CHAPTER - II

REVIEW OF LITERATURE

In Abroad:

At the global level, the significant works on physico-chemical characteristics of water have been carried out by Moyle (1946); Gaufin (1958); Talling and Talling (1965); Horton (1965); Mercer (1966); Wilber (1970); Hickel (1973); Young *et al.* (1973); Hem (1975); Hollis (1975); Lewis and Weibezahn (1976); Rai and Hill (1978); Adebisi (1981); Bass and Harlet (1981); Warren (1981); Wright (1982); Steinitz-Kannan *et al.* (1983); Fauris (1985); Sakai *et al.* (1986); Kunishi (1988); Steele (1989); Meybeck (1989); King and Ekeh (1990); Ayotamuno (1994); Dojlido *et al.* (1994); Bukit (1995); Somlyody *et al.* (1998); Stambuk (1999).

A number of scientists and researchers have extensively studied ecology and water quality of aquatic bodies and established principles of ecology (Odum 1971; O' Sullivan 1971; Reid and Wood 1976; Mortain and Baylay 1977; Fisher *et al.* 1982; Payne 1986; Kling 1988; Townsend 1989; Magurran 1991; Allan and Flecker, 1993; George 1997; Mackie 2001; Fytianos *et al.* 2002; Sood et al. 2008 and Jonathan *et al.* 2008).

Fonkou *et.al*. (2004) studied on macrophyte diversity in polluted and non-polluted wetlands in Cameroon. Katharina *et al.* (2001) showed the effects of macrophytes richness in wetland ecosystem functioning and services. Hu *et. al.* (2003) studied on advances in utilization of macrophytes in water pollution. Roton and Maltchik (2006) showed that environmental factors as predictors of aquatic macrophyte richness and composition in wetlands of Southern Brazil. Khan *et. al.*(1994) studied physico-chemical limnology of lake Kaptai, Bangladesh. Rose *et. al.* (1996) showed the effect of emergent macrophytes on dissolved oxygen dynamics in a prairie pothole wetland.

In recent past, various studies pertaining to assessment of the impact of pollutants on aquatic environment have been carried out by Ekholm *et al.* (2000); Williams et al. (2000); Bordalo *et al.* (2001); Izonfuo and Bariweni (2001); Jonnalagadda and Mhere (2001); Pronansky *et al.* (2002); Tsiouris *et al.* (2002); Daniel *et al.* (2002); Simeonov *et al.* (2003); Yu and Fang (2003); de Vlaming *et al.* (2004); Carrera *et al.* (2004); Hector Hernandez-Romero *et al.* (2004); Said *et al*. (2004); Debels *et al.* (2005); Djuikom *et al.* (2006); Fawell *et al.* (2006);Sanchez *et*

al. (2006); Kannel *et al.* (2007); Hasanzadeh (2008); Jassem and Raad (2008);Malakahmad *et al.* (2008); Zheng *et al.* (2008); Wang *et al.* (2008); Moiseenko *et al*. (2008); Chang (2008); Siyue *et al.* (2009); Bornette (2009) studied on ecology of macrophytes. *Koirala* and Jha studied on macrophytes of the lowland wetlands in Morang district of Nepal.

In India:

Earlier works on floral diversity in the Indian subcontinent were carried out by J. D. Hooker during 1872-1897.In India aquatic plants study literatures were contributed by Biswas and Calder (1936, revised in 1954),Mirashi (1954), Bhadri *et.al*.(1961), Subramanyam (1962), Chauhan (1971), Gupta (1979), Kachroo (1983), Srivastava (1987) and Singh (2006). Majumdar (1965) studied aquatic and semi aquatic flora of Calcutta and adjacent localities.

Rao (1971) studied the ecological study of the three freshwater ponds of Hyderabad, Kaul (1971) studied the production and ecology of some macrophytes of Kashmir lake, Gopal (1973) carried out a survey of Indian studies on ecology and production of wetland and shallow water communities, Thomas (1976) made some ecological survey of aquatic plants in Kerala. Literature on new taxa of certain hydrophytes from Kerala had been reported by Sivarajan (1976).

Chitranshi and Bilgrami (1986) studied comparative ecological studies of two ox-bow lakes of the river Burhi Gandak. Swarnalatha and Narasingarao (1998) studied the ecological studies of Banjora Lake with reference to water pollution. Prasad (1988) and Prasad *et. al*. (1996) studied the flora and wetland angiosperms of Keoladeo National Park. Ghosh *et. al*. (1993) investigated the phonological studies in aquatic macrophyte plants of Lower Gangentic Deltas of West Bengal. Parihar *et. al*. (2000) studied the macrophyte and plankton components of two contrasting wetlands in Midnapore district.

A number of studies and various physico-chemical and biological aspects of water of wetlands were done in all over the world including different parts of lndia. Important contributions were made by Hutchinson (1937), Gonzalves and Joshi (1946), Sarup (1961), Khan and Siddiqui (1970), Mahajan (1980), Singh *et. al*. (1982), Handoo and Kaul(1982), Kulshreshtha and Gopal (1982), Seshavathararn and

Chandramohan (1982), Vyas (1984), Khatri (1984) and Ramalingam and Jayaraman (1985). Munawar (1970) studied the limnological studies of freshwater ponds of Hyderabad, Puttaiah and Somashekhar (1987) studied the limnological studies on certain freshwater bodies of Mysore district of Karnataka, Upadhyay (1988) studied the physic-chemical characteristics of the Mahanadi estuarine ecosystem in East Coast of India, Sarwar and Wazir (1991) studied the physicochemical characteristics of freshwater ponds of Srinagar(Kashmir), Kumar *et. al* (2011) recorded an assessment of seasonal variation and water quality index of Sabarmati River and Kharicut canal at Ahmedabad.

