

## Chapter- III

# GEO-ENVIRONMENTAL SETTING OF THE STUDY AREA

### 3.1. Introduction

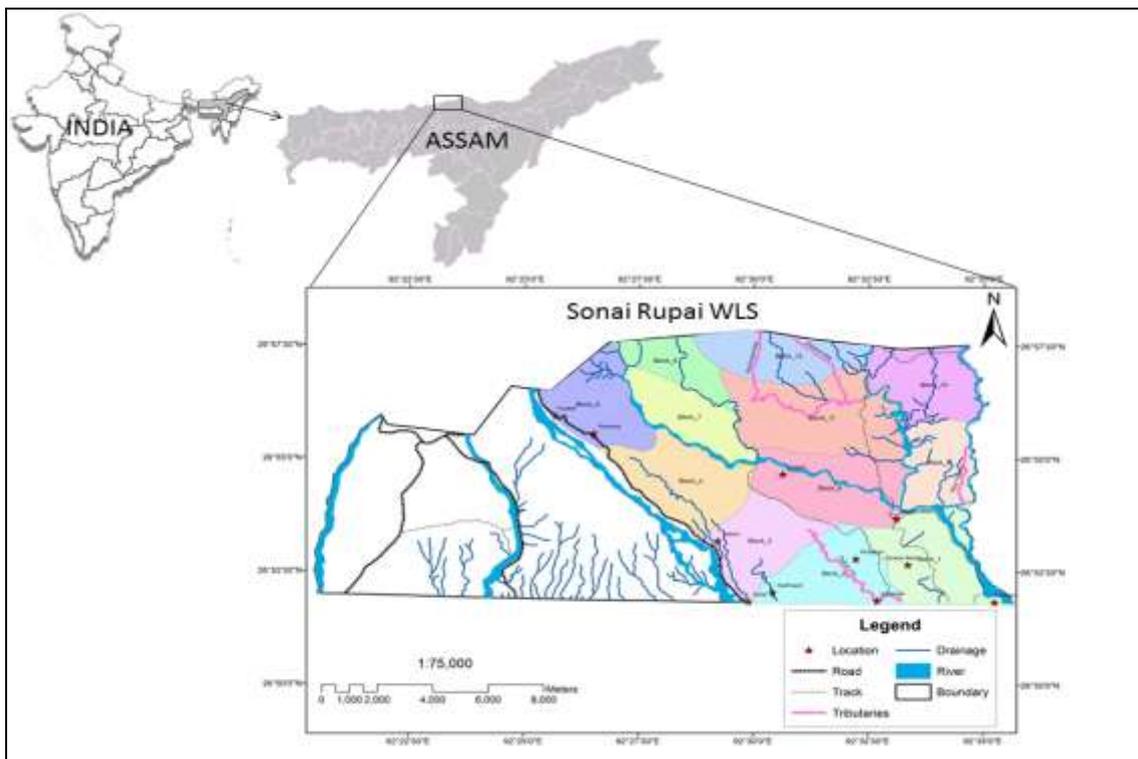
#### 3.1.1. Location

Sonai-Rupai Wildlife Sanctuary was carved out from Charduar Reserve forest in Assam and was designated as “Sonai-Rupai Game Sanctuary” in the year 1934, because of its rich biodiversity that included one-horned Rhinoceros (*Rhinoceros unicornis*) and reported populations of wild buffalos. However, both these species are being locally extinct from this Sanctuary in recent years. Later on in the year 1998, the Sanctuary was notified as “Sonai-Rupai Wildlife Sanctuary” with a Notification No. 172 dated 22/10/1998. The Sanctuary is located in the northern part of Sonitpur district of Assam and lies along the foothills of Eastern Himalayas of Arunachal Pradesh (*Fig.3.1*). It shares contiguous northern boundary with reserve forests of Arunachal Pradesh. The Sanctuary is 45 km away from the Salonibari (Tezpur) Airport. The nearest towns are Tezpur and Dhekiajuli at distances 52 km 30 km from the Sanctuary. The Sanctuary was spread out over an area of 220 square kilometres.

#### 3.1.2. Monitoring and Maintenances of the Sanctuary

An added advantage of the rich biodiversity of the Sanctuary is the presence of Doimara Reserve Forest and beyond this the Eaglenest Wildlife Sanctuary across the border in Arunachal Pradesh, covering about 50,000 ha. The flora and fauna represent

rich biological significance of this Sanctuary. For many species of fauna, it is a large wilderness area. The Sanctuary forms an important component of a single ecological unit comprising of reserve forests, such as – Charduar, Balipara, Naduar, Biswanath, Behali and Nameri National Park towards east and Rowta reserve forest on the west. Sonai-Rupai Wildlife Sanctuary together with Nameri National Parks is a part of Sonitpur-Kameng Elephant Reserve as well as one of the important protected areas on the North Bank of the river Brahmaputra. The Sanctuary is known for conservation of mega-herbivores such as Asian Elephant, Indian Bison as well as several carnivores including leopard.



