

CHAPTER II

BASIC RESOURCES OF THE RURAL ECONOMY

2.1. INTRODUCTION

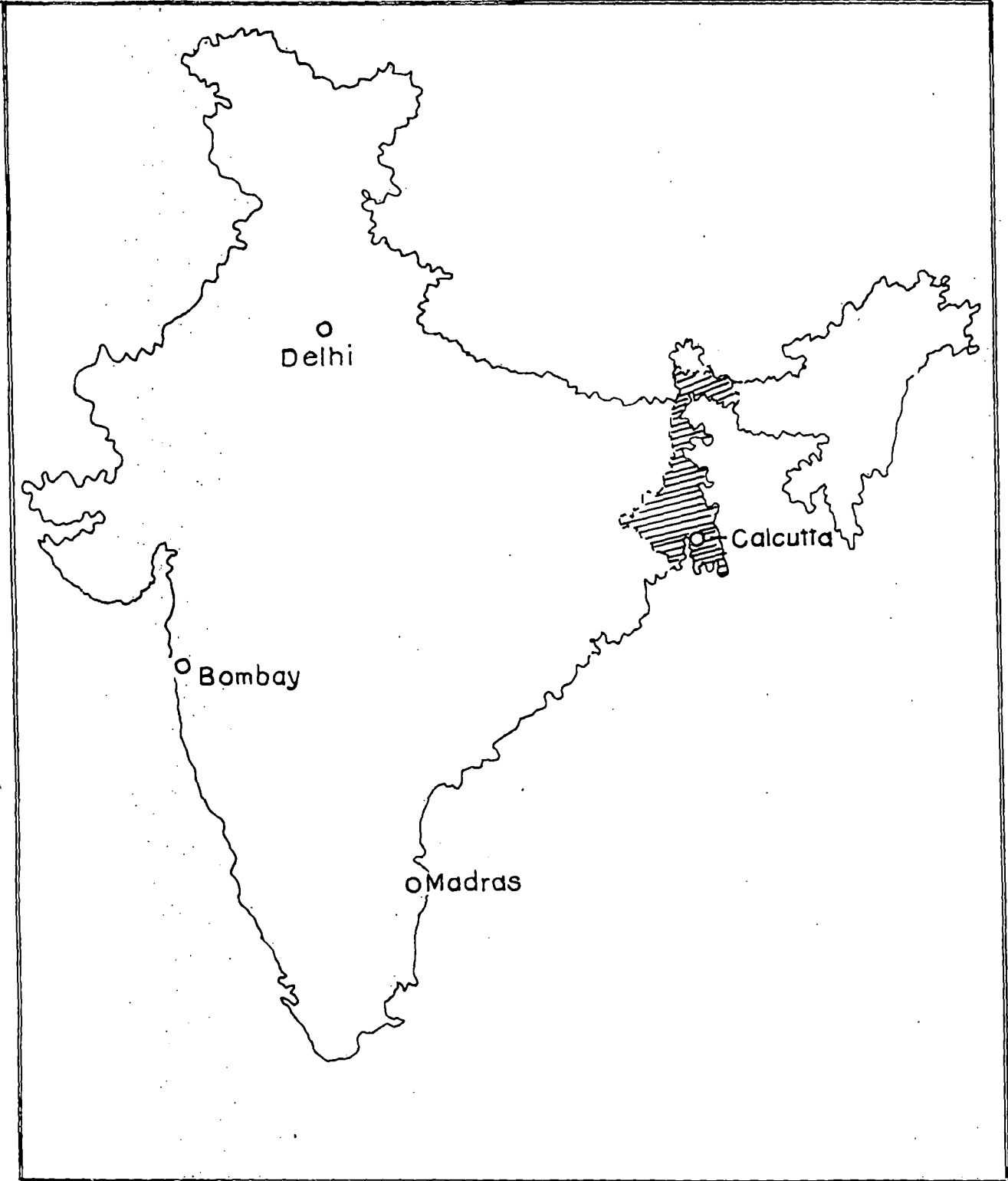
The Hugly district is one of the important districts in the southern region of West Bengal. Geographically it is situated between $22^{\circ}39'32''$ and $23^{\circ}01'20''$ north latitudes and between $87^{\circ}30'20''$ and $88^{\circ}30'15''$ east longitudes. In its eastern side the district is bounded by the meandering Bhagirathi which plays an important role for the district economy. In the north, the district is surrounded by the adjoining district Burdwan. It is bounded by the district Bankura to the south-west. The West lies To the district Midnapore and the south reaches to the district Howrah.

