

3. STUDY AREA

Malda, a district of West Bengal is unique in that it contains Gour, the ancient Hindu capital of Bengal. The district maintains its traditional agrarian culture. Some of the historical monuments of the district include : the mosque Jami Masjid (1566) and the land mark Nimasarai Tower across the river Mahananda. The present district town English Bajar served as a river port of the Hindu capital "Pandua". During the 18th century it was the seat of prosperous cotton and silk industries. Presently the district produces rice, jute, legumes and oil seeds besides silk and mango. Mango trade and silk manufacture are the main economic activities of this district.

3.1. Geographical Location

Malda is the gate way of North-east India. The district is surrounded by Uttar Dinajpur, Murshidabad and Dakshin Dinajpur district of West Bengal in the north, south and east respectively. The eastern part of the district is also bordered the Bangladesh. The western part on the other hand is demarcated by Bihar (Figure.3.1.). Malda (26.043m MSL) is situated between 25⁰33'8" and 24⁰40'20" latitude in the northern hemisphere and very close to the Tropic of cancer. The eastern and western most extremities of the district is marked by 88⁰28'10" and 87⁰45'50" longitude respectively.

3.2. Area and Population

The district spans over a total geographical area of 3733.00 sq. km. (as per census, 2001), with 2 administrative subdivisions, 15 blocks and 147 gram panchayets with a total population of about 3.29 million and population density of 881/sq. km.. The mighty Ganga engulfed nearly 23.00 sq. km. of land area along with some mango orchards at Panchanandapur of English Bajar block during the last 5 years.

3.3. Meteorology

The district receives on average 1400 mm rainfall per year, the mean maximum and minimum temperature is 36⁰C and 16⁰C respectively. The relative humidity of the district varies from a maximum of 85% to a minimum of 57%.

The average monthly precipitation recorded during the study period i.e. January 1998 to December 2001 is shown in Figure.3.2. The district receives highest rainfall 292 mm i.e. 20.87% of yearly 1400 mm in July and more than 80% rainfall during the monsoon i.e. from May to September.

Figure.3.3. presents average daily maximum and minimum temperature of the district during 1998-2001. Temperature reached a maximum of 38⁰C in May and declined in a regular fashion to a minimum of 11⁰C in January.

Mean relative humidity stays on the higher side throughout the year. A minimum humidity of 57% was recorded in March and increased to a maximum of 85% in July and September. Percent humidity varied little (70% to 75%) during the winter months, November to February (Figure.3.4.).

The district is flood-prone and during the year 1971, 1978, 1989, 1996, 1999 and 2001 serious devastations occurred. Many blocks are regularly inundated by flood during the monsoon period.

Cyclonic storms often accompanied by gusty rains called "Kal Baishakhi" are frequent in the pre-monsoon period. Sometimes it causes severe damage to mango inflorescence. Hail-storms causing severe damage to mango inflorescences, buds and young fruits are also not infrequent during pre-monsoon period.

3.4. Rivers

Rivers that flow through the district are Ganges, Mahananda, Bhagirathi, Fulhar, Pagla, Kalindri and Tangan all of which in general flow from north to south. The Ganges makes an island i.e. BHUTNI DIARA at Manikchak block. Another important river i.e. Mahananda comes from the north and after traversing through Malda enters into Bangladesh. Figure.3.5. shows the rivers of the district.

Most of the rivers are flood-prone and inundate vast areas in the monsoon almost every year. Despite all the calamities the district produces lot of crop materials, probably due to deposition of fertile alluvium during inundation. It may, however, be pointed out that sizable land areas are engulfed by the Ganges every year particularly at Panchanandapur of English Bajar block. The State and Central Government has already taken some urgent step in this context.

3.5. Soil

The district can be subdivided into three district regions according to physiography and hydrological characteristics of soil i.e. – BORIND, TAL and DIARA. BORIND areas include Gajole, Bamongola, Habibpur and Old-Malda. TAL situation prevails at Ratua-I, Ratua-II, Changhal-I, Chanchal-II, Harishchandrapur-I, Harischandrapur-II and DIARA situations at English Bajar, Manikchak, Kaliachak-I, Kaliachak-II and Kaliachak-III. Figure.3.6. shows the three regions of the district. Table.3.1. presents the characteristics of the regions in tabular form.

Organic matter status belongs to medium category ranging from 0.5% to 0.75% throughout the district. In certain areas of Ratua-I, Manikchak and Old Malda organic matter was found lower i.e. below 0.5%.

3.6. Vegetation

Agro-climatically the district falls under lower Gangetic plain region (Zone-III) and is fortunate to have a fertile soil and abundant water through rainfall and rivers for irrigation of agricultural fields. Thus a number of major crops are produced in the district besides silk and mango. The major crops are rice, wheat, rape seed, jute, gram, sugar cane, maize and potatoes. Table.3.2. presents quantity in tones (per annum) and value as % of district total of those crops.

3.7. Mango Cultivation

Mango is the primary cash crop of the district and is cultivated in all the 15 blocks (Table-3.3). Total area on mango orchards in the district is 24560 hectares with an estimated production of 253876 MT. The country as a whole has an area of 1522600 hectares under mango producing about 10237000 MT. The comparable figures for West Bengal is 65,400 hectares with a production of 585000 MT.

