

WATER QUALITY ASSESSMENT OF HUSSAIN SAGAR LAKE BEFORE AND AFTER IMMERSION OF GANESH IDOLS

INTRODUCTION

The Hussain sagar Lake is one of the oldest man-made lakes of peninsular India located in Greater Hyderabad. The lake is spread over an area of about 540 ha. prior to 1995 which is encroached and at present shrunk to 450 ha. The full tank level (FTL) of the lake is being maintained at +513.43 m with a working assumption that one in five years would be a dry year. The total capacity of the lake is ~1 TMC (Thousand Million Cubic meters). The total catchment area of Hussain sagar is spread over 240 Sq.km.



Hussain Sagar Lake
(Photo Source: www.google.com)

The flows from the entire catchment area are fed into the Hussain sagar lake by four major nallas (streams) viz., Kukatpally, Picket, Banjara and Balkapur. The former two nallas are joining from the North West and North East while later two are joining from West and South West respectively. Earlier, the natural stream network formed in the catchment area used to bring the runoff all along the course into the lake. With urbanization in catchment area and all along these nallas, now sewage is flowing. At present, the sewage from Banjara nalla is diverted by construction of Interception & Diversion Structure and lake is now fed from only three nallas. Kukatpally nalla is the main feeding channel which brings in about 58% of dry weather flow into the lake i.e.

about 70 MLD. Apart from domestic sewage, industrial effluents from Jeedimetla, Kukatpally industrial areas drain into this nalla.

The sewage coming from Balkapur nalla is allowed to enter Sewage Treatment Plant of 20 MLD capacity (which is 17% of lake inflow) and treated water is discharged into the lake and balance is diverted into “A” Main. Similarly, sewage coming from Picket nalla is allowed to enter Sewage Treatment Plant of 30 MLD capacity (which is 25% of lake inflow) and treated water is allowed into the lake and the balance is diverted into K&S Main. These two treated water inflows are intended to meet the hydrology of the lake. The outflows from the lake are occurring through two sluices; one at Marriot Hotel side and other into Liberty nalla. The flows from Liberty nalla are used for horticulture purposes in the existing gardens.

Hyderabad gets rainfall mainly from South – West monsoons from June – October. The total annual average rainfall is 781 mm. There are periodic local meteorological disturbances, which also occasionally bring some showers. The Hussain Sagar catchment area has a rugged terrain underlined by Granites. They are grey to pink, medium to coarse grained and porphyritic or non- porphyritic and massive in nature. The catchment area is encompassed with higher topographic levels forming denudational hillocks, sometime dome shaped mounds (Inselbergs) and bouldery outcrops.



Hydrological balance of the lake

(Source: EPTRI - A Pilot Study on Hussainsagar Lake Environment, March 2015)

EFFECTS OF GANESH-IDOL IMMERSION ON WATER QUALITY

Immersion of idols of Lord Ganesh is carried out every year on the Ananta Chaturdasi day in the month of Bhadrapada (Chandramana calendar), i.e. either in August or September, after ten days of worship. These idols are made up of plaster of paris, clay, and cloth supported by small iron rods, and are coloured with different types of paint such as varnish and watercolours. When immersed, these coloured chemicals dissolve slowly leading to significant alteration in the water quality. Thousands of Ganesh idols of various sizes reaching heights up to 45 to 50 feet are immersed in the Hussainsagar Lake in the twin cities of Hyderabad and Secunderbad in Telangana. Similarly, after Durga pooja, which occurs in the month of October, idols of Goddess Durga are also immersed in the lake.

AFTER IMMERSION, A CLEAN HUSSAINSAGAR INITIATIVE

DECCAN CHRONICLE

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The two-day Ganesh festival generated huge amount of waste.

Immersion of 200 more idols, 9,000 MT garbage removed

Over 200 more Ganesh idols are expected to be immersed on the 13th day at Hussainsagar. The HMDA has removed over 3,000 metric tonnes from the NTR Marg side since day one. Over 94,000 plastic bags were distributed for waste collection. The two-day Ganesh celebration generated over 4,500 MT of garbage. On Sept. 25, over 7,500 MT of waste was generated including the city's waste and over the weekend including Monday's delayed immersion around nine MT was cleared from the city by the GHMC sanitation wing.

Water quality goes from bad to worse at Hussainsagar

The quality of water at Hussainsagar has gone from bad to worse due to Ganesh immersion. Telangana State Pollution Control Board (TSPCB) conducted water monitoring at six points of the lake on five days during the Ganesh festival. The locations were Lumbini Park, Platform 1 and 2 opposite NTR Park, Necklace Road, Lepakshi handicrafts and at midstream near Buddha statue.

