CHAPTER : 3

GENERAL INFORMATION ABOUT THE STUDY

AREA

North East India

North East India consists of seven states, viz, Arunachal Pradesh, Assam, Meghalaya, Nagaland, Manipur, Mizoram and Tripura. This part of India is mainly a mountainous terrain, largely of tertiary origin and has remarkably luxuriant vegetation. The region has three distinct physical features: the Brahmaputra Valley, the Surma or the Barak Valley and a series of mountain and hilly ranges-with the Himalaya in the north, Khasi, Garo and Jaintia Hills in the south; the Patkoi and Naga hills and Manipur plateau in the east and the Lushai or Mizo hills extending from south of Manipur to Myanmar as the Arakan Yoma. Bhutan, West Bengal and Bangladesh lie to the West of North East India. The climate is highly humid tropical with a long monsoon period stretching from June to September.

The species rich habitat of NE India has a lower rate of endemism than Western Ghats, another biodiversity hotspot of the country, because of its continuous landscape along with similar climatic features with Yunan and Myanmar, forming with the latter a distinct biogeographic zone, which has been designated as the Indo-Burma Biodiversity Hotspot (Myers et al., 2000). Geologically the northeastern region of India represents a distinct microplate separated from Indian and Burmese plates by distinct faults, but on its eastern side it develops a number of undulations, the troughs of which probably act as the channel for entry of species of the Chinese and Burmese regions and also from the
far south east. Therefore it is quite obvious that the region has much higher faunal
affinity to Myanmar and far southeast regions than the Indian peninsula and acts as
the biogeographic gateway for the species of Myanmar and Chinese region and a
complex mixture of Indian, Myanmar and Chinese species occur in the region.
However, today’s distribution of amphibians and reptiles is the result of a complex
process, which is difficult to reconstruct, as fossil evidences are extremely scarce.

Barak Valley

The Barak Valley, an important fertile plain surrounded by a series of small
hills, has a total area of 6922 Sq. km., representing about 9% of the entire land area
of Assam. The Barak Valley (24°8' - 25°8' North latitude and 92°15' - 93°15' East
longitude) is divided into three districts namely Cachar, Karimganj and Hailakandi.
The Valley is surrounded to the North by Borail Hills, to the south by the state of
Mizoram, to the east by Manipur and to the west by Tripura state and Sylhet
District of Bangladesh.

The river Barak is the principal river of the Valley, which rises from the
southern slopes of the lofty ranges of Nagaland and after flowing in a south-west
direction through Manipur turns north and forms the boundary of Manipur and
Cachar. It flows a distance of 192 Km receiving a number of northern tributaries
viz. Jiri, Chiri, Badri, Madhura, Jatinga, Hareng and Kalaincherra. The southern
tributaries are the Sonai, Rukni, Ghagra and Katakhal. The river Barak itself
bifurcates into the Surma flowing northwards and the Kushiara flowing southwards
at Haritikar near Badarpur. Longai and Singla are the important tributaries of
Kushiara while Ghumra is the most important tributary of Surma. All these rivers
especially the Barak, which adopt a meandering path through the alluvial plains,
frequently shift their courses and form ox-bow lakes. Furthermore this region abounds in other freshwater systems including flood plains, wetlands, tanks and ponds of varying sizes, streams, and marshes. These ecosystems thus have the potential of supporting a species rich amphibian fauna.

**Agricultural Land Use**

The land use pattern in relation to cropping in the Barak Valley is as follows:

1. Ahu followed by Sali paddy.
2. Monocrop as Sali paddy.
3. Boro paddy in lowlying and hawor (flood plain) areas.
4. Ahu followed by winter vegetables, pulses and oil seeds.
5. Ahu and Sali seedbed followed by pulses, oil seeds and winter vegetables.
6. Oil seeds, pulses, winter vegetables and summer vegetables in the riverine areas.
7. Sugar cane in upland and tilla land and food crops including pineapple.

The land area under different paddy crops in the three districts of Barak Valley during 2003-2006 is provided in Table: 3.
Table: 3. District wise area coverage of Paddy under Southern Zone, (Barak Valley).

