Biological studies

Algal ecology, Zooplankton ecology, Benthos ecology .

Achievements project

Results obtained so far indicate that water quality in Lake Victoria has deteriorated with a decrease in fish species diversity over the past thirty years. These changes are due to nutrient enrichment and species introductions and perhaps regional climate change. The fisheries of lakes Victoria and Kyoga are unstable and unsustainable

Algae, anoxia, fish kills

Water problems include growth of the algae to the point where the water environment is very green and harmed. What happens is that the algae grow in large numbers, and when they die they use up oxygen as they rot. Fish must have enough oxygen to survive (breathe). Rotting algae can use all the oxygen in certain parts of the lake which results in fish kills seen frequently especially in lakes Victoria and George. Fish movements in search for areas with adequate oxygen are frequent and a problem to fishermen looking for the fish. Fish been has been found to redistribute themselves in response to changes in the water environment especially anoxia. Fish stocks and composition are largely governed by oxygen levels and food availability.

Reduction in herbivore

The excess biomass can be due to inefficient harvests by the insects (macro-invertebrates) and fish whose composition is quite changed especially in Lake Victoria. Big zooplankton have started to re-appear in Lake Victoria suggesting a reduced grazing pressure.

Light reduction

This light absorption increases the water temperature in Lake Victoria which has negative effects on water quality and life in the water. Yet, the water quality is important to people through fish and through direct use of water resources.

LAKE PRODUCTIVITY PROJECT

NATIONAL AGRICULTURE RESEARCH ORGANISATION

FISHERIES RESEARCH INSTITUTE

1995

Introduction

Lake Productivity Project examines how the water environment controls fish production. In order for fish to grow they need food. Different kinds of fish eat different foods. For example, some fish eat other fish, some fish eat small insects (Zooplankton and Benthos) in the water, and some fish eat plants (algae) that grow in the water. These foods for fish also need food themselves. If the water environment is not healthy, then these plants and animals that fish eat will grow poorly. That means the fish will suffer and die, and in turn there will be fewer fish for people to eat.

What is in the water environment

The water environment includes large fish, small fish, insects, snails, large plants near the shore, and small plants called algae that you cannot see with the naked eye. These algae are the primary source of food for animals that live in the water. The study of all of these organisms and the water that they live in is called limnology.

Why lake productivity research

Management of lakes is necessary to ensure good water quality for increased and sustainable fish production. The reason for our research is to understand what controls the amount of food that is available for the fish. To feed our families we must ensure that there are enough fish both today and in the future. To ensure this continuing fish production, we must protect the water environment.
To achieve this the Lake Productivity Project undertakes a whole ecosystem research examining changes in the lake productivity mechanisms in Lakes Victoria and Kyoga following introduction of the exotics.
Comparative data is collected from Lake Albert, the original habitat of the introduced fish species.

The limnology component studies the insects (zooplankton & benthos), small water plants (algae) and the water itself (physical and chemical variables) impacts on production. The goal is to optimise fish productions and to protect and save the fisheries of Uganda for future generations. It is hoped that this Project will contribute to Pollution Control Strategy that will be developed to solve water pollution problem.

Broad objectives

Determine nutrient sources and quantities especially phosphorus that might be causing pollution /eutrophication in Lake Victoria.

Determine the extend and spread of anoxia in relation to fish production in Lake Victoria and evaluate the causes of the fish kill that are now common in some Ugandan lakes.

Determine the causes of the biological inefficiencies through changes in algal biomass, productivity, as well as dynamics of major zooplankton and invertebrates groups and fish.

Parameters being measured

Physical parameters

Lake depth at sites, location and sites (latitude, longitude, and altitude, Water temperatures, Secchi transparency, Solar radiation (in air and water), Wind speed and direction, Rain quality and quantity

Chemical parameters

Dissolved Oxygen, Gaseous Carbon dioxide, Alkalinity, Phosphorus (SRP, TDP, TP), Nitrogen (Ammonia, Nitrites, Nitrates), Lake sediments (cores; with collaborators)