CHAPTER TWO
CHAPTER II

PHYSICAL SETTING

2.1 LOCATION:

Darrang district is located between 26°12'N and 26°57'N latitudes and 91°42'E and 92°22'E longitudes. It is bounded on the north by the Bhutan and Arunachal Himalayas. Two perennial tributaries of the Brahmaputra, the Panch- noi and the Barnadi mark the eastern and western boundaries of the district, separating it from Sonitpur and Kamrup districts respectively. Marigaon district and a part of Kamrup district, south of the Brahmaputra, form the southern boundary (Fig. 1).

The district covers an area of 3481 km². It was formerly a subdivision of the undivided Darrang district and was known as Mangaldai subdivision. The district has a population of 1,298,860 as per 1991 census. Most of the population is rural and town-dwellers living in four towns, namely Mangaldai, Kharupetia, Tangla and Udalguri, account for 4.92 per cent only. Out of the total population, the Scheduled Tribes number 224,957, which is 17.3 per cent of the total. The major tribal groups include the Bodo-Kacharis, Rabhas and Garos. Only a few of the other tribal communities live in the district, but they hardly form important social groups. So they have been left outside the purview of the present discussion.

The other important social groups of the district are the indigenous non-tribal population consisting of Hindus (60.54 per cent) including refugees from erstwhile East Pakistan, Muslims (31.37 per cent) including immigrant Muslims, some tea-garden and ex-tea garden labourers and Nepalis. The district has an average density of population of 373 per km² as per 1991 census. It is higher than the state's average of 286. The growth rate of population of the
LOCATION OF DARRANG DISTRICT

40° 48Km

BHUTAN
ARUNACHAL
PRADESH

KAMRUP DISTRICT
MARIGAON DISTRICT

TANGLA
UDALGURI
ROWTA
MANGALDAI
KALAI GAON
DALGAON
KHARUPETIA

FIG. 1
district during the period 1971-91 is 55.63 per cent, which is also higher than that of Assam as a whole (53.26 per cent), during the same period.

2.2 GEOGRAPHICAL BACKGROUND:

Darrang district, which lies on the northern bank of the middle part of the Brahmaputra valley, consists of two administrative sub-divisions, namely Mangaldai and Udalguri.

The district lies mostly on the Brahmaputra plain. The southern slopes of the foothills of the Bhutan Himalayas, lie to the north of it. The mighty river Brahmaputra flows from north-east to south-west along the southern border of the study-area, separating the district from Marigaon and Kamrup districts to the south.

Darrang district consists chiefly of plain areas with only a few hills and hillocks lying in the extreme south-west corner. For the convenience of analysis in this study area, the district has been divided into six Development Blocks: (i) Sipajhar, (ii) Kalaigaon, (iii) Khairabari, (iv) Udalguri, (v) Mazbat and (vi) Dalgaon-Sialmari (Fig. 2). There are altogether twenty seven mauzas under these Development Blocks. In order to facilitate this study from the regional point of view, these twenty seven mauzas of the district have been considered as the spatial units. These are: (1) Sekhar, (2) Majikuchi, (3) Dakua, (4) Harisinga, (5) Ambagaon, (6) Udalguri, (7) Barchilajhar, (8) Orang, (9) Chinakona, (10) Sarabari, (11) Kalaigaon, (12) Silpota, (13) Shyamabari, (14) Dipila, (15) Rainakuchi, (16) Dalgaon East, (17) Dalgaon West, (18) Sialmari East, (19) Sialmari West, (20) Bonmoja, (21) Lokrai, (22) Sipajhar, (23) Hindughopa, (24) Dahi, (25) Chapai, (26) Rangamati and (27) Kharupetia (Fig. 3).