**Fig 3.1:** Location Map of Sonai-Rupai Wildlife Sanctuary

The Sanctuary is under grave threat from potential encroachers who have already cleared the adjacent Balipara and Charduar Reserve Forests. Already, a part has been encroached since the early 1990s. Even the slightest opportunity given to the encroachers due to slackness in administration, may put the entire Sanctuary in jeopardy. Hence, the site is in need of high conservation attention. The problem has been aggravated due to a plan to convert some of the open areas into a firing range. Such plans should be dropped once and for all.

From the viewpoint of the protection of Sonai-Rupai Wildlife Sanctuary, it has already been declared as an ecosensitive zone. A draft proposal for declaring the area in and around Sonai-Rupai Wildlife Sanctuary as Ecosensitive Zone was prepared by the Divisional Forest Officer Western Assam Wildlife Division, Tezpur. They considered ecosensitive zone up to five kilometres away from the boundary of the protected area of Sonai-Rupai Wildlife Sanctuary. The ecosensitive zone has been further divided into 0 – 1km zone, 1 – 2 km zone and 3 -5 km zones. Because of the presence of Reserve Forest and interstate boundary with the Arunachal Pradesh no ecosensitive zone is proposed towards the north of the Sanctuary.

## **3.2. Physiography and Drainage**

### **3.2.1. Geology and Soil**

Geologically, the landscape is not a homogeneous unit. The hill and hillock are made up with varied rock types ranging from Precambrian to Tertiary. The river valleys are developed during the past geological ages depending upon uplift and erosion.

The Brahmaputra valley including the study area mainly consists of older and alluvial deposits. The home state of the Sanctuary, Sonitpur belongs to the middle part

of Assam and all the plains are broken parts of isolated hills. The soil types found in the area are Entisoles (flood prone plain areas), Inceptisols (sediment deposit of river), Alfisols (foot hill region), Ultisols (reddish colour hill soil) and Histosols (water logged bodies).

The terrain in Sonai-Rupai is flat and gently sloping towards the south, typical of *bhabar* and *terai* areas. Towards north, promontories of the small hills of Arunachal Himalaya can be seen. The slope is gentle that gradually increases towards the interstate boundary in the north (Arunachal Pradesh). Average altitude within the Sanctuary is 170 m ranging from 100 – 450 metre. The soils are mostly composed of clay loam with fine sand and the Bhabar formation consisting of boulders, cobbles and gravels is noticeable in most part of the area and is more prominent in the northern part.

### **3.2.2. Drainage**

A number of rivers which originate in the Himalayan foothills flow southwards and ultimately enter into the mighty Brahmaputra River. The major rivers that used to flow through the Sanctuary are Belseri, Gabharu, Sonai, Pasnoi, Gelgeli. These rivers are perennial in nature and during the rainy season, several “*beels*” (wetlands) also come into existence in the Sanctuary. There are many other small tributaries that also flow and join to these perennial rivers.

### **3.3. Climate and Vegetation**

The vegetation types and their floristic compositions mainly depend on the climatic condition of the area. The Sonai-Rupai Wildlife Sanctuary falls in the subtropical climatic region, and enjoys monsoon type of climate. The main seasons are summer, rainy, autumn and winter. Summer is very hot and humid with an average

temperature of 29° C and prevails from March to May. The highest temperature is recorded just prior to the onset of Monsoon (around May and early June). Monsoon rain is heavy, and is principally caused from late June to early September by the moisture-laden South-West Monsoon wind, on striking the Himalayan foothills of the north. Such rain is both a boon and a bane for the people. It is a boon as it provides natural irrigation to the fields but sometimes it becomes a bane as it causes the rivers to overflow their banks and cause floods. Most of the rainfall occurs during May to September. Autumn is dry and warm. It gets cooler as the months progress. Rainy season lasts from May to October and winter covers the months November to February. Throughout the year, humidity remains at fairly high levels. Sky is mainly clear with bright sunshine hours varying between 7 and 8.3 hrs/day. The annual rainfall in the district is about 2393 mm. Relative humidity ranges from 67% in March to 87% in July. Maximum average temperature occurs during the months of June-October and minimum in December-January.

Biogeographically, the entire district of Sonitpur including the study area falls under biogeographic zones 9A and 9B. The forests belonging to Sonai-Rupai Wildlife Sanctuary comprise of tropical evergreen, semi-evergreen and moist deciduous forests with cane brakes and narrow strips of open grassland along the rivers. The semi-evergreen and moist deciduous species dominate the area and the forest types available within the reserve are – Assam Valley Tropical Evergreen Forests, Sub-Himalayan Light Alluvial Semi-evergreen Forests, Eastern Alluvial Secondary Semi-evergreen Forests, Cane Brakes, Low Alluvial Savanna Woodland, Eastern Hollock Forests, Eastern Seasonal Swamp Forests, Eastern Dillenia Swamp Forests and Eastern Wet Alluvial Grassland.

