1. INTRODUCTION
1. Introduction:

India is very rich in wetland habitats exhibiting different ecological diversities, climatic conditions and changing topography. A great number of these wetland habitats have been affected by various human impacts but realising the crucial role of the wetlands in ground water recharge, ground water discharge, flood storage and desynchronization, shoreline anchoring and dissipation of erosive forces, sediment trapping, nutrient retention and removal, food chain support, habitat for fisheries, habitat for wild life, active recreation, passive recreation and heritage value, Ministry of Environment and Forests, Govt. of India (1990) and also IUCN (1989) published the directories of wetlands of India and Asia respectively.

On the basis of topographical variation, Indian Wetlands are of four major types-1) Himalayan Wetlands 2) Wetlands in the Gangetic plain 3) Wetlands in the desert and 4) Coastal Wetlands. Along the 7,500 km coast line of India, there is a great diversity of wetland habitat with lagoons, estuaries, mangrove swamps and coral reefs. Among the coastal wetlands, coastal lagoons are the shallow coastal water bodies separated from the ocean by a barrier connected atleast intermittently to the ocean by one or more restricted inlets and usually oriented parallel to shore (Phleger, 1981). Coastal lagoons are usually found on low-lying coasts and are normally aligned with their largest diameter parallel to the seashore. A number of lagoons are distributed all along the East and the West Coasts of India. There are 17 noteworthy lagoons in Indian coast with 8 on the east and 9 on the west. The 8 important coastal lagoons in the east are: 1) Chilka Lagoon 2) Pulicat lagoon 3) Pennar lagoon 4) Bendi lagoon 5) Nizampatnam lagoon 6) Muttukadu Lagoon 7) Muthupet lagoon and 8) Gulf of Mannar Lagoon. The 9 important coastal lagoons in the West are: 1) Vembanand lagoon 2) Ashtamudi Lagoon 3) Paravur lagoon 4) Ettikulum Lagoon 5) Veli lagoon 6) Murkumpuzha lagoon 7) Talapady lagoon 8) Lagoons of Bombay coast and 9) Lakshadweep Lagoons (Kavaratti and Minicoy Lagoon).

Out of several wetlands in India, Chilka lake in the state of Orissa was designated as Ramsar site in 1991 as an internationally important of waterfowl habitat. Among the six Ramsar sites [Chilka Lake (Orissa), Keoladeo Ghana National Park (Rajasthan), Wular Lake (Kashmir), Harik Lake (Punjab), Loktak...
Lake (Manipur) and Sambar Lake (Rajasthan) in India, Chilka Lake is the largest one and unique in its kind for its magnificent biological diversity, ecological complexity and sustainability. This vast water body spreading over an area of 1100 sq. km harbours innumerable number of both floral and faunal components. It is a haven for migratory birds, having 159 species/subspecies (Dev, 1997). More than 800 species of animals are reported from this lake and its vicinity by Zoological Survey of India (Ghosh, 1995). About 225 species of fish have been reported from this lake (Dean & Saaltink, 1991). On the banks of the lake there are 8 fairly large towns and 122 villages. About 70% of this population depend upon fishing as the only means of livelihood. A population of about 1,27,000 souls are directly dependent on fisheries in the lake and 50,000 cattles may get their fodder need from the margin and bank of the lake (Trisal and Chauhan, 1998). A revenue of over 70 million rupees, is collected from 24 revenue villages on its banks (Bandyopadhay & Gopal, 1991). Besides these, the lake attracts several national and international tourists for its pristine beauty and charming environment. On an average 2.5 lakh tourists visit this lake annually.

Though much information regarding the common ecological and environmental status of the lake exist, still there is a gap in the baseline data on the total plant resources. Little is known of their taxonomy, quantitative ecological status and the mechanism by which they differ in their distributional patterns, their importance in the food chain of different fishes and birds as well as their effective role in protecting soil erosion and purifying the water quality. Not only information on ecological amplitude of algae/phytoplankton and seagrasses, or of aquatic macrophytes but also of the terrestrial plant communities living in the stressed environment of the islands and the shores and their role in this ecosystem are wanting. The detailed survey and studies on the plant resources of the islands and the lake surrounding, it is hoped, will give very important informations on the present status and monitoring the changes, if any, over time. These informations are required for proper planning of management towards sustainability of the ecosystem as a whole. Bandhyapadhy & Gopal (1991) suggested, “The biological and ecological diversity of this unique lagoon ecosystem need an in-depth study.” With this view, the present study on
'Ecological investigation on the plant resources of the lake Chilka, Orissa, India' was undertaken to provide basic data of these kinds.

1.1. Objectives:

The major objectives of the present study are:

1. Assessment of physico-chemical parameters and their seasonal changes;
2. Study of different aquatic plant communities, their taxonomy, distribution (spatial and temporal variation), interaction, role in food chain, rarity and threats;
3. Survey of floristic diversities of the islands and shores;
4. Correlation of physicochemical and biological parameters;
5. Evaluation of potential or actual uses of the plants in the total ecosystem, threats operating and the effects; and
6. Finally to identify the priorities for conservation and management.

1.2. Plan of work:

The work of the thesis is divided into the following parts.

1. Study of physico-chemical parameters:

This part deals with the seasonal collection and analysis of water samples from different sectors of the lake as well as/or from amongst different plant communities and polluted areas for (i) the study of water temperature, (ii) water salinity, (iii) transparency, (iv) dissolved oxygen, (v) pH; (vi) Nitrite, (vii) Nitrate, (viii) Phosphate (ix) Ammonium; and (x) Water depth. Secondary data include siltation, water current and tidal amplitude.

For the study of edaphic condition of the habitat, sediment/soil samples from different sectors of the lake are to be collected for estimation of the of silt, clay, sand, organic matter, nitrogen, phosphorus, potassium, pH and conductivity especially in different plant community zones.
2. Study of phytoplankton and seaweeds:

This part deals with seasonal collection of phytoplankton both qualitatively and quantitatively, periphyton on different aquatic macrophytes and seaweeds, their identification and distributional pattern depending on salinity, siltation, tidal effect in the different parts of the lake. Phytoplankton and algae are also to be collected from polluted and algal bloomed area.

3. Study of seagrasses:

This part deals with the seasonal collection of seagrasses, their identification, taxonomic description, phenology and distributional pattern in relation to different edaphic condition, water salinity, siltation and tidal effect of the lake. Biomass estimation of seagrasses in different sectors of the lake in different seasons is to be performed.

4. Study of aquatic macrophytes:

This part deals with the seasonal collection of aquatic macrophytes, their taxonomy, phenology, distributional patterns and concentration in regard to different soil pattern, water salinity, siltation, tidal effect and polluted condition. The special emphasis is to be given to the seasonal macrophytic growth in the Nalban Island, the Bird Sanctuary of the lake. Informations regarding the use and utilisation of aquatic macrophytes are to be collected from the local fisher folk as well as different literatures for the conservation and sustainable development of the lake.

5. Study of the vegetation and flora of islands:

This part deals with the seasonal collection, distribution and phenology of terrestrial plant from the island of the lake and its vicinity. The vegetation pattern of different islands is to be studied also. Available food crops and nesting facility of the avian fauna are also to be studied in the field and available published literature.

6. Threat and conservation:

This part deals with the investigation of the present threats to the Lake system and formulation of conservation strategies and ecological securities in consideration of different problems and environmental parameters of the lake.