2.3 PHYSIOGRAPHIC SETTING:

The district, intersected by numerous hill-streams, is almost a quadrilateral block of alluvial plain, having a southward slope, with a dip towards the south-west. The plain of the
district slopes to about 54 metres near the Brahmaputra from the foothills of the Bhutan Himalayas in the north, having an altitude of 150 metres above mean sea level. The district with an average north-west extension of 50 km, falls into the following four physiographic divisions:

(a) The narrow Bhabar zone along the foothills of the Bhutan in the north, with an average width of 4-5 km consists of a thin layer of coarse, unassorted sandy soils, containing boulders, pebbles and cobbles. The surface run-off flowing from the sub-Himalayan tract immediately percolates down in this zone. It supports a thick forest cover containing deep-rooted plants of *Camellia* species. Most of the twenty eight tea gardens of the district are located within this Bhabar zone.

(b) The Tarai area, south of the Bhabar zone, is comparatively broad, with a width of 8-10 km on the average. The area is relatively flat and has a perpetual damp ground, encouraging luxuriant growth of tall grasses. The water that percolates down the Bhabar zone oozes out here, keeping the ground saturated and sometimes providing spring-heads to the south flowing seasonal rivers. This tract is chiefly inhabited by the Bodo and Nepali people.

(c) To the south of the Tarai, lies the relatively consolidated built-up Central Zone. This zone is the main abode of the vast majority of the district’s population, with homesteads of the non-tribal indigenous population. These old villages abound in pan (betel-leaves) and tamal (areca-nut) plants, bamboos and some other tropical fruit trees. Built by the fertile river-deposits and being free from the devastating floods, this area provides ideal ground for paddy cultivation. Its average width varies from 15-20 km (Fig. 4).

(d) The low-lying flood plain area of the extreme south, bordering the river Brahmaputra, has an average width of 3-8 km. It stretches from Kurua in the west to the Rajib Gandhi Wildlife Sanctuary in the east, covering a length of nearly 30 km. Formed by the annual sand and silt deposits of the Brahmaputra and its tributaries, this zone is extremely fertile, but is liable to frequent flooding. Covered with reeds and tall swamp grasses, this low flat alluvial plain, has become the abode of immigrant Muslims from erstwhile East Pakistan (now Bangladesh).
INDEX

INTERNATIONAL BOUNDARY
STATE
DISTRICT
BLOCK
IMPORTANT PLACE

FIG. 2
Dexterous cultivators as they are, a number of crops like winter rice, pulses, jute, mustard and vegetables are grown in the sandy soil. These chars and chaporis\(^1\) also form good grazing grounds. In the eastern part of this division, lies the East and West Dalgaon mauzas, where the plain is situated at a higher level and is dissected here and there by the old Dhansiri river. It was covered by wild jungles till the beginning of the twentieth century. But with the advent of the Muslim immigrants, since about 1901, the jungle-covered wastelands were reclaimed and brought under human habitation within a few decades. In recent years, this entire region has been converted into the stronghold of the immigrant Muslims with nearly hundred per cent of the population being made up by them. However, one portion of this area has been covered by the famous Rajib Gandhi Wild Life Sanctuary i.e., Orang Wild Life Sanctuary.

The flood plain in the southwestern part, within Sipajhar mauza has a sprinkle of Pre-Cambrian hillocks, detached from the Meghalaya plateau. Formed of granites and gneisses, these hillocks have altitudes varying from 150 metres to 220 metres. Of these hillocks, the important ones are Kurua, Dhalpur, Aparia, Bamon-Parbat, Ganesh Pahar and Gadhia Pahar. Some of these hills are also traditionally associated with the kings of Mahabharata.

Thus, the entire district, intersected by numerous hill-streams, is almost a block of alluvial plain, with a southward slope.

In the northern border areas too, low ranges of foothills of Bhutan and Arunachal Himalayas, like Kherkheria, Neuli, Kaling-duar, etc. emerge out in some parts, within the district. The average height of the hillocks in the northern marginal areas, is about 350 metres. The three Development Blocks of the north, stretching towards the foothills, are Khairabari, Udalguri and Mazbat.

