# WATER QUALITY IN AQUACULTURE

# CHARACTERISATION OF WATER BODIES

- Water bodies can be characterised by the three major components:
- hydrology,
- physico-chemistry,
- biology.
- An accurate assessment of water quality is based on appropriate monitoring of these three components.

# CHARACTERISATION OF WATER BODIES

- All freshwater bodies are inter-connected, from the atmosphere to the sea, via the hydrological cycle.
- Water constitutes a continuum, with different features ranging from rainwater to marine salt waters.

# EACH OF THE THREE PRINCIPAL TYPES OF WATER BODY HAS DISTINCTLY DIFFERENT HYDRODYNAMIC PROPERTIES AS DESCRIBED BELOW:

- *Rivers* are characterised by uni-directional current with a relatively high, flow velocity.
- The river flow is highly variable in time, depends on:
- climatic situation
- drainage pattern.

# EACH OF THE THREE PRINCIPAL TYPES OF WATER BODY HAS DISTINCTLY DIFFERENT HYDRODYNAMIC PROPERTIES AS DESCRIBED BELOW:

- *Lakes* are characterised by a low, current velocity.
- Currents within lakes are multi-directional.
- Many lakes have alternating periods of stratification and vertical mixing; the periodicity of which is regulated by
- -climatic conditions
- -lake depth

# EACH OF THE THREE PRINCIPAL TYPES OF WATER BODY HAS DISTINCTLY DIFFERENT HYDRODYNAMIC PROPERTIES AS DESCRIBED BELOW:

- *Groundwaters* are characterised by a rather steady flow pattern in terms of direction and velocity.
- The flow velocities commonly found in aquifers has a low value that are mainly governed by the porosity and permeability of the geological material.

# PHYSICAL AND CHEMICAL PROPERTIES

- Each freshwater body has an individual pattern of physical and chemical characteristics which are determined largely by the climatic, geomorphological and geochemical conditions.
- Total dissolved solids, conductivity and redox potential, provide a general classification of water bodies of a similar nature.
- Mineral content is an essential feature of the quality of any water body resulting from the balance between dissolution and precipitation.
- Oxygen content, essential for all forms of biological life, is another vital parameter of any water body which influences the solubility of metals and is

# BIOLOGICAL CHARACTERISTICS

The development of biota in surface waters is governed by a variety of environmental conditions.

The primary production of organic matter, in the form of phytoplankton and macrophytes, is most intensive in lakes and reservoirs and usually more limited in rivers.

The degradation of organic substances can be important in groundwaters and deep lake waters which are not directly exposed to sunlight.

In contrast to the chemical quality of water bodies the description of the biological quality of a water body is a combination of qualitative and quantitative characteristics.

# BIOLOGICAL MONITORING CAN GENERALLY BE CARRIED OUT AT TWO DIFFERENT LEVELS:

- the response of individual species to changes in their environment or,
- the response of biological communities to changes in their environment.