CHAPTER II

REVIEW OF LITERATURE

2.1 Physico chemical parameter of water

The survival of aquatic organisms mainly depends on the physical and chemical properties of water. Further, the productivity and health of a water body rely on a tolerable range of physico-chemical property of water and hence, hydrological survey of various rivers, floodplain wetland, lakes has been a matter of attraction for different researchers.


There are also a good number of reports available on the hydrobiology and ecology of floodplain wetlands, riverine system and hill streams of NE India. Dey (1981) investigated on the hydrobiology of beels of Assam. Since then various workers (Kar, 1984; Goswami, 1985; Jhingran & Pathak, 1987; Acharjee, 1997)

### 2.2 Physico chemical parameter of soil

Different workers worked on soil characteristics of ponds, wetlands and rivers. Nath et al. (1994) studied correlation between fish production and physico-
chemical parameters of water and soil in semi-intensive carp culture ponds of West-Bengal. Neogy et al. (1994) studied on soil factors associated with productivity of fish ponds of red and lateritic zones. Deka & Baruah (2008) studied the physico-chemical characteristics of soil of Kapla beel, a freshwater wetland in Barpeta district, Assam to understand the role of soil in sustaining biodiversity and overall productivity of the wetland. Sarma (2013) reported soil characteristics of historic Joysagar tank.

2.3 Aquatic macrophyte

Macrophytes are an important component of an aquatic ecosystem and play a major role in primary productivity of the aquatic ecosystem (Nath, 2012). Aquatic macrophytes are generally used for environmental monitoring and water quality assessment. The relationship between aquatic macrophyte and water quality parameters attracted a lot of workers to study on it.

Dhote & Dixit (2007) conducted a study to evaluate the usefulness of different macrophytic species (Biofilters) in reducing the pollution level of water. Sharma (2008) reported macrophytic diversity and state of environment of three lakes of Jammu Province. Das et al. (2009) studied hydrophytes in some lentic water bodies in West Bengal. Goswami et al. (2010) reported macrophyte diversity from a wetland in Cooch Behar district. Thangadurai et al. (2012) conducted a study on aquatic macrophytes in Veeranam tank in Cuddalore district. Palit & Gupta (2012) studied the influence of physico-chemical attributes of water on macrophyte diversity associated with wetlands in Birbhum district, West Bengal. Palit &

2.4 Ichthyofauna

Fish are one of the most important biotic components of an aquatic ecosystem which are not only used as protein rich food source for human beings, but also act as a good bio indicators of a water body (Deori et al., 2015). In India, several workers worked on freshwater fish species of rivers and different water bodies.


Acharjee & Barat (2013) studied ichthyofaunal diversity of Teesta River in Darjeeling Himalaya of West Bengal. The study revealed that the river stretch sustained about 65 rheophilic, cold water fish species from 39 genera and 10
families with ornamental, food and sport value of which 11 species were ubiquitously found. Vyas & Vishwakarma (2013) made a study on ichthyofaunal diversity of Jammer River: a tributary of Narmada River. A total 27 fish species were recorded under four orders, nine families and 16 genera from this river. Jain et al. (2013) studied on ichthyofaunal diversity of Bilawali Tank in Indore. The observation revealed the occurrence of 21 species of ichthyofauna belonging to 16 genera, 3 orders and 9 families. Khanna et al. (2013) reported fish diversity and their limnological status of Ganga River system in foothills of Garhwal Himalaya, Uttarakhand. Mohan et al. (2013) studied on ichthyofaunal diversity of Chenani Hydroelectric Reservoir in Udhampur (J&K). Kumar & Singh (2013) investigated on the ichthyofauna of Kararia Lake of Motihari, Bihar. During the ichthyofaunal studies, the fishes collected from Kararia Lake were contributed by 33 species which belongs to 21 genera, 14 families under 9 orders. Out of these 33 species, family Cyprinidae was dominant of all with 11 species. Shukla & Singh (2013) reported distribution and diversity of freshwater fishes in Aami River, Gorakhpur. The results of the investigation revealed the occurrence of 18 fish species belonging to 6 orders, 11 family and 17 genera.