The district measures the area about 1,216 sq. miles. The embanked river Damodar flowing from north to south has separated the district into two parts. The western part is much smaller than the eastern counterpart. The longitudinal extent of the district is much greater than the latitudinal. The district consists of four sub-divisions namely Hugly (Sadar), Chandannagar, Serampore and Arambagh. Chinsura is the headquarter of the district and of the Hugly (Sadar) sub-division. The towns of Chandannagar, Serampore and Arambagh are the headquarters of the three other sub-divisions.

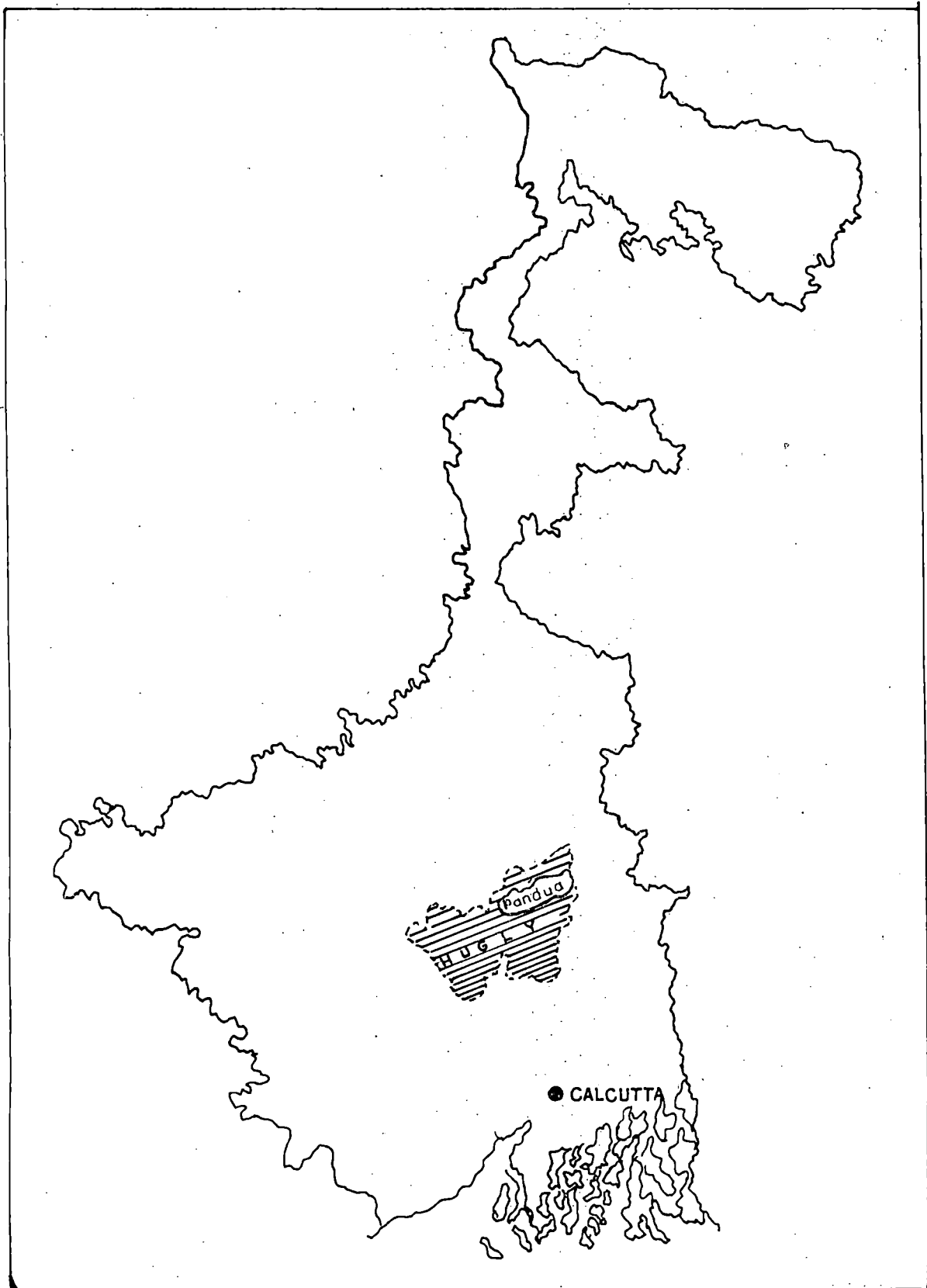
2.2 RAINFALL AND INCIDENCE OF HAILSTORM

In the rural area of the district, agriculture is the main activity. The agricultural productivity, is very much dependent on the good rainfall. A major portion of the district has not been

Map of India and the state of West Bengal



West Bengal, the District of Hugly and the Pandua Block



covered by any irrigation facility. In that area rainfall is the only source of watering the land.