A systematic study on the faunal diversity of the Sanctuary is yet to be done. However, there are many records of occurrence of carnivores and herbivores within the Sanctuary. The main predators of the Sanctuary are leopard and wild dog. In the past, presence of tiger was reported. Mega herbivores like Asian elephant and Indian Gaur do occur at fairly good numbers. Other species recorded are sambar, barking deer, hog deer, Himalayan Crestless porcupine, Large Indian Civet, Small Indian Civet, Black bear, capped langur and Sloth bear. Fairly good avifaunal diversity exists in the Sanctuary, although no formal bird checklist has been prepared. Some of the rare and endangered bird species sighted in the Sanctuary includes white winged wood duck, Great Hornbill, Oriental Pied Hornbill, Wreathed Hornbill and Bengal Florican. Though information regarding reptile and invertebrate diversity is sketchy, but field observations indicate that these species do occur within the Sanctuary.

### **3.4. Settlements in the Periphery of the Sanctuary**

Sonai-Rupai Wildlife Sanctuary is surrounded by four revenue villages and many unrecognized encroached villages. There is no official record of the encroached villages. The revenue villages surrounding the Sonai-Rupai Wildlife Sanctuary are shown in *Table 3.1*. The village No.1 Jia Gabru lies towards northern side of the Sanctuary. This village is separated by an electrified power fence constructed by the forest department. Rikamari is the village adjoining Jia Gabharu River and lies on the same line to its west. The village Bandarhagi Pathar lies to the east of Sonai-Rupai wildlife Sanctuary. Bengenjuli village is on the southern boundary of Sonai-Rupai Wild Life Sanctuary.

**Table 3.1.** List of Revenue Villages

Sl. No	Villages Name	Description
1	No. 1 Jia Gabru	The Sonai Rupai Wildlife Sanctuary lies to the north of the village and is separated by a power fence
2	Rikamari	Rikamari is the village adjoining Jia Gabharu and lies on the same line to its west.
3	Bandarhagi Pathar	The village lies to the east of Sonai Rupai WLS.
4	Bengenjuli	It is lying on the southern boundary of Sonai Rupai WLS.

There are many “encroached villages” in the Sonai-Rupai Wildlife Sanctuary. These encroached areas are mainly dominated by tribal peoples. Agriculture is the major occupation of the villagers. In Chardwar Reserve forest which is surrounding the Sanctuary has eight (8) encroached villages and in Sonai-Rupai Wildlife Sanctuary eleven (11) encroached villages have been identified. The list of identified encroached Villages in and around the Sanctuary are Shown in **Table 3.2**.

**Table 3.2:** List of Identified Encroached Villages in and around the Sanctuary

Sl. No	Villages in the Sonai-Rupai Wildlife Sanctuary	Villages in Charduar Reserve Forest
1	Golai	Milanpur
2	Jiabari	Azarbari
3	Simologuru	Oabari
4	Amlaiguri	Rupanjali
5	Anthaibari	Sonapur
6	Kamengbari	Alubari
7	Depanjali-No-6	Ramnathpur No. 1
8	Dayalpur	Ramnathpur
9	Bengnaguri	
10	Khirsiguri	
11	Bwigribari	

A Proposal for Declaring Eco-sensitive Zone around Sonai-Rupai Wildlife Sanctuary was prepared by the Divisional Forest Officer Western Assam Wildlife Division, Tezpur. They have prepared Eco-sensitive Zone upto five kilometers from the boundary of the protected area of Sonai-Rupai Wildlife Sanctuary which is further divided into 0 – 1km zone, 1 – 2 km zone and 3 -5 km zones. Because of the presence of Reserve Forest and interstate boundary with the Arunachal Pradesh no ecosensitive zone is proposed to the north of the Sanctuary.

### **3.5 Geo-Environmental Problems**

The following geo-environmental problems have been identified in the study area.

- a) **Decline in the area under forest:** The Sanctuary is under the threat of forest loss. During the last few decades the Sanctuary has lost its 60 % of forest cover.
- b) **Loss of biodiversity and habitat:** Once the Sanctuary was rich in its floral and faunal diversity. But due to forest degradation and habitat loss, many of these species and their abundance have also been decline.
- c) **Conversion of forest into built up area and agricultural land:** The migrated people have cleared the forest land for their settlements and livelihood opportunities.
- d) **Changes in the fluvio-geomorphic behaviours of the rivers:** The Rivers flowing through the Sanctuary are very meandering and braided in nature. During monsoon, these rivers are causing river bank erosion which has also resulted in forest loss. On the other hand it is causing serious deposition of sediment on the fertile land of forest.

- e) **Increase in flooding intensity:** During the last few decades the intensity of flood has increased which is causing loss of forest and agricultural land. The bank line areas are mostly affected.
- f) **Poaching and illegal logging:** The incident of poaching and illegal logging has been increased in the Sanctuary.

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