

# Estimation of Water Excellence of Himayatsagar and Osmansagar Lakes in Hyderabad– A Model study

Akhil Gurijala, S.S.Asadi, D.Satish Chandra

**ABSTRACT---** Water is single major element accountable intended used for living on top of the globe. India's plane irrigates flow during fourteen main stream basins past incalculable average/slight basins. The weather modify is disturbing the rainfall with eventually affect the quantity of clean water obtainable, while, plane water as healthy as earth stream resource. The plane stream excellence is an awfully essential with receptive problem is a large environmental concern worldwide. Plane water contamination through physical, chemical, with biological pollutants is able to be measured since a spate every more the planet. The learn region of study job is Himayatsagar and Osmansagar lakes in Hyderabad, Distic of Rangareddy Telangana State. India. In this present study is analysis of water quality index of two water bodies under Musi River. Water samples collected from different check points during the month of December 2018.

**Key words:** Surface Water, Himayatsagar, Osmansagar, physical, chemical characteristics

## I. INTRODUCTION

Water is a single major element accountable used intended for living lying on the globe. The 6 billion public lying on top of the globe utilize almost thirty percent of the universe overall available regeneration stream supply. Thus far billions of publics be depressed of essential water accessibility.[1] Along with additional country In the earth, India is single of the little elected country able by means of sensibly fine earth since fit since irrigate assets. India is a nation by means of vast geographical, genetic with climatic range. Standard yearly rainfall by snowstorm is approximately. 4000 bcm above the nation.[2] The regular yearly irrigate asset within a mixture of stream basin be predictable toward be 1869 bcm, of which 1086 bcm is functional counting 690 bcm of plane stream with 396 bcm of land irrigate. The have a rest of the stream is mislaid via evaporation or flow eager on top of the ocean with go unutilized. India's plane stream flow through 14 main stream basins. In adding toward Main River, present are 44 average with 55 small stream basins.

### A. Water Quality in River Basins

Water is especially important intended for human being with the health of its environment. Therefore, class of water

is very significant.[5] The float up water class is an extremely susceptible issue and as well as a huge ecological unease universe. Plane water contamination through substance, bodily, and genetic pollutant can reason endemic harms, on period every one more than the planet.[3] Fish endurance / increase and extra biodiversity, preservation actions, entertaining activities similar to swim with industrial / municipal water supply, agricultural uses such as irrigation with livestock watering, ravage disposal and all additional water use are affected by the physical, chemical, plus biological situation that exist inside the water course and also in subsurface aquifers.[6]The plane water system is naturally open to the environment, such as lakes, rivers, estuaries, reservoirs and coastal waters.[8] A normal procedure such as vary within attrition, rainfall, weather of crustal objects since fine one anthropogenic influence such since town, manufacturing with undeveloped actions.

### B. Hydrological features

The Systematic information of the hydrological properties of the irrigate body should be acquires ahead of an efficient irrigate eminence monitor scheme be recognized. Every internal water body is characterized by single hydrological features such as:

- a. **Rivers:** characterized through uni-directional present by relatively elevated standard speed (0.1 – 1.0 m/s). In common, careful and incessant upright addition is achieved within river owing to the current and turbulence.
- b. **Lakes:** characterized by short, standard recent (0.001 to 0.01 m/s) charitable advanced inhabited instance designed for water. Current within a lake are multi-directional by mixing in time by the weather conditions and tarn depth.
- c. **Ground water:** characterized through a stable run outline together within way with pace so as to mainly govern through the porosity of the physical substance since an effect of which the addition is deprived.
- d. **Reservoirs:** In-between streams with lake.

## II. DESCRIPTION OF STUDY AREA

The study area for the present work consists of catchment areas of Himayatsagar and Osmansagar reservoirs. The Himayatsagar reservoir was constructed on Esa river in 1925 and is located 9.6 km in southwest direction from the city and Osmansagar reservoir was constructed on Musi river in 1922,

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and is located 9.6 km. [10 11] from Hyderabad in western direction. The Himayatsagar catchment covers 153 villages, area with a slope range of 575m to 715m Where the Osmansagar catchment area consists of 748 km<sup>2</sup> with a slope varies between 585m to 705m and covers 93 villages. [10] The two reservoirs are supplying drinking water to Hyderabad city, which is extending from 170 10' to 17050' of North latitude and 78<sup>0</sup> 10<sup>1</sup> to 78<sup>0</sup>50<sup>1</sup> of East longitude. Both the catchments of Himayatsagar and Osmansagar reservoirs are shows flat to gently undulating topography except for few hillocks and valleys. [11] The region is mainly underlain by a peninsular gneissic complex that includes a variety of granites, magmatites of various phases and enclaves of older metamorphic rocks belonging to the Archean age.[9] These are intruded by various acidic (pegmatite's, aptite, quartz veins/reefs) and basic intrusive of dolerite and gabbros. Major dykes of dolerite composition cut across the country rocks in different.



