

EUTROPHICATION IN FRESHWATER

Note, the word trophic is a Greek word which means nourishment. The word is often used to refer to the nature of organic nutrients and its concentration thus it is used to qualify the fertility of water body. Eutrophication of lakes may be considered as high or excessive enrichment of water body which may be desirable or not. If it is desirable, the increase is looked upon as a fertilizing enrichment but more frequently the results are undesirable and thus eutrophication receives the connotation of pollution. Types of eutrophication include: natural eutrophication which is a gradual process of enrichment and it is part of ageing process; and artificial/cultural eutrophication which occurs after discharge of industrial and domestic effluents and the run-offs from agricultural and which has been 'dressed' with nitrate and phosphate artificial fertilizers.

When a lake is young, it typically has a very low concentration of dissolved nutrients, because of this, gross production in the water body is limited and it is a typical oligotrophic lake. As time proceeds, the nutrient materials accumulate in the lake either as substrate dissolved in the river or as solid sediments carried by the river. As nutrient level rises, its role in limiting production decline and thus allowing productivity to increase.

Based on this concept, there are 3 types of trophic lakes, though some degrees of intermediate conditions can exist. The lake with relatively rich plant nutrients and low O₂ tension are termed eutrophic while the lakes with low plant nutrients and are highly oxygenated are termed oligotrophic. Brown water lakes where high concentration of humic acid inhibit bacterial decay and recycling of nutrients occur are termed dystrophic lakes. Eutrophic and oligotrophic lakes are distinguished by the bathymetric characteristics. Find these out during the lectures.

Causes of eutrophication include: (i) urbanization where water bodies are polluted by wastes from industries, referred to as industrial pollution e.g. Ogunpa river in Ibadan (ii) water use organic

wastes accompany water being used either in the homes, schools, hospitals and from other sources (iii) Rainfall-the dusts/floods of debris that settle down inside water bodies after each rainfall act as pollutants in water

(iv) Municipal sewage – In some urban cities, man turned water bodies to refuse deposition centres and these refuses, pollute such water bodies e.g. Ogun River in Abeokuta.

(v) Sewage system – Soak-away faeces are dumped into water bodies which could lead to pollution of such water bodies etc.