I Introduction

Water is said as liquid of life and it is the essence of all living processes. Water is universal solvent as it dissolves more substances than any other liquid without undergoing any chemical change. Thus water; the unique component of nature has played an important role in the life from molecules to man, hence since the time unmemorable the great human civilization has originated, evolved and flourished around water resources. Water covers about 70% of the earth’s surface but only 2.7% of the total water is fresh water, of which 1% is ice free water in the rivers, lakes, and atmosphere and as biological water. It has been estimated that only 0.00192% of the total water on the earth is available for human consumption (Trivedi 1998).

Water is most vital resource for all kinds of life on this planet and is adversely affected by human activities on land, in air and also in sea due to increasing industrialization, urbanization and rapid development. Today most of the river of world received millions of liters of sewage, domestic sewage, industrial and agricultural effluents. Regular drinking water monitoring not only prevents disease and hazards but also checks the water resources from being further polluted.

Presence of total dissolved solids, turbidity, conductivity and pH are significant parameters to study water quality. Higher conductivity is harmful for irrigation purpose. Level of specific conductivity depends on input of large amount of salts. Turbidity in water caused by the suspended matter such as clay, slt, finally divided into organic & inorganic matter. Turbidity and water transparency play a crucial role in determining fish community. The lower layer of being in close contact with the decaying organic matter suffers from
oxygen depletion, causing the death of fishes (Sarla Devi 1997). Dissolved solids denote the various types of minerals present in water. The high content of TDS elevates the density of water organisms. The concentration of TDS is higher in summer and rainy season, while the minimum values found in winter because of stagnation (Ansari, 1993). The excess amount of TDS in case osmotic pressure which results into imbalance of osmotic regulation and finally results in suffocation in river water (Verna et. Al., 78)

The pH indicates hydrogen ion concentration. pH is used in several calculations in analytical work and its adjustment is necessary for some analytical procedures. Most of the plant and animal species can survive in a narrow range of pH from slightly acidic or slightly alkaline conditions. Drastic change in pH adversely affects them. Few plants and animals are adapted to highly acidic or highly alkaline waters and hence pH of water is important for the biotic community. Minor fluctuations of pH of water are not much of the health problems. pH values below 4 & above 8.5 produce sour taste and alkaline taste respectively. Higher pH values increase the scale formation and reduce the germicidal potential of Chlorine. A pH lower than 6 may cause corrosion of water carrying pipes and add toxic metals in dissolved form.

Water being universal solvent has been and is being utilized by man kind time and now. Of the total amount of global water, only 2.4 % is distributed on the main land, of which only a small portion can be utilized as fresh water. The available fresh water to man hardly 0.3 – 0.5 % of the total water available on the earth and therefore, its judicious use is imperative (Ganesh and Kale, 1995). The fresh water is finite and limited resource (Bower, 2000). Contamination of these fresh bodies might lead to a change in their
tropic status and render them unsuitable for aquaculture and drinking purposes. Several Physico-chemical or biological factors could act as stressors and adversely affect fish growth & reproduction. (Iwama et al 2000). Hence regular monitoring of Physico-chemical parameters is essential to determine status of water with reference to drinking purpose.

The major inputs of Phosphates into an aquatic ecosystem come from the domestic sewage, detergents, residual fertilizer rich agriculture run off and industrial wastes. Most of the inorganic phosphorous comes from the metabolic breakdown of proteins and phosphates in the urine. All phosphorous containing compounds yield inorganic phosphate after decomposition. The surface water can have significant phosphorous concentrations contributed by soil erosion and wastewater discharges. Wetzel (1983) concluded that phosphorous was the most important limiting factor responsible for eutrophication of Water all over the world.

