

CHAPTER - IV

THE PRESENT WORK

Importance of the conservation of wetlands is now well-visualized. The Ramsar Convention and its follow-up to conserve innumerable wetlands round the world as '*Ramsar Sites*' has created a history in the field of conservation. In fact, the importance of wetlands in the ecosystem was wrongly interpreted previously, especially from the productive point of view. If one look directly into the marketable products from most of the wetland then that will look too much insignificant.

In India the wetlands are spreading almost in all corners of the country, from tropical to alpine belts, from high rainfall zones to the *Thar* deserts in Rajasthan and the biological elements living there are very much significant not only in number but also to their taxonomic nature, but also the ecosystem services they perform. So far only an insignificant number of 26 Ramsar Sites has been declared from the areas within the political boundary of India. This reflect our poor realization and/or least desire to conserve our biological resources.

Rasik Beel Complex has been developed due to the repeated shifting of the River Raidak in the Coochbehar district of the state of West Bengal. For long time it was left unattended by man and the entire surrounding area was covered with mostly mixed deciduous vegetation. Innumerable local and migratory birds were also known to live there since long. In every winter winged guests from far away countries and continents come in flocks in thousands and live in harmony for few months. From this observation it appears that the capacity for sustaining such large number of birds is present in the Beel.

On the other hand, the Rasik Beel is now being projected as a place of touristic interest, and that too is based mainly on these migratory birds. Any person who understand the method and need of conservation will realize how the tourism related activities are affecting the wetland habitat is being affected and endangering the life of all biological elements.

Considering all these points it is realized that to impose the strict conservation measures, at first, we need to have good basic knowledge on the elements of the biological diversity of Rasik Beel complex.

4.1. Previous Floristic Works

The green diversity of Terai and Duars has attracted a large number of researchers and plant collectors from different parts of the world at least for the last three centuries (Don, 1823, 1825; Das, 1995, 2004). Soon after, the famous naturalist Griffith also explored Terai green belt in 1847. The famous botanist Sir J.D. Hooker made his visit sometime during 1848 – '49 (Hooker, 1849, 1904). Immediately after J.D. Hooker, no other botanist taken up intense study of the Duars region. He explored the entire region and made a historic collection of approximately 2500 specimen of plants. His expedition and the account published by him include the *Flora of British India* (1854, 1872 –

1897, 1904) is still one of the most comprehensive descriptions of botanical splendors for this region.

Significantly, botanists from different other parts of the world has latter made significant contributions to the flora of Terai and Doors region of Jalpaiguri. They include Cowan and Cowan (1929), Ohashi (1975), Grierson and Long (1979, 1983 – 1991, 1999 – 2001, 1994 - 2000).

Champion and Seth (1968) also surveyed this region. Mukherjee (1965) prepared a sketch of the vegetation of Jalpaiguri District. Sikdar (1984) worked on Baikunthapur Forest division, Banerjee (1993), Pandit (1995) and Das *et al* (2003) worked on the Jaldapara Wildlife Sanctuary (now Jaldapara National Park), and Biswas *et al* (2012) published a detailed Dicotyledonous flora of Gossain Hat Beel. Wetlands of India was explored by Biswas and Calder (1937), Subramanyam (1962), Deb (1976), Cook (1996) and Fassett (2000). Pal *et al*. (2010) and Das (2013) worked on wetland of Assam. For Wetlands and their conservation, wetland macrophytes etc. of India are also reviewed by IUCN (1971), Gopal (1973), Wells (1992), WWF India (1993) and Williams (1997). Bandyopadhyay *et al* (2005) listed aquatic and wetland vascular plants of Cooch Behar district. But, a detail study on Rasik Beel area was not done previously. Saha *et al* (2013) worked on the medicinal plants of Gorumara National Park. Das *et al* (2010) prepare a detail sketch of three MPCAs of Terai and Dooars. These selected publications, on the other hand, showed the attractiveness of the plant diversity of this region. At the same time it is also clear that none of these works is complete and much more intensive explorations are essential for proper documentation from different aspects.

4.2. Importance of the Present Work

Broadleaf forests of West Bengal Duars are situated very near to the foothills of Eastern Himalaya and is a part of the IUCN recognized Himalaya Biodiversity Hotspot. The entire Landscape of the region is having significantly rich botanical diversity, occupied an important platform for huge inflow of tourists, researchers and also for botanists, mainly taxonomists. The flora is representing all the major groups of plant kingdom. The migration of plants from widely different localities since the upheaval of the Himalayas during Triassic from the bordering as well as from distant land masses is continuously enriching the flora. Important countries or places include China and Malaysian in the east and south of Oriental lands, Europe, America and Africa on the west and of Tibet and Siberia on the North have contributed to the floristic diversity of Terai-Duars region (Hooker, 1904).

