CHAPTER 6

SUMMARY AND CONCLUSION

- Fluctuations in various Physico-chemical parameters were observed during summer, monsoon and winter seasons of the study period. The correlation coefficient indicates positive and negative correlation of Physico-chemical parameters with each other.
- The study shows that the water of Thol Bird Sanctuary Wetland exhibits high concentration of BOD, COD, TOC, TSS, NO_3-N, Phosphate etc. indicating high organic load and moderately eutrophicated condition on several instances.
- The application of WQI is demonstrated for three different locations of Thol Wetland. The WQI values across the locations and during the monsoon and winter seasons are found to be excellent. The comparative value during the summer is higher than the other period of the year which indicates that organic load gets accumulated during summer.
- The WQI thus developed is a simple tool yet very useful for the water quality assessment and it can be used by all concerned for maintaining good health of the Thol wetland.
- The Integrated water quality of Thol wetland is observed to be 'Moderately Polluted' owing to comparatively high organic content. The results of Physico-chemical analysis are in consonance with the Biological Water Quality Criteria developed by Central Pollution Control Board. Therefore the use of Biomonitoring for water quality assessment using Benthic Macroinvertebrates

can be used as a complementary method along with the regular physico-chemical analysis for comprehensive water quality monitoring.

- The value of total daily productivity (Gross Primary Productivity - GPP) ranged from 0.3 g C/m^3/d to 12.45 g C/m^3/d and the average value during the study period of 5.68 g C/m^3/d. It is also found that to the yearly primary production, summer season contributes maximum. The value of Photosynthesis – Respiration ratio (P/R) ranged from 0.032 to 3.02 against the average P/R ratio of 0.92 during the study period.
- During the in situ measurements, the Photosynthesis Respiration Ratio is found to be greater than 1 during winter and summer seasons. This indicates that there is an accumulation of organic matter in Thol Wetland. This finding was also substantiated by the fact that (i) organic detritus in the form of dried leaves, twigs, flowers etc. falling from the surrounding trees and shrubs and (ii) the water column visually appeared greenish due to lush phytoplankton growth indicating high organic content. However during monsoon season, the Photosynthesis Respiration ratio is found to be less than 1 indicating that Respiration activity is more than the Photosynthesis the reasons being organic content gets diluted during the monsoon season as well as the rapid depletion of organic content by the primary consumers.
- These results are important to assist in the interpretation of biological results because of the direct influence water quality has on aquatic life forms. Thus, an integrative approach, which included physical-chemical, habitat and biological assessments, was followed to provide increased accuracy.

Recommendations:

1. Apart from pollutants, all other range of threats to wetland such as drainage must be regulated. De-siltation and De-weeding of the Thol Bird Sanctuary Wetland at regular intervals is suggested so as to control the nutrients level and silt deposition.
2. Integrating water quality with water quantity will help protect and restore unique features of wetland. Because of its location in the arid region and also release of water for irrigation, water level and water spread gets depleted fast, sometimes to mere 1 ft in most areas. Reduction in water spread also reduces bird richness and abundance and therefore the decision to maintain water level between 3 ft to 6 ft has to be observed strictly.
3. This study may be helpful in optimum utilization and sustainable management of the wetland. The biological response is very integrative and accumulative in nature. This may lead to a reduction of the number of measurements both in space and time. To monitor all water quality criteria and many different pollutants, ecosystem monitoring should ideally involve all components of the community. Such comprehensive assessment will not be feasible. In practice a less comprehensive evaluation based on well chosen indicators will suffice for most forms of pollutions.
4. It is to be ensured that reliable and updated information and data gets incorporated by the State during the development of policy, legislation and administrative interventions for various management aspects of Thol wetland.

5. ONGC has to come out with effective oil spill prevention plan considering the worst case scenario and regular mock drills for the same in coordination with the forest department, irrigation department and other stakeholders.
6. For any aquatic body which is used for several purposes the use which requires the highest quality is called the 'designated best use'. It is essential to know how often the quality parameters are exceeding the criteria. When this happens frequently or since long time, a pollution control plan is needed based on thorough survey and monitoring. However, the pollution control planning will target up to the criteria associated to its designated best use i.e. focus has to be on main polluting sources.
7. Although the concentrations of heavy metals did not exceed permissible limits, regular monitoring of heavy metals is necessary to prevent human health risks and to ensure healthy ecosystem conditions.
8. The achievement of activity wise physical and financial targets as laid down in the Management Plan for Thol Wildlife Sanctuary has to be monitored and appropriate actions to be initiated as and when gaps are observed.
9. Key steps in conserving and regaining healthy wetlands include: enhancing the network of Ramsar Sites and other wetland protected areas, integrating wetlands into planning strengthening legal and policy arrangements to conserve wetlands, implementing Ramsar guidance to achieve wise use, applying economic and financial incentives for communities, ensuring participation of all stakeholders in wetland management.