SUMMARY AND CONCLUSION

Inventory of riverine wetlands of Tamiraparani in the lower reaches in Tuticorin District was carried out during June 2011 to May 2012. In this present study, surface water samples were collected from 25 sites representing three different seasons (divided into south-west monsoon, north-east monsoon and post-monsoon season). Water quality parameters such as air temperature, water temperature, pH, alkalinity, dissolved oxygen, hardness, conductivity, total dissolved solid, nitrogen, phosphorus, bicarbonate, chloride, calcium, magnesium, sodium and potassium were studied in all the study sites. Soil quality parameters was studied in all the sites and soil quality parameters are pH, electrical conductivity, soil texture, macro nutrients and micro nutrients. Diversity of birds was also studied in all the study sites. Heavy metals were also analysed in surface water and soil samples and the heavy metals analysed are iron, copper, zinc, cadmium, lead and chromium. Integrating all the casuals data on surface water quality, soil quality, birds species diversity and spatial analysis heavy metals in water and soil was carried out using geographic information system (GIS) in all the sites.

A preliminary survey of the Tamiraparani River wetlands were carried out to have an assessment of the characteristics of the wetlands, the factors which may influence water quality in the wetlands, land-use activities, wildlife, fisheries and anthropogenic activities. Based on the preliminary survey, twenty five wetlands were selected for this study. The sites were selected in the lower reaches of the Tamiraparani River in Tuticorin District because most of the wetlands are larger in size. The result of water quality analysis revealed that the quality mainly deteriorated through less dissolved oxygen content of the river. During the study most of the physico-chemical variables were
within the criteria prescribed by BIS and WHO whereas parameters like exceeded the quality criteria during various phases of the study.

The study result of spatial analysis of physical and chemical properties of soil revealed that the soils of the Tamiraparani Riverine wetland plain were slightly acidic to neutral of low nitrogen contents, moderate to high exchangeable bases, with a possibility of experiencing iron deficiency and phosphorus limitation.

Check-list of 88 avian compositions was generated to find out species composition, relative abundance and distribution of bird fauna in the wetland habitats in the lower reaches of Tamiraparani River. The results clearly demonstrated that habitat structure affects avian diversity and the species abundance in this study. Therefore, it was recommended that regular monitoring of the site should be carried out so as to control changes in the state of wetland especially on the resident and pale arctic species.

Distribution of heavy metals in soil and surface water of the Tamiraparani Riverine wetlands were analysed and to assess the pollution load in water and soil. Heavy metals, especially Fe, Cu, Zn, Cd, Cr, and Pb can contaminate the water and reported higher amount during the post-monsoon than the limits reported previously. It is concluded that industrial and to some extent, anthropogenic activities are the prime source for this toxic metal in the soil of Tamiraparani Riverine wetlands. The values of various parameters are far higher than the WHO limits for drinking purposes.

GIS is an effective tool for water quality mapping and essential for monitoring the environmental change detection. The present study was attempt to map the seasonal and spatial variation of surface water quality parameters for Tamiraparani Riverine wetlands of Tuticorin District, Tamil Nadu using GIS. The integrated map shows
the broad idea about good, moderate and poor water quality zone in the study area. From
the integrated analysis, moderate range of the water quality prevails over the south eastern
part and central part of the basin and the rest of the area has good water quality condition.
All so the present study encourages the stake holders of the river for its suitability for
irrigation, industrial and also for drinking purposes.