



Double role of Vembanadu lake (Ramsar site) on coastal fertility and on red tide blooms

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The variations in downstream flow associated with heavy rains can affect the quantity and ratio of various nutrients essential for phytoplankton growth in the coastal region. The recent red tide bloom of September along the south west coast of India might be the result of such heavy fluxes of dissolved nitrate and phosphate and a lesser quantity of silicate. Inputs of silicon from land had declined by dams, while phosphorus and nitrogen inputs had increased steadily. The long-term trends of nutrients in Vembanadu Lake had two-fold increases in dissolved nutrients in 42 years. Forcing of nutrient rich ground water (with less silicate) through the porous narrow strip between lake and sea into Arabian Sea also occurs when the water level difference between sea and lake attains a critical value to overcome the frictional resistance. Such conditions prevail during heavy flood discharges and with the sea level remaining at its annual low. The nutrient rich 'external sources' from coastal pockets had induced a three times increase in coastal productivity. A shortage of silicon, a nutrient needed for diatom growth, relative to the supplies of nitrogen and phosphorus accelerated the growth of flagellated phytoplankton. The phytoplankton growth stimulation of Zn and Fe is of high significance as the dissolved zinc had enrichment in the lake with 116 ug/l in 1986 and with 879 ug/l in 1991. Nearly 80 tons of Zinc had accumulated in the water body by anthropogenic input. Attempts for reversing the eutrophication tendency require management strategies for watersheds reaching far inland from the coastal region and restoration of wetlands and floodplains that act as nutrient traps.