Precipitation at the eight recording stations within the district indicate that though rainfall is adequate with about 70 to 100 rainy days in a year, there is enough variability. It will be seen from the following table that over a period of 15 years (1971-85) the annual rainfall in the district was 1636 mm.

Table 2.1
Rainfall (1971-85) of Hugly

Month	Actual 1985	Average	No. of Rainy days (1985)
January	13.1	8.79	2
February	10.7	45.96	1
March	1.3	33.80	-
April	14.5	89.61	1
May	99.5	177.08	5
June	303.0	260.28	12
July	258.1	394.67	17
August	360.9	265.45	19
September	219.7	197.60	15
October	96.6	116.34	5
November	Nil	3.62	Nil
December	Nil	42.34	Nil
Total	1377.4	1635.54	77

(Source: Agricultural Marketing in Hugly District - Annual Review, 1986).

The above table shows that the heavy rainfall occurs during the period June to September. Absence of well designed drainage system causes flooding when heavy rainfall occurs and this occasional flood makes the Kharif crops subject to severe damage. November to March more or less dry season. August is the rainest month. On the whole the rainfall varies in the district from 1350 to 1650 mm. The rainfall during the Bay monsoon and the south-west monsoon amounts to about 72% of the total annual precipitation. The normal date (which, however, is liable to vary) of arrival of the monsoonal regime lies between the 5th and the 10th June and that of its withdrawal between the 1st and the 15th October.

The district experiences 75 rainy days on the average (i.e. days with rainfall of 2.5 mm or more). The number of rainy days varies from 62 at south-east Hugly to 90 at North-east of the district precipitation features indicate that oceanic influences penetrate through the Bhagirathi channel. The constant juxtaposition of oceanic and continental winds over the district resulting in high or low local precipitation.

Proximity of the Bay of Bengal has the influence on the weather of the district. Storms and depressions from the Bay of Bengal often reach the district and its neighbourhood in May and in the post monsoon season and cause widespread heavy rain with high winds. This high winds in May sometimes causes heavy damage to the crops in the field.

Tropical cyclones developing over the Bay are usually active at the end of summer which creates heavy tidal wave and sometimes that cause much damage to life and property of those live near the Bhagirathi river. During tropical monsoon months most of the storms having a gale force originate in the north of the Bay and move west or north-west and the depressions bring heavy rain. Though very infrequent, the turn of the monsoon is also a period of cyclonic activities.

2.3 TOPOGRAPHY AND RIVER BASINS

This district forms a part of the fertile Indo Gangetic plain and a part of south Bengal basin with its numerous hydrographic changes. Topographical homogeneity of the district is remarkable on the average. Only marked topographical variation noticeable with the numerous shifts and diversions of the rivers which made some surface above flood-level and others below water-table.

Though most of the part of the district is flat plains of the lower Gangetic delta, however, mentioning of some of the important surface differences within the general pattern of alluvial plains will not be irrelevant for the development planning of the district. The river Dwarakeswar has divided the district into two distinct parts, the plains and the uplands. The region between the river Bhagirathi and the Dwarakeswar is the flat alluvial plain intersected by a number of sluggish rivers and streams. This part of the district slopes gradually from the north and west towards the south and east as is indicated by the flow of water courses,

the slopes of which, however, vary from a couple of inches to more than a foot per mile.

The most important river flowing within the flat alluvial plains is the Damodar. By taking Damodar as the dividing line, the region can again be sub-divided into three regions, namely (1) the Dwarakeswar-Damodar interriverine plain (2) Damodar-Bhagirathi interriverine plain and (3) the char land (the predominantly sandy areas which were under rivers periods ago).

Parts of the Dwarakeswar-Damodar region are low lying and so ill-drained that seasonal marshes have formed. The region is liable to floods during the rainy season, particularly in the areas between the Kana Nadi (one-eyed river i.e. non-perennial river) on the east and Khanakul to the south and the old course of the Kana Nadi to the east and the Rupnarayana to the west. The latter tract is studded with streams, swamps and embankments. Except where protected by embankment this region is susceptible to constant floods as the big rivers bounding this tract, namely the Dwarakeswar and the Damodar, are gradually having their beds raised by annual deposits of silt and sand. Very often, this leads to the sudden and unpredictable submersion of crops. The adjoining areas of Mundeswari are more flood prone as its constantly shifting banks are not embanked. Purusurah block is one of the most backward areas in the district due to this baneful geographical condition. Even the smaller streams come down in flood heavily with excess water from north to south.