Pawara et al. (2014) reviewed on fresh water fish diversity of Maharashtra. The review reported 165 species belonging to 9 orders, 26 families and 82 genera of fishes. Sharma et al. (2014) studied on biodiversity and composition of ornamental fish fauna inhabiting in upper lake of Bhopal. A total of 56 species were recorded from the lake and out of which, 36 fish species were having ornamental values.
surveyed ornamental fish diversity across Brahmaputra Valley of Assam and altogether enlisted 81 species.

2.5 Diversity index

Diversity index is a statistical method which is planned to evaluate the variety of a data group consisting of different types of components. Features of a population such as number of existing species (richness), distribution of individuals equally (evenness) and total number of existing individuals underlie the basis of diversity indices (Wilhm & Dorris, 1966; Allan, 1975). Various workers around the world worked on biodiversity indices during last a few decades to quantify the diversity of individuals including richness measures, diversity indices, evenness indices and taxonomic distinctness (Peet, 1974; DeJong, 1975; Clarke & Warwick, 1998 and 2001).


2.6 Fishing gear

According to Reed et al. (1967), prehistoric fishing is known to have started with hooks and some nets. The early activities must have been limited to streams, riverbanks, creeks and close to shore water bodies. As there was a decrease in shore stock there, then arose the use of gears and crafts, but before the advent of these gears, fishing was carried out using crude methods such as forming barriers across water bodies and obstructing the flow of water, fishing extensively with baskets and weapons (Obande et al., 2010)

Various workers worked on fishing activities and methods of wetlands and rivers. Some of them are- Rahman et al. (1993), Dewan & Mazid (1994) and Alam et al. (1997). Alam et al. (2009) reported fishing gears, fish marketing and livelihood status of the poor fishermen around the Basantapur beel at Lalpur Upazila. Sharma (2001) studied traditional fishing methods and fishing gears of Assam while Bhattacharjya et al. (2004) studied fishing crafts and gear of north eastern India. They have documented various types of fishing crafts and gears operated in that area. Gurumayum & Choudhury (2009) documented fishing methods in the rivers of Northeast India. Barua et al. (2010) carried out work on fish trapping devices in the Brahmaputra Valley of North Eastern India while Pravin et
al. (2011) reviewed fish trapping devices and methods in Assam. Bania (2011) recorded different types of fishing traps and gears used by the fishermen of Dibru Saikhowa National Park. Dutta et al. (2012) investigated on traditional gears used for capturing and preservation of fish by Mishing community of northern bank of the Brahmaputra River. In their study, 32 gears were recorded among which, the most common were Kawai Langi (gill nets), Tongi Jal (lift nets), Jakoi, Borchalani, Juluki (bamboo traps) and Danari Barashi (fishing line). Baruah et al. (2013) recorded traditional fish trapping devices and methods in the Brahmaputra valley of Assam. The identified fish traps were classified into 28 different types of 5 major categories based on the principle of capture, design and operational methods. Chakravartty & Sharma (2013) recorded different types of fishing gears used by the fishermen in Nalbari District of Assam. The survey of the fishing gears and their method of operation in Nalbari district had revealed that 36 types of fishing gears were in vogue in commercial use which belongs to several categories. Islam et al. (2013) studied fish diversity and fishing gears used in the Kulsi River of Assam. They had recorded five different types of fishing gears from the river.

Kumar & Kumar (2013) studied fishing craft and gears in Dhaura Reservoir, Uttarakhand. During the investigation, one craft and four different kinds of gears were observed in the reservoir. The craft was a wooden boat while the gears were Gill net, Cast net, Scoop net and Hook and Line. Das & Barat (2014) studied fishing gears operated in lentic and lotic water bodies of Cooch Behar district. About 22 different types of fishing gears were documented from Cooch Behar district.
Laxmappa & Bakshi (2014) reported types of fishing gears operating and their impact on Krishna River. During that study, five different types of nets and gears were recorded.

2.7 Cage culture