

CHAPTER – FOUR

4.0 Climate and Its Effects on Agriculture

Agriculture implies settled population and can therefore, be carried on only if the yield is sufficient to support more or less a permanent settlement. The limits of cultivability are set by topography soil, rainfall and temperature. Moreover the extent to which agriculture is practiced depends on the relative factors of human behaviour, cultural tradition and pressure on population.¹

Success or failure of farming is very intimately linked up with the prevailing weather conditions. Farming in India is largely a gamble in weather condition. A sound knowledge of climatic factors and effects of weather on crop growth and yield is therefore essential for every farmer.

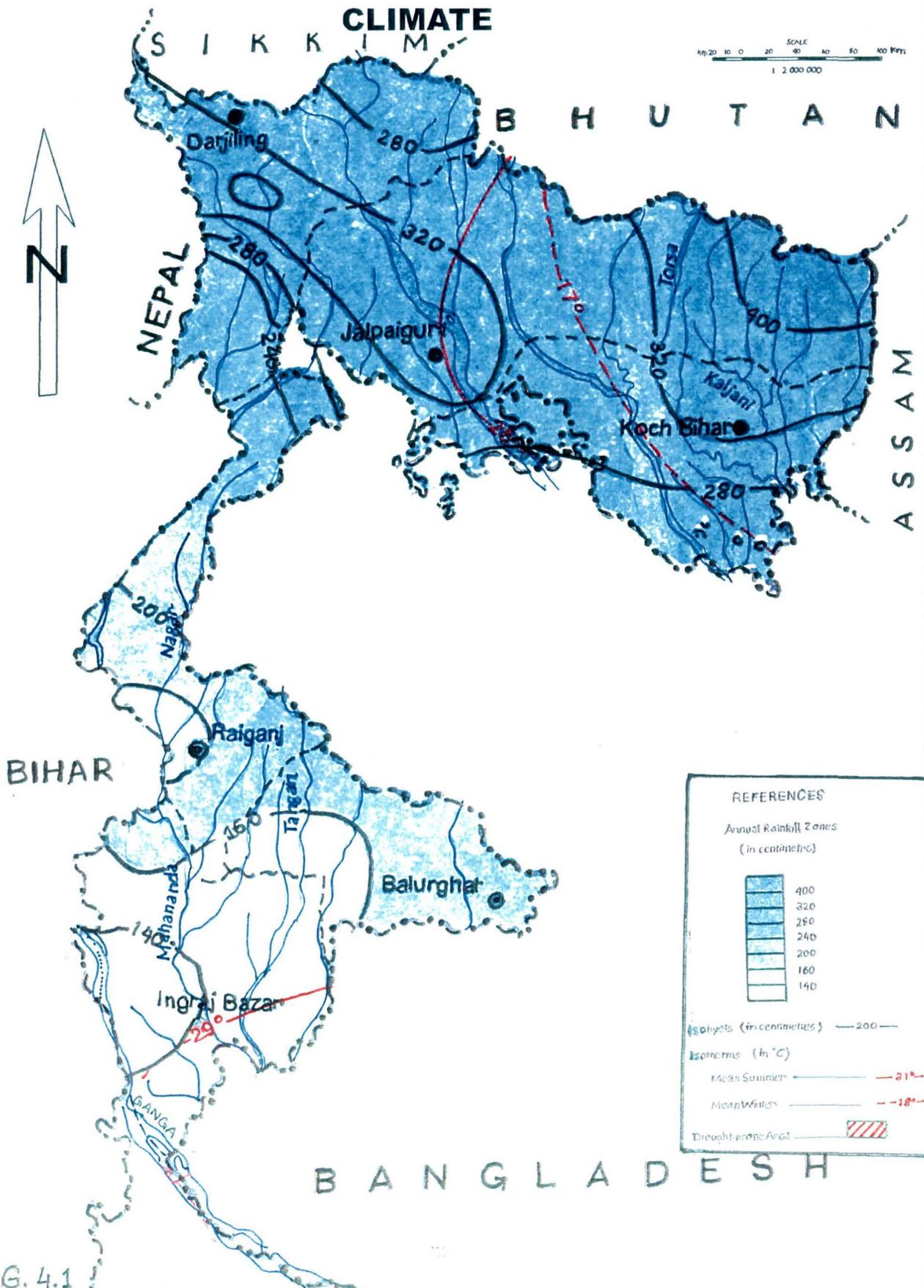
The North Bengal has two distinct tracts – the hills and the plains.

The mountainous portion of the north-east and the area bordering the Himalayas in the north experience lower temperature mainly due to the effects of elevation. The west extension of the Himalayas effectively bars the influence of cold polar winds, on the other hand annual range of temperature does not show continental character due to the influence of the Bay of Bengal. **Fig 4.1** reveals the climate of North Bengal. Table 4.01 shows annual range of temperature in North Bengal.