The result is continued waterlogging around the basin. They also add to the general uncertainty of the crops, for if they deposit alluvial silt, excellent rabi (winter) crops are raised, but if sand, the land becomes sterile. The general effect, however, is that land is being slowly raised and in greater part will probably so high as to be above ordinary floods. The gradual rise of the river beds necessitating higher and higher embankments and the rising of flood level would thus appear to move in a vicious circle. When such conditions operate, the breaches of embankments may have serious consequences. The terrific velocity due to water flowing from a much higher level generates sweeps away everything in its way and sometimes washes of entire village.

In the Damodar-Bhagirathi interriverine plain, the slope is from West to East. A very prominent natural level has formed downstream along the West bank of the Damodar which constitutes an important feature of the topography. In the Hugly district the Damodar has embankments of 41 miles on its West banks and 12 miles on its east banks. The West embankment being continuous had been provided with many sluices to allow for irrigation and outflow of inland drainage. The area to the West of the Damodar is ideal for cultivation.

There are depressions in the centre of this area. These are helpful for draining the surrounding lands and in the rains discharge their contents through small channels into larger streams. After the cessation of the monsoons the non-perennial rivers are

represented by a succession of stagnant pools in the deeper parts of their beds. Such shallow basins alternately contains lakes and swamps according to the season. After they have been drained, the swampy lands may become very fertile because of their high humus content.

Several chars have been formed in the north-eastern part of the district. These chars are bars which grew and are still growing on the inside of meander bends of the Bhagirathi. Successive floods and deposits of silt or sand have gradually raised these char lands permanently above the flood-level. This process of alluvium and diluvium is most marked at the river beds and at the points of confluence with other streams. These chars are source of high quality sands for building construction.

The entire western side of the river Dwarakeswar is the western upland of the district. This region has some important topographical variations from the remaining part of the district. This region is triangular shaped comprising the Goghat thana having an area a little less than one-eighth of the district area. Here there is a perceptible rise in elevation and surface gradually rises westwards. In the small corner of the West, the land is distinctly rocky. In these parts the general slope is from north-west to south-east and the country is drained by numerous non-perennial small torrents all debouching into the Dwarakeswar. They are mere trickles during the greater part of the year but have a rapid and unformidable current rising suddenly with monsoonal rains. Their channels display scars of gully erosion and have sandy beds. On the whole, these

112558

NORTH BENGAL
University Library
Raja Ram Mohunpur

13 DEC 1995

uplands are less liable to floods than the country to the east.

Thus, in more senses than one, the rivers of the Hugly district provide a key to its geography, regional economy, socio-political pattern, cultural heritage and history.

2.4 HEAT, HUMIDITY AND WINDPOWER

The prospect of agricultural production depends among other things on the natural factors. The agricultural pattern is conditioned by the availability of these natural factors. Heat, humidity and windpower are very important natural factors for determining the types of agricultural activities.

The latitudes of the district, as mentioned in a preceding section, give it a place in the high tropics. During the monsoons the tropical heat is modified. Heat reveals itself when clouds are absent even during the official monsoon months.

In the first half of January the district experiences the minimum temperature with mercury falling around 10°C at night but the day temperature varies around 25°C to 27°C . From the middle of February the temperature starts rapid rising with minimum temperature 20°C at night. End of February the temperature at day time reaches around 30°C . The number of hot days in a year with mercury rising beyond 38°C is not many. The day temperatures reach their maximum in April or May when the mean maximum temperature is about 36°C and the mean minimum about 24°C . The heat in summer is

oppressive due to high moisture content of the air. The oppressive high temperature continues from the beginning of March till the end of October.

Relative humidities are generally high throughout the year, especially during spells of very wet weather with incessant rains; but with hot winds blowing, such as is common in the summer months, they are comparatively low, though more oppressive. In winter, humidity decreases from south to north and east to west and on an average the variations in relative humidity are smaller than in winter.

The sun is seen between the equator and the tropic of cancer from 23rd March to 22nd June. The Indian land mass is evenly heated. As a result of these differences in heat we have during April and May occasional rain, thunderstorm and hailstorm in the district. The process is aided by the vapour laden winds coming from the Mediterranean via the Himalayas as well as upper India. Being situated far from the coast of the sea or high mountains the district is not benefited for even small periods by wind power more than 25 kilometers per hour.

2.5 GENERAL QUALITY OF SOIL

The entire district is covered with alluvia of two different types - older alluvium and newer alluvium. Both are of recent age. The older alluvium is found only in the westernmost parts of district. The rest of the district is mantled by newer alluvium mainly composed of sands, silts and clays brought by the rivers. The western

tract of the district consists of loamy alluvium, red in colour. This red soil is generally deficient in nitrogen, phosphoric acid, humus and lime but contains a reasonable amount of calcium and magnesium. This soil is slightly acidic and is of lighter texture, porous, friable and has some moisture retentive capacity. This soil as a whole is fertile. Actual red soil covers 6800 hectares of the district.

