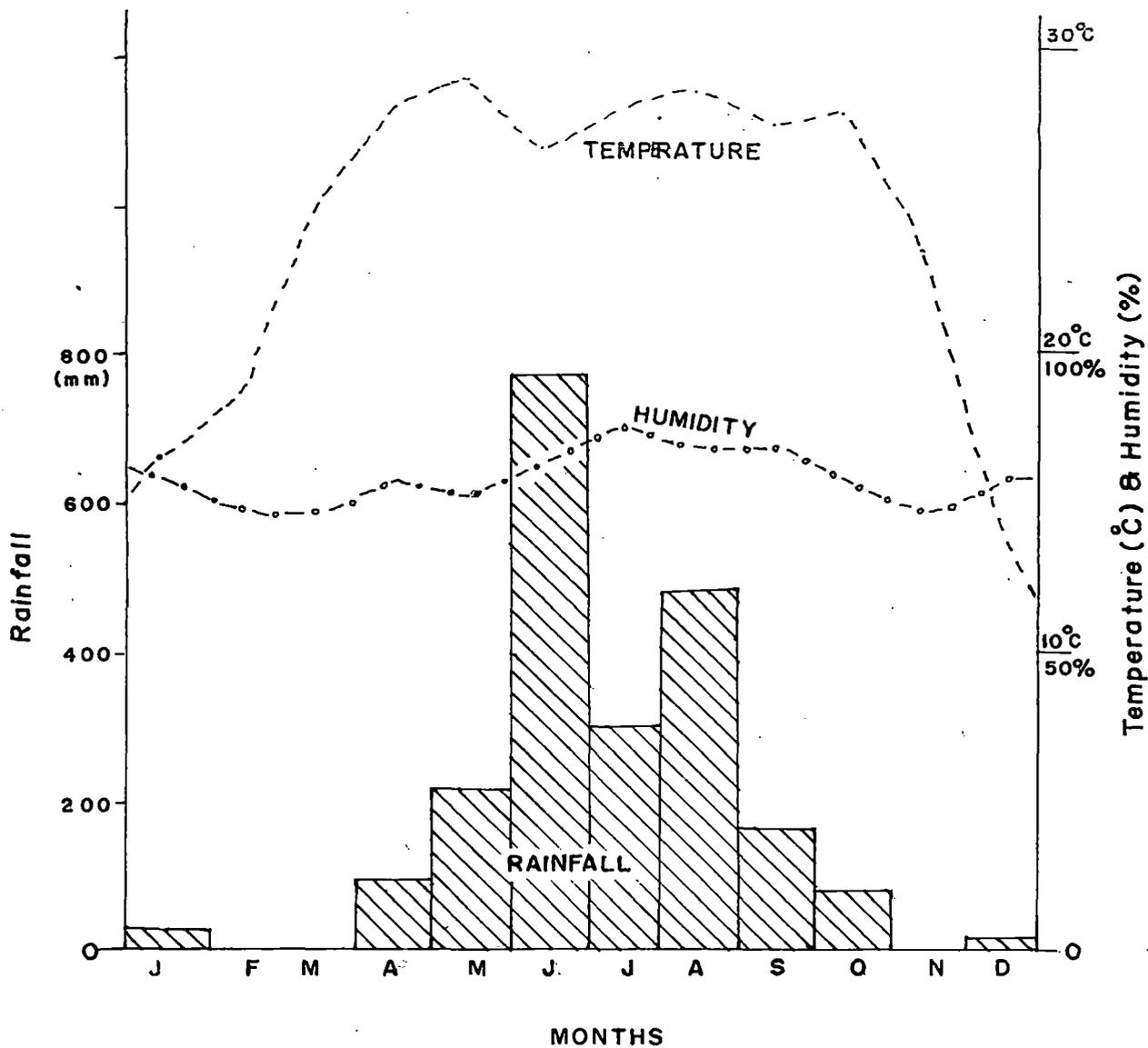


Fig-1-5

Rainfall : Bagerhat district enjoys an annual average precipitation of 174 mm. There is small variation in rainfall in different parts of the district. The 15th of June is the beginning of the rainy season, but rainfall starts frequently by the end of April due to approach of monsoon. The rain continues upto October but maximum rainfall is experienced in the month of July. The month of October and November lie in the transition period from the rainy season to the winter. The maximum amount of rainfall 482 mm was recorded in the month of August, 1995. The minimum rainfall in the month of December was 6 mm of the dry season.

