CHAPTER 6

SUMMARY

Analysis of the data obtained in the present study revealed that iron was the most abundant metal in the coastal environment of Kerala. Compared to Cochin estuary the concentration of zinc and cadmium were low in Chaliyar river estuary indicating lesser anthropogenic influence in this estuary. A notable feature is that in Chaliyar the Cd in the surface sediments is solely of lithogenous origin.

Partition studies provided valuable information about the origin, path way and the fate of trace metal contaminants in the coastal ecosystems of Kerala. In the nearshore region of Kerala, suspended particulates are the major sink for the trace-metals, other than iron. In the Chaliyar estuary, the sediment is the main repository for the metals like Cu, Zn, Mn and Fe. Very high amounts of metal inputs in Cochin estuary both in the dissolved and particulate forms make the partitioning complex among various phases in the aquatic environment. However, very high levels of Cu, Zn, Pb and Cd in the suspended particles of Cochin estuary indicate that in the estuarine environment, the suspended particles play a vital role by acting simultaneously as a source and sink for heavy metals.

The geochemical fractions of trace metals in the sediments revealed that in the coastal region of Kerala, more
than 50% of the total metals in sediments was found to be associated with the non-lithogenous fraction, especially in the organic/sulphidic fraction. The percentage distribution of non-residual fraction for most of metals except for Pb was found to increase towards the marine region. Thus the 'bio-availability' of those metals are increased many fold in the near shore region. Lead was found to be highly 'immobilised' in marine region while Cadmium was labilised. Even though a large quantity of anthropogenic input of metals like Zn, Cd, Pb etc. have been detected in the Cochin estuarine system, the partition patterns showed the retentivity of the inputs in and around the sites of discharge itself, through the geo-chemical transformation of the metal species. High percentage of trace metals in the organic/sulphidic fraction of sediments and the observed correlation between metals and organic C content of sediments implied that the organic matter was the most important contributor to the metal enrichment in the sediments of the coastal ecosystem of Kerala.

Trace metal levels evaluated in the biomaterial indicated that though there exists no serious threat of toxic metal enrichment in the fish at present, high levels of Zn observed in the flesh part of fish cannot be ignored.