Towards the north of Udalguri Block, the slope is gentle, while it is relatively steep in Khairabari and Mazbat. In the northwest of Khairabari Block, around Rajagarh area, the altitude is around 200 metres. Towards the south of these three Blocks, the average height comes down to about 100 metres. Among the northern Blocks, Mazbat attains higher ground elevation.

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\(^{1}\) Char means small sandy river island and chapori means broad flat chars.
But among other southern Blocks, southwestern part of Sipajhar Block is covered by some swampy grounds. A good number of swamps among them, has been reclaimed by constructing embankments on the river Brahmaputra, Na-Noi and Barnadi (Fig. 5).

2.4 DRAINAGE PATTERN:

River Brahmaputra is the master-stream of the study-area, flowing along the southern boundary of the district, from northeast to southwest, covering a distance of nearly 55 km. The network of other rivers and streams originating from or near the Bhutan Himalayas, flow through the district from north to south and discharge their water to the Brahmaputra. Most of the rivers carry huge volumes of water during the summer months from June to October, when heavy downpour takes place along the Bhutan foothills, with frequent flood havoc and soil erosion, causing extensive loss of crops and other properties of the inhabitants of the nearby localities. Some of the northern tributaries, like the Suklai, the Dimakuchi, the Na-Noi, the Mora-Bhola, the Kulsi, etc., disappear in the gravel slopes at the foot of the Bhutan hills and reappear in the form of streams farther down and then flow in well-drained channels.

Darrang district is drained by three river-systems - (i) the Bar-nadi-Na-noi group in the west, (ii) the Mangaldai-Noa-nadi group in the middle and (iii) the Jia-Dhansiri group in the east. Some of the streams of these groups, originate from the mountains and are perennial, while some others, originate from the Tarai, and dry up in winter (Fig. 6).

The river Na-Noi, has its origin in the Tongsa Province of Bhutan at an elevation of 1220 metres above mean sea level. It enters Darrang district, through the Kaling-duar forest and is now shifting its course towards west, from its original channel, known as the Saktola river, to its present position by about eleven km, in its lower course. It has left several channels, ox-bow lakes and swamps on its abandoned course and has sent out a new branch to the Barnadi river recently. An area of about 500 km² is ravaged in the lower course due to the shifting nature of this group of rivers. It ultimately joins the Brahmaputra, at about 16 km upstream of North Guwahati. The river is approximately 104 km in length and has a catchment area of 504 km².
The Mangaldai-Noa-nadi group is almost stable and is flowing vertically southward from the Bhutan hills, traversing a length of about 70 km by each of its rivers. Formerly, these two rivers jointly met the Brahmaputra, at a place, a few km to the southwest of Mangaldai town. But in 1973, the lower course of the Mangaldai river had been diverted by digging a canal to meet the Brahmaputra independently, directly to the south of Mangaldai town. This direct flow has made the Mangaldai river quite deep now.

The nature of the Jia-Dhansiri river is very peculiar. Flowing from the Tashi Gorge of Bhutan, it enters Darrang district at Bhairabkunda, the trijunction of Assam, Arunachal Pradesh, and Bhutan. On its down-stream, it has been joined by many streams and the combined river flows in a southeasterly direction, against the general slope of Assam valley. It is still migrating east. During the last two centuries, it has migrated towards east from its original confluence with the Brahmaputra, at a place to the south of Mangaldai town, leaving many abandoned channels of the Dhansiri river, like Tangani, Mora-Dhansiri, etc. are still to be found, the former is flowing along the eastern margin of the Tangani Tea-Estate and the later along the Lakhimi Seed Farm, Lalpool. The total length of the Jia-Dhansiri river, is approximately 80 km from its source to the confluence with the Brahmaputra. Its bed is shallow and has a tendency of frequently changing its course, especially during the flood season, causing a havoc to life and property. The Govt. of Assam, undertook a project, known as ‘Dhansiri Irrigation Project’ at Bhairabkunda, just at its entrance in Darrang district, during the nineteen-seventies to control the annual floods and to utilise the abundant water resources. The construction of dams, sluice-gates, embankments, etc. with a network of irrigation channels, are now nearing completion. An area of about 800 km², to the east of Mangaldai, has been left ravaged by the Jia-Dhansiri river, resulting in the growth of very sparse settlements, due to frequent occurrence of devastating floods. The numerous abandoned channels of the Jia-Dhansiri river lying east of Kopati, which can still cause menace during the summer, helps one appreciate the magnitude of devastation. It is only during the recent period that the Muslim immigrants have occupied all these vacant lands.