Temperature : The maximum and minimum temperature during the winter season (Dec - Feb) vary from 25° to 14°C. The weather becomes very hot in April and continues to middle of June. During the summer season i.e., from March to June, the maximum and minimum mean temperature vary from 33° to 21° C.

Humidity : The humidity of atmosphere is considerably high through out the year never falling below 70 percent (average). Studying the nearby areas and this district as a whole the annual percentage of humidity is 77. Generally the lowest humidity that is 61% is recorded in the months of January and February and the highest humidity 96 percent is recorded in July and August. (Table 1.2). The climate of the district has seasonal variations. Bagerhat district experiences the following three seasons in the year.

DIFFERENT SEASONS

(a) **Rainy Season :** Rainy Season on-sets from June and continues upto October. In the rainy season, the district receives more than 80% (about 140 mm) of the total annual rainfall and it is the important agricultural season. The south-west monsoon breaks in the second week of June, while it normally withdraws before the middle October. This season is characterised by high relative humidity and high temperature making the water very much stuffy. July and August are the rainiest months, and the amount of rainfall during these months varies between 200 and 500 mm. The peak of the monsoon is to be found in these two months and it is also the peak of the flood season which may even escalate upto the month of September.

(b) **The Winter Season :** Winter season starts from November and continues upto the end of February. The north-east wind prevails in the winter season, and at this time, the direction of wind over North India is from north-west. This wind contains very little

moisture because of its land origin. Cool and fair weather conditions prevail in this season, but sometimes scanty rainfall occurs consequent upon the passage of the Western disturbances. The average winter temperature ranges between 15°C and 25°C. The summer weather prevails in the months of March and April, when the night still remains cool. It is replaced by the warm moist southerly sea wind bringing in more and more humidity in the daytimes and the end of the winter season.

(c) **The Summer Season (April - May)** : This is the hottest period with average maximum temperature between 32° and 38° c The highest temperature is usually recorded in the month of May. In this season Nor' westers locally known as 'Kalbaishakhi' are of frequent occurrence. The Nor' westers are evening squalls or violent winds with an average velocity of 50 - 65 Km per hour. Occasionally attaining 90 Km. Per hour uprooting trees, capsizing boats and collapsing huts. These are also frequently associated with thunder showers, as a consequence of which there is always a sharp fall of temperature sometimes even by 16°-18° c. The average rainfall in the Nor'wester season is little more than 125 mm and this helps for fruits and vegetables productions. The summer season includes the months of March, April and May.

The climate has a great influence on the agrarian economy of the region. The amount as well as distribution of rainfall is of vital significance in crop production. Abnormality and low incidence of rainfall often bring out adverse effects on the crop production and on the economic life of the people. Its impact is clearly manifested on the marketing and determination price of the commodities. It has been reported that due to the variability of rain in the years of excess or drought, the price of certain commodities such as nut, brinjal, rice, pulses, jute etc. fluctuate. This situation is however not applicable for the country as a whole (Ahamed - 1988). Again, in normal years, generally there is a good harvest and as a consequence huge supply of agricultural commodities at the market centres bring down their prices considerably. Sometimes excess of rainfall and floods damage standing crops. The impact of natural calamities again is manifested on the marketing price of commodities at the markets. Thus, the pulsation of the 'hats' is closely associated with the failure or fair harvest of the crops, which in turn, is linked with seasonal variability of rainfall.

The intensity of marketing and also attendance of people at the market centre vary at different seasons of the year, even if the occurrence of rainfall is normal and timely. During summer Nor' Wester, the peasants remain busy for ploughing and sowing

Jute and Aus paddy. Again during the rainy season, the peasants cultivate the lands prepare them for aman, the main rice of the study area. Aman is harvested in the months of November or December and also first half of January. During the harvesting period, the peasants remain busy for harvesting purpose. After the harvesting period, the peasants generally stay in their residence. So the post-harvesting period (i.e, January and February) is the period of low employments and the lands are generally left fallow until next cropping season. As a result, the people in general and the peasants in particular usually command a fair purchasing power in the markets. And a large number of them are found to do marketing more frequently during this period than other two seasons of the year. So it is found that the attendance and commodities arrival in the markets depend on climate and production of crops.

