Studies of Water Quality Assessment of Hebbal Lake
C. V. Varun¹, Sampath Kumar. V², Pallavi. M³
UG Student¹,²,³
Department of Civil Engineering
SVIT, Bengaluru, India

Abstract:
A lake which is filled with water, localized in basin that is surrounded by land, apart from any river or other outlet that serves to supply or drains the lake. Historically lakes in Bangalore region were managed by public works department, but the Hebbal lake was managed by Karnataka state forest department. The management was transferred in 2002 to lake development authority, A non profit society started with the aim of managing lakes in the Bangalore region. An attempt has been made to understand the water quality assessment of Hebbal lake.

Keywords: Assessment, basin, etc.

1. INTRODUCTION
A lake which is filled with water, localized in basin that is surrounded by land, apart from any river or other outlet that serves to supply or drains the lake. Lakes lie on area which is larger and deeper than the ponds. Natural lakes are generally found in mountains areas, linear crack zones and areas with continuing glaciation. All lakes are temporary over geologic time scales, as they will slowly fill in with sediments or spill out of basin. Many lakes are manmade, which are constructed for industrial and agricultural use, hydroelectric power generation, domestic water supply, for aesthetic and etc. The lakes in Bangalore are greater in numbers and there are no rivers close by. Most lakes in Bangalore region were constructed in 16th century by damming the natural valley systems by constructing bunds. The effect of urbanization have taken some heavy toll on the beautiful lakes in Bangalore. Urban development has caused 19 lakes got converted into bus stands, golf courses, play areas, residential areas and few tanks were breached under malaria eradication program. A project for lake restoration funded under indo Norwegian environment program at a cost of 27million let to the major change in the eco system beginning in 1998. Two to artificial islands were created using the soil from desilting under this project. The vegetated islands have become the roost sites of many water birds. Desilting was ostensibly taken up in 2003 as a part of this program.

2. OBJECTIVE OF INVESTIGATION
The main objective of the present study is to assess the water quality parameter of Hebbal Lake

1. To collect the water samples at different points from Hebbal lake
2. To evaluate physico-chemical water quality parameters of the hebbal lake.
3. To plot the physico-chemical water quality parameters of Hebbal lake
4. To compare the obtained results with water quality index (WQI)

3. MATERIALS
3.1 Selection of the study area
Bangalore is capital of Karnataka state, popularly known as the “garden city of India”. located on the Deccan plateau in the south eastern part of Karnataka, it expands over an area of 741 sq.kms. Hebbal Lake is nearly 150 acre in area. It is one of the three lakes created by kempegowda in the year 1537. The lake receives water from catchment area covering localities like BEL HMT colonies, nagavara, narsipura, mathikere, yaswanthpur and other locations.

4.2 Water sampling collection and storage
Sampling methods for physico-chemical analysis. Sample bottles must be clean, the time between sampling and analysis should be kept to a minimum (preferably within 24 hours). Storage in polyethylene or a glass bottle at a low temperature in the dark is recommended. Sampling bottles will be clean. pH, turbidity, temperature and DO will be tested immediately after collection as they will change during storage and preservation.

Figure 1. Collection of sample from Hebbal lake

4. METHODOLOGY
- Initially, sample bottle was cleaned using distilled water and was be maintained at certain temperature.
- The bottle was held near its base and plunged, with its neck pointed downwards, below the surface.
- The bottle was turned until the neck points slightly upward and the mouth is directed towards the current. If there was no current, the bottle was moved horizontally in a direction away from hand.
If samples cannot be immediately delivered to a laboratory (within an hour of collection), they should be transported to the laboratory in an ice box.

5. TEST RESULTS

We found that the acidity of hebbal water samples were varied as shown above fig.2. Acidity was varying due to environmental conditions. Samples are taken from different places of Hebbal Lake due to which variation in acidity was observed. And also acidity varied periodically.