The important rivers and tributaries of the three groups are Barnadi, Na-Noi, Saktola, Kalpani, Noa-nadi, Mangaldai, Bega, Tangani, Sukhajani, Mora-Dhansiri, Jia-Dhansiri and Panch-noi. It is interesting to note that, all these rivers have their origin in the mountains and
debauch onto the plain with wide braided courses over the Bhabar zone and then begin to meander over the Tarai, built-up zone and flood plain before emptying their water into the Brahmaputra.

2.5 THE CLIMATE OF DARRANG DISTRICT:

Darrang district, being in North East India, lies under the Monsoon type of climate, with distinct summer and winter seasons. It is characterised by the absence of a distinct hot summer season, the highest temperature being experienced during the southwest monsoon season, associated with abundant rains and with high humidity throughout the year. The cool weather season starts from the last part of November and continues up to the end of February. This is followed by occasional thunderstorm and lightning from March to April. The southwest monsoon season starts from June and continues up to the end of September. October and November constitute the period of retreating monsoon.

Rainfall and Temperature:

The average amount of rainfall in the district is high, over 200 cm. The rainfall increases from south to north. Sufficient rainfall comes even during the pre-monsoon period of April and May. The southwest monsoon arrives the district by about mid-June. Heavy monsoon rainfall occurs during the months of June and July and gradually decreases towards August and September. However, from June to the beginning of October, the wet rainy season prevails with 85 to 90 per cent of the total annual rainfall coming in this period. The annual variation of rainfall is comparatively small. From 1901 to 1951, the heaviest annual rainfall occurred in 1920, recording 293 cm. in Mangaldai, while the lowest was recorded (59 cm.) in Kherkheria during 1908. In the recent years, the minimum rainfall recorded was 89 cm. in 1974, in almost all throughout the district. The average annual rainfall in the southwest of the district is 160 cm., while in the extreme north-east, around Jingabil, bordering Arunachal Pradesh, it is 225 cm.
On the average, there are about 107 rainy days in a year, although the number varies from 94 days at Mangaldai to 122 days at Bettibari Tea-Estate in the northeast of the district. During the months of November and December, a considerable amount of rainfall occurs in the district. This rainfall is the outcome of the low-pressure centres that develop over the Bay of Bengal and of the western disturbances.

**Temperature Condition:**

There are two meteorological observatories at Mazbat and Tangla in the district. The seasonal temperature shows a steady fall from the south to the north. Winter season prevails from the beginning of November to the middle of February. January is the coldest month with a mean daily maximum of 24°C and a minimum of 9°C temperature. The district occasionally experiences in winter cold spells for a day or two, when the minimum temperature may fall below 5 °C. From February, however, the temperature begins to rise and occasional showers begin to occur. The occasional hailstorms become frequent from late March onwards, while temperature goes on rising. The highest mean daily temperature is experienced in July and August, when the daily maximum comes nearer to 32 °C and the daily minimum stands at 25°C. This together with high humidity, makes the southwest monsoon season rather unpleasant. The highest temperature ever recorded was 39.5 °C, experienced at Tangla, on 13th June, 1961. The lowest temperature of 4.3 °C was also experienced at the same place on 30th January, 1964.