In the eastern and south-eastern parts of the district, Gangetic Alluvium soils are found and this Gangetic alluvium belt comprises areas of 59,150 hectares of the district. Soil is rich in calcium and it is fertile with high available potash and medium nitrogen and available phosphate and normal phosphorus.

The Arambagh sub-division and some of the adjacent areas have been formed by the silt deposition of Dwarakeswar and Damodar. This soil is known as Vindhya Alluvium soil. It is less fertile than Gangetic alluvium soil. Low in nitrogen and available phosphate, medium in available potash. Soil is slightly acidic. The Vindhya alluvium soil covers total area 2,48,550 hectares. The soil in the extreme north of the district consists of partly lateric clay and partly red-coloured coarse-grained sand. Whatever be the natural components and nutrients of the soil, the soils, throughout the district, are very suitable for certain types of crops the production of which the agro-climatic characteristics allow.

2.6 AGRO-CLIMATIC ZONES

As the district Hugly is one of the large district of the State of West Bengal, it shows conspicuous heterogeneous features over its wide area. However, intensive study reveals the homogeneity of features within a specified area. The district can be divided into different agro-climatic zones on the basis of topographical and other geographical homogeneity.

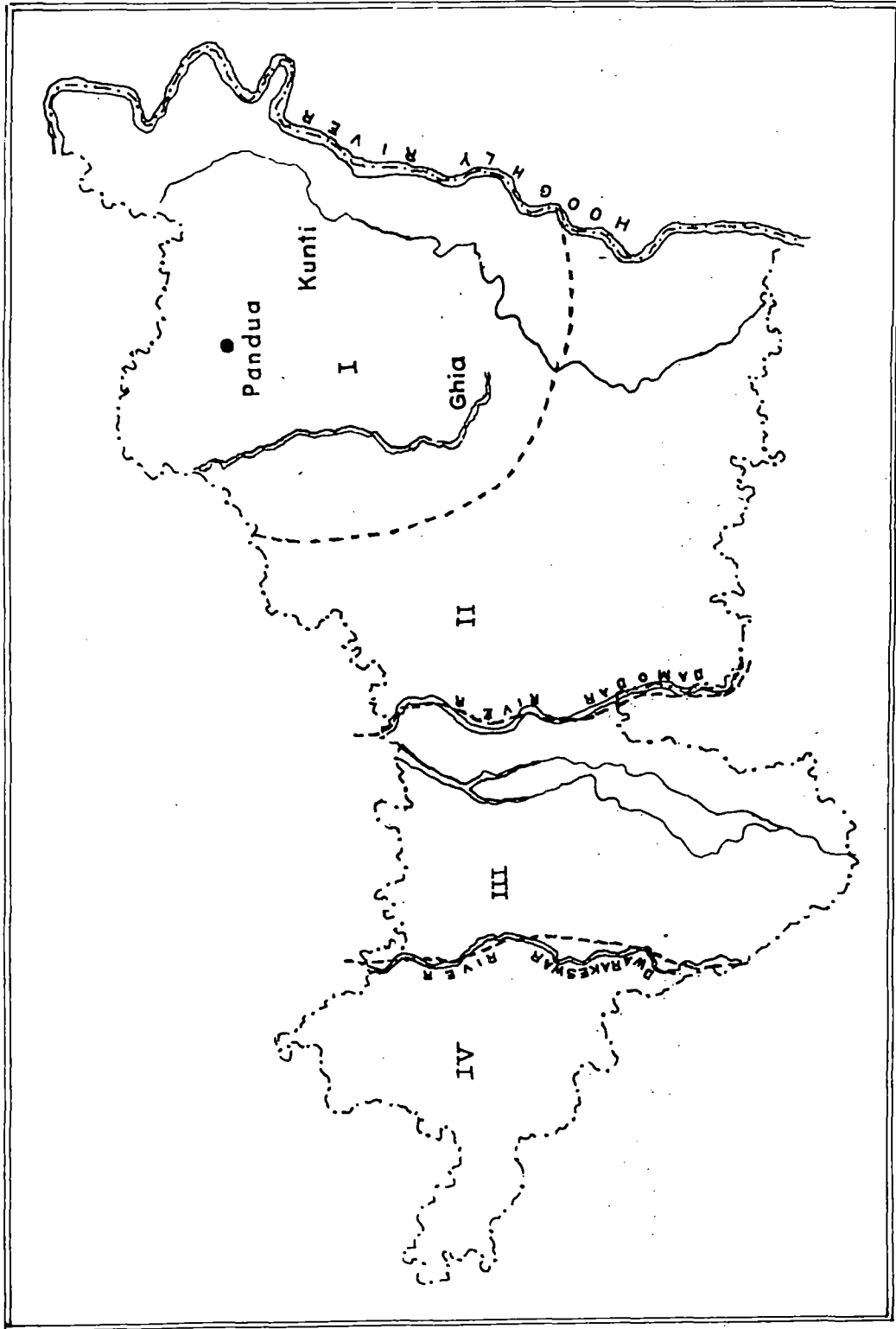
We have divided the district into four agro-climatic zones on the basis of factors like river system watering of the regions and their flood proneness, topography and general soil contents. These factors differentiate, in our view, one zone from the other. The rainfall has not been used as a factor of variation in these zones as the different rainfall recording stations of the district do not show much variability of rainfall in these zones.

