CHAPTER- II

GENERAL DESCRIPTION OF THE STUDY AREA

INTRODUCTION

One of the versions of the origin of name of the state “Assam” traces its root in the Sanskrit word “Asom” meaning unparalleled or peerless. Indeed Assam is unparalleled as nature has been uniquely generous in endowing the State with such bounties that Assam is part of one of the 25 mega diverse regions on planet earth.

In 1992, the Assam Remote Sensing Application Centre, Assam Science and Technology Education Council, and the Space Application Centre of the Indian Space Research Organization developed a classification system for the wetlands in Assam that divided them into six categories: (i) lake/pond; (ii) oxbow lake/cut-off meander; (iii) waterlogged areas; (iv) swamp/marsh; (v) reservoir; and (vi) tank. The first four are natural water bodies while the last two are human-made. In the two major drainage systems of Assam - the Brahmaputra and the Barak and in the flood plains of these river systems exist patches of marshy depressions and swamps as well as perennial water bodies of varying shape, size and depth called locally as beels, haors, jalah, doloni, hola, pitoni etc. A total area of 101232 ha is covered by 3513 wetlands. This is close to 4% of the total floodplain area and 1.3% of the total area of the State.
The lakes/ponds occupy an area of 15494 ha and number 690. There are 861 oxbow lakes/cut-off meanders covering 15461 ha. The waterlogged areas number 1126 and occupy 23436 ha (dry season satellite data). The swamps and marshes cover an area of 43434 ha and number 712. The resources of these wetlands are important for human nutrition and the economy, as they provide a habitat for a number of aquatic flora and fauna. Fishing is the main economic activity in the beels. Rice and vegetables are farmed on the catchment areas.

A lentic ecosystem is the ecosystem of a lake, pond or swamp. Included in the environment are the biotic interactions (amongst plants, animals and microorganisms) and the abiotic interactions (physical and chemical). Lentic refers to standing or still water. It is derived from the Latin lentus, which means sluggish. The Barak Valley is bestowed with many large and small water bodies throughout the areas. These are of immense importance as a source of water for different uses. The small water bodies especially the ponds and temporary pools and puddles are diverse in their water quality, which in turn provides diverse environment for the aquatic fauna.

**The Study Area and the Study Sites**

Barak Valley, composed of three districts, is situated in the southern part of the state of Assam in India. The main city of the Valley is Silchar. Barak Valley mainly consists of three districts namely Cachar, Karimganj and Hailakandi. The longitude is 92°15" and 93°15" East and latitude is 24°8" and 25°8" North. The Valley constitutes 8.9% of the geographical area of Assam;
contains 11.22% of the population (2001 census). The North Cachar Hills District and the state of Meghalaya is in its north, Mizoram in the south, Manipur in the east, and the state of Tripura and the Sylhet district of Bangladesh in the west of the Valley. The Valley has an undulating topography characterized by hills, hillocks, wide plains, and low-lying water bodies, locally known as beels, some of which, however, dry up in the winter, termed as howers. Most of the hills have a north-south spread interspersed by the strips of plains. The land is alluvial, and is naturally fertile.

This plain track of Barak Valley is a geographical extension of Gangetic Bengal. The valley is predominantly inhabited by the Indo-Aryan population, and the demography has been formed in early times through the integration of the Indo-Mongoloid, Austric and other non-Aryan ethnic groups in a long historical process.

The principal river, Barak origins from Angami Naga Hills in Manipur, and travels in curved route cutting through the heart of Cachar district, reaches Haritikar in Kathigora revenue circle to be divided into two branches, Surma and Kushira to flow into Bangladesh as separate rivers. Kushira, however, flows in Karimganj and forms the natural border of India and Bangladesh. Jiri, Chri, Madhura, Jatinga, Dhalesweri, Ghagra, Katakhal, Longai, Shingla, Sonai are the major tributaries of Barak in Barak Valley.