¹ The Indian Geographical Journal 1993, Vol. 68, No. 2.

NORTH BENGAL CLIMATE

SCALE
1:2,000,000
0 20 40 60 80 100 Km



REFERENCES

Annual Rainfall Zones
(in centimetres)

	400
	320
	280
	240
	200
	160
	140

Isohyets (in centimetres) — 200 —

Isotherms (in °C)

Mean Summer ———— 21° —

Mean Winter ———— 18° —

Drought-prone Area / / / /

FIG. 4.1
Source-NATMO, Kolkata

Table 4.01
Annual Range of Temperature in North Bengal (1997-2001)

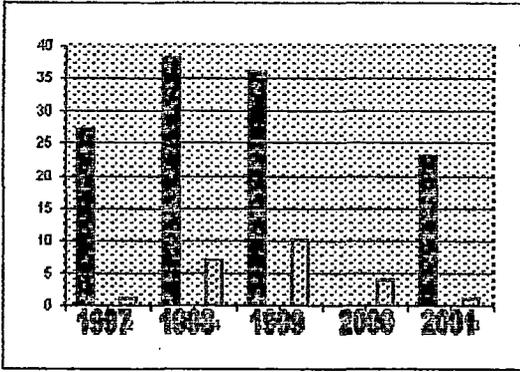
District	1997		1998		1999		2000		2001	
	Max.	Min.								
Darjeeling	27	1	38	7	36	10	-	4	23	1
Jalpaiguri	37	6	39	8	37	8	37	7	37	1
Cooch Behar	36	7	39	8	39	8	37	7	36	7
Uttar Dinajpur	40	7	39	7	37	7	38	7	39	6
Dakshin Dinajpur	40	7	39	7	37	7	38	7	39	6
Malda	41	9	43	8	42	9	40	8	41	7

Source: Meteorological Department, Govt. of West Bengal, 2002.

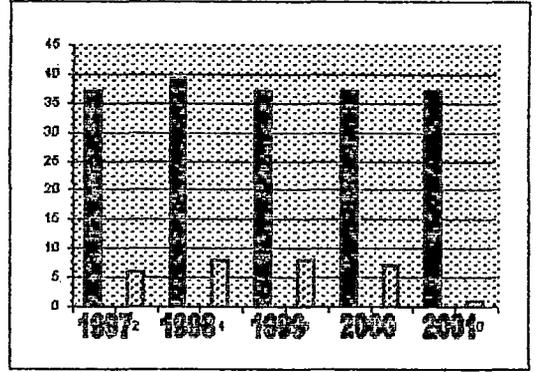
January is the coldest month of the year in North Bengal. The east west trend of isotherms specially in the north reveal the influence of mountains on temperature distribution. The temperature in hills both at night and day is higher during monsoon. The mean daily maximum and minimum temperature in the month of January varies between 1° to 9° Celsius respectively.

In the remaining parts of North Bengal the average annual temperature is almost uniform. May is the hottest month of the year with a greater range of temperature. In the district of Jalpaiguri, Cooch Behar, Uttar Dinajpur and Dakshin Dinajpur the summer temperature is more or less the same and increases upto 38° Celsius and above. The temperature continues to increase further southward crossing the mark of 43° Celsius in the Malda plains. This district experience very hot summer. A similarity in winter temperature is observed in Jalpaiguri, Uttar Dinajpur, Dakshin Dinajpur districts and between the districts of Cooch Behar and Malda. January is the coldest month of the region. (Fig. 4.2)

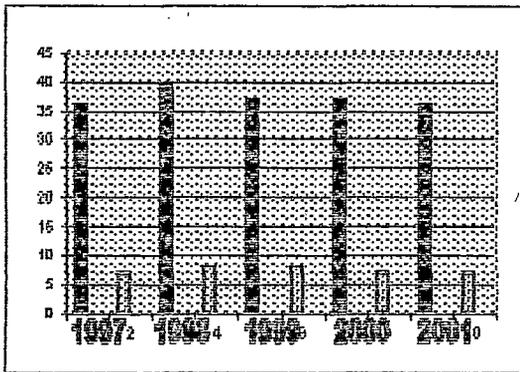
The winter of North Bengal is characterized by clear and almost stable atmospheric conditions.