The agro-climatic zones are :

(1) North-East Hugly (dominated by the Ghia-Kunti river basin and clay loam type of soil), (2) South-East Hugly (between Damodar and Hugly dominated by sandy soil), (3) Damodar-Dwarakeswar Basin (dominated by loam and clay loam soil) and (4) Higher terrain of the West. The higher terrain of the West is quite different in all respects from the rest of the district. This region is distinctly rocky and is, in general, not liable to flooded like some other areas of the district. The Damodar-Darakeswar basin is the more or less flood prone area and as a result this part of the district is most backward. The frequent flood has raised general uncertainty

AGRO-CLIMATIC ZONES

HUGLY DISTRICT



of the crops. If due to flood, the rivers deposit alluvial silt, excellent rabi (winter) crops are raised but if sand, the land becomes sterile.

South-East Hugly is basically industrial area. The agro-climatic condition of this region is not suitable for agricultural activities and hence very little agricultural activities are found there. On the other hand, North-East Hugly is agriculturally dominant and famous for its paddy cultivation. The agro-climatic condition, in fact, of this region is very favourable for paddy cultivation. This region is well protected from flood. Therefore, flood cannot damage the cultivation in the North-East part of the district.

2.7 LAND AREAS

Land is the most important for the agriculture. Let us assess the land position of the district. Here we first consider the total land area in the district and then blockwise distribution of land area. Land utilisation statistics of the district have been summarised in the following table 2.2.

Table 2.2
Land Utilisation Statistics of Hugly District
(Area in Hectares)

Name of the District/Block	Net area available for cultivation	Area under non-agl.	Forest	Barren and uncultured land	Permanent pasture & other grazing land	Area under Orchards, Plantation crop, Misc. etc.	Current fallows
1	2	3	4	5	6	7	8
Hugly	2,18,931	59,337	228	463	264	5,631	627
1. Polba-							
Dadpur	21,044	-	-	-	-	-	-
2. Pandua	20,650	4,785	2	-	-	-	10
3. Balagarh	16,000	-	-	-	-	-	-
4. Chinsura-							
Mogra	3,684	-	-	-	-	-	-
5. Dhaniakhali	21,133	6,174	-	230	-	960	-
6. Singur	10,973	6,830	-	-	-	2,160	-
7. Haripal	12,343	2,840	40	-	-	2,330	-
8. Tarakeswar	9,713	2,279	-	-	-	-	-
9. Serampore-							
Uttarpara	2,763	3,200	-	-	-	-	-
10. Jangipara	12,716	-	-	-	-	-	-
11. Chanditala I	6,800	2,400	-	60	-	-	-
12. Chanditala II	4,737	1,200	-	-	-	-	-
13. Arambagh	21,658	7,799	143	143	-	49	607
14. Purusurah	7,110	2,936	-	-	-	-	-
15. Khanakul I	12,400	4,573	-	-	264	2	-
16. Khanakul II	8,800	3,100	-	-	-	40	-
17. Goghat I	12,804	5,807	10	-	-	20	10
18. Goghat II	13,583	5,414	33	30	-	70	-

Source: Annual Action Plan, 1987-88, Hugly District Rural Development Agency.

The area not available for cultivation includes homestead sites, roads and rivers. Out of the total area available for cultivation 89% is usually under plough. So, there remains very little scope to bring more area under plough for increasing agricultural output. The forest area in the district is very limited - it is evident from the table. The small patches here and there cover in all a total area of 288 hectares.

There is some obvious gap in the data given to us by some district authorities. For at least seven block data for uses except agricultural have not been given. Thus even though the district is shown as having a total of (463+264+627) or 1354 hectares which can be brought under pastures for milk farms, this area will be much higher if complete returns under all heads would have been available.