<table>
<thead>
<tr>
<th>Year</th>
<th>Paddy</th>
<th>Total Production /Ha</th>
<th>Total production</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003-2004</td>
<td>Autumn</td>
<td>30,373.00</td>
<td>2,45,835</td>
</tr>
<tr>
<td></td>
<td>Sali</td>
<td>1,95,921.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Summer</td>
<td>19,541.00</td>
<td></td>
</tr>
<tr>
<td>2004-2005</td>
<td>Autumn</td>
<td>34,024.00</td>
<td>2,45,671</td>
</tr>
<tr>
<td></td>
<td>Sali</td>
<td>1,93,539.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Summer</td>
<td>18,108.00</td>
<td></td>
</tr>
<tr>
<td>2005-2006</td>
<td>Autumn</td>
<td>34,894.00</td>
<td>2,48,693.00</td>
</tr>
<tr>
<td></td>
<td>Sali</td>
<td>1,96,452.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Summer</td>
<td>17,347.00</td>
<td></td>
</tr>
</tbody>
</table>

Vegetation:

Flora

The natural vegetation of the Barak valley comprises of moist evergreen and semi-evergreen type. Important tree species include: Michaelia spp., Lagerstroemia flosreginae, Eugenia jambolina, Mangifera indica, Tamarindus indica, Azadirachta indica, Artocarpus heterophyllus, A. chama, Ficus bengalensis, F. religiosa, F. glomerata, Tetrameles nudiflora, Barringtonia acutangula, Diperocarpus turbinatus, Mesua ferrea, Duabanga sonniioides, Cedrela toona, Palaquium polyanthum, Gmelina arborea, Terminalia bellerica, T. chebula, T. myriocarpa, Anthoceplhus cadamba, Cynometra polyandra, etc. Several species of bamboos and canes are also important constituents of the flora in this area (Gupta, 2001).

Fauna

The major endangered mammalian species in Barak Valley include Trachypethecus pileatus, T. phayrei, Hylobates hoolock, Nycticebus coucang;
Felis temmincki, F. bengalensis; Elephas maximus, Capricornis sumatraensis, Platanista gangetica, Manis pentadactyla, etc. Endangered birds include Buceros bicornis, Aceros nipalensis, Ptilolaemus tickelli, Cairina scutulata, Leptotilos javanicus, Aquila clanga, Francolinus gularis, Pardicula manipurensis, Vanellus cinerius, V. gregarius, Pellorneum palustre, Aythya baeri, etc., while important reptiles include turtles and tortoises like Aspideretes gangeticus, A. hurum, Lissemys punctata andersonii, Pyxidea mouhotii, Manouria emys, Chitra indica, Indotestudo elongata, Cuora amboinensis and Pangshura sylhetensis; snakes like Python molurus, Bungarus fasciatus, B. niger, Naja naja naja, Naja naja kaouthia, Ophiophagus hannah, and Vipera russelli; and amphibians like Hoplobatrachus tigerinus, Fejervarya limnocharis, Euphlyctis cyanophlyctis, Duttaphrynus melanostictus, Kaloula pulchra, Microhyla ornata, and M. heymonsi, (Chanda, 1994; Choudhury, 1997, 2000; Dey and Gupta, 1999, 2000; Grosselet et al., 2004a, 2004b; Whitaker and Captain, 2004).

Climate

Barak Valley has a tropical climate with three principal seasons - summer, monsoon and winter. Summer is severe from April to September/October, while monsoon coincides with summer and starts from early June extending up to September/October, although pre-monsoon rains commonly occur in March-May. Winter is short and mild from December to February. The months of March and April witnesses' severe storms with strong wind thunder and hail. Temperature and relative humidity are high and vary over a rather narrow range. Rainfall, however, varies considerably being the lowest in January and February and heavy during May to September. The average annual rainfall is 2500 mm. The monthly
variations in temperature, relative humidity and rainfall over a period of three years, viz., 2003-2005 from January to December are presented in Table: 3.1.

**Study Sites**

The present study was conducted at four sites, of which two were in Cachar district, while one site each was located in Hailakandi and Karimganj districts.

District Cachar covers an area of 3786 Sq. km. Silchar; the district headquarter and the largest city in South Assam is 398 Kms from Guwahati via Shillong (Meghalaya) connected by National Highway No. 44. It is situated on the Bank of River Barak.

Singari Basti and Uttar Krishnapur, the two study sites in cachar district, are situated in the two corners of Silchar town, in its southwest and southeast respectively. The vegetation of both the area is more or less similar. The primary occupation of the people inhabiting both Singari Basti and Uttar Krishnapur is cultivation of paddy. On an average, a farmer owns around 1.1 ha. of land for cultivation of paddy. The temperature and relative humidity of Singari Basti and Uttar Krishnapur ranges from $19^\circ C - 35^\circ C$, and $21^\circ C - 34^\circ C$; and $51\% - 96\%$, and $52\% - 91\%$, respectively.

Hailakandi district is sandwiched between Cachar and Karimganj. It is the smallest district of Barak Valley, covering an area of 1327 Sq. Km. Hailakandi, the district headquarter town is located 54 Km south east of Silchar surrounded by hillocks.