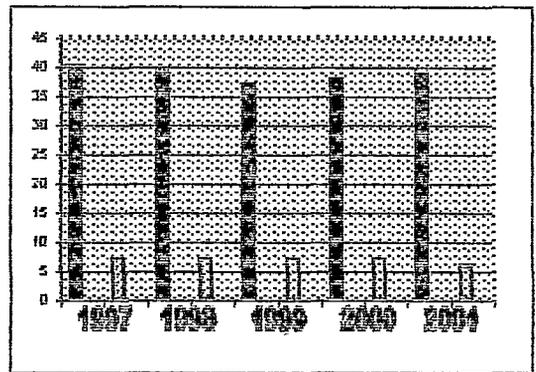
Darjeeling



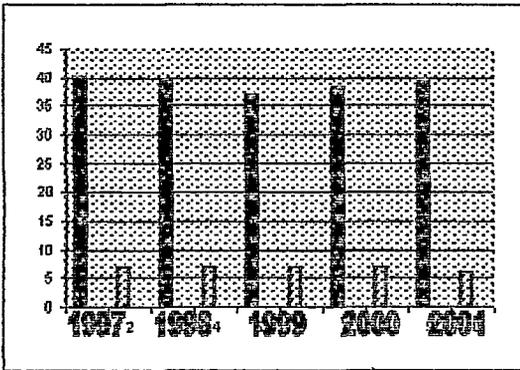
Jalpaiguri



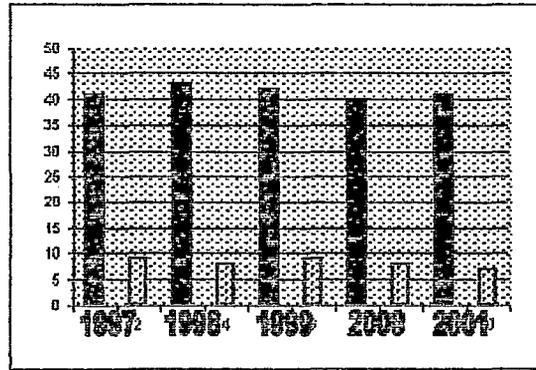
Cooch Behar



Uttar Dinajpur

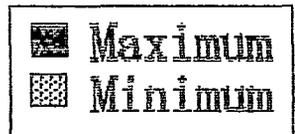


Dakshin Dinajpur



Malda

Annual range of temperature in North Bengal
 Fig. 4.2 (tempt. in degree Celsius)



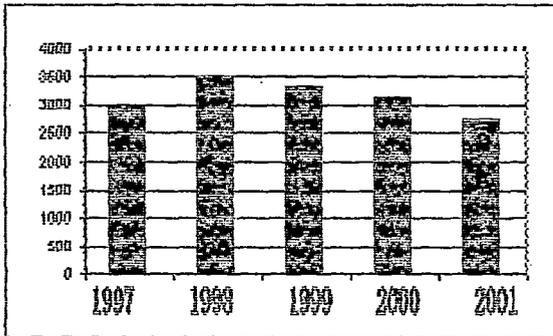
The relation between temperature and cultivation cannot be established without taking rainfall into consideration. Like temperature, rainfall plays an equally important role in the production of crops. But it is rather difficult to specify the ideal requirements of rainfall for each variety of crops. Apparently it appears that there is no such upper limit of rainfall at which the plant might cease to grow. The highest amount of rainfall is restricted to the northern-most part of the region at higher altitude and it decreases southward. Table 4.02 shows rainfall in six districts of North Bengal.

Table 4.02
Annual Rainfall in Six Districts of North Bengal (in millimeter)

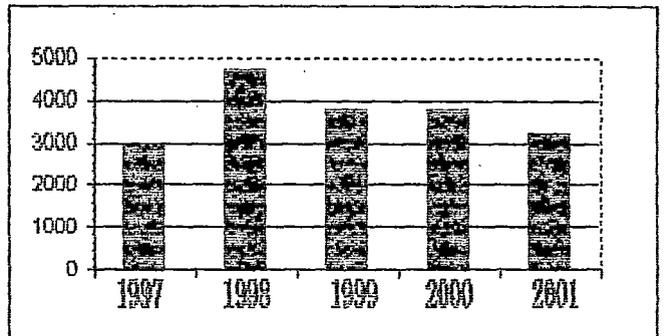
District	Normal	Actual				
		1997	1998	1999	2000	2001
Darjeeling	2961	1966	3474	3323	3123	2727
Jalpaiguri	3571	2935	4698	3736	3733	3205
Cooch Behar	2898	2530	4141	3182	2961	2526
Uttar Dinajpur	2085	2027	3026	2811	1955	2259
Dakshin Dinajpur	1625	1464	2267	2306	1455	1656
Malda	1661	1418	1719	2059	2141	1557

Source: Meteorological Department Govt. of W.B., India, 2002.

