Chapter 8
Prediction of Fish Availability Using Regression Analysis in Vembanad Lake

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ABSTRACT

Fish diversity is correlated with the biotic and abiotic factors in the aquatic environment. Fish samples from the Vembanad lake were collected for three consecutive years. Sodium, Potassium, Magnesium, Manganese, Copper, Iron, Calcium, Dissolved Oxygen, BOD, pH, salinity, and temperature in the water samples were analyzed using APHA (1998). Fish diversity was analyzed using diversity indices such as Berger Parker index, Shannon Weiner index, Simpson Index, Hills number

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and Margalef's index. Pearson's correlation coefficient was using to find out correlation among variables. Regression analysis have been shown that temperature is the most predictable variable for the fish diversity in Vembanad ecosystem.

INTRODUCTION

There are many environmental factors that influence a species to exist in its surrounding environment. A variety of living organisms like animals, plants, microorganisms and fungi inhabited on earth refers to biodiversity. The living beings on the earth interact with each other for natural resources and these interactions are essential for the protection and stabilization of the ecosystem. The existence of life and its diversity is an exceptional feature of earth. Researches showed that there are about 15000 of new species are being discovered in every year (Henneberg & Schofield, 2008). The countries which accommodate the greatest number of the earth's species are known as mega diversity countries, and India ranks among the seventeen-mega diversity regions of the world.

The dimensions of biodiversity include genetic diversity, species diversity and ecological diversity. In the genetic level diversity, a single species shows genetic level variation among individuals. Species diversity shows number of species in diverse ecosystems. Diversity at ecosystem level is the ecological diversity, where different ecosystems have different types of diversity. Ponds, rivers, estuaries, coral reefs are some examples of different types of ecosystems.The loss of biodiversity extremely affects the functioning of ecosystem and consequently affects the whole society (Vellend & Geber, 2005). Biodiversity has ecological, cultural, aesthetic, economical and scientific role in an ecosystem. Ecosystem productivity and ecosystem stability have significant effects on biodiversity. The biodiversity of an ecosystem is directly proportional to the ecosystem productivity. Since the ecosystem is resilient, it is able to restore the destructed part of an ecosystem after a particular time (Haines-Young et al., 2010).

There are various factors like climate change, habitat loss, over exploitation, invasive alien species and pollution that harmfully affects the stability of biodiversity. Aquatic pollution is one of the biggest issue facing India, in which nutrients containing nitrogen and phosphorus are major cause of aquatic pollution. Studies on water pollution are based on the physico-chemical characteristics of the aquatic ecosystem (Okorondu et al., 2022).

The physio-chemical parameters considered for study are temperature, pH, colour, turbidity, odor, Total Dissolved Solids (TDS), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Dissolved Oxygen (DO), hardness, salinity, alkalinity, electrical conductivity, etc. Drastic changes in the physico-chemical