1.5 SOIL

The district is formed entirely by the deltaic action of the Ganges which brought mud and limestone from the Himalaya. The soil is not to a great extent uniform in character and varies only by greater or small admixture of sand. The percentage of sand is high along the river banks and less in those areas where deltaic action has ceased. In old 'beel' (marsh), the decayed vegetation produced a stratum of black soil.

During the delta building, rivers had direct connection with the Ganges, they brought down a considerable admixture of sand which they deposited along with finer alluvial mud. The resulting soil is of light sandy in character and suitable for intensive cultivations when first deposited, for growing pulses, oil seeds and melons and after enrichment by vegetables detrites, suitable for fruit trees and betel vines. Soil of this nature exists in the older upland areas of the northern district and in the vicinity of the only two rivers, which, now, carry the Ganges water viz- the Ichhamoti and Modhumoti-Baleswar. The soil deposited by river whose head waters are closed in either surface deposits or fine alluvial brought down by more active rivers and distributed by connecting channels on the flood time; in other case it is fine tenacious mud often arillaceous in the character. This soil is generally prevalent throughout the district and is the main source of paddy crops. In ancient 'beel' (marsh) area the decayed vegetation produces a stratum of black soil known as 'Jobe-mati'. It is almost sterile unless enriched by a considerable admixture of alluvial soil and even so, produces very inferior crops Deep boring reveals the presence of this stratum in many places in the district but fortunately it only crops out in a few marshy areas sufficiently near the surface to interfere with cultivation.

In context of Bangladesh, a group of soil formed in the same way and which are broadly similar in appearance. The soil survey project has indentified 17 general soil types formed (FAO. 1971) in Bangladesh. These 17 types of soils are distributed all over the region. Bagerhat district has grey flood plain soil and lime phase class of the country. A generalised account of the nature and distribution of the soils reveals that micro variations of soil are seen in the district. There are three zones of soil that is the north, the east and the southern zones.

The soil of north part in the district is composed of recent alluvium. This soil type covers the low lying areas in the district which is riverine flood plain. The potash (K) and phosphorous (P) content are fairly high. The soil responds quite well to manuring and generally acidic in character. This soil is found in Mollahat and Fakirhat Police Stations, There is also black brown peat in some areas. This category of soil is ideal for paddy, Jute, vegetables and mustard.

The eastern soil zone includes the Kachua and Bagerhat Police Stations and northern part of the Morrelgonj Police Station. This Soil is clay loam (Doash) and is ideal for different kinds of paddy. Its need for manuring is becoming so great that the soil fertility is declining due to intensive farming. In this part, Bagerhat Police Station (70%) have 'doash' soils and Kachua Police Station has 58% 'entel' soil. (Table-1.3) Secondly, this includes only three police stations of eastern part of the district. It is a low land area and in most part is liable to be submerged under saline and tidal water. The soil is clay and fine sand loam of saline character. But, in case of regular washing by rain-water the salinity remains low. This soil is productive in different kinds of cereal crops. The amon paddy is successfully grown in the soil because of high ground water table.

The mangrove forest soil, lies in the southern part of the district. In the mangrove zone, the soil is highly salines and gets submerged regularly during high tides. Land formation in the area is not yet complete and regular silting is taking place undisturbed by human agency. Most of this soil are located out side the forest zone and forest area, with mangrove trees (Sunderbon). This type of soil covers four police stations and about 80% of their land are flooded. When reclaimed, this soil does not yield good crops at the beginning, because of high salinity. The yield can be increased by reducing the salinity of soil and also by rain wash over a numer of years.

Table - 1.3 Composition of Soils in percentage of the Police Stations

Name of the Police Stations	Doash (loamy)	Sandy	Entle (clayey)	Kankor (Pebbly)	Total
Bagerhat	70	10	20	-	100
Chitalmari	40	-	55	5	100
Fakirhat	20	40	40	-	100
Kachua	40	2	58	-	100
Mollahat	40	25	20	15	100
Mongla	20	55	25	-	100
Morrelgonj	60	20	15	5	100
Rampal	14	2	84	-	100
Sarankhola	30	70	10	-	100

Source : District Statistical book 1989 Khulna District, Bagerhat.

