SUMMERY AND CONCLUSION
5. Summery and Conclusion

Terna Project is one of the major Project of the Osmanabad District. It is based on the river Terna, originating from the village Terkheda. The Project is situated near to the historical village, Ter which is located near about 25 km from Osmanabad city. The water from same project is supplies for the drinking purpose to the Osmanabad, Dhoki cities and also number of small villages. The water is also uses for irrigation purpose. The fish culture practice is also take place in the same project.

Due to the increasing urbanization on the bank of the river, the chance of mixing of domestics wastes from nearby villages is increased and due to which the water gets polluted. The interference of man to disturb this natural ecosystem, so this become very essential to conserve it. Considering all this aspects in mind the present investigation was carried out.

The Hydrobiological study of Terna Project was carried out for the period of two years. The study was started from June 2009 up to May 2011. During this study period number of Hydrobiological aspects was studied. The obtained data has been collected. The result of present investigation are statistically analyzed and the summery and conclusion are drawn on the basis of obtained data.

The morphometric data of Terna Project shows that, it is a perennial, moderate water body in comparison with other large Projects. During the study period the area was visited monthly and physical, chemical and biological parameters were analyzed by standard methods of APHA and IAAB.
The water of same project was found fulfill its maximum limit of storage capacity during monsoon. The water during winter season started decreasing and during summer it becomes limited.

The physical, chemical and biological parameters which had studied during the period June 2009 to May 2011 are summarized below.

The atmospheric temperature ranges between 25.30°C (in January) to 40.03°C (in May) during the period of two years. The maximum values of atmospheric temperature were recorded in May and minimum values are recorded during winter season. The atmospheric temperature was recorded decline from June up to January and it was started increasing after February up to the May. The decline in the temperature during winter and increase in the temperature during the summer is due to the changes in the environmental conditions.

The water temperature is also shows same fluctuations during the study period as compare to atmospheric temperature. The minimum water temperature 23.23°C (in January) was recorded during winter seasons of both the years and maximum temperature of water was recorded during summer season, which is reach up to 38.73°C (in May). As per the changes in the atmospheric temperature the water temperature was also seen to be changed. The water temperature recorded during the study period is about 2 to 5°C less than the atmospheric temperature. This is the common thing which found in all reservoirs.

The transparency of Terna Project shows maximum during winter season (40.06cm in the month November) and minimum transparency recorded during summer (31.33cm in the month of June).
The pH of water from Terna Project was alkaline. It was higher during summer season (8.63 in the month April) and lower during monsoon season (7.23 in the month August).

The above physical parameters such as atmospheric temperature, water temperature, transparency and pH shows correlations and all the parameters are under the prescribed limits of inland surface water.

The chemical parameter studied in the Terna Project and their analysis is as follow.

The dissolved Oxygen was recorded maximum during winter (8.13 mg/lit. in the month December) and minimum oxygen recorded during summer season (5.20 mg/lit. in the month May).

The Biological Oxygen Demand (BOD) of the Terna Project was recorded maximum during the monsoon season (3.93 mg/lit. in the month July) and minimum BOD was recorded during the winter season (3.26 mg/lit. in the month November).

The Free Carbon dioxide recorded maximum during the winter season (3.96 mg/lit. in September) and minimum Free CO₂ was recorded during summer season (1.33 mg/lit. in May).

The Total Hardness recorded in Terna Project was maximum during the monsoon season (119 mg/lit. in the month July) and the minimum hardness recorded during the winter season (104.66 mg/lit. in the month December).

The Total Dissolved Solids in Terna Project was found to be maximum during the summer season (380.33 mg/lit. in the month May) and minimum
TDS was recorded during the winter season (233.66 mg/lit. in the month November).

Total Alkalinity of the Terna Project was found maximum during the summer season (187 mg/lit. in the month May) and minimum alkalinity was recorded during the monsoon season (151.33 mg/lit. in the month September).

Calcium values recorded in the Terna Project during the two years study was maximum during the summer season (22.38 mg/lit. in the month May) and minimum Calcium level was recorded during the winter season (16.43 mg/lit. in the month October).

Very minimum fluctuations in the values of Nitrates was recorded in the Terna Project, the minimum Nitrates was recorded during the monsoon season (0.035 mg/lit. in July) and maximum Nitrates was recorded during the summer season (0.072 mg/lit. in the month April).

The values of Phosphates recorded during the two years study period in the Terna Project was maximum during summer (0.163 mg/lit. in month May) and minimum Phosphate values recorded during the winter season (0.104 mg/lit. in the January).

The Magnesium values recorded during the study period in the Terna Project was maximum during the monsoon season (17.52 mg/lit. in the month August) and minimum Magnesium values recorded during the summer season (14.40 mg/lit. in the month May).