The climate of Barak Valley is sub-tropical, warm and humid. The average rainfall is 3180 mm with average rainy days of 146 per annum (data
furnished by the Regional Agricultural Research Station, Karimganj). The rainfall is caused by the South-west monsoon, which begins in the early June to continue up to October. The Valley, however, experiences pre-monsoon rainfall in the month of March and April. The wind generally blows from the northeast in the morning and from the southeast in the afternoon. Summer is hot, humid and interspersed with rains and thunderstorms. Winter generally starts towards the end of November and lasts till February. Towards the start of the Bengali month of Baishakh (mid-April) rain clouds start covering the skyline. Silchar is inundated frequently due to excessive rainfall and flooding by the river Barak. In the last three decades, Silchar and the Barak Valley have been ravaged by three major floods—in 1986, followed by the one in 1991, and more recently in 2004 and 2010.

A study on ten different fresh water systems of Barak Valley has been conducted from February 2008 to March 2010. The different sites are designated as S1, S2, S3 and so on (Table 2.1). Site1 to 4 are the oxbow lakes. The name of “Oxbow” refers to its shape, which is like a horseshoe or Oxbow. Oxbow Lakes are connected with the flood plain of the river by inlets and outlets. By screening the inlets and outlets, an Oxbow Lake can be converted into a culture-based fishery.

Site 1 (S1) is the Baskandi Anua (Oxbow lake) which is situated nearly 20 km away from the city (Silchar). The longitude is 92°15” and 93°15” East and latitude is 24°8” and 30.2°8” North. The vegetation present in the Anua was small.
grass, musk grass (*chara*), bladderwort etc., (Image: 2.1). The plants nearby are Bamboo, Sal, some paddy fields (only seasonal) etc.

Site 2 (S2) is the Satkarakandi Anua. The longitude is 92°53" and 80°4" East and latitude is 24°45" and 20°9" North. It is fully covered by vegetation. Sometimes the people dwelling nearby clean the water hyacinths, from their common fund for fishing (Image 2.2). The plants present in the nearby area are mainly Bamboo, *Jaitun* (common name) an oil yielding plant called Jatropha, some mango trees, jack fruit trees, small flowering plants (Image: 2.2a) etc. One very old Mosque stands opposite to this *Anua*. The people of the locality use the water of the Anua.

The Site 3 (S3), (Image:2.3) is the Phulbari Anua, the longitude is 90°41" and 80°10" East and latitude is 24°51" and 43°9" North. On the bank of the system, some of the hydrophytes such as water hyacinth (*Eichhornia crassipes*), musk grass, etc are present. On the bank of the *Anua* there are Bamboo, Sal and Sisho trees. Different seasonal vegetables are also planted on the bank.

The Site 4 (S4), is Ramnagar Anua (Image:2.4), which is situated very close to Silchar town. The longitude is 92°45" and 59°6" East and latitude is 24°5" and 32°3" North. The system is fully covered by hydrophytes as water hyacinth etc. The plants around the *Anua* are some wild plants, Banana trees, Bamboo etc.

The site 5 (S5), the Temple pond 1 (Bharam Baba) (Image:2.5) is situated in the Silkuri area which is 10-11 km away from Silchar town. The longitude is
92°45" and 93°15" East and latitude is 24°8" and 25°8". The pond is about 150 years old (Report from temple Authority). It is covered by Quarters of Silkuri Tea Estatein in one side, Temple on the other side and the high way on another side. The one side of the pond is covered by different aquatic macrophytes such as Salvinia cucullata (Flame moss), Azolla pinnata (Feathered mosquito fern), Trapa bispinosa (Water chestnut), Jussiaea repens (Primrose willow) and Cynodon dactylon (Bermuda grass), Nymphaea nouchali (Blue water lily), Nymphoides cristatum, N. indicum, Nelumbo nucifera (water lotus) and Hygrorhiza aristata (Indian lotus).