Seven blocks i.e. Kaliachak-I, Kaliachak-II, Old Malda, Ratua-I and Ratua-II, Manikchak and English Bajar accounted for 88.4% of the land on mango cultivation of which English Bajar alone contributed more than 35%. Two blocks i.e. Bamongola and Habibpur together accounted for less than 1% and the rest of the blocks i.e. Kaliachak-III, Harishchandrapur-I, Harishchandrapur-II, Chanchal-I, Chanchal-II and Gajole accounted for about 11% (Figure.3.7.). It may be pointed out that State Government is trying to promote mango cultivation in the district particularly in Bamongola and Habibpur for about two decades – as a result present area under mango cultivation is about 14% higher than in 1986-87 i.e. 21140 hectares (1986-87) to 24560 hectares (2002-03).

3.8. Monkey Infested Blocks

Rhesus macaques are one of the few animals that are exploiting human ecosystems and are becoming more and more dependant on cultivated land,

orchards and gardens as a primary source of food. This situation may be considered as a direct fall out of human extension into forest and wildlife habitats – escalating man-animal conflict. It is observed that monkey density is quite high in blocks with high mango production. Thus concentration of monkeys is high in blocks with extensive mango cultivation such as English Bajar, Ratua-II and Old Malda. It is further observed that in some blocks even with extensive mango cultivation areas such as Manikchak, Kaliachak-I, Ratua-I concentration of monkeys is low because production of mango is rather low due to the fact that most plantations in these blocks are young and production is low. As already pointed out State Government is promoting mango plantation and Fruit Processing Industry in the district in a big way and substantial portion of plantations in some blocks are young with low production.

More than 90% monkey populations are found in extensive mango cultivation blocks and the rest are found in blocks with moderate mango cultivation. No monkeys are found in blocks with poor mango cultivation. Figure.3.8. shows monkey affected blocks of the district.

3.9. Specific Study Spots

Although mango plantations occur in all the 15 blocks of the district the extent of plantation and production of mango vary considerably in different blocks. Monkey population in the blocks varies as a function of mango plantation and production. Specific aspects of the work was actually conducted at a number of spots dispersed over the extensive and moderate mango cultivation areas. The study spots are Gopalpur, Jaharatala, Sadullapur, Jadupur, Manikpur, Mehedipur, Baluchar in English Bajar block; Kotwali, Bachamari, Old Malda of Old Malda block; Araidanga, Parapur, Ekbarana of Ratua-I and Ratua-II block. Besides these, some areas namely Baluchar, Golapatty adjacent to Malda town under English Bajar block where human population density is high with no mango cultivation also served as study site as some human communities of the area regularly fed monkeys with nuts, bananas and other food items on religious considerations.

The factories for mango products, Govt. mango processing centres may also be considered as a study spot because these factories were regularly visited in order to collect various data regarding mango preservation, processing and training of personnel etc. Different wood workshops of the district and various villages were also visited in this study because a large number of people are directly engaged in making baskets for transportation of mangoes in various parts of the West Bengal as well as India.

Table.3.1. Some of the characteristics of three regions, mainly based on the soil properties of the district.

CRITERIA	BORIND	DIARA	TAL
Area :	1,32,761 hect.	1,09,493 hect.	1,14,100 hect.
Land situation :	High (59.7 mt).	Flat	Lowering area, slope towards south-west.
Soil :	Old alluvial	New alluvial	New alluvial
pH :	4.5 to 7.5 (Strongly acedic to nutral)	Near about 7 (Mildly acedic to nutral)	Near about 7 (Mildly acedic to nutral)
Major Crop :	Rice, Jute	Rice, Jute, Sugar cane, Legume, Wheat, Oil seeds	Rice, Jute, Wheat, Oil seeds
Soil Composition :	Sandy : 7-9% Sandy loam : 15-16% Loam : 45-47% Clay : 13-15% Clay loam : 11-12% Silt loam : 5-6% Clay	Sandy : 2-3% Sandy loam : 8-9% Loam : 35-36% Clay loam : 42-43% Silt loam : 4-5% Clay	Sandy : 2-3% Sandy loam : 8-9% Loam : 35-36% Clay : 42-43% Silt loam : 4-5% Clay
Blocks :	Gajole, Bamongola, Habibpur and Old Malda	English Bajar, Manikchak, Kaliachak-I, Kaliachak-II and Kaliachak-III	Ratua-I, Ratua-II, Chanchal-I, Chanchal-II, Harishchandrapur-I and Harishchandrapur-II

Table.3.2. Major crops of Malda district and their quantity per annum and value as % of district total.

Crop	Quantity (tones)	Value as % of district total
Rice	387,960	72.03
Wheat	71,090	9.29
Rape Seed	15,856	6.01
Jute	131,410	4.37
Gram	7,166	2.04
Sugar Cane	71,973	1.33
Maize	9,413	1.66
Potatos	15,080	1.13

Table.3.3. Block-wise mango cultivation land of Malda district for the year 2002-2003.