Numerous anthropogenic activities like disposal of sewage & industrial water, recreational activities, excesses fertilization of lands and use of pesticides has threatened environment health of both surface and ground water. In addition to this, due to the uneven distribution of fresh water on earth, due to development thrust of man and due to difference in the per capita availability of water, the water has become scarce natural resources and national wealth. Water pollution now a day is considered not only in terms of publics’ health but also in terms of its conservation, aesthetics and preservation of natural beauty and resources. Water pollution has however threatened to reduce the quantity available in ponds, lakes, rivers and reservoirs due to disposal of sewage, industrial waste and due to other human activities (Trivedi and Chandrasekhar,
Population explosion, industrialization, urbanization and development thrust of man have created these problems of water pollution. According to different surveys, 70 to 80 percent of the Indian water sources are polluted and different enteric diseases affect millions of the people every year. United Nations Organization report has indicated that mortality of world population lack reliable sources of drinking water. Hence, now-a-day raw water from the water body is being analyzed for its utility like drinking, aquaculture, industrial and irrigation purpose.

India has rich fresh water resources in the form of rivers, lakes and rivulets. From all the resources in India, the total available fresh water is estimated to be 1900 billion cubic meters per year. About 80% of this water is lost as surface run-off. The surface flow represents 97% of the available water. The water-spread area of reservoirs and tanks is about 3 million hectares; whereas lakes and ponds of India measures more than 1.5 million hectares. In India there are about 1,17000 small and large natural and manmade fresh water bodies (Ann. India, 1983). Every year there is an addition in the total water supply tanks, city water supply tanks, irrigation tanks, flood control reservoirs etc. Shrivastava et. al (1983) and Jain (1948) reported the approximately estimate of cultural water spread area as 2.3 million hectares in India.

Most of the small water bodies are located in the vicinity of temples and mosques like religious places. Most of the “Yatras” and “Melas” are celebrated near these lakes. The day-to-day maintenance of these reservoirs is neglected. These activities cause pollution of these holy water bodies. Water is precious and therefore it is duty of each and every individual on the earth to conserve all the available water.
It is due to negligence of man many ground water and surface water sources get contaminated. Ultimately the contamination of water lead to many hazards situations and many times it becomes harmful to the large community. The contaminated water is dangerous to aquatic flora and fauna and to the precious vegetation grown on such water.

The contaminated water bodies have been polluted largely due to contaminations of microbes, human and animal wastes with its pathogens collecting during its course-up reservoirs. Information on species diversity, richness evenness and dominance species evaluation on the biological component of the eco-system is essential to understand detrimental changes in environment or deterioration of water quality (Krishnamoorty and Subramaniam 1999). Biological contamination is a basic measure of community structure and organization and the most important parameter to understand the health status of the ecosystem. The biological diversity index gives us a measure of the way on which individuals in a community are distributed.

Some lakes die because of lack of oxygen. In a normal lake, the amount of dissolved oxygen in the water varies little with depth. In eutrophic lake oxygen count varies from sufficient at the surface to very low at the bottom. The population pressure and activities near lake like bathing and cloth washing contribute substantially in reduction of the oxygen level of the lakes. The surface area run-off increases the volume of nitrates and phosphates flowing in to the lake water, which stimulate weed growth.

Thus, the increasing pace of developmental activities and extensive use of water resources are subjecting the quality and hydrobiology of fresh water resources (Mishra and Trivedi, 1993). These activities not only influences the
micro fauna of fresh water but also favor the development of variety of undesirable new fauna, rendering the water unfit for human consumption. This increase in the nutrient status is termed as “Eutrophication”, which makes the water body unfit for most of use.

Water is one of the prime necessities of life. We can hardly live for a few days without water. Generally water contains iron, calcium, Manganese, silica, fluoride, nitrite, phosphate, Sulphates and chlorides. When the quantity of these rises, then it affects the body systems and cause destructions of health. Arsenic salts can create cancer, cadmium affects kidney while Barium carbonate has bad effects on veins etc.

The study of freshwaters in all their aspects physical, chemical, geological and biological is termed as Limnology (Odom 1971). Or limnology is the study of freshwater or saline water, which are contained within continental boundaries (Goldman and Horn 1983). Limnology is also described as “Hydrobiology or aquatic biology”. According to Edgar do Baldi a prominent Italian ecologist Limnology is the science dealing with internal action of processes and methods where by matter and energy are transformed within the lake or pond. Welch (1952) stated it as the science dealing with biological productivity of waters together with all the casual influences on the qualitative and quantitative features along with its actual potential aspects. Wetzel (1975) defined limnology as “Study of the functional relationship and productivity of freshwater biotic environmental factors.”

