2. OBSERVATION AND RESULTS

In the present study “HYDROBIOLOGICAL STUDIES OF THE MHASWAD TANK, MHASWAD, M.S, INDIA.” emphasis is given on Physico-chemical characteristics, zooplankton and phytoplankton study, and Primary nature of fresh water of Mhaswad tank. Observations were mainly concerned with pollution measuring indicators and parameters.

The water samples from four different sites of the water body were collected and analyses of various Physico-chemical parameters was done and following observation were made.

Temperature

In present investigation the monthly variation in temperature of air ranged between 24.5 and 38.1°C in the year 2006-07 and similarly 24.7 to 38.2°C in the year 2007-08 (Table 1,2). The minimum air temp was recorded in the month of August and maximum in the month of May. The air temp exhibited high degree positive correlation with water temperature. It also exhibited low degree positive correlation with the changes according to the seasons. Over all the air temp at all four sites A, B, C and D was somewhat same throughout the two years.

The water temperature ranged between 21.9°C to 27°C in year 2006-2007 and 21.7°C to 27°C in year 2007-08 (Table 3, 4). The minimum temperature was recorded in month of December while maximum temperature was recorded in the month of May in both years.

pH

The pH of water ranged between 7.2 and 8.5 in 2006-07. The minimum pH was 7.2 in the month of October and it was highest in the month of May, which was 8.5. Similarly, in 2007-08 minimum pH was 7.2 in the month of October and it was highest in the month of May, which was 8.6. The pH was found to be minimum in rainy season and maximum in summer season. It was observed that the average pH values were almost within 7.83 to 8.39 throughout the two years (Table 5, 6).
**Transparency:**

The Transparency of water was ranged between 20 to 40 cm in Year 06-07 and 21 to 39 cm in year 07-08 (Table 7, 8). The transparency of water was minimum in rainy season and it went on increasing from October to May. The water was more turbid in rainy season because of rainwater along with other waste materials; hence transparency of water was very less in rainy season.

**Total Suspended solids (TSS):**

Total suspended solid fluctuated between 24 mg/L in the month of May and 70 mg/L in the month of September 2006-2007. The TSS was 23 mg/lit in the Month of May and 70 mg/lit in the month of September in 2007-08 (Table No. 9, 10). The seasonal variations in TSS were also observed. In Rainy and winter season the TSS was higher as compare to TSS values in summer at all four sites throughout the two years.

**Total Dissolved solids (TDS):**

Total dissolved solid fluctuated between 160 mg/L in the month of November and 288 mg/L in the month of January in 2006-2007. The TDS was 178 mg/lit in the Month of November and 290 mg/lit in the month of January in 2007-08 (Table No. 11, 12). In winter and summer season the TDS was higher as compare to TSS values in Rainy season.

**Conductivity:**

In present investigation Electric Conductivity ranging between 260 (µmho/cm) and 402 (µmho/cm) in the year 2006-07. Similarly the conductivity was ranging from 260 (µmho/cm) to 400 (µmho/cm) in year 2007-08. Similar trend was found at all four sites. It was observed that the conductivity was highest in winter and summer season while lowest in rainy season (Table No. 13, 14).
Dissolved oxygen: (DO)

In present investigation, the values of Dissolved Oxygen ranging between 7.8 mg/lit and 12.6 mg/lit in the year 2006-07. Similarly it was ranging from 7.7 mg/lit to 12.5 mg/lit in year 2007-08. Similar trend was found at all four sites. The seasonal variations in the values of dissolved oxygen were also observed. (Table No. 15, 16)

Free CO$_2$:

In present investigation, free CO$_2$ was below detectable level in the months of February to July 2006-07 and January to August 2007-08. In remaining period the values of free CO$_2$ ranging between 0.4 mg/lit and 1.2 mg/lit in the year 2006-07. Similarly it was ranging from 0.5 mg/lit to 1 mg/lit in year 2007-08. Similar trend was found at all four sites. (Table No. 17, 18)

Alkalinity:

The water of this reservoir was more alkaline throughout the year. Total alkalinity was ranged between 180 mg/L to 265 mg/L in year 2006-07 and 182 mg/L to 270 mg/L in year 2007-08 (Table No. 19, 20). The alkalinity was more or less similar throughout both years.

Chloride:

During the period of investigation chlorides in the water of this reservoir was ranged between 49 mg/L to 78 mg/L in year 2006-07 and it was ranged between 49 mg/L to 80 mg/L in year 2007-08 (Table No. 21, 22). During rainy and winter season higher values were recorded whereas in summer season less chloride content was detected.

Salinity:

During the period of investigation salinity in the water of this reservoir was ranged between 88.4 mg/L to 140.8 mg/L in year 2006-07 and it was ranged between
88.4 mg/L to 144.4 mg/L in year 2007-08 (Table No. 23, 24). During rainy and winter season higher values were recorded where as in summer season less chloride content was detected.

**Sulphates:**

During the period of investigation Sulphates in the water was ranged between 33 mg/L to 60 mg/L in year 2006-07 and it was ranged between 30 mg/L to 60 mg/L in year 2007-08 (Table No. 25, 26). During rainy season higher values were recorded where as in summer and winter season fewer Sulphate content were detected.

**Total hardness:**

The water of this reservoir was not so hard throughout the period of investigation. The total hardness ranged between 117 mg/L to 167 mg/L in year 2006-07 and 119 mg/L to 167 mg/L in year 2007-08 (Table No. 27, 28). The values of total hardness showed increasing order in winter, summer and rainy season.

**Biochemical oxygen Demand (BOD):**

In present investigation BOD was totally absent in the water for both years (Table No. 29, 30).

**MPN of Coli form:**

The MPN in the water ranged between 15 and 45 in both years 2006-07 and 2007-08. The MPN was found to be minimum in rainy season and maximum in summer and rainy season (Table No. 31, 32).

**Zooplankton Biodiversity**

Monthly water samples from Mhaswad tank were collected to study quantitative and qualitative data of various zooplanktons. Rotifers are represented by 2 species,
Cladocerans by only 1 species and Copepods also by only 1 species. The list of Zooplankton was given in table No. 33 to 35.

Among the total Zooplankatonic organisms rotifer come first in order of abundance. Rotifers were represented by 2 species (Table No. 33). *Mytilina* was dominated in the tank. The highest density of rotifers was observed in the month of April. Throughout the summer months rotifer population was maximum, however, during winter season, the rotifer population was comparatively less.

Cladocerans were represented by single species-*Daphnia carinata* (Table 34). It was observed only in winter and early summer. During late summer and monsoon they were absent.

Copepods were also represented by single species-*Nauplius larvae*. It was dominant in summer months and least during late rainy and early winter season (Table 35). A minor peak of the population of copepods was seen during November and December while major peak being in February and March.

**Phytoplankton biodiversity**

Monthly water samples from 4 different sites were collected to study the phytoplankton biodiversity of the Mhaswad tank.

The phytoplankton species occurring in the water were listed in table no. 37, 38. 3 species of Bacillariophyceae and 3 species of chlorophyceae were recorded from the Mhaswad tank during the period of study.

From Bacillariophyceae *Naviculo, Asterionella* and *Diatoms* dominated during period of investigation (Table 37). These species were dominant during summer seasons than the winter. No species from the Bacillariophyceae was recorded during rainy season.

From chlorophyceae 3 species (Table 35) namely, *Spirogyra, Volvox* and *Chlorella vulgaris*, were recorded. They were dominant during summer seasons than the winter. They were absent in rainy season.

**AQUATIC WEEDS:**

No any aquatic weed was found during the period of study.