**Relative Humidity:**

The atmosphere of Darrang district is highly humid all throughout the year, except the period from February to April, when the relative humidity comes down to about 70 per cent. The relative humidity recorded in June-July is about 87 per cent. However, the annual average relative humidity remains at 79 per cent in the district. When atmosphere remains hot during the
months of June to October, relative humidity rises rapidly, rendering the atmosphere sultry and trying.

The following table depicts the conditions of rainfall, temperature and relative humidity of Tangla and Mazbat in the year 1971 and 1995.²

<table>
<thead>
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<th>Station</th>
<th>J</th>
<th>F</th>
<th>M</th>
<th>A</th>
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<th>S</th>
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<td>R.F. (cm.)</td>
<td>2.5</td>
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<td>18.7</td>
<td>23.7</td>
<td>24.9</td>
<td>27.1</td>
<td>28.7</td>
<td>32.1</td>
<td>28.3</td>
<td>28.2</td>
<td>25.9</td>
<td>20.3</td>
</tr>
<tr>
<td></td>
<td>R.H. (%)</td>
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<td>67.5</td>
<td>59.0</td>
<td>86.0</td>
<td>86.0</td>
<td>83.5</td>
<td>82.0</td>
<td>85.0</td>
<td>78.0</td>
<td>67.5</td>
<td>75.0</td>
</tr>
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<td>MAZBAT (1995)</td>
<td>R.F. (cm.)</td>
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<td>22.6</td>
<td>37.9</td>
<td>78.4</td>
<td>512.4</td>
<td>293.4</td>
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<td>20.8</td>
<td>22.0</td>
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<td>27.0</td>
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<td>84.5</td>
<td>82.5</td>
<td>83.0</td>
<td>85.0</td>
<td>88.0</td>
<td>79.0</td>
<td>71.0</td>
</tr>
</tbody>
</table>

Source: Meteorological Centre, Mazbat and Tangla.

Wind blows light over the district throughout the year, except from short spells of thunderstorms that occur in the period from March to May. Northeasterly or easterly winds are most common throughout the year. Strong dust storms interfere with the otherwise peaceful atmosphere, from the middle of March to the middle of April, especially along the southern fringe, where the sandy chars and chaporis of the Brahmaputra exist. But since the beginning of the nineteenth century, along with the increasing settlement of immigrant Muslims and subsequent development of their orchard-gardens, over the river banks, the havoc of dust storm has lessened.

² Data collected from Tangla and Mazbat observatories during field investigation by the researcher in 1996.
2.6 BEELS, MARSHES AND TANKS:

There are numerous beels, marshes and swamps in the study area. The beels or lakelets may be divided into four classes: (a) Some of these are abandoned courses of the rivers, left as ox-bow lakes; (b) some beels and swamps were dug during the floods; (c) some others represent natural depressions; while (d) some originated in the Tarai belt, where the water that percolates down in the Bhabar, reappears. In cold weather season they are surrounded by a belt of green seasonal grasses and afford splendid grazing grounds. The important beels in the district include Batha, Roumari, Bherpari, Na-noibeel, Moamari, Barghop, Bhanganmari, Gadhiabeel and Diplinga. These beels are natural fisheries and provide fish to the whole of the district.