Although limnological observation has a long history, they only evolved into distinct discipline during last two centuries. For the first definition of limnology one will owe to Forel (1892), a Swiss Professor, who has been called
the father of limnology. His pioneer investigations were focused on Le Leman (Lake Geneva). He published three volumes on Lake Geneva in 1892, 1895 and 1904. In the first 40 years of the 19th century Birge and Juday worked on will consign lake to become the first American limnologists. Thienemann and Naumann formed the International Association of limnology in 1992. Some important literature appeared in many languages, such as Macan and Worthington (1951) Treatise on limnology by Hutchinson (1957, 1967 and 1975) Rcid (1962) on tropical limnology by Beadle (1974), Wetzel (1975) and Cole (1983).

About 1500 year ago development had proceeded so far that an Aryan civilization in the Dry zone of Srilanka relied on extensive exploitation of the stream of the low lands. The construction of system of reservoirs or lake and channels started in the second century A. D. and reached a high technical level in the fourth century. Gradually much of low land of Srilanka was placed under well-planned scheme of water utilization. In India also damming streams in ancient times were mainly used for irrigation and drinking water supply.

Man’s impact on nature is growing exponentially under the pressure of ever-larger technical projects. The stream and rivers are part of those natural systems, which produce easily exploitable energy much appreciated for being clean and easy to handle compared to other forms and less disastrous to the ecosystem.

Therefore, the exploitation of streams will go on increasing in spite of the fact that greater part of the world, majoritily, the economically exploitable running waters are already regulated or under construction for small and large scale irrigation project.
According to Water Frame Work Directive (WFD), some characteristics suggested for different type of lakes are, for each lake type reference conditions must be established, as far as possible, undisturbed conditions and including biological as well as hydro morphological and physico-chemical baselines. The purpose is to identify reference biological communities against which other communities will be compared (Heinonen et al. 2001).

WFD gives standard definition for the classification of lakes into different ecological quality classes, such as high, good and moderate status. The ecological status of lake is based on its level of deviation from the reference biological population (which corresponds to high status) and includes phytoplankton, Macrophytes, phytobenthos, benthic invertebrate and fish data.

Man has tried to cope up with this scenario and has rapidly advanced its efforts to counteract this Malady. In past few decades natural and polluted waters have been studied in detail all over the world and considerable data are now available on most kind of pollutants and their effects on ecosystem as well as on organisms. A large number of parameters signifying the quality of waters in various uses have been proposed. A regular monitoring of some of them not only prevents the hazards but also checks the water resources from going further polluted.

Several researches from abroad have made contribution on hydrobiology on large natural lake and man made reservoirs of north America, Canada and Europe in temperate climatic conditions.

Some workers from abroad who have studied various aspects of the hydro biological conditions in fresh water are Juday et al (1932) Ricken (1937) Brett (1950) Smith (1952, 1961) wright (1954) Hutchinson (1957) weiss and


The primary productivity of the phytoplankton is one of the most important sources of energy input in aquatic ecosystem. This productivity is greatly dependent on the nutrient status of the aquatic body in relation with other physico chemical parameters. The process that contribute to Primary

In order to utilize a freshwater body it is very important to study the biotic and abiotic factor influencing the biological productivity of said water body. Research in this field is not doubt of indirect assistance but it will serve as a guideline to maximize the use of the productivity of water.

Such investigation estimate the productivity of any water body involves mapping the shape and depth of the water body observation on the physical factor like temperature, turbidity, transparency, color of water. Chemical factor like $\text{pH}$, Dissolved oxygen, free carbon dioxide, hardness of water. In Biological investigating study of micro and macro flora and fauna always provides the clear picture of the ecological relationship existing in water body.