Name of the Block	Area (in hectares)	Category of plantation
Bamongola	20	Poor
Habibpur	60	"
Chanchal-II	200	Moderate
Kaliachak-III	220	"
Harishchandrapur-I	400	"
Gajole	430	"
Harishchandrapur-II	620	"
Chanchal-I	900	"
Kaliachak-II	1780	Extensive
Old Malda	2000	"
Kaliachak-I	2000	"
Ratua-I	2150	"
Ratua-II	2160	"
Manikchak	3000	"
English Bajar	8620	"
Total	24560	

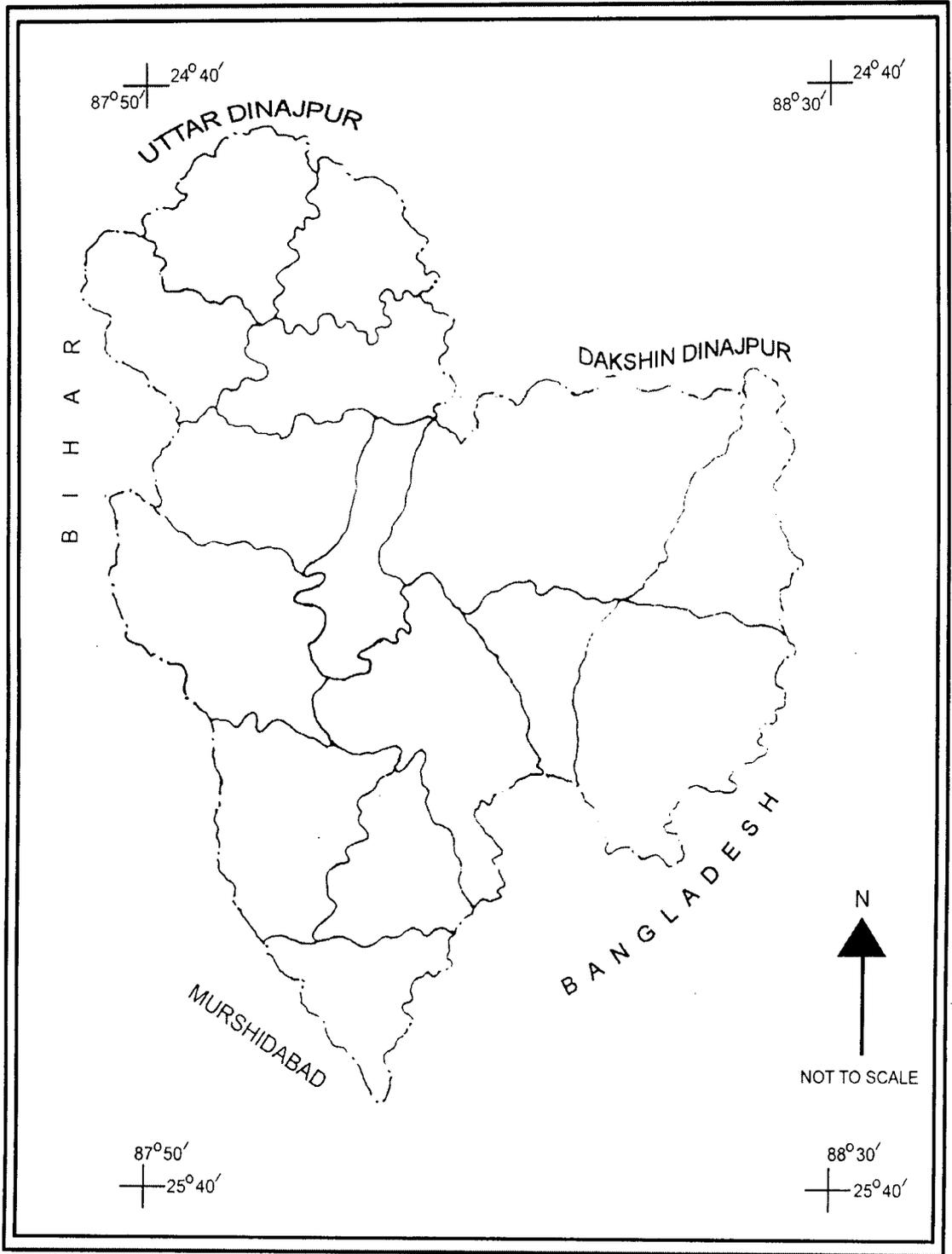


Figure.3.1. Malda District

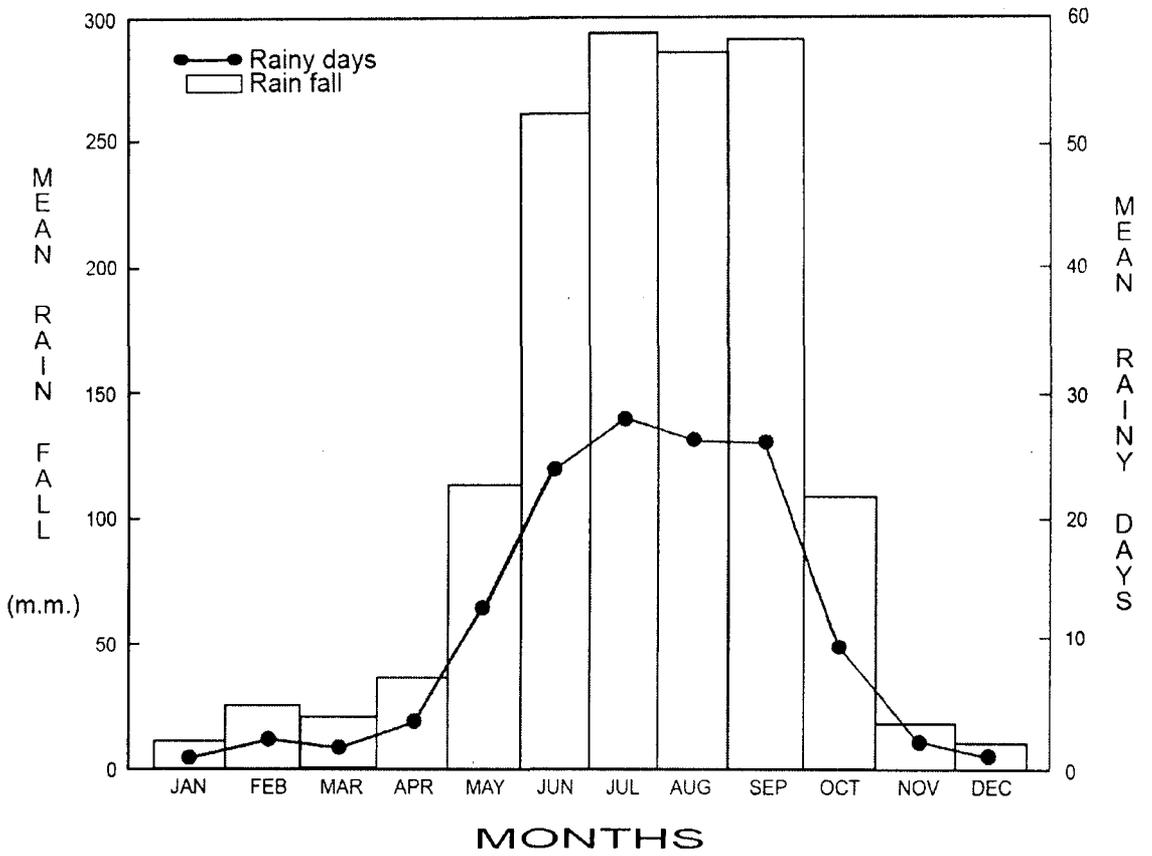


Figure. 3.2. Mean monthly rain fall at Malda district during the period January, 1998 to December,2001.