The Chloride content in the Terna Project shows maximum values were recorded during the summer (15.05 mg/lit. in the month June) and minimum
values were recorded during the winter season (44.59 mg/lit. in the month December).

The Zooplankton studies for diversity and density were done for the four major groups viz. Rotifera, Copepoda, Cladocera and Ostracoda. Among the total zooplankton observed the rotifers is the most dominant group accounting of about 8 of the total population of the Zooplankton. It is found to be followed by Copepoda accounting for about 4 species of the total population. The Cladocera and Ostracoda were least in number regarding diversity and density and found to be accounting for about 4 and 2 respectively of the total population of Zooplankton recorded in the study period in the Terna Project. At the same time maximum number of Zooplankton species was found during the summer season and minimum number of species was found during the monsoon season.

The density of various Zooplanktons found in order Rotifera > Cladocera > Copepoda > Ostracoda.

From the above studies it can be concluded that, the environmental factors and seasons are responsible for the variations in the physicochemical factors of the Terna Project. The study shows that the maximum atmospheric temperature, water temperature, pH, Total Dissolved Solids, Total Alkalinity, Calcium, Nitrates, Phosphates, Magnesium and Chlorides were found during the summer season, while Dissolved Oxygen, Transparency were less in the same season. In monsoon season Biological Oxygen Demand, Total Hardness was more while pH, Total Alkalinity, Nitrates, Transparency, Magnesium were recorded lower. In winter season Transparency, Dissolved Oxygen, Free Carbon dioxide was recorded higher while the atmospheric temperature,
water temperature, Biological Oxygen Demand, Total Hardness, Total Dissolved Solids, Calcium, Phosphates, Chlorides were less.

The variation in water temperature is due to the rise in atmospheric temperature during summer season and lower during winter season. The same variation in the water temperature is also found, due to the changes in the atmospheric temperature. The summer is dry as compare to the monsoon season, due to which the temperature will be found to be increases.

The increase in pH, Total Dissolved Solids, Total Alkalinity, Calcium, Nitrates, Phosphates, Magnesium and Chlorides found to be higher during the summer season is due to the stagnancy of water and domestic activity.

The Dissolved Oxygen found to be higher in winter season is due to the increase in the photosynthetic activity in the winter and monsoon seasons. While minimum DO was found in the summer season is the effect of increase in temperature causes in the reduction of water holding capacity for DO.

The Transparency of water body is affected by factor like planktonic growth, the lower Transparency recorded during the monsoon is due to the increase in the soil content in the water mixed during the flowing of water. The pH of water is affected also by the atmospheric temperature. The minimum values of free CO₂ observed during the summer period is due to the increase in the phytoplankton number, which uses the free CO₂ for photosynthetic activity. While during the monsoon and winter seasons the decrease in photosynthetic activity, lower down the free CO₂ values.

In the same project water from the nearby villages is also mixed, in which the domestic wastes are also found to be mixed with the runoff water,
at the same time the fertilizers used by the farmers on the bank of the river Terna for the agricultural purpose is also found to be mixed in some extent in this water. But the water does not cross the maximum permissible limit.

In the present study the pH, Dissolved Oxygen, Total Dissolved Solids, Magnesium were found to be within the permissible limit. But Total Hardness, Total Alkalinity, Calcium, Phosphates, Chlorides found to be below the permissible limit given by the WHO and ICMR.

It is possible that due to coassive presence of impurities in the lake there are many different parameters found to be increased during summer and have got diluted during rainy season.

Finally it is concluded that the ecological as well as biological environment of Terna Project is free from pollution and water is quite suitable for drinking purpose, after taking proper treatemant and the water is also well for the agricultural and fish culture activities.
Suggestions:

The present study of Terna Project shows that the Morphometric, Ecological and other parameters of water is suitable for drinking, irrigation and aquaculture practices.

To conserve this valuable water resource, some suggestions are definitely useful.

1. To protect aquatic flora and fauna, the interference and direct and indirect dumping of domestic sewage must be prevented.

2. The farmers are advised to use biofertilizers instead of excess use of chemical fertilizers, pesticides etc.

3. Presently there are very poor an aquacultural activity in the project is introduced, but if the advanced technique in aquaculture will introduced get the benefit.

4. The washing of cloths and bathing is also made by nearby peoples in the river, this should be avoid to protect this project from pollution.

5. The visitors advised to maintain the clean atmosphere of the reservoir.

6. It is the duties of the concerned authorities as well as people of the area to protect such contaminations. Public awareness is most essential for those who are responsible for pollute the natural water quality.

7. A harmonious relationship between humans and nature is essential for the sustainable use of lakes.
8. It is expected that NGO’s and other Social Organisations run a campaign to inform the school and college students to protect the valuable resources of water.

9. ‘Gramsabha’ should also create an awareness among people regarding the water uses.

10. Idols of the deities should not be merged in water resources.