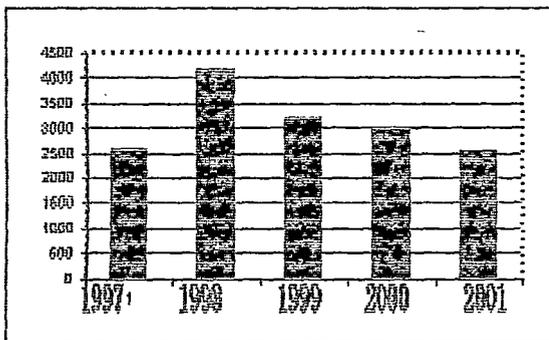
In higher altitudes rainfall is well distributed from February to October. About eighty percent of the total rainfall is received during the months between May to September. During this period there are more than twenty rainy days in each month. This region has an average of one hundred twenty rainy days in a year. The rainfall in general is heavier in the southern slopes may get 4050mm while Kalimpong in the north gets 2254 of rainfall. Siliguri subdivision gets around 3000mm of rainfall annually. In other parts of the district of Jalpaiguri and Cooch Behar, decrease in the amount of rainfall is almost gradual. The rainfall in these area ranges between 2500 to 4000mm in a year. The total amount of rainfall decreases in the southern districts of Uttar and Dakshin Dinajpur. The average annual rainfall is between 2000mm to 1600mm.



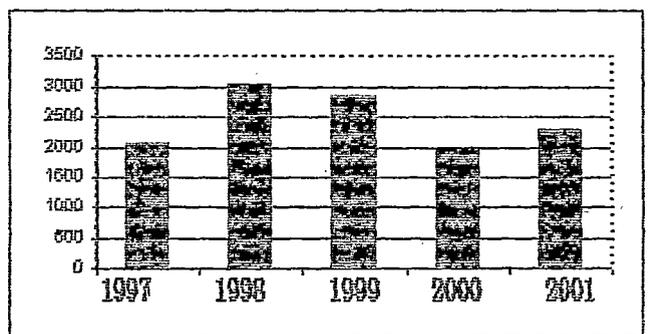
Darjeeling



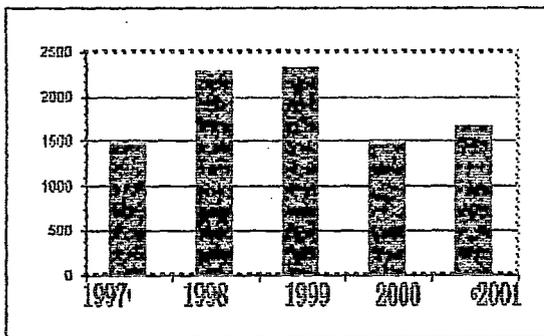
Jalpaiguri



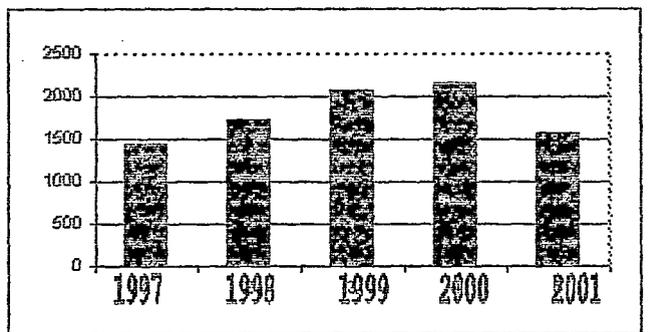
Cooch Behar



Uttar Dinajpur



Dakshin Dinajpur



Malda

Fig. 4.3 Annual rainfall in six districts of North Bengal (rainfall in mm)

Rainfall further decreases in Malda and annual rainfall ranges between 1600 to 2000mm.

Fig.-4.3 Showing rainfall variation in six districts of North Bengal

It has been observed through experience that the yield of crops usually increases with an increase in rainfall. But if the heavy rainfall continues for a long time, the production of crops falls. This may be attributed due to the non-availability of sunlight during the growing period. Excessive rainfall generally occurs from the period of mid June to September. This is due to combination convergence of wind system and orographic effect.

The moisture content present in the air mass is also another factor affecting the crops. The air-mass in North Bengal usually contains 85 to 90 percent of relative humidity. It may be mentioned here that generally, heavy rainfall is favourable for the cultivation of jute and rice in plain areas, but excessive rain causes flood and water logging and damages standing crops. Extreme low rainfall in some hilly tract of North Bengal needs artificial watering. Hailstorms also occur in many areas of North Bengal and also damages crops.

Productivity of crops depends very much on the total amount of light which plant receives in varying degree with seasons. Strong wind and cyclone, which usually occurs in some areas of North Bengal damage crop by breaking fruits and branches of trees. In such cases wind break belts and selection of protected sites become helpful.