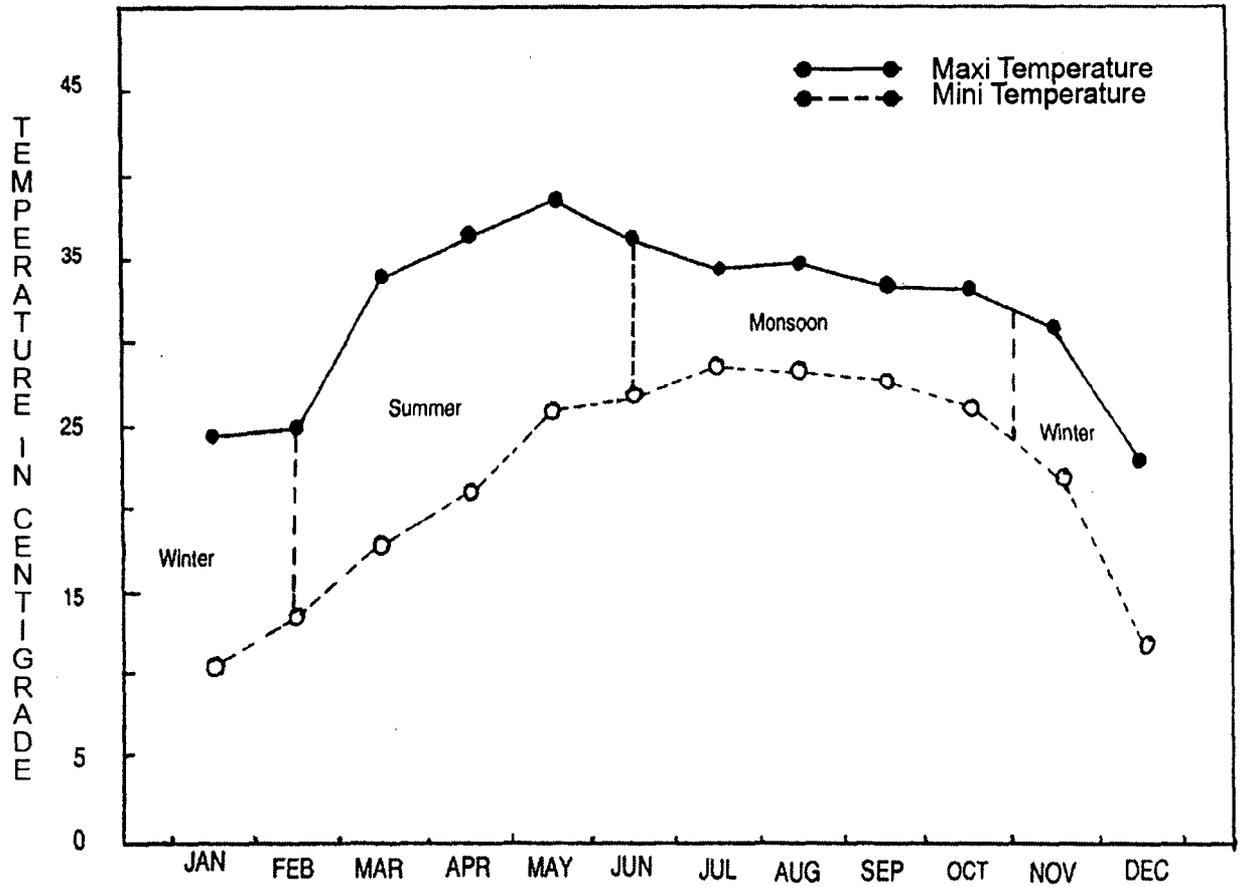


Figure. 3.3. Average monthly maximum and minimum temperature at Malda district during the period January, 1998 to December, 2001.

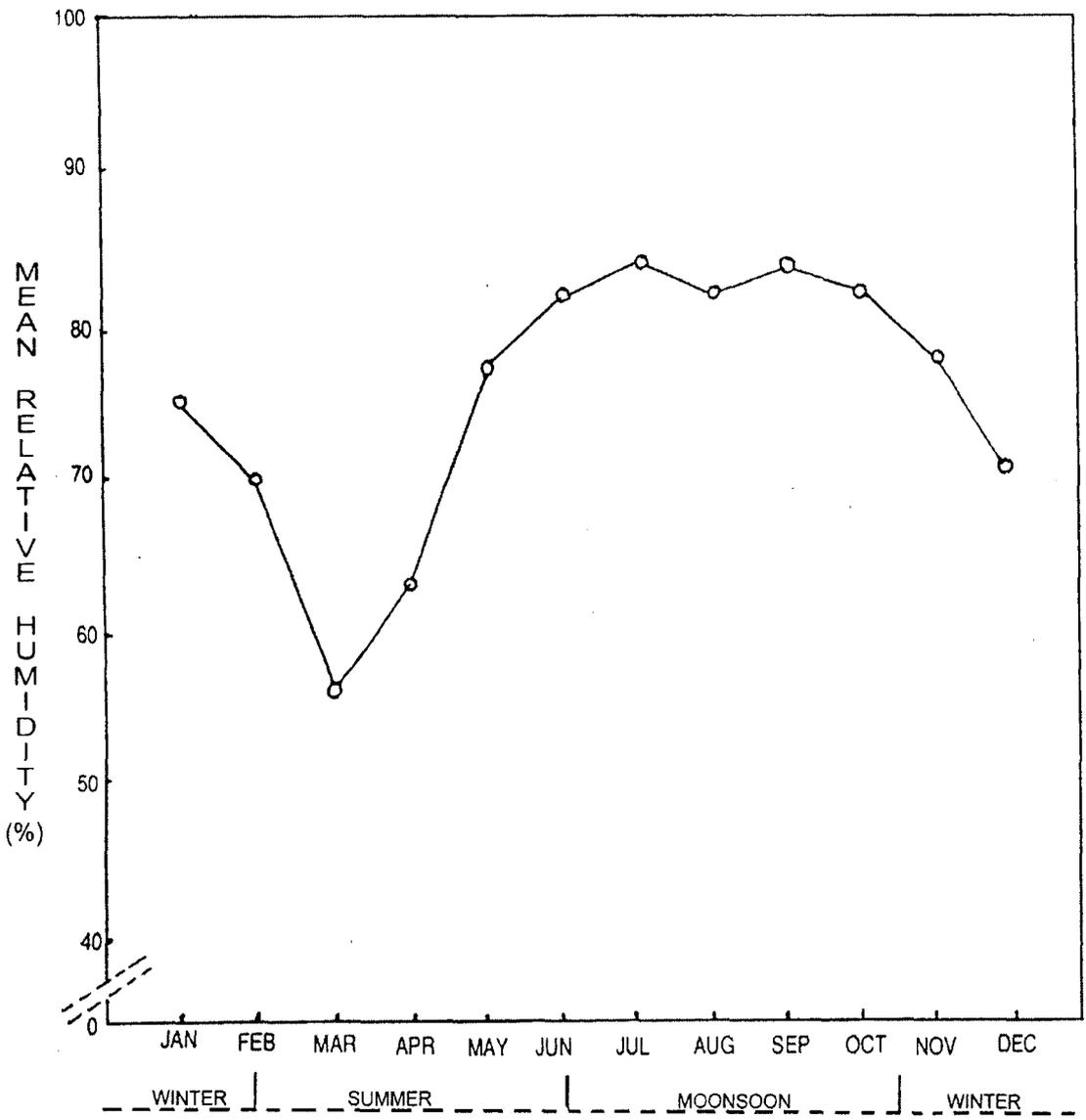


Figure. 3.4. Mean monthly relative humidity at 07.00 hour at Malda district during the period January, 1998 to December, 2001.

