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Ponds and reservoirs constitute an integral part of both rural and urban community in respect of providing drinking water source and fish culture. However, due to unplanned urbanization, population expansion and increase in density and over exploitation for various purposes, these important aquatic resources are under severe stress leading to deterioration of water quality and depletion of aquatic biota. In rural areas, the ponds are relatively free from human interference, harbor sizable diverse plankton species and maintain water quality, as compared to the ponds of urban areas which are subjected to excessive human activities, pollution and water quality
degradation. The water quality assessment is usually done either by monitoring the physico-chemical properties of water or by analysing inhabiting biota including bacteria, diatoms, phytoplankton, zooplankton, macroinvertebrates and aquatic vertebrates.

Now a days, with ever increasing demand of water, there is a look out for efficient water resources assessment with whatever limited hydrological data that is available. WADI is a software consisting of programs written in BASIC. The programs are used to conduct analysis of water, balance of the natural lakes, design criteria for small dams, hydrograph analysis, field tracings of floods, mean annual runoff and its distribution etc (Vijaykumar and Balek, 1997).

Water is essential to sustain life and a satisfactory supply must be made available to the community. Protection of water from any contamination is the first line of defence against infection and disease. Source protection is almost invariably the best method of ensuring safe drinking water and is tobe preferred to treat a contaminated water supply to render it suitable for consumption (WHO, 1993). Protection and management of water bodies have been recognised as a priority sector all over the world, since the quality of potable water is directly related to public health.

Further, water quality index has been considered as one of the most effective ways to communicate information on water
quality trends to policy makers and the general public (Tiwari and Mishra, 1985). It gives an exact idea on the extent of pollution and current qualitative status of the water body.

Biotic interactions and density dependent processes are particularly important in the pelagic zone of a lake. Plankton has numerous properties (e.g. short life cycles, size, structure etc.) that make them suitable objects for testing hypothesis and developing concept relevant for general ecology. Zooplankton being in the centre of aquatic food webs and influenced strongly by both bottom-up and top-down processes, have often been used as models for ecological paradigms. The trophic-dynamic concept, the theory of population dynamics, and the analysis of predator prey relationship are examples of successful contribution of zooplankton research.

Protozoa are the most abundant phagotrophs in the biosphere, but no scientific strategy has emerged that might allow accurate definition of the dimensions of protozoan diversity on a global scale. Recently, Finalay and Esteban (1998) have began this task by searching for the common ground between taxonomy and ecology.

The primary interpretive paradigm used to study lakes is their trophic status. The term eutrophication refers to a change in status of a lake. In their natural state, lakes exhibit different degrees of trophic status ranging from the unproductive oligotrophic type through mesotrophic to the highly productive eutrophic type. The
strong empirical relationship between nutrient loading and productivity is a valuable tool for research and management of lakes (Williamson et al. 1999). During the last two or three decades many lakes in developed countries of the world have shown signs of an increasing rate of enrichment or eutrophication. Some lakes, which are under purely natural conditions were categorized as oligotrophic, have reached a stage of high productivity. These changes, brought about by man's influence, are mainly due to an excessive input of plant nutrients.

Agriculture and urban activities are major sources of phosphorous and nitrogen to aquatic ecosystems. Atmospheric deposition further contributes as a source of nitrogen. These nonpoint inputs of nutrients are difficult to measure and regulate because they derive from activities dispersed over wide areas of land and are variable in time due to effects of weather. In aquatic ecosystems, these nutrients cause diverse problems such as toxic algal blooms, loss of oxygen, fish kills, loss of biodiversity and other problems. Nutrient enrichment seriously degrades aquatic ecosystems and impairs the use of water for drinking, industry, agriculture and recreation (Carpenter et al. 1998). In one review article, Carpenter et al. (1998) stated that (1) eutrophication is a widespread problem in rivers, lakes, estuaries, and coastal oceans, caused by over-enrichment with P and N; (2) nonpoint pollution, a major source of P and N to surface waters of the United States, results primarily from agriculture and urban activity, including industry; (3) inputs of P and N to
agriculture in the form of fertilizers exceed outputs in produce in the United States and many other nations; (4) nutrient flow to aquatic ecosystems are directly related to animal stocking densities, and under high live stock densities, manure production exceeds the needs of crops to which the manure is applied; (5) excess fertilization and manure production cause a P surplus to accumulate in soil, some of which is transported to aquatic ecosystems; and (6) excess fertilization and manure utilization on agricultural lands creates surplus N, which is mobile in many soils and often leaches to downstream aquatic ecosystems, and which can also volatilize to the atmosphere, redepositing elsewhere and eventually reaching aquatic ecosystems. If current practices continue, nonpoint pollution of surface water is virtually certain to increase in the future. Such an outcome is not inevitable, however, because a number of technologies land use practices, and conservation measures are capable of decreasing the flow of nonpoint P and N into surface waters. They were also of the opinion that (1) nonpoint pollution of surface waters with P and N could be reduced by reducing surplus nutrients flow in agricultural system and processes, reducing agricultural and urban runoff by diverse methods, and reducing N emissions from fossil fuel burning; and (2) eutrophication can be reversed by decreasing input rates of P and N to aquatic ecosystems, but rates of recovery are highly variable among water bodies. Often, the eutrophic state is persistent, and recovery is slow.