The Site 6 (S6) (Image: 2.6), is another temple pond which is situated in Silchar town at the locality called Bilpar. The pond is about 200 hundred years old (Data collected from the priest of the temple and year of the establishment). The Temple is of Goddess Radha and God Madhav (Lord Krishna). The whole pond is covered by aquatic hydrophytes Lemna minuta (Duck weed). In one side there is the holy temple, some small and big plants are present in other two sides. The pond is less used by the pilgrims of the temple. So the aquatic organisms present here is lying in undisturbed condition.

The next site is the Site 7 (S7) (Image:2.7), which is about 12-13 km from the Silchar town. The name of the temple is Kachakanti (one of the forms of Goddess Kali) temple. The longitude is 90°25" and 27°66" East and latitude is 24°52" and 90°29" North. This pond is also approximately 100 years old. The temple and also the pond now are under the control of a trustee and the temple management imposes restrictions over misuse of this holy pond, therefore they
remain comparatively clean. The pond is situated inside the temple. Large number of fishes is found in the pond. But during the study period the system was disturbed by the repairing works. The trees, which stand nearby are mainly Coconut tree, some flowering plants like China rose, Lotus, *Sephali*, *Togor* and Mango, Jack fruit etc.

Site 8 (S8) (Image:2.8), is the flood plain wet lands which are present near the Durgakona area of Silchar town. The longitude is 92°46” and 26°4” East and latitude is 24°42” and 69°7” North. The Flood or Flooding means a general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland or tidal waters or the unusual and rapid accumulation or runoff of surface waters from any source, or flooding from any other source. It has number of small inlets and one outlet which drains into river Barak. It attains an area of about 1750 ha during monsoon. The aquatic vegetations mainly present in the flood plain are *Eichhornia crassipes* (Water hyacinth), *Salvinia cucullata* (Flame moss), *Azolla pinnata* (Feathered mosquito fern), *Jussiaea repens* (Primrose willow), *Ipomia pulmata* and *Cynodon dactylon* (Bermuda grass).

The site 9 (S9) (Image:2.9), is the Agricultural wet land, the land is cultivated for the production of food and other essential commodities. This type of land is present throughout the Valley. The present area selected for the above study is situated near the Phulbari Anua. In monsoon and post monsoon season this field is used for the cultivation of paddy (Image: 2.9).
The site 10 (S10), last study area is the temporary water covered area which is called rain pools, which are situated in the Silcoorie area of Cachar district (Image:2.10). The longitude is 92°15’ and 93°15’ East and latitude is 24°8’ and 25°8’ North. This system is covered by rain water mainly in three seasons, such as premonsoon, monsoon and postmonsoon season. The system becomes dry in the winter. Temporary freshwater habitats are created directly or indirectly by rain. Their existence, extent and duration therefore depend on climatic factors and on morphometric and sediment characteristics.

Source: From web site-Images for map of Assam-Report Image
Abbreviation:

S1-Banskandi Anua (BA), S2- Satkarakandi Anua, S3- Phul Bari Anua, S4-Ramnagar Anua, (RA), S5-Temple pond I (TPI), S6- Temple pond II (TPII), S7- Temple Pond III (TPIII), S8- Flood Plain lake (FP), S9-Agricultural Field (AF). S10- Rain pool (RP).