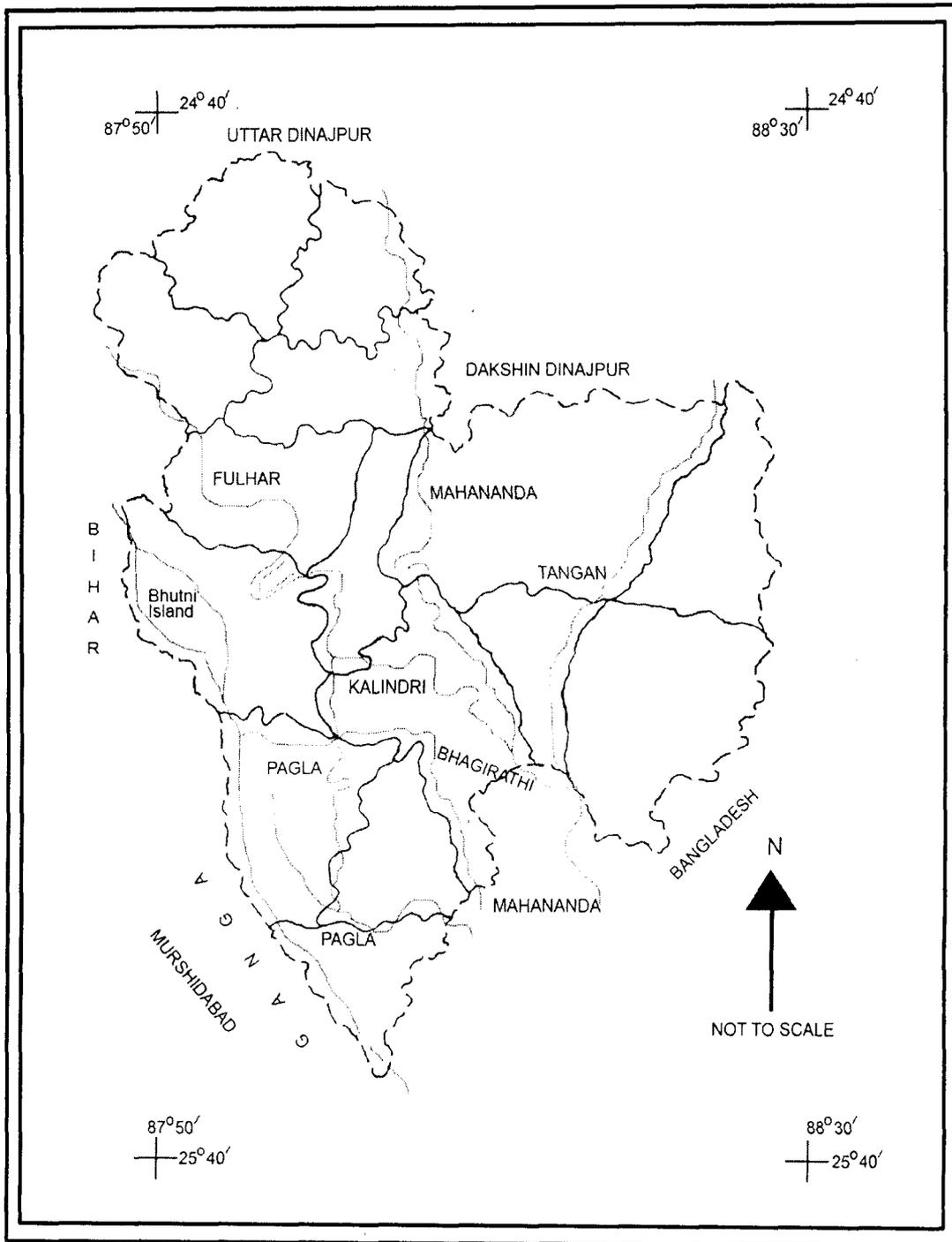


Figure.3.5. Rivers of Malda district.