Figure 1: Shows two water bodies under musli stream

### III. OBJECTIVES

To analyze the physical, chemical and Biological. Characteristics of surface water of Osmansagar and Himayatsagar lakes.

### IV. METHODOLOGY

Method is the organized, notional study of the method applies toward a field of revise. It comprises the notional

investigation of the methods with principle connected among a branch of awareness. Normally, it encompasses concept such as, notional phase with quantitative before qualitative technique.

#### A. Selection of Site

Sample site intended for the irrigate body/lagoon be elected toward stand for the water value on diverse point with depths. Normally two sample site are elected used for monitoring.

**Inlet:** the spot anywhere the major feeder open ken on the lagoon.

**Centre:** the spot to give the broad stream worth of the lagoon.

**Outlet:** the position anywhere the run over occur.

#### B. Types of Sampling

Generally, three types of sampling are adopted for collecting water samples.

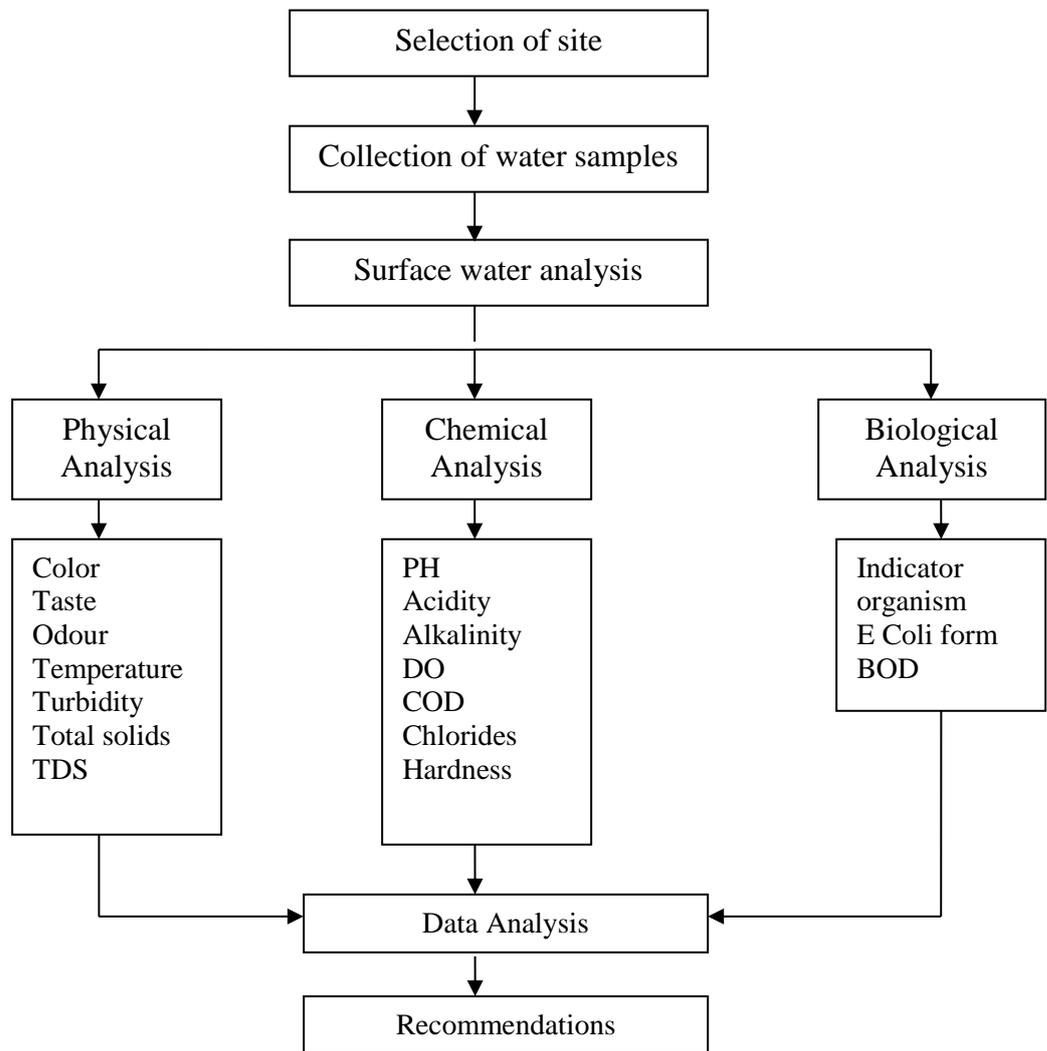
**Grab or Catch sampling:** the sample is being composed on an exacting point in time with position to represent the composition of the basis on to exacting spot with period.

