CHAPTER I

INTRODUCTION
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Wetlands are transitional areas between aquatic and terrestrial ecosystems where the water table is usually at or near the surface, or the land is covered by shallow water. The extent of the world’s wetlands is generally thought to be from 7 to 9 million km², or about 4 to 6% of the land surfaces of the earth. According to William (1990), the wetlands occupy only 6.4% of earth surface. Wetlands are among the most productive life support systems in the world and are of immense socio-economic and ecological importance to mankind. They are ‘open systems’, i.e., wetlands interact with other ecological systems, such as ground water tables and rivers, in a way that enhances the overall environment and, in particular, water quality. According to the standard ecological definition published by US Fish and Wildlife Service, ‘Wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. The single feature that most wetlands share is soil or substrate that is at least periodically saturated with or covered by water.’

Wetlands have also been called ‘biological supermarkets’ because of the extensive food chain and rich biodiversity that they support. They play major roles in the landscape by providing unique habitats for a wide variety of flora and fauna. As the wetlands function as the downstream receivers of water and waste from both natural and human sources, they are sometimes also described as ‘the kidneys of the landscape’. They stabilize water supplies, thus ameliorating both floods and draught. They have been found to cleanse polluted waters, protect shorelines, and recharge groundwater aquifers. Besides, they play important role in erosion control, sediment/toxicant retention, nutrient retention, biomass export, storm protection, microclimate stabilization, water transport and recreation/tourism. But of the many distinguishing features of the wetlands, the most notable ones are the presence of standing water for some period during the growing season, unique soil conditions and organisms, especially vegetation adapted to or tolerant of saturated soils.
Wetlands are unique because of their hydrologic conditions and their role as ecotones between terrestrial and aquatic systems. This ecotone position has been suggested by some as evidence that wetlands are mere extensions of either the terrestrial or the aquatic ecosystems or both, and have no separate identity. Wetlands are usually categorized according to their characteristic vegetation: their location (coastal or inland); the salinity of the water they contain; or other biological, chemical, hydrological, and geographical features. The scientific classification system divides wetlands into two types, Inland, and marine and coastal wetlands. Terms such as swamp, marsh, fen, and bog have been used in common speech for centuries.

The wetlands of the Indian sub-continent may be broadly categorized in to high altitude lake systems, mountain, Indus Gangetic-Brahmaputra floodplains, River Delta, Peninsular river systems, Deccan percolation tanks and coastal tidal flood plains. The majority of the wetland systems are sustained by rainfall and flooding. In India, the total area of wetlands excluding rivers is 58,286,000ha or 18.4% of the country. 70% of which comprises areas under paddy cultivation (Sinha and Mohanty, 2002). In our country, the importance has been given on two main categories of freshwater ecosystems such as ponds and lakes or beels, and streams and rivers. Beels are the characteristic examples which can be defined as freshwater bodies with only littoral zones. As the wetlands of India are mostly situated on flood plains of major rivers, they are better designated as flood plain wetlands (Sugunan, 1995a, 1995b). 70% of 1.6 million hectares fresh water available in the country exists in the form of ecobiologically disrupted wetlands. Assam, the North-eastern part of India is bestowed with abundant natural wetlands comprising lakes, rivers, streams, rivulets, beels, marshes, bogs, and ponds. The monsoonal climate with high rainfall pattern (annually over 2000mm) is one of the primary reason for large number of wetlands in Assam with water throughout the year. The beels are very rich in nutrients and have immense production potential for various types of flora and fauna. The total number of wetlands in Assam is 3474 of which 1392 are floodplain wetlands and cover an area of 1.01,229.4 ha accounting for 1.29% of the total geographic area of the state (Bhagabati et al., 2002).
The structural components of wetland ecosystem including water, soil and biological assemblage and the functioning of ecosystem and energy transformation among different trophic levels of the food chain determine the overall health of the wetland ecosystem. The sun is the ultimate source of energy for all types of ecosystem of the biosphere. Phytoplankton and macrophytes help in the transformation of the solar radiation by photosynthesis to chemical energy which later transform into mechanical and heat energy during metabolic activities, growth and development of organisms. The two ecological processes, energy flow and mineral cycling, involving interaction between the physico-chemical environment and the biotic communities are the central theme of ecosystem dynamics. The progressive direction of energy in the trophic levels of aquatic food chain is unidirectional pattern. To understand the functioning of the ecosystem, the energy dynamics is of great importance which provides information regarding health of the ecosystem and provides input for sustainable management. Natural phenomena like severe flood, siltation, macrophytes infestation and human activities cause degradation and grossly disturb ecological functioning of the wetlands. Mismanagement also contributes to total destruction of wetland ecosystem. It is therefore, imperative need to conserve wetlands to avail its services on sustainable basis.

The Kaziranga National Park of Assam has number of wetlands which support the variety of wild life of the park. These wetlands deserve attention from every quarter for maintenance of ecology and proper management for sustainable growth and development of its resources and for care and support of dependent wild life populations including world famous one horned *Rhinoceros unicornis*. In this context, a basic understanding of hydrological and edaphic characteristics of the wetlands, its flora and faunal characteristics, energy dynamics and biotope improvement is of paramount importance.

The present investigation was therefore undertaken to carry out some ecological aspects of selected wetlands of Kaziranga National Park.
OBJECTIVES

The objectives of the present study were-,

1. to study area, size and shape of the wetlands of Kaziranga National Park,

2. to analyse the physico-chemical characteristics of water and soil of the wetlands,

3. to study plankton and benthic organisms of the wetlands,

4. to study productivity of the wetlands,

5. to study conservation measures of the wetlands in Kaziranga National Park.

SIGNIFICANCE OF THE STUDY

It is expected that the findings of the present investigation will contribute significantly to the ecological status of the wetlands of Kaziranga National Park in particular and sub-tropical monsoonal natural flood plain wetlands in general. The study will further add to the structure and functioning of the wetland ecosystem and help to formulate management strategies for conservation of these natural water bodies. This will in the long run, yield sustainable development of wetland resources and assist and support the wild life population of Kaziranga National Park on sustained basis. The findings will benefit the environmentalists, academicians, non-government organizations and concerned authorities in the matter of decision making for management of wetlands under the environmental condition of Assam as well as north eastern region of India.