Out of the total land area of the district 77% is being used for the cultivation. Among the blocks wide variation is being observed in available net sown area. Barring one block of the district, remaining all blocks have more net area available for cultivation than non-agricultural use. Only one block Serampur-Uttarpara has the peculiar feature, its land area of non-agricultural use exceeds the net area available for cultivation.

2.8 TOTAL LABOUR FORCE

Two definitions have been used by analysts of the process of employ in less developed countries of South Asia : (1) Age 10 and above and (2) Age 15 and above. As 10-14 age is the childhood

age, so it might be a debatable issue whether this age group should be included in the labour force or not. In order to avoid this debate, we have considered the potential labour force of the district both with or without this age group.

The age and sex distributions of the potential total labour force on the basis of the two definitions have been shown in tables 2.3 and 2.4. The table 2.3 shows that the age group 10-14 contributes 18 per cent of the total labour force. Therefore, it is not negligible part of the total labour force. The sex distribution of

Table 2.3
Total Labour Force (Age 10 and above)

Age	Males	Females	Total
1	2	3	4
10-14	249043	236708	485751
15-19	199596	190530	390126
20-24	191656	170538	362194
25-29	160325	138496	298821
30-34	124984	107387	232371
35-59	414543	330493	745036
60+	95757	103191	198948
Total	1435904	1277343	2713247

Source : Census of India 1961, Series - 23, West Bengal
Part IV A.

Table 2.4
Total Labour Force (Age 15 & above)

Age	Males	Females	Total
1	2	3	4
15-19	199596	190530	390126
20-24	191656	170538	362194
25-29	160325	138496	298821
30-34	124984	107387	232371
35-59	414543	330493	745036
60+	95757	103191	198948
Total	1186861	1040635	2227496

Source : Census of India 1981, Series-23, West Bengal Part IV A.

labour force does not show much difference. In the total labour force 53 per cent are males and remaining 47 per cent are females. Total labour force has been divided into two parts : skilled and unskilled labour force. This division has been made on the basis of education as education helps the labourer of being skilled. In the next sections, we shall elaborately discuss the features of skilled and unskilled labour forces.

2.9 SKILLED LABOUR FORCE

It is generally found that education and skill bear a positive relationship i.e. as one gets more years of education, one becomes more skilled. Thus, the standard of education is the factor of variation of skill of the labour force. We have used three categories of standard of education viz., (1) 4 years of education (2) 8 years of education and (3) 10 years of education, for the

determination of skilled labour force. According to our definitions, at least four years of education is essential for acquiring any skill in any area. Therefore, the number of skilled labour force in the district varies on the basis of the standard of education. Tables 2.5 to 2.10 indicate the age and sex distribution of different types of skilled labour force of the district.

Table 2.5
Persons with 4 years of Education
(Age 10 & above)

Age	Males	Females	Total
1	3	4	
10-14	104537	86983	191520
15-19	119603	97919	217517
20-24	121196	83842	205038
25-29	99805	59458	159263
30-34	75960	39237	115197
35-59	222065	75502	297567
60+	45166	10533	55699
Total	788332	453469	1241801

Source : Census of India, 1981, Series-23, West Bengal Part IV A.

Table 2.6
Persons with 4 years of Ed.
(Age 15 & above)

Age	Males	Females	Total
1	2	3	4
15-19	119603	97914	217517
20-24	121196	83842	205038
25-29	99805	59458	159263
30-34	75960	39237	115197
35-59	222065	75502	297567
60+	45166	10533	55699
Total	683795	366486	1050281

Source : Census of India, 1981, Series-23, West Bengal Part IV-A.

Table 2.7
Persons with 8 years of Ed.
(Age 10 and above)

Age	Males	Females	Total
1	2	3	4
10-14	14088	11718	25806
15-19	66134	50093	116227
20-24	74969	49835	124804
25-29	63201	31776	94977
30-34	47039	18429	65468
35-59	124660	26539	151199
60+	25124	2262	27386
Total	415215	190652	605867

Source : Census of India, 1981, Series - 23, West Bengal Part IV-A.

Table 2.8
Persons with 8 years of Education
(Age 15 and above)

Age	Males	Females	Total
1	2	3	4
15-19	66134	50093	116227
20-24	74969	49835	124804
25-29	63201	31776	94977
30-34	47039	18429	65468
35-59	124660	26539	151199
60+	25124	2262	27386
Total	401127	178934	580061

Source : Census of India, 1981, Series-23, West Bengal Part IV-A.