1.6 VEGETATION

The tropical climate and the fertile soil combine to clothe the study area in an evergreen mantle. The greenery is very striking to the traveller from the western part of the Indian subcontinent, who find the thick cover of trees and grasses and crops a delightful contrast to the dun and brown vegetation of the western sides. It is viewed from the air that the vegetation looks its loveliest, the rows of graceful palm, the deep green masses of mango trees, the light green replashes of the clumps of bananas and the feathery bamboo, all arranged neatly around the huts and water tanks, make the country side look like a garden.

The ten families of the plants found in the area / which has within it parts of the Gangetic plains are :

- (i) Grasses (*Graminae*).
- (ii) Pulses, ground nut; tamarind etc. (*Leguminosae*.)
- (iii) Sedges (*Cyperaceae*)
- (iv) Some weeds of the rice field etc. (*Sporobolaceae* etc.)
- (v) Cotton ladyfinger. etc. (*Malvaceae*)
- (vi) Hargoza; Babasak etc. (*Acanthaceae*)
- (vii) Sunflower, gujital etc. (*Compositae*)
- (viii) Castor-oil, rubber latkan etc. (*Euphorbiaceae*)
- (ix) Sweet potato, morning glory etc. (*Convolvulaceae*).
- (x) Mint, Basil and other herbs (*Labiatae*)

The following are also largely represented : Bamboos (*Poaceae*), Palms (*Palmeae*), Various vegetables, (*Cucurbitaceae*) Akanda (*Asclepiadaceae*) etc.

The most common trees of the countryside is the Coconut and Mango. (*Cocos nucifera* and *Magnifera indica*). This is a fruit tree, but often when it does not fruits, it is used for timber. The betelnut palm (*Areca catechu*) ought to hold the second place. The palm is the most common tree of the groves. Along water courses and water tanks, the *Madar* (*Erythrina variegata*) *Jiyol* or *Badi* (*Iannea grandis*) and *Hijol* (*Barrinatonnia acutangula*) are the common trees. The *Jiyol* is a very common fencing as it grows readily from cuttings. Within the groves the Jak fruit (*Artocarpus heterophylla*), Jam (*Syzygium Jambolana*), Banana (*Musa sapientum* and *M. paradisiaca*) and the Coconut (*Cocos nucifera*) are the other common trees. Of bamboos, the Talla (*Bambusa tulda*) is the commonest. The khejur palm (*Phoenixsyvestris*) and Tal palm Coconut (*Borassuas flabellifer*) are generally grown at a distance away from the groves, around water tanks, along road or on the narrow divides between the fields. The Rattan palm (*Calamus rotang*) grows in thicks is damp ground. Along the ditches and by the sides of the groves, small flowering plants like *Homalomena aromatica*, *Crinum amoenum* *Globba subulata*, *Alpinia bracteata* and *A. malaccensis*, *Hedyclium flavum* and many others grown. In shades damp corners of ferns such as *Actiniopteris flabellata*, *Hamionities cordata*. and *Drymoglossum Piloseloides* grow on trees and amongst the under growth.

Several varieties of orchids are common. *Jibanti* (*Desmostrichum fimbriatum* *Budbar*) (*Eulophia muda*) *Rasna* (*Vanda tessellata*), *Salibmisri* (*Eulophia campestris*) and *shethuli* (*Zeuxine strateurnatica*) are medical orchids used in the country side. *Calanthe masuca* and *Dendrobium pierardi* are two of the most common orchids. Open spaces such as the edges of playground, railway and road embankment, follow fields etc. usually have a scattering of perennials like *Jatropha gossypifolia*, *Solanmus indicum*, *Argemone mexicana*, *Mimosa pudica*, and *calotropis gigantea*; with break of the monsoon rains there are almost choked with the rapid growth of various small *Cassias* (*sophera*, *tora* and *occidentalis*) and grasses, the most prominent of which are *Cynodon dactylon* and *Imperata arundinacea*.

