

WATER POLLUTION and CONTROL

Biomagnification

A variety of toxic chemicals move through food chains.

Toxic pesticides may be sprayed for controlling insect pests, fungi, herbs, but they concentrate in the food chain and harm to other (non target) organisms.

The increase in concentration of accumulated toxic chemicals as one goes higher in the food chain is termed **biomagnification**.

Biomagnification has at times threatened the reproduction and survival of carnivores (secondary consumers) who occupy the highest level of the food chain.

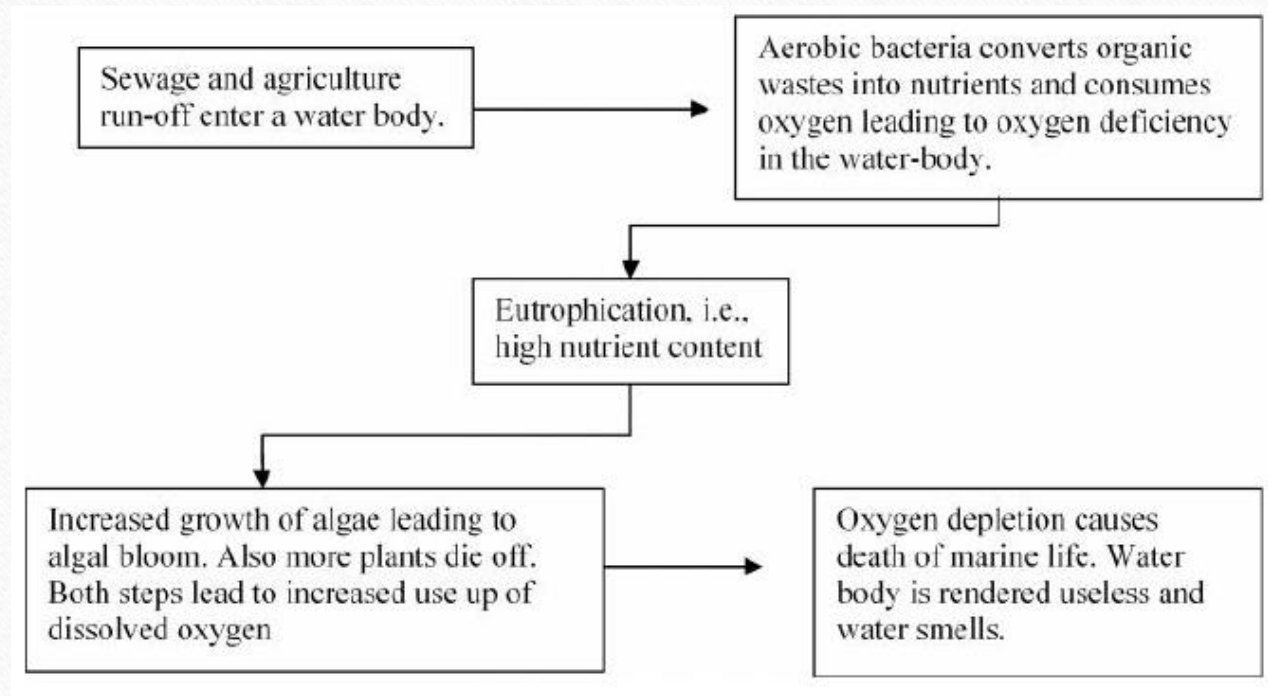
Sewage and agriculture run-off enter a water body.

Aerobic bacteria converts organic wastes into nutrients and consumes oxygen leading to oxygen deficiency in the water-body.

Eutrophication, i.e., high nutrient content

Increased growth of algae leading to algal bloom. Also more plants die off. Both steps lead to increased use up of dissolved oxygen

Oxygen depletion causes death of marine life. Water body is rendered useless and water smells.



The Effects of Water pollution

- Physical effects,
- Oxidation effects
- Toxic chemical effects
- Chemical nutrients effects
- Pathogenic effects
- Radionuclide effects

Physical Effects

Insoluble finely divided organic solids, undergo slow biodegradation and cause a reduction of the dissolved oxygen in the water.

The effect of settlement layers is to reduce the solar energy absorption by plants and so lower the rate of photosynthesis, and to produce low oxygen conditions in the river bed.

Oxidation Effects

There are two types of oxidation:-

- (i) Action of bacteria on organic pollutants
- (ii) Chemical oxidation of other pollutants present in industrial waste.

Chemical Toxic Effects

Some organic and inorganic chemical substances are toxic or poisonous to plants, animals and humans.

Chemical toxins can be broadly considered under the following four patterns:

- (i) Metal and salt toxins
- (ii) Pesticide toxins
- (iii) Acid and alkali toxins
- (iv) Other organic compounds toxins eg. Phenols and cyanides.

Toxic Metals

These are usually heavy metals eg Iron, Lead, Mercury, Cadmium, Zinc, Copper, Nickel and Arsenic. Varying quantities of these metals may cause a deleterious effect, and plants and animals vary in this respect.

One of the most significant effects of metallic pollution is that aquatic organisms can absorb and accumulate concentrations of these metals in their tissues.

References

- <http://phpt.uonbi.ac.ke/sites/default/files/cavs/vetmed/phpt/BSc%20Fisheries%20Notes.pdf>