✔The primary productivity is one of the most important
sources of energy input in freshwater ecosystem. This productivity is greatly dependent on the nutrient status of the aquatic body in relation with other physico-chemical parameters. The processes that contribute to primary productivity exhibit complex environmental relationships, where radiative energy is converted to chemical energy with the help of other physico-chemical parameters by the autotrophs through photosynthesis. Thus measurement of the amount and rate of energy fixation is based on the evolution of photosynthetic oxygen.

Zalidis et al. (1997) studied the environmental impacts on Greek wetlands and found the following factors most frequently affected the Greek wetlands: (a) Construction of irrigation schemes and diversion of water courses causing changes in water regime; (b) Overpumping, land clearing and illegal hunting, causing depletion of natural resources; (c) Agricultural and municipal pollution, causing changes in water quality and establishment of housing facilities and expansion of agriculture, causing loss of wetland area.

Herbivorous zooplankton occupies the key position in the food chain of lakes determining its type (grazing or detrital). 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 trophic phase of a water body (Mathew, 1975; Verma and Data Munshi, 1987). Zooplanktons play an integral role in transferring energy to the consumers, hence they form the next higher trophic level in the energy flow after phytoplanktons. Therefore, in view of importance in studies related to their distribution, ecological requirement and mode of reproduction, zooplanktons have attracted the attention of several workers throughout the world.

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

Changes in both zooplankton community structure and zooplanktivorous predators often accompany the anthropogenic acidification of lakes (Williamson et al., 1999).

Rotifers are especially suited for an analysis of habitat
relations because this group contains such a high number of species, inhabiting diverse environments (Pejler, 1995). Furthermore, rotifers are to a large extent cosmopolitan, implying that ecological barriers, rather than geographical, are decisive of their distribution.

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).

Reaves and Croteny-Hartman (1994) have explained the wetlands and their importance as below -

Wetland Biology typically is hydrologically driven. The hydrology of created and restored wetlands frequently differs from that of natural systems, and the resulting floral and faunal composition of the wetland may also differ. In general, restored wetlands are more similar to natural wetlands than are created wetlands, and the biota of restored wetlands will more closely resemble that of natural wetlands. Created wetlands vary greatly from natural wetlands in both the hydroperiod and the quality of the water moving through them. Consequently, created wetlands are often biologically quite distinct from natural wetlands. Substantial efforts to restore wetlands throughout the United States have been taking place since the mid 1980s. The goals of wetlands restoration are to 1) Improve water quality 2) Control stormwater, and 3) Provide habitat for a variety of plants and animals. Numerous species of plants and animals,
including many endangered or threatened species, are dependent upon wetland habitats. Following restoration of the hydrologic regime, native aquatic plants return to restored wetlands within one year. As the water regime and plants cover become established, the wetlands are colonized by a variety of animals, including aquatic invertebrates. Use of the wetland system by wildlife is directly related to the size of the wetland, but distance between wetlands may affect the occurrence of taxa that have restricted dispersal ability. Unlike most natural wetlands, artificially created wetlands may have constant water regime that can influence the floral composition of the system. Wetland plants that need periods of draw down are often eliminated with time. The biology of wetlands created for wastewater treatment is also greatly influenced by influent water quality. Wastewater often contains high levels of organics and ions that stress both the plants and the animals. If the system is used for the primary or secondary treatment of wastewater, the invertebrate assemblage will shift to pollution tolerant species. Even created wetlands utilized for tertiary wastewater treatment may be subjected to water of lower quality than natural wetlands, and they may experience a lesser shift toward pollution-tolerant species. However, increased nutrient inputs can lead to greater productivity in wastewater treatment wetlands than is found in comparable natural wetlands. Wildlife and avian use of constructed wetlands are directly related to the size of the facility. Large systems attract a greater diversity of birds. These treatment systems may provide major bird-watching areas for the people they serve. Large waste treatment wetlands also harbor significant numbers
of amphibians, reptiles, and wetlands utilizing mammals. Small wetlands that serve only a single family farm will be utilized less by wildlife but, can still provide usable habitat. Thus, wetlands as complex systems present hierarchy of functions, regulatory mechanisms and feedback systems.

Amravati University is probably the only nonagricultural University in India which has constructed its own water reservoir to meet the daily needs of water throughout the year. The percolated water from the reservoir has increased the water level of most of the wells in the campus. However, once the water body is established, it forms a definite ecosystem. The natural energy flow in it, alters the physico-chemical and biodiversity conditions. The increased human activities and beneficiaries create negative impact on it. With this view, it was proposed to investigate the present status of the newly constructed Amravati University Reservoir No. 1 along with other sources of water in the campus.

The problem was investigated by considering the following aspects.

1) Physico-chemical analysis of water from Amravati University Reservoir No. 1

2) Zooplankton biodiversity in Amravati University Reservoir No. 1
3) Studies on macroinvertebrates and avian fauna of the reservoir.

4) Phytoplankton biodiversity in Amravati University Reservoir No. 1

5) Physico-chemical analysis of water from Kolhapuri Bandh and five other wells from Amravati University Campus.