Darrang district abounds in man-made tanks. Altogether, there are 361 tanks, but most of them have now become silted-up\(^3\). Most of these tanks were excavated by the Koch-kings or by the Bhuyan feudal lords, who ruled over the area from the thirteenth century to almost the time of the annexation of Assam by the British in 1826. Some of these tanks are associated with the ruins of temples on their banks. The remains of such temples on the bank of Baldev Pukhuri in Byaspara may be cited as an example. Government of Assam, through its Fishery Department, has now renovated many of these tanks. Some of the important renovated tanks are - Dologuri Pukhuri, Baldev Pukhuri, Padum Pukhuri, Buhri-Nagar Pukhuri, Raja Pukhuri, Jaipal Pukhuri, Lakhimpur Pukhuri, Mangaldai Pukhuri, Upahupara Pukhuri, etc. In the historical past, the water of these tanks were used by the inhabitants of their surroundings, not only for domestic purposes, but also for minor irrigation. Many of such silted-up tanks in and around Dalgaon, Chikanmati and Rowta have now been reclaimed by the immigrant settlers for agricultural purposes. Some others, like Dologuri Pukhuri, Upahupara Pukhuri, etc. have been converted into lucrative fisheries.

2.7 FLORA AND FAUNA:

Darrang district is very rich in natural vegetation which may broadly be divided into - (a) evergreen forest, (b) deciduous forest, (c) grasses and (d) swamp vegetation.

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The evergreen forest vegetations including tea plants (*Camellia assamica*) are abundantly seen in the northern Bhabar zone. Apart from tea, the other important species include Nahar (*Meshua ferra*), Tita Champa (*Mechelia chapaca*), etc.

The deciduous vegetations are commonly seen in the Central Built-up zone and partially in the Tarai zone. They become very luxuriant during the rainy summer and shed their leaves in winter when rainfall is less.

Grasses and swampy vegetations are mainly seen in the southern flood-plains and the swampy lands of the southwest of the district respectively. Tall grasses are also seen in the Tarai zone during the summer and they often encourage the wild elephants to come to the lower plains. Reports of destruction of crops annually by the wild elephants in Dimakuchi, Suklai, Bengbari, etc. justify the statement.

Government reserved forests of the district include Bengabari, Kaling-duar, Barnadi, Na-Noi forest, Rowta forest, etc. along the north of the district up to Bhutan border and Arunachal Pradesh. Besides, the extreme southwest of the district is covered by the Rajib Gandhi (Orang) Wildlife Sanctuary and the extreme southwest is covered by the Kurua Reserved Forest. The valuable species of trees found in the district include Sam (*Artocarpus chaplasha*), Gunserai (*Cinnamomum glanduliferum*), Titachampa (*Mechelia chapaca*), Makai (*Shorea assamica*), Nahar (*Meshua ferra*), Sonaru (*Cassia fistula*), Gomari (*Gmelina arborea*), etc. Varieties of grasses, timber, cane, reeds, bamboo, etc. are the important forest products of the district. The rare species of Agar trees are the most noteworthy products grown in Chapai mauza of this district.

So far fauna is concerned, Darrang district is rich in wild elephant, wild buffalo, tiger, bear, wild pig, monkey, varieties of deer and also rhinoceros. Among the varieties of birds - hornbill and peacock are notable. Common species of birds include pelican, pheasant, quails, partridge, parrot, kingfisher, moina, scarlet, wild goose, wild pigeon, etc.
Among the reptiles monitor, lizard, python, king cobra, etc. are found in the district of Darrang. Crocodiles and tortoises are also seen in the rivers, particularly in the Brahmaputra.

All kinds of common fishes, such as Rahu (*Labeo rohita*), Mirica (*Cirrhinus mrigala*), Pithia (*Tor tor*), Chital (*Notopterus chitala*), Borali (*Wallago attu*), Magar (*Calanus batrachus*), Kawai (*Anabas testudineus*), Sal (*Channa striatus*), Goroi (*Channa punctatus*), etc. are found in the rivers and swamps. Silghoria and trouts are abundantly available in the foothill regions of the north, especially in Jia-Dhansiri, Kulsi, Na-Noi and Suklai rivers.

Swamps in the district support many aquatic plants and animals, which constitute important items of food, both for the tribal and non-tribal population.

The Rajib Gandhi (Orang) Wildlife Sanctuary is famous for the one-horned rhinoceros, that helps in bringing the place in the Tourist map of India.