Table: 2.1 - Description of different study sites

<table>
<thead>
<tr>
<th>Sites</th>
<th>Location</th>
<th>Latitude &amp; longitude</th>
<th>Age</th>
<th>Depth from ground level</th>
<th>Area (Acre)</th>
<th>Catchment area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Banskandi Anua (BA) S1</td>
<td>Situated 20 km Away from Silchar town.</td>
<td>92°15&quot; &amp; 93°15' E 24°8&quot; &amp; 30.2°8' N</td>
<td>80-90 yrs old</td>
<td>14 feet (approx)</td>
<td>543.20 acre</td>
<td>Agricultural land and human settlement in one side.</td>
</tr>
<tr>
<td>2. Satkarakandi Anua (SA) S2</td>
<td>Situated 13 km From Silchar Town.</td>
<td>92°53&quot; &amp; 80°4' E 24°45&quot; &amp; 20°9' N</td>
<td>150-200 yrs old</td>
<td>14 feet (approx)</td>
<td>345.68 acre</td>
<td>A big Mosque and human settlements. System is surrounded by big trees.</td>
</tr>
<tr>
<td>3. Phulbari Anua (PA) S3</td>
<td>Situated about 35 km from Silchar town.</td>
<td>90°41&quot; &amp; 80°10' E 24°51&quot; &amp; 43°9' N</td>
<td>70-80 yrs old</td>
<td>12 feet (approx)</td>
<td>296.30 acre</td>
<td>Catchments areas are agricultural land and human settlements.</td>
</tr>
<tr>
<td>4. Ramnagar Anua (RA) S4</td>
<td>Situated about 5 km from Silchar town.</td>
<td>92°45&quot; &amp; 59°6' E 24°5&quot; &amp; 32°3' N</td>
<td>100 yrs old</td>
<td>14 feet (approx)</td>
<td>345.70 acre</td>
<td>This Anua is called Berakhali. Catchments areas are highway in one side and human settlements.</td>
</tr>
<tr>
<td>5. Temple Pond 1 (TP I) S5</td>
<td>Bharambaba temple is 10 km from Silchar town.</td>
<td>92°45&quot; &amp; 93°15' E 24°8&quot; &amp; 25°8' N</td>
<td>200 yrs old</td>
<td>7 feet (approx)</td>
<td>0.4591 acre</td>
<td>Catchments are Staff quarters of Silcoorie Tea estate, and road</td>
</tr>
<tr>
<td>6. Temple Pond II (TP II) S6</td>
<td>Radhamadhava Akhara temple is situated in Silchar town.</td>
<td>91°45' &amp; 93°15' E 24°8' &amp; 23°8' N</td>
<td>70years old</td>
<td>3.5feet (approx)</td>
<td>0.2295 acre</td>
<td>The temple is close to the pond and water is not used at all.</td>
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<tr>
<td>7. Temple Pond III (TP III) S7</td>
<td>Kachakanti temple pond is 11km from Silchar town</td>
<td>90°25' &amp; 27°66' E 24°52' &amp; 90°29' N.</td>
<td>100yrs old</td>
<td>5feet (approx)</td>
<td>0.3213 acre</td>
<td>The pond is in the temple compound, the system is clean and small plants &amp; trees are present nearby.</td>
</tr>
<tr>
<td>8. Flood Plain (FP) S8</td>
<td>About 12 km from Silchar town</td>
<td>92°46' &amp; 26°4' E 24°42' &amp; 69°7' N</td>
<td>Permanent systems</td>
<td>6feet (approx)</td>
<td>4344.06 acre</td>
<td>Agricultural field and main road towards Assam University (Chatla flood plain).</td>
</tr>
<tr>
<td>9. Agricultural field S9</td>
<td>7 km from Silchar</td>
<td>90°41' &amp; 80°10' E 24°51' &amp; 43°9' N</td>
<td>Temporary systems</td>
<td>1.5 feet (approx)</td>
<td>0.2571 acre</td>
<td>Paddy field</td>
</tr>
<tr>
<td>10. Rain Pool (RP) S10</td>
<td>17 km from Silchar</td>
<td>92°15' &amp; 93°15' E 24°8' &amp; 25°8' N</td>
<td>Temporary systems</td>
<td>1foot (approx)</td>
<td>0.0275 acre</td>
<td>Away from human settlement.</td>
</tr>
</tbody>
</table>

*Source: Department of Irrigation Silchar Division. Assam.2009 (Information about Oxbow lakes) and rest are primary data.*