Narayanpur in the eastern part of Hailakandi town has temperature and relative humidity ranging from $21^\circ C - 28^\circ C$ and $55\% - 86\%$, respectively.
The district Karimganj covers an area of 1809 Sq. Km. Karimganj, the
district headquarter town is nearly 55 Km away from Silchar. The town is on the
southern bank of the Kushiara River that demarcates the border with Bangladesh.

Dorakona - the study site is situated to the southwest of Karimganj town
along the Karimganj-Sutarkandi Road. The temperature and relative humidity
ranges from 23° C - 33° C and 55% - 92%, respectively. The climatic condition is
also moderate. The vegetation of this area is less, dominated by pasture lands and
rice fields.

Types of paddy cultivated in all the study sites throughout the season are
Sali, Boro and Ahu.
Fig: 3.1

MAP OF BARAK VALLEY, ASSAM, NORTH EAST INDIA
SHOWING STUDY SITES

MIZORAM
TRIPURA
BANGLADESH
DORAKONA
NARAYANPUR
SINGARI BASTI
UTTAR KRISHNAPUR

MEGHALAYA

33
Table: 3.1: Monthly records of selected environmental variables in Barak Valley during the study period.

<table>
<thead>
<tr>
<th>Months</th>
<th>Rainfall (mm)</th>
<th>Temp. °C</th>
<th>R.H%</th>
<th>Rainfall (mm)</th>
<th>Temp. °C</th>
<th>R.H%</th>
<th>Rainfall (mm)</th>
<th>Temp. °C</th>
<th>R.H%</th>
</tr>
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<tr>
<td>January</td>
<td>0</td>
<td>25.3</td>
<td>11.7</td>
<td>93.0</td>
<td>47.0</td>
<td>2.2</td>
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<td>93.0</td>
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<td>February</td>
<td>2.5</td>
<td>29.1</td>
<td>14.4</td>
<td>91.0</td>
<td>41.0</td>
<td>0</td>
<td>28.1</td>
<td>12.9</td>
<td>92.0</td>
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<tr>
<td>March</td>
<td>52.0</td>
<td>30.6</td>
<td>16.9</td>
<td>89.0</td>
<td>36.0</td>
<td>20.2</td>
<td>32.3</td>
<td>18.7</td>
<td>92.0</td>
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<td>April</td>
<td>197.3</td>
<td>32.0</td>
<td>21.4</td>
<td>95.0</td>
<td>59.0</td>
<td>684.2</td>
<td>29.0</td>
<td>20.3</td>
<td>69.0</td>
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<td>May</td>
<td>239.4</td>
<td>32.3</td>
<td>23.3</td>
<td>96.6</td>
<td>351.1</td>
<td>32.2</td>
<td>23.3</td>
<td>95.0</td>
<td>61.0</td>
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<td>June</td>
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<td>21.7</td>
<td>96.0</td>
<td>71.0</td>
<td>263.9</td>
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<td>24.5</td>
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<td>July</td>
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<td>33.6</td>
<td>25.8</td>
<td>94.0</td>
<td>65.0</td>
<td>582.0</td>
<td>31.2</td>
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<td>August</td>
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<td>25.4</td>
<td>94.0</td>
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<td>September</td>
<td>369.2</td>
<td>32.8</td>
<td>24.8</td>
<td>94.0</td>
<td>71.0</td>
<td>387.8</td>
<td>31.0</td>
<td>24.3</td>
<td>96.0</td>
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<td>October</td>
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<td>23.6</td>
<td>94.8</td>
<td>69.0</td>
<td>134.8</td>
<td>30.9</td>
<td>21.8</td>
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<td>November</td>
<td>7.0</td>
<td>29.1</td>
<td>16.8</td>
<td>95.0</td>
<td>63.0</td>
<td>0</td>
<td>29.5</td>
<td>17.2</td>
<td>92.0</td>
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<td>December</td>
<td>83.5</td>
<td>26.5</td>
<td>14.2</td>
<td>94.0</td>
<td>59.0</td>
<td>8.6</td>
<td>27.2</td>
<td>13.7</td>
<td>3.0</td>
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<tr>
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<td>367.6</td>
<td>240.00</td>
<td>1126.46</td>
<td>1001.10</td>
<td>2411.80</td>
<td>353.50</td>
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<td>Mean</td>
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<td>30.63</td>
<td>20.00</td>
<td>93.87</td>
<td>83.43</td>
<td>200.98</td>
<td>29.46</td>
<td>25.91</td>
<td>81.42</td>
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*Data collected:
Cachar Advisory Centre.
Tea Research Station, Toklai, 788 118, Cachar, Assam.