Hydrophytes and helophytes of Apalchand Reserve in Jalpaiguri District have been surveyed during 1994 to 1999 (Dutta *et al*, 2002). In the near past, Chowdhury and Das (2007) surveyed in Rasik Beel and Bochamari Villages and recorded 33 species of angiosperms belonging to 22 families, which includes some common medicinal and some other useful plants.

Bala *et al* (2007) 42 species of angiosperms belonging to 26 families and 2 species of Pteridophytes from the wetlands of Nadia district of West Bengal, which are locally used for various purposes. Of these, 30 species are known to have good medicinal properties. As much as 172 species of vascular plants under 91 genera belonging to 42 families, of which 25 families with 43 genera and 79 species are Dicotyledonous and 13 families with 44 genera and 89 species belong to Monocotyledons

were, so far, recorded from the wetlands in Cooch Behar district (Bandyopadhyay *et al*, 2005). Mukhopadhyay (1987) enlisted 75 species under 47 genera of aquatic and semi-aquatic plants of Birbhum district. Of these, 15 species are belong to the dicotyledons and 57 species are monocotyledonous. Chowdhury (2009) recorded 357 species under 209 genera from 77 families that consists of 202 dicotyledonous species under 122 genera of 51 families, 147 species of monocotyledonous under 82 genera covering 19 families, 7 pteridophytes and 1 bryophytes from the Malda district located in the central part of the state of West Bengal. Gopal (1995) recorded over 1200 species of aquatic plants from India and also provided a list of animals from the wetland systems of India. However, no such study provided a reasonably complete wetland flora for different districts of West Bengal. The floristic estimate for the West Bengal wetlands is very poor and the required data for the Cooch Behar District is incomplete (Bandyopadhyay *et al*, 2005). So, the reliable data on wetland flora of Cooch Behar District is a basic requirement. Rasik Beel is a Complex of seven Beels and are intimately associated with Atiamochar and Takomari reserved forests in the Cooch Behar District. So, it was expected that the vegetation of the Beel Complex is much divers and is supposed to share a large number of aquatic and Wetland flora. Wetlands are also important as resting sites for migratory birds. Aquatic vegetation is the most valuable source of food, especially for the waterfowls. In the winter, migratory waterfowl search all the layers, sediment to above water plant parts for nutritious seeds, roots, tubers, small animals etc. for their sustenance. Resident waterfowls are feeding on different species of aquatic vegetation year-round (Gopal, 1995, 1994).

It is estimated that freshwater wetlands alone support 20 per cent of the known range of biodiversity in India (Deepa and Ramachandra, 1999). As many as 476 wetlands of different kinds each exceeding a total area of 10 ha have been identified within the Indian state of West Bengal. Of these, 12 wetlands are man-made. A few salt marshes have been explored for their macrophytic vegetation. A total of 123 species of angiosperms comprising 67 dicotyledonous and 56 monocotyledonous species were collected and their growth-forms were determined (Panda *et al*, 2009). The total numbers of aquatic plant species exceed 1200 is given by Gopal (1995). But, the actual State wise, District wise and Wetland wise estimation totally unknown.

4.3. Objectives of the Present Work

Rasik Beel is one important wetland located in the Coochbehar district of West Bengal and has been formed due to the shifting of the courses of the river Raidak. A group of Beels has been created and basically those are ox-bow lakes.

The present work is an attempt to know the vascular plants diversity in the Rasik Beel complex including its intervening and surrounding terrestrial vegetation.

So, the objectives of the present was basically:

- i. Detailed survey for the preparation of vascular plants flora of the Rasik Beel complex and of the adjoining regions. This is the prime objective of the present study.
- ii. Understanding the vegetation structure, including the phytosociological characters of the study area.
- iii. To understand the importance of the Beel and terrestrial vegetation in the life of the local villagers.

- iv. Understanding the occurrence and their present status of marketable NTFPs in the study area.
- v. Recognition of Endemic, Rare and Threatened species and to observe their population status in the area.
- vi. Recognition of alien elements in the flora and their local distribution pattern
- vii. Accumulation of sufficient voucher specimens to preserve in different Herbaria for future studies.
- viii. Recognition of disturbances in the process of *in situ* conservation in Rasik Beel complex and understanding the remedial measures.
- ix. Understanding the effects and *ex situ* conservation, including eco-development measures, on the local vegetation and the flora.
- x. Present status of conservation and thinking for the scope of improvement so that the total ecosystem, including local flora and fauna can be conserved effectively.
- xi. Assessing the possibility of forwarding a proposal to declare Rasik Beel Complex as one **Ramsar Site**.