

**Abstract: Cultural Eutrophication in Ambir lake- Increased phosphorous levels due to high population and poor sewage system**

Human activities accelerated the natural processes. Human settlement, the clearing of forests, development of buildings and industry have increased the addition of nutrients to catchments and increased water erosion and flow from catchments to downstream disturbed lake ecosystem.

The substances among those emitted in the concrete production process that are related to eutrophication were deduced to be  $\text{NO}_x$ ,  $\text{NH}_3$ ,  $\text{NH}_4^+$ , COD,  $\text{NO}_3^-$ , and  $\text{PO}_4^{3-}$ . The substances among those emitted in the concrete production process that are related to acidification, were found to be  $\text{NO}_x$ ,  $\text{SO}_2$ ,  $\text{H}_2\text{S}$ , and  $\text{H}_2\text{SO}_4$ . The materials and energy sources among those input into the concrete production process, which have the biggest impact on acidification and eutrophication, were found to be coarse aggregate and fine aggregate.

The main causes of eutrophication observed in Ambir Lake are:

- run-off from erosion (following mining, construction work and poor land use)
- discharge of detergents (containing phosphates)
- discharge of partially treated and untreated sewage (containing nitrates and phosphates)
- discharge of effluents from pharmaceutical and other industries
- immersion of chemical idols during Ganesh Chaturdhi and Dusserah though necessary campaigns were done

The main effects of eutrophication observed are an

- increase in plant and animal biomass
- increase in growth of rooted plants, e.g. reeds
- increase in turbidity (cloudiness) of water
- increase in rate of sedimentation
- development of anoxic conditions (low oxygen levels)
- decrease in species diversity – migration of birds completely slowed down
- change in dominant biota - blue-green algae replaced normal algae and an
- increase in the frequency of algal blooms, *Eichhornia* sps.

**Algal blooms:** Blooms result in deoxygenating of the water mass when large masses of algae die and decompose; leading to the death of aquatic plants and animals. And the eutrophic lake is left entirely devoid of fish.

**Disease-causing agents** - Malaria, typhoid and dengue are common-from the months of September till date Dengue is observed as common.

Eutrophication (the over enrichment of aquatic ecosystems with nutrients leading to algal blooms and anoxic events) is a persistent condition of surface waters and a widespread environmental problem. Some lakes have recovered after sources of nutrients were reduced. In others, recycling of phosphorus from sediments enriched by years of high nutrient inputs causes lakes to remain eutrophic even after external inputs of phosphorus are decreased. Slow flux of phosphorus from over fertilized soils may be even more important for maintaining eutrophication of lakes in agricultural regions. This type of Eutrophication is not reversible unless there are substantial changes in soil management. Technologies for rapidly reducing phosphorus content of over enriched soils, or reducing

### **Conclusion:**

In principle, eutrophication is reversible, but from the perspective of a human lifetime, lake eutrophication can appear to be permanent unless there are substantial changes in letting the industrial waste, and sewage management. Technologies for rapidly reducing the phosphorus content of over enriched soils, or reducing erosion rates, could greatly accelerate improvements in water quality.

Soil phosphorus density must decline to improve water quality. Once soil phosphorus is decreasing, other useful interventions may include steps to decrease transport of phosphorus in surface waters and manipulations to decrease phosphorus recycling within lakes.

Effective functioning of sewage treatment plant and restriction of construction of buildings would certainly help in restoring our LAKE back to some extent.

- Rajasree Krishna, 29<sup>th</sup> November,2018, Abstract for Telangana Science Congress.

