

PRESENT STATE OF THE MARINE ENVIRONMENT AROUND INDIA

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The 7500 km long coastline along with the 2.015×10^6 sq.km. Exclusive Economic Zone of India, which is influenced by semi-diurnal tides of 1-8m amplitudes, annually receive 4.7×10^9 cu.m. untreated or partially treated domestic sewage and 0.47 cu.m. of industrial effluents in addition to about 5×10^6 cu.m. wastes transported by 1645 cu.km. river run-off. About 212 million of 850 million Indians are, directly or indirectly, dependent on the bounties of the sea for their living. Almost two-thirds of the global marine transport of oil is carried along the two tanker routes across the Arabian Sea from the Middle East countries. Monitoring of the cumulative effects of all these, with the help of quality-controlled data, since 1975, has led to the results as detailed below.

1. As a result of the disposal of ballast water, bunker washings and occasional tanker disasters the Arabian Sea and the southern Bay of Bengal gets polluted resulting in considerable quantities of dissolved/dispersed petroleum hydrocarbons, floating tar particles and tar-like residues on beaches. Due to a gradual reduction in the transported volume of oil, pollution due to it appears to have stabilised, perhaps, indicating a relative decrease. New analytical techniques for identification of sources of oil pollution have been standardised and are being applied with good results.

2. Concentrations of toxic and non-toxic heavy metals and metalloids in water, organisms and sediments are, in general, within

safe limits for human use. But in the Thane Creek, in Bombay, fishes have been rendered unfit for human consumption due, mainly, to indiscriminate discharge of industrial wastes. The same cause-effect relation has resulted in the Mahim Creek turning from a verdant area into anoxic and near-eutrophic state. Such features are not very uncommon near urban and industrial conglomerates. The metals have been observed to be selectively absorbed in different body tissues of fishes.

3. Concentrations of residues of organochlorine pesticides are low in water, sediments and organisms. Occasional high values of DDT, BHC, Aldrine and Dieldrine have been encountered in nearshore plankton and inshore sediments. Orders of magnitude differences have been observed between river mouth sediments of east and west coasts respectively. The reason could be the washings from agricultural lands into the eastward flowing major rivers. Fishes seem to be unaffected, as yet, by pesticide pollution.

4. 85% of dissolved metals, carried by River Ganga, settle at the confluence of river water with sea water leaving only 15% to flow out to the Bay of Bengal. Similar figures for suspended and particulate metals are 50% and 40% respectively, 10% having settled within the river. Tidal oscillations of substances in the rivers will ultimately leave a part of the pollutant within the estuary. Flow patterns at the mouth indicate that some portion of the outflow streams back into the river along with the inflow.

5. The major source of input of all pollutants is through river run-off, as their concentrations are not significantly high in rainfall, excepting those over metropolises.

6. The short renewal time of about 4 years of the oxygen-poor intermediate waters of the Arabian Sea and the Bay of Bengal suggests that this is an unstable time-variable feature.

This may react quickly to any future climatic and/or environmental perturbations, like global warming from increasing inputs of fossil fuel carbon dioxide or an increased downward flux of organic carbon from pollution or photosynthetic productivity, rendering this oxygen-poor layer completely anoxic, leading to catastrophic consequences.