**Composite sampling:** a mix of grasp sample is composed on the similar sample spot at dissimilar period intervals.

**Included sampling:** a mix of grasp sample collected on dissimilar spots at once.

#### C. Surface Water Analysis

In surface water analysis we have physical, chemical and biological analysis. Physical analysis relates to the physical parameters of the water. [7] Through the physical analysis of water we come to know the following parameters PH, Color, Taste, Odour, Turbidity and Temperature. [12,15] In Chemical analysis we carry on the following experiments on the sample like Acidity, Alkalinity, Hardness, Total Dissolved Solids, Iron Content, Chlorides, Fluorides, and Nitrites. In Biological analysis we carry on the following experiments on the sample like Chemical oxidation demand and Biological oxidation demand.



Flow chart 1. Step by step process of methodology

**I. OSMANSAGAR AND HIMAYATSAGAR**

The Osmansagar (as well famous like Gandipet) in addition to Himayatsagar be designed with the fit notorious engineer, M. Visweswarayya, used for control of floods inside Musi stream plus intended for supply intake water toward the town of Hyderabad. [13,16] Following this experience Osmansagar diagonally Musi and Himayatsagar across Esa (a branch of Musi) were constructing in 1920 and 1927 correspondingly (Alikhan, 1990: 174, 178). Of the 145 Mgd (million gallons per day) water drawn during 2000-01 from the four main sources for

Hyderabad city, 40 Mgd (27.6 per cent) was drawn from these two reservoirs (HMWSSB, 2001: 3).[10] The water starting these two-source flow keen on the water allocation scheme completely through gravity with then expenses especially little. Used for the primary instance in regarding 80 years, Osmansagar have dried up in the following week of February 2003 creation it not easy in favor of the Hyderabad city Water provide with Sewerage Board (HMWSSB) to draw some extra water meant for intake purpose.[14] These lakes have a catchment region of concerning

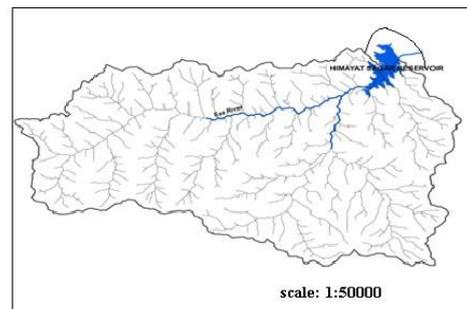
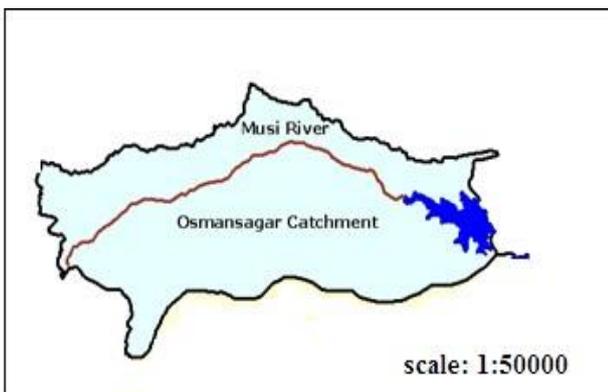


Figure 3: shows catchment area of Himyatsagar

VI. CONCLUSIONS

From the above study the following conclusions were made.

