CHAPTER X
CONCLUSION

The present work was carried out on 40 different lakes of Mehsana district. It is considered as the heart of northern Gujarat. It is further divided into nine talukas. The 40 lakes selected for the studies are taken from whole Mehsana district. The lakes selected from each taluka. Among all this lake, some lakes are natural and some are man-made constructed by District Development Authority to restore their rain water and to recharge underground aquifers. The study of physical, chemical and botanical parameter was carried seasonally from June 2012 to June 2014. The physical and chemical parameters included in the studies are Temperature, pH, Electrical Conductivity, Turbidity, Total dissolve solid, Total alkalinity, Total hardness, Calcium, Magnesium, Dissolve oxygen, Biochemical oxygen demand, Chloride, Sodium, Nitrate and Phosphate. The analysis of physical and chemical parameter were done based on APHA, Standard Methods (2005) ‘Water Studies, Method for Monitoring Water Quality’ and Trivedy and Goel (1984) “Chemical and Biological Methods for Water Pollution Studies” Composite samples were collected in pre washed polythenecans from different lakes in the morning to access various physico-chemical parameter. Few parameters which undergoes changes quickly such as temperature, pH, Electrical Conductivity, Dissolve oxygen, Turbidity were evaluated on the spot, immediately after
collection of sample, were as remaining parameter were performed in the laboratory.

I was collected water samples from total 40 places from the study area. The analysis of physicochemical properties of different water sources from lakewater (Table 2).

The maximum temperature was recorded at Chimnabai lake and the minimum temperature recorded Karannagar lake. The temperature recorded for all the lakes ranges from 18°C to 27°C.

In water slightly alkaline to moderately alkaline in relation. The maximum pH was recorded at Chadasana lake and the minimum pH recorded Karannagar lake. The overall pH values were ranged from 7.20 to 8.74. The maximum EC was recorded at Thol lake and Vanagla pond and the minimum EC recorded Asjol pond. The electrical conductivity of the surface waters ranges from 0.14 to 1.47. The maximum turbidity was recorded at Asjol lake and the minimum turbidity Gadha, Dela, Thol Lake. The turbidity of the surface water ranges from 162 NTU to 1 NTU.

The maximum TDS was recorded at Kamli lake and the minimum TDS recorded Tarabh pond. The total dissolved solids recorded in all sampling sites ranges from 90 ppm to 664 ppm. The maximum TH was recorded at Badarpur lake and the minimum TH recorded Kadarpur lake. The total hardness of all sampling sites ranges from 35 to 120 ppm. The maximum calcium hardness was recorded at Badarpur lake and the minimum calcium hardness recorded Chadasana lake. The value of calcium hardness of all
sampling sites ranges from 40 ppm to 100 ppm. The maximum magnesium hardness was recorded at Asjol lake and the minimum magnesium hardness recorded Jantral lake. The value of magnesium hardness from all sampling sites ranges from 2.49 to 32.40 ppm. The maximum sodium was recorded at Chadasana pond and the minimum sodium recorded Motipura pond. The concentration sodium ranged from 12.12 to 117.22 mg/l. The maximum potassium was recorded at Motipura pond and the minimum potassium recorded at Kadarpur lake. The concentration potassium ranged from 1.00 to 51.11 mg/l. The concentration of \( \text{CO}_3^{2-} + \text{HCO}_3^{-} \) varied from 66.99 to 243.6 mg/L, the minimum value recorded in Vaghvadi Lake and maximum value in Champa lake. The maximum phosphate was recorded at Deusana pond and the minimum phosphate recorded at Gadha pond. The concentration phosphate ion ranged from to 0.04 to 0.64 mg/l. The maximum chloride was recorded at sip or pond and the minimum chloride recorded at Asjol lake. The concentration Chlorides ranged from 10.61 to 38.99 mg/L. In the gasses analyses the average of Free \( \text{CO}_2 \) 27.5 mg/l, DO 1.66 mg/L, BOD 0.7 mg/L and COD 266 mg/L (Table 11). There are no high; so the water sources are not polluted, the data of instrumental analysis indicates that the water is good for irrigation. But some pond like Asjol, Rangpurda, Borisana, and Karannagar were some of the polluted because of the industry waste. There are no high; so the water sources are not polluted, the data of instrumental analysis indicates that the water is good for irrigation.
Detailed analyses of phytoplankton are done by study and identification of each genus. And looking toward the botanical result, high dominance of *Oedogonium sp.*, *Oscillatoria sp.*, *Anabena sp.*, *Cylindrospermum sp.*, *Microcystis sp.*, *Lyngbya sp.*, *Spirogyra sp.*, *Chlorella sp.*, *Scenedesmus sp.*, *Closterium sp.*, *Cosmarium sp.*, *Navicula sp.*, *Nitzschia sp.*, *Synendra* and *Gomphonema sp.* which indicates that these lakes possess high amount of organic waste and water of the lake is organically polluted. All the above lake shows the dominance of chlorophyceae over cyanophyceae, bacillariophyceae and euglenophyceae.

The result of botanical analysis in the data of plants were collected on their habitat, flowering and fruiting time.

During my present work I collected total more than 200 plant taxa.

**The leading families by species numbers**

Cyperaceae (32 species) > Poaceae (26 species) > Asteraceae (16 species) > Fabaceae (9 species) > Caesalpiniaceae (9 species)

This shows that Cyperaceae, Poaceae and Asteraceae are dominants in the study area. On the account of species collected in the area herbs are highest in number in comparison with habit type’s species.

According to proportional relationship, that show Dicotyledonous families are 45, taxa are 142 and Monocotyledonous families are 17, taxa are 81.

Also in my present work, I found 205 wild plant species. 8 cultivated plant species. This relationship between wild plants species and cultivated plant species are shown in figure 15.
According to this chart, total 26 families are monogeneric and monospecific they are as under:

Papavaraceae, Oxalidaceae, Zygophyllaceae, Vahliaceae, Trapaceae, Gentianaceae, Hydrophyllaceae, Ehretiaceae, Solanaceae, Pedaliaceae, Martyniaceae, Chenopodiaceae, Ceratophylaceae, Musaceae, Cannaceae, Amarylidaeae, Pandanaceae, Typhaceae, Aponogetonaceae.

Mention family wise genera and species in chapter 9.

I listed species from study area of their different life-forms; there were submersed, floating and amphibious.
Phytoplanktons

Phacus sp.

Closterium sp.

Chlorella sp.

Cosmarium sp.

Euglena sp.

Oedogonium sp.
Zygnema sp.
Nitzchia sp.
Cymbella sp.
Spirogyra sp.
Eichhornia crassipes

Hydrilla verticilliata

Lemna

Oxalis

Nelumbo nucifera

Cyperus esculentus

PLANTS
STUDY SITES

ASJOL

CHADASANA

KALRI

VIJAPURDA

PRATABHNAGAR