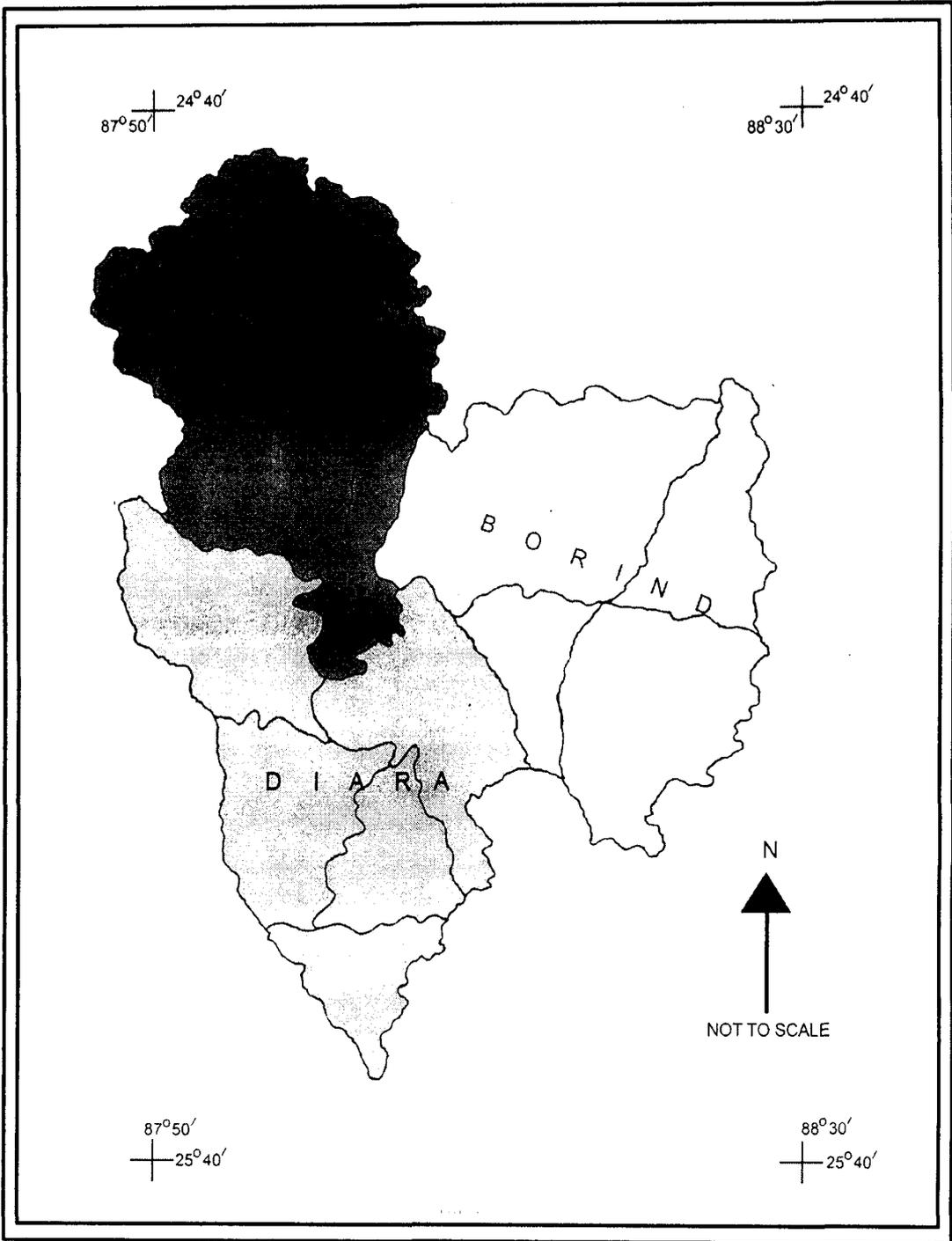


Figure.3.6. Three distinct region of district as per nature of soil.