Planktonic organisms play a vital role in aquatic environment, they form an important link in the food chain and are capable of affecting the entire aquatic life. Information with regard to the freshwater planktonic organisms is scanty in India. Even the basic aspects of the knowledge of freshwater plankton is very limited and detailed study on their biological and ecological relations are required. However the prominent contribution to the freshwater plankton in India were made by Allikunhi (1952) Arora (1931, 1966) Bhowmic (1968), Chacko and Krishnamoorthy (1954) Chocko and Sreenivsan (1955)

Among the planktonic communities, zooplankton occupies the key position in the food chain of Lake it determine the types (grazing or detritus). Therefore, interactions between zoo and phytoplankton are a central topic in plankton ecology. Zooplanktons are the microscopic free-swimming animalcule components of an aquatic ecosystem, which are primary consumers of Phytoplanktons. Zooplanktons provide the main food item of fishes and can be used as indicators of the tropic phase of water body (Mathew, 1975). Verma and Datta Munshi, (1987). Zooplanktons play and integral role in transferring energy to the consumers, hence they form the next higher tropic level in the energy flow after phytoplankton. Therefore, in view of importance in studies related to their distribution zooplanktons have attracted the attention of several workers throughout the world.

The diversity of the zooplanktons in reservoirs is controlled by several physico-chemical factors of water. The pattern of algal distribution and its density is the main biological factor affecting the diversity of the zooplanktons.
Temperature, dissolved oxygen (DO) and organic matter are the important factors which control the growth of zooplankton (Hanaazato and Yasuno 1985, Bhati and Rana 1987, Takamura et. Al 1989). Several researches have used the different zooplankton groups to evaluate the tropic status and pollution potential of the freshwater bodies all over the world. Zooplanktons are also used as biological indicators of eutrophication.

Phytoplankton plays a very important role in regulating the dynamics of the aquatic food web and become a driving force in shaping the community structure of zooplankton (Xie et.al 1998).

Eutrophication is a global phenomenon associated with nutrient enrichment of aquatic ecosystems. In natural course it is slow process of lake ageing which ultimately lead to succession. However, man is responsible for accelerating the process many folds endangering the survival of water bodies all over the world. The Nutrients like Nitrates, Phosphates, Sulphate, Chloride and silicates are contributed to the process of eutrophication. In developing countries sewage pollution from rapid urbanization is a major environmental issue today. The lack of proper sewage treatment and disposal are the two factors responsible for gross pollution of ecosystems, particularly in urban environment.

Nutrient enrichment directly affects the water quality and lead to a number of consequences indicative of imbalance in the ecosystem.

The first and most visible symptom of nutrient enrichment is prolific growth of algal communities (Primary Producers) producing mono or polyspecific blooms. The main groups of hypertrophic phytoplanktons are Cyanoceac Chlorophyceac Crytophyceae, and Euglenophyceae. Comparatively
diatoms attain biomass lower than the preceding groups. Other groups like desinids occur in an oligotrophic system. Dianoflagellates, chrysophyceae and xanthophyceae are either absent or present in very low number in hypertrophic lakes.

Blue green algal blooming is a global phenomenon and a lot of efforts at theoretical and practical levels are going on the evolving effective strategies for its control. Environmentally the algal blooms are highly detrimental to ecosystem; they adversely affect water quality, disrupt nutrient and energy cycles, alter trophic states, reduce biodiversity and are responsible for fish kills. Thus, water forming algal blooms is totally useless for aquaculture, and use in domestic, industrial and irrigation sectors; theoretically algal targeting the measures at life histories, environmental requirements and ecological responses of the problematic species can control blooms.

Aquatic weeds referred to, as Macrophytes constitute an important component of an aquatic ecosystem. They provide support, shelter and oxygen to other organism and play an important role in biological production. Their diversity and biomass influence primary productivity and complexities of trophic states (Singh, 1991, Verghese 1992)


Normally well-balanced ecosystem maintains fairly constant biogeochemical and energy cycles, trophic states and biodiversity. However, in balance as a result of pollution more tolerant fast breeding and hardy one replace one set of sensitive species. Biodiversity is markedly reduced and
succession sets in. fishes occupy high position in the food chain, Moderate cooler Climate, high degree of precipitation and tropical ecosystem in lake sustain significant piscine fauna.

**The principal objectives of the present Study are-**

1) Evaluate the quality of surface water during different seasons of the year.

2) Detection of any sign of deterioration in water quality.

3) Identification in the chemical and biological aspects.

4) Establishing pattern in variation of water quality, if there are any.

5) Recognize microbial pollution if any.

6) Establish pattern if any in over all conservation of ecosystem.