1. PH value of surface water is 7.55 mg/lit (or) PPM as per drinking water standards it should have 6.5-8.5 mg/lit (or) PPM (IS: 3025-part 11) so it is desirable therefore treatment is not required.
2. Temperature of surface water is 17.4°C as per drinking water it should have 7-15°C so it is undesirable and treatment is required for it.
3. Surface water is tasteless but as per drinking water standards water should have agreeable taste (IS: 3025-part 7&8) therefore treatment is required.
4. Surface water consists high amount of odour nuisance but as per drinking water standards water should have agreeable odour (IS: 3025-part 5) therefore treatment is required.
5. Surface water is generally grey or pale white in color where as per drinking water standards water should be color less so treatment is required.
6. Turbidity of Surface water is 4.8NTU but as per drinking water standards turbidity of water should be in range of 1-5 NTU (IS:3025-part 10) therefore treatment is required.
7. Number of total solids of Surface water is 450 mg/lit (or) PPM as per drinking water it should have 100 mg/lit (or) PPM (WHO) so it is undesirable and treatment is required for it.
8. Amount of total dissolved solids of surface water is 465 mg/lit (or) PPM as per drinking water it should have 500-1500 mg/lit (or) PPM (IS: 3025-part 16) so it is desirable and treatment is not required.
9. Amount of total suspended solids of Surface water is 82.19 mg/lit (or) PPM as per drinking water it should have 22-152 mg/lit (or) PPM (WHO) so it is desirable and treatment is not required.
10. Acidity of surface water is 141 mg/lit (or) PPM as per drinking water it should have 5-8 mg/lit (or) PPM so it is undesirable and treatment is required for it.
11. Total Alkalinity of surface water is 135 mg/lit (or) PPM as per drinking water it should have 200-600 mg/lit (or) PPM (IS: 3025-part 23) so it is undesirable and treatment is required for it.
12. Total Hardness of surface water 801mg/lit (or) PPM as per drinking water it should have 200-600 mg/lit (or) PPM (IS: 3025-part 21) so it is undesirable and treatment is required for it.
13. Chlorides of surface water is 42mg/lit (or) PPM as per drinking water it should have 150-250mg/lit (or) PPM (IS: 3025-part 32) so it is undesirable and treatment is required for it.
14. D.O of surface water is 4.8 mg/lit (or) PPM as per drinking water it should have 5.0-9.5 mg/lit (or) PPM so it is undesirable and treatment is required for it.
15. B.O.D of surface water is 4.1 mg/lit (or) PPM as per drinking water it should have 3-5 mg/lit (or) PPM so it is undesirable and treatment is required for it.

738 sq.km. The Himayatsagar, which have a catchment region of concerning 689 sq.km, additional or fewer dried out intended for the primary time in the final week of June 2003.[13] Therefore the two huge reservoirs with the oldest source of drinking water for Hyderabad have dried up in 2003. A massive water supply project is at present in use up at a charge of Rs. 10000 million to convey 45 Mgd water in the primary segment starting the Nagarjunasagar reservoir (across Krishna river).

V. RESULTS AND DISCUSSIONS

The studies on two water bodies are Himyatsagar and Osmansagar under musli stream placed at distic of Rangareddy Hyderabad town. Analyzed of water quality index like physical and chemical characteristics during December 2018. Each water body has selected two sample locations and its two different check points they are shown in table.1.

S.No	Name of the Lake	Location Name	Sample location
1	Himyatsagar	Near Himyatsagar village	L-1
		At kothwalguda	L-2
2	Osmansagar	At gandipet tank	L-1
		Near balaji temple	L-2

Table 1. Sampling locations of two lakes

S.No	Parameter	Himyatsagar		Osmansagar	
		L-1	L-2	L-1	L-2
1	Color	Grey or pale white	Grey or pale white	Colour in Grey	Colour in Grey
2	Taste	Tasteless	Tasteless	Tasteless	Tasteless
3	Odour	Medium	Above medium	Medium	Medium
4	Temperature	26	24	22	25
5	Turbidity	3.7	4.8	2.8	3.6
6	Total Solids	4.5	4.3	5.2	5.5
7	TDS	560	463	374	386

Table 2. Shows physical Characteristics of two lakes

S.No	Parameter	Himyatsagar		Osmansagar	
		L-1	L-2	L-1	L-2
1	pH	7.6	7.5	6.9	6.2
2	Acidity	115	118	121	128
3	Alkalinity	141	135	151	153
4	DO	3.6	3.7	4.4	4.8
5	Chlorides	40	42	52.1	48
6	Hardness	780	762	801	813
7	BOD	2.8	3.4	4.1	3.8
8	COD	22	25	24	21

Table 3. Shows Chemical Characteristics of two lakes



16. C.O.D of surface water is 24 mg/lit (or) PPM as per drinking water it should have 0 mg/lit (or) PPM so it is undesirable and treatment is required for it.

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