Table 2.9
Persons with 10 years of Education
(Age 10 and above)

Age	Males	Females	Total
1	2	3	4
10-14	1108	911	2019
15-19	27308	19760	47068
20-24	49352	30714	80066
25-29	43767	20253	64020
30-34	31984	10761	42745
35-59	75181	11857	87038
60+	15982	687	16669
Total	244682	94943	339625

Source : Census of India, 1981, Series-23, West Bengal Part IV-A.

Table 2.10
Persons with 10 years of Education
(Age 15 and above)

Age	Males	Females	Total
1	2	3	4
15-19	27308	19760	47068
20-24	49352	30714	80066
25-29	43767	20253	64020
30-34	31984	10761	42745
35-59	75181	11857	87038
60+	15982	687	16669
Total	243574	94032	337606

Source : Census of India, 1981, Series-23, West Bengal Part IV-A.

The total number of skilled labour is maximum with 4 years of education and this figure gradually decreases as the number of years of education rises. Hence the total number of skilled labour is lowest when 10 years of education is taken as the basis of skill. The above tables show that in the district males are more skilled than the females.

2.10 UNSKILLED LABOUR FORCE

The number of unskilled labour force has been calculated corresponding to the skilled labour force as the number of skilled labour varies due to the different number of years of education. Total unskilled labour force has been calculated with regard to our earlier two definitions of labour force (i) 10 and above and (ii) 15 and above. The distribution of unskilled labour is presented in tables 2.11-2.16.

Table 2.11
Persons with less than 4 years of Education
(Age 10 and above)

Age	Males	Females	Total
1	2	3	4
10-14	144506	149725	294231
15-19	79993	92616	172609
20-24	70460	86696	157156
25-29	60520	79038	139558
30-34	49024	68150	117174
35-59	192478	254991	447469
60+	50591	92658	143249
Total	647572	823874	1471446

Source : Census of India, 1981, Series-23, West Bengal Part IV-A.

Table 2.12
Persons with less than 4 years of Education
(Age 15 and above)

Age	Males	Females	Total
1	2	3	4
15-19	79993	92616	172609
20-24	70460	86696	157156
25-29	60520	79038	139556
30-34	49024	68150	117174
35-59	192478	254991	447469
60+	50591	92658	143249
Total	503066	674149	1177215

Source : Census of India, 1981, Series-23, West Bengal Part IV-A.

Table 2.13

Persons with more than 4 but less than 8
years of Education

(Age 10 & above)

Age	Males	Females	Total
1	2	3	4
10-14	234955	224990	459945
15-19	133462	140437	273899
20-24	116687	120703	237390
25-29	97124	106720	203844
30-34	77945	88958	166903
35-59	289883	303954	593837
60+	70633	100929	171562
Total	1020689	1086691	2107380

Source : Census of India, 1981, Series-23, West Bengal Part IV-A.

Table 2.14

Persons with more than 4 but less than 8
years of Education.

(Age 15 and above)

Age	Male	Females	Total
1	2	3	4
15-19	133462	140437	273899
20-24	116687	120703	237390
25-29	97124	106720	203844
30-34	77945	88958	166903
35-59	289883	303954	593837
60+	70633	100929	171562
Total	785734	861701	1647435

Source : Census of India, 1981, Series-23, West Bengal Part IV-A.

Table 2.15

Persons with more than 8 but less than
10 years of Education

(Age 10 and above)

Age	Males	Females	Total
1	2	3	4
10-14	247935	235797	483732
15-19	172288	170770	343058
20-24	142304	139824	282128
25-29	116558	118243	234801
30-34	93000	96626	189626
35-59	339362	318636	657998
60+	79775	102504	182279
Total	1191222	1182400	2373622

Source : Census of India, 1981, Series-23, West Bengal Part IV-A.

Table 2.16

Persons with more than 8 but less than 10 years of ed.

(Age 15 and above)

Age	Males	Females	Total
1	2	3	4
15-19	172288	170770	343058
20-24	142304	139824	282128
25-29	116558	118243	234801
30-34	93000	96626	189626
35-59	339362	318636	657998
60+	79775	102504	182279
Total	943287	946603	1889890

Source : Census of India, 1981, Series-23, West Bengal Part IV-A.

The above tables indicate that if 4 years of education is taken as the basis of skill, the number of unskilled labour is minimum and this figure rises when more years of education has taken as the basis of skill. In all categories of unskilled labour, the number of female unskilled outweighs the number of male unskilled. Therefore, it can be inferred that in the district females are less exposed to the education than the males. In the lower age groups the difference between the number of male and female unskilled labour is relatively small than in the upper age groups.

Thus, the above analysis makes it clear that in the district females are more unskilled than males as far as education is concerned although they are not any small part of the total labour force. Therefore female labour force requires special attention for the development of skill.