The fig.3 above shows the alkalinity of different samples; we found that the 19 samples have less alkalinity due to the very less presence of minerals. The 12th sample has high alkalinity due to the more presence of minerals because of inflow of water into the inlet.

The fig.4 above shows the description of water quality index which is conducted on TS, TSS, TDS with a graphical representation. The desirable limits is shows TS (500-2000) mg/l, where as TSS,TDS should be (200-500) mg/l. All samples are within the desirable limits these samples were collected in the month of Feb.

The fig.5 above shows the result of experimental study which was conducted on TS, TSS, TDS with the help of graphical representation. The desirable limits TS (5002000) mg/l, where as TSS,TDS should be (200-500) mg/l. All samples are within the limit which was collected in the month of March.

The fig. 6 above shows the experimental study which is conducted on TH, CH, MH with a graphical representation. The desirable limits TH should be within (200) mg/l, whereas CH should be (70-200) mg/l. Whereas CH should below 70 mg/l. All samples are within the limit these samples are collected in the month of February.

The fig. 7 above shows the experimental study which is conducted on TH, CH, MH with a graphical representation. The desirable limits TH should be within (200) mg/l, whereas CH should be (70-200) mg/l. Whereas CH should below 70 mg/l.
The sample has the value of 70 mg/l. All samples are within the desirable limits these samples were collected in the month of March.

Figure 8. Chlorides and Sulphates (collection on Feb)

The fig.8 above shows the experimental study which is conducted on Chlorides and sulphates with a graphical representation. The desirable limit of chlorides should be above 250 mg/l and less the 600 mg/l. The sample 19 which collected in month of February is below desirable limit the value is 115.17 mg/l but whereas all the other samples are within the desirable limits. The sulphates of all samples were below the desirable limit.

Figure 9. Chlorides and sulphates (March)

The fig.9 above shows the experimental study which is conducted on Chlorides and sulphates with a graphical representation. The desirable limit of chlorides should be above 250 mg/l and less the 600 mg/l. The sample 19 which collected in month of March is below desirable limit the value is 15.29 mg/l but whereas all the other samples are within the desirable limits. The sulphates of all samples were below the desirable limit.

Figure 10. pH, BOD and DO (Feb)

The fig. 10 above shows the experimental study which is conducted on pH, DO and BOD. With an graphical representation. The pH limit should be 6.5 to 8.5 all the sample are within the desirable limit. The DO limit should be 5 to 10 mg/l all samples are within the desirable limit. The BOD limit should be within 6 mg/l but the sample 1-12 which was collected in month of February has BOD of 115 mg/l. high BOD is an indicator of heavy load of organic matter. It reduces the abundant supply of dissolved oxygen in the water.

Figure 11. pH, BOD and DO (march)

The fig. 11 above shows the experimental study which is conducted on pH, DO and BOD with a graphical representation. The pH limit should be 6.5 to 8.5 all the samples are within the desirable limit. The DO limit should be 5 to 10 mg/l all samples are within the desirable limit. The BOD limit should be within 6 mg/l But the sample 1-12 which was collected in month of February and march has BOD of 35.8 mg/l. High BOD is an indication of high amounts of biodegradable organic matter present in a water samples.

6. CONCLUSION

The physico chemical parameters which were analyzed for hebbal lake was pH, Turbidity, DO, BOD, Total solids, Total dissolved solids, Total suspended solids, Total hardness, Magnesium, calcium, Chlorides, Sulphates, all parameters are within the desirable limits. BOD and Sulphates were not within the desirable limits. BOD value was higher when compared to the water quality index. The reason behind higher value of BOD was presence of higher concentration of biological contaminants that is lake is surrounded by trees, garden area, tree leaves and plants grown in lake. The analyzed values compared to water quality index the water quality was good 86, the sample collected at the inlet the water quality resulting 12, so it is medium water quality After comparing with water quality index the water stored in hebbal lake can be used for domestic purpose, irrigation. If the water is filtered it can be used for drinking purpose also.

7. REFERENCES


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