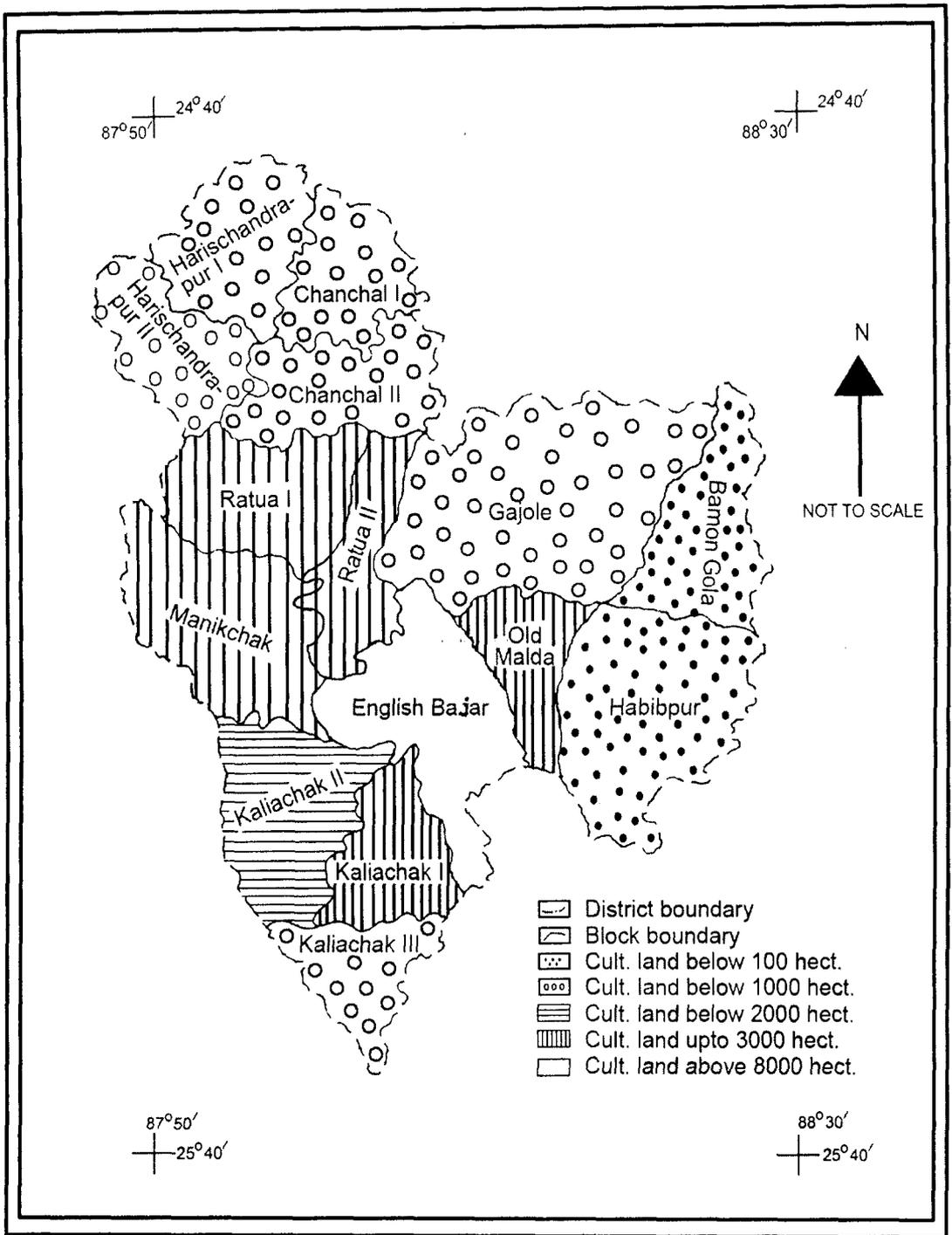


Figure.3.7. Area of mango cultivation land of different blocks of Malda district.