Gujarat. Reid (1961) stated that solubility of oxygen in water is increased by lowering the temperature. Other important contributions include those by Sheshavatharam (1990) in Kolleru Lake, Andra Pradesh and Sheshavatharam *et.al*. (1990) in Lake Kodakaria near Visakapatnam. Goswami *et. al.* (2010) carried out investigation on studies on physic-chemical characteristics, macrophytic diversity, and their economic prospect in Rajmata Dighi of Cooch Behar district of West Bengal. Mishra and Yadav (1978) carried out a comparative study on physico-chemical characteristics of rivers and lakes in central India. Palit *et. al*. studied on water quality and macrophyte composition in wetlands of Bankura districts of West Bengal. Udayakumar and Ajithadoss (2010) studied on angiosperms and hydrophytes of five ephemeral lakes of Thiruvallur distict of Tamil Nadu. Mukhopadhyay and Dewanji (2005) showed in their paper the presence of tropical hydrophytes in relation to limnological parameters in two fresh water ponds in Kolkata. George *et. al*. (2013) studied on the influence of hydro-chemical parameters on phytoplankton distribution along Tapi estuarine area of Gulf of Khambhat. Prasad. *et. al*. (2002) studied on conservation of wetlands of India as a review. Ramachandran *et. al*. (2003) studied on conservation values of wetlands. Ghosh (2010) showed wetland macrophytes as toxic metal accumulators. Dhote (2009) studied on role of macrophytes in improving water quality of an aquatic eco-system. Goswami *et. al*.(2010) studied on the physico-chemical characteristics, macrophyte diversity and their economic prospect in Rajmata Dighi wetland in Cooch Behar district, West Bengal. Laishram and Dey (2014) reported on water quality status of Laktak lake in Manipur. Kaushik *et. al*. (1999) studied physico-chemical limnology of certain water bodies of Central India.

Sinha *et. al.* (2011) analysis of physic-chemical characteristics to study the water quality in Kalyani, W.B.

In Assam and North East:

Day (1981) estimated the presence of 1392 wetlands in the state of Assam. Nath *et al*. (1987) studied different wetlands of Barak Valley in Assam. Agarwala (1996) contributed on beel ecology. Lal and Bhattacharya (1989) reported a short term study on the pollution status of the Bharalu river. Significant work on Subansiri river ecosystem of North East India was carried out by Dutta *et.al*.(2010). Dutta *et.al*.(2010) investigated the pre impact studies of the 2000 MW Lower Subansiri Dam on certain aquatic environmental aspects of downstream of the river Subansiri with special reference to plankton and fishes. Dutta *et. al*. (2011) carried out an investigation on the influence of riparian flora on the river bank health of a Himalayan river before being regulated by a large dam in North East India. Ecological studies of wetlands of different parts of Assam were done by few workers including Verma (1971), Malakar (1995), Dutta (2005), Saikia (2007), Deka and Sarma (2014), Sarma and Borah (2014), Hazarika and Borthakur (2014).Borah and Sarma (2012) carried out the phytosociological investigation vis a vis human impact on two wetlands of Sonitpur district of Assam. More recently, Deka and Sarma (2014) carried out the present status of aquatic macrophytes of the wetlands of Nalbari district of Assam. The quantitative analysis of mycrophytes and physico-chemical properties of water of the two wetlands were also reported from the Nalbari district by Sarma and Deka (2014). Bhuyan (1970) studied the physico-chemical qualities of water of some ancient tanks in Sibsagar district of Assam. Acharjee *et.al*. (1990) carried out investigation on the role of physico-chemical parameters in the evaluation of productivity of Dighali beel of Nagaon district of Assam. Baruah *et. al*. (1997) investigated the study on the water quality of Elenga beel at Jagiroad in central Assam. Dutta *et. al.* (2010) studied a statistical overview of certain physic-chemical parameters. Lal and Bhattacharya (1989) reported a short term study on the pollution status of the Bharalu river. Das (2013) worked in diversity of aquatic and wetland angiospermic macrophytes in the Kamrup district of Assam. Hazarika *et. al*. (2014) worked on hydrophytic flora and its diversity in Nagaon district of Assam. Dewan and Saikia (2004) studied Kapla wetland complex in West Assam. Saikia (2013) made a

paper on aquatic macrophytes on the wetlands of Hojai sub-division in Assam. Kar and Barbhyan (2000) studied on macrophytes diversity in certain wetlands of Barak Valley region in Assam. Abujam *et. al*. (2011) reported the diversity of plankton in Maijan Beel of Upper Assam. Hussain *et. al.* (2011) observed physico-chemical characteristics of flood plain lake of Dhemaji in Upper Assam. Yadava (1987) studied the limnology and productivity on an ox-bow lake in Dhubri district of Assam. Yadava *et. al*. (1987) published works on Limnology and productivity of Dighali Beel of Assam. Kalita *et al.* (2006) studied the physico-chemical quality of Beel water of Marigaon district of Assam. Dutta (2005) presented ecological status of wetlands of Rudrasagar area in Sivasagar district of Assam. Paswan. *et. al*. (2012) studied certain physic- chemical parameters of Borsola Beel of Jorhat, Assam. Sarma and Biswas (2012) studied the bottom water quality and macrobethic community as bio-indicators in Joysagar tank.