Banyan (*Ficus bengalesis*) and *Oshot* (*F. religiosa*) are large trees, of the fig family grown as shade trees. The rain tree (*Samania saman*), another species which grows to a very large size is also grown for shade. Some of the largest of these three species may be seen in the compounds of the Government offices in the market. Trees

of these species, measuring four and a half metre and more around the trunk (at one and a half metre from the ground) are fairly common. The swamps, ditches and many of the water tank contain a rich variety of species. The water lettuce (*Pistia stratiotes*), duckweed. (*Lemna minor*) *Nasturtium palustre*, *Lepidium Sativum*, *vallisneria spiralis*, and the water-lily (*Nymphaea stellata*) are common. Two of the most interesting are the blue flowering *Euroyle ferox* and the floating flytrap *Aldrovanda vasiculosa*. The edges of the water courses and swampy areas usually favour the growth of reeds and large grasses, like *Arundo donax*, *Saccharum spontaneum* and various *Andropogons*. No account of natural vegetation can be complete without mention of the Bengal Rose (*Rosa in volucrata*), which is found in the high land. This white-flowering rose is remarkable that it is the only representative number of genus (*Rosaceae*) that is otherwise strictly extra tropical. Various acclimated garden roses also flower profusely.

Various strongly scented flowers are widely grown in the district. Among them the Queen-of-the-night (*Nyctanthes arbotristic*), *Jasmine (Jasminum officinale)*. *Rajanighandha (Polioanthes tuberosa)*, *Beli (Tabernaemonta divaricata)* *Bakul (Mimusops elengi)* and *Kamini (Murraya exotica)* are common. Other common shrubs and trees grown are *Hibiscus rosasinensis*, *Hibiscus mutabilis*, *Gardenia florida*. *Michelia champacasaracaindica* *Plumeria acuminata* and *Bauga inville rosea* Of seasonal flowers, the French and Indian Marigolds and the Cocks comb have been in favour for a longtime, Pansy, Phlox and Sanpragon are not uncommon. Roses are favoured by the few discriminating gardeners. Of late flowers are being grown for commercial purpose and many florist have opened shops in the town area. Unlike most tropical areas, gregarious species are not uncommon in Bagerhat forest. The forest at the Southern end of the district and extends inland, in places as far as 160 Km. The Bengali name for the Sunderbans is "Sunder-Bon" beautiful forest. The main tree is sundari (*henitiera fomes*). Which yield a heavy but excellent timber. It comprises over 70% of the forest cover between Haringhata and Pusur river, but diminishes to 50% along the Arpangasia river of the forest. The Gewa (*Excoecania agallacha*) is the next most important tree. It comprises 20% of the forest in this zone. It yields a soft timer which is being extensively used in the newsprint factory. Other trees associated with this area are *Dhundul (Carapa Obovata)* *Amur (Amoora Cucullata)*, *Pasur (Carapa moluccensis)*, *Bain (Avicennia tomentosa)*, *Kankra (Brugniesa gymnorhiza)*, and *Sondal (Afzelia bijuga)*. All these trees are nongregarious in character. Along the streams the common trees are the two palms. *Hantal (Phoenix paludosa)* and *Golpata (Nipafruticans)*. The willow like *Keroa*

(*Sonneratia apetala*) and such small trees as Kirpa (*Lumnitzera recomosa*), Shingra (*Cynometra remiflora*), Sing (*Cynontetra bijuga*) Parash pipal (*Thespesia populnea*), and Ora (*Sonneratia acida*). The important weeds in this type of forest are Bhola (*Hibiscus tiliaceus*) Kewa kanta (*Pandanus odoratissimus*). Hodo or Tiger Fern (*Achostichum aureum*) and Sundri-lota (*Browntonia lanceolata*). Goran (*Ceriops roxburghiana*), Dabur(*Cerbera odallam*), Karanj (*Pongamia glabra*), Dimal (*Salacia prinoides*), Kenkti (*Acanthus ilicifolius*), Khalsi (*Agiceras corniculata*), Baen, Pasur, Bhola and Hantal are the other common trees in this western zone of the forest. Goran is the most common tree of this forest. (Ahmed, 1997). The Sunderbon forest is the reserved forest and managed by the government authority (Fig - 1.1)

CONCLUSION

From the study it is visualised that the district is flat and covered with alluvial broken down by the rivers and channels. Due to topographical variations and locational characteristics, the district suffered from acute drainage and flood problem. Cyclones occasionally occurred, soil is fertile but salinity water makes the soil unfertile for crop production. Heavy concentrated rainfall and storms are the common characteristics features of the climate in the district. So it is revealed that the district has suffered for physical and environmental problems. The fertile soil and vegetation and their characters developed on account of these processes are of fundamental importance for this study which can be discussed in the next chapter.

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