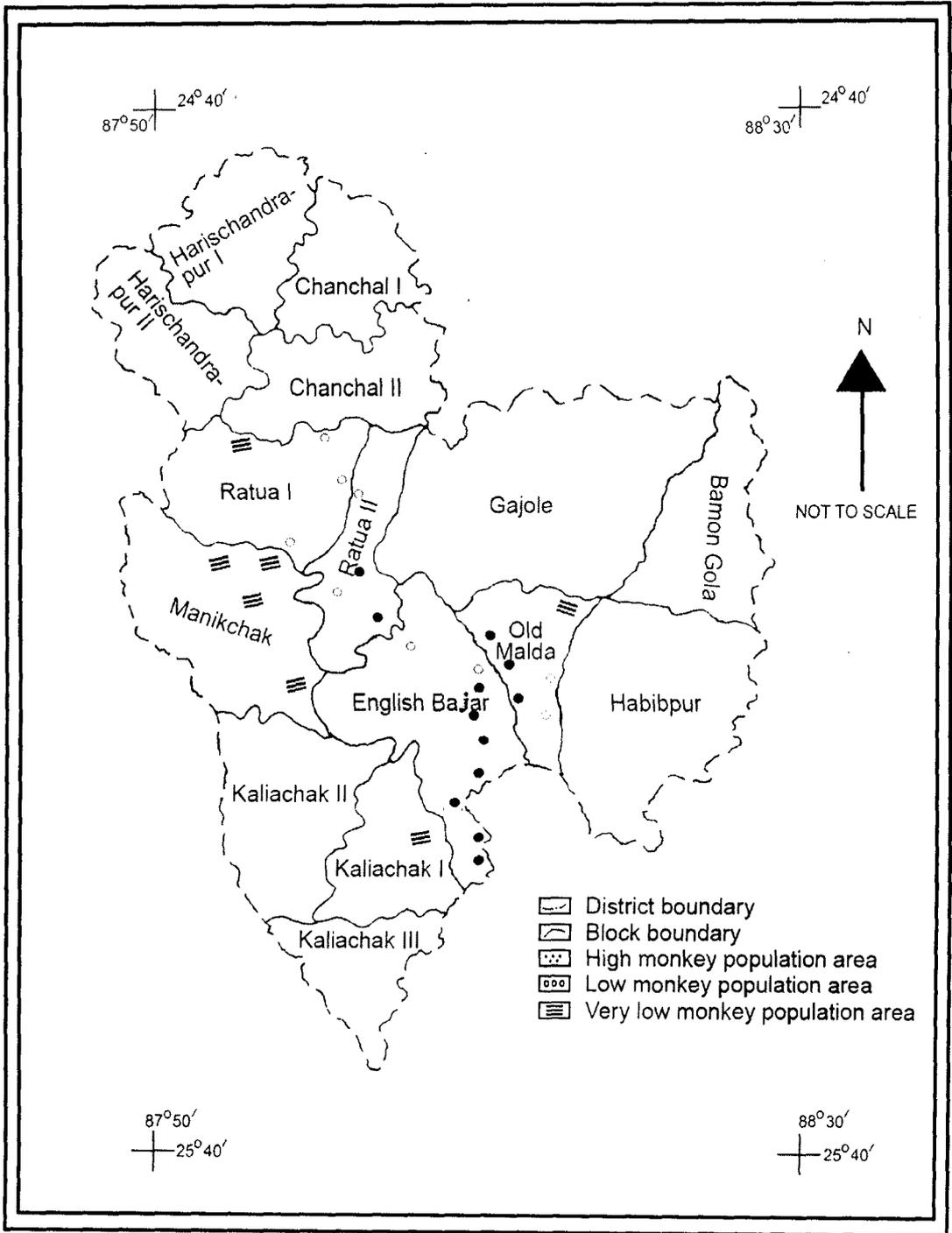


Figure.3.8. Monkey affected blocks of the district.