The TSPCB report on impacts on water are projected below:

Source: TELANGANA STATE POLLUTION CONTROL BOARD, HYDERABAD

COMPARATIVE STATEMENT OF WATER QUALITY OF HUSSAIN SAGAR LAKE BEFORE AND AFTER IMMERSION OF GANESH IDOLS

Station: **OPP. NTR PARK Platform No.1**

	Before immersion					During immersion					After immersion					Basic water quality criteria as per CPCB (Class-E)
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	
Conductivity	1514	1257	1320	1390	1552	1403	1556	1340	1420	1618	1489	1333	1290	1430	1556	2250 (Max)
TDS	954	687	720	906	812	980	746	728	766	867	764	628	780	886	840	-
COD	79	92	86	97	100	84	180	90	112	132	78	90	88	97	118	-
BOD	20	35	22	49	28	84	68	23	46	42	30	31	26	35	36	<3 (Class-C)
DO	4.3	6.0	3.1	1.1	1.8	84	2.8	1.9	0.7	1.5	3.8	5.8	2.2	1.2	1.7	4 (Min.)
Heavy Metals																
Zinc	0.34	0.01	0.015	*	**	0.03	0.01	0.03	*	**	0.07	0.01	0.02	*	**	-
Lead	<0.01	0.01	0.01	*	**	<0.01	0.01	0.02	*	**	<0.01	0.01	0.01	*	**	-
Copper	0.02	0.01	0.02	*	**	0.01	0.01	0.02	*	**	<0.01	0.01	0.01	*	**	-
Chromium	<0.01	0.01	0.01	*	**	0.03	0.01	0.01	*	**	0.04	0.01	0.01	*	**	-

Note: All values are expressed in mg/L except pH and Conductivity (micro S/cm).

(*) - Not carried out due to refurbishing of laboratory

(**) - Analysis is under process

Class - E: Irrigation, industrial cooling, controlled waste disposal (as per water quality criteria for different uses specified by CPCB, 1979 and BIS, 1982).

COMPARATIVE STATEMENT OF WATER QUALITY OF HUSSAIN SAGAR LAKE BEFORE AND AFTER IMMERSION OF GANESH IDOLS

Station: **OPP. NTR PARK Platform No.2**

	Before immersion					During immersion					After immersion					Basic water quality criteria as per CPCB (Class-E)
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	
pH	7.6	7.7	7.4	7.5	7.6	7.75	7.38	7.8	7.2	8.24	7.91	7.66	7.9	7.2	7.5	6.0 - 8.5
Conductivity	1511	1237	1290	1410	1541	1396	1490	1390		1611	1414	1250	1280	1466	1541	2250 (Max)
TDS	780	697	906	910	965	840	737	760	894	837	763	690	810	953	847	-
COD	57	123	90	130	88	90	210	110	116	106	67	114	106	100	90	-
BOD	15	40	25	53	20	28	80	32	45	32	31	32	30	34	22	<3 (Class-C)
DO	4.5	2.9	2.4	1.2	1	4.3	<1.0	1.0	0.9	1.0	4.0	3.0	1.8	1.7	1.0	4 (Min.)
Heavy Metals																
Zinc	0.431	0.01	0.03	*	**	0.02	0.01	0.04	*	**	0.09	0.01	0.03	*	**	-
Lead	<0.01	0.01	0.02	*	**	<0.01	0.01	0.02	*	**	<0.01	0.01	0.01	*	**	-
Copper	<0.01	0.01	0.01	*	**	<0.01	0.01	0.01	*	**	<0.01	0.01	0.01	*	**	-
Chromium	0.02	0.01	0.01	*	**	0.04	0.01	0.01	*	**	0.05	0.01	0.01	*	**	-

Note: All values are expressed in mg/L except pH and Conductivity (micro S/cm).

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Station: **Lumbini Park**

Parameters	Before immersion					During immersion					After immersion					Basic water quality criteria as per CPCB (Class-E)
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	
pH	7.7	7.8	7.71	7.5	7.6	7.61	7.46	7.85	7.2	7.92	8.2	7.48	7.96	7.3	7.42	6.0 - 8.5
Conductivity	1514	1237	1280	1310	1505	1363	1270	1308	1380	1642	1407	1344	1260	1300	1584	2250 (Max)
TDS	870	713	726	867	939	790	853	740	902	1037	818	671	730	882	960	-
COD	68	110	98	168	64	88	180	102	118	108	82	110	96	83	80	-
BOD	14	35	30	71	16	30	88	32	46	32	25	34	32	30	22	<3 (Class-C)
DO	3.3	3.1	2.4	1.7	1.1	3.3	<1.0	1.8	2.1	0.5	4.6	4.0	2.5	1.0	1.5	4 (Min.)
Heavy Metals																
Zinc	0.281	0.01	0.02	*	**	0.02	0.01	0.05	*	**	0.17	0.01	0.04	*	**	-
Lead	<0.01	0.01	0.01	*	**	<0.01	0.01	0.02	*	**	<0.01	0.01	0.01	*	**	-
Copper	<0.01	0.01	0.01	*	**	<0.01	0.01	0.01	*	**	<0.01	0.01	0.01	*	**	-
Chromium	0.03	0.01	0.01	*	**	0.01	0.01	0.01	*	**	0.08	0.01	0.01	*	**	-

Note: All values are expressed in mg/L except pH and Conductivity (micro S/cm).

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COMPARATIVE STATEMENT OF WATER QUALITY OF HUSSAIN SAGAR LAKE BEFORE AND AFTER IMMERSION OF GANESH IDOLS

Station: **Lepakshi Handi crafts**

Parameters	Before immersion					During immersion					After immersion					Basic water quality criteria as per CPCB (Class-E)
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	
pH	7.6	8.1	7.8	7.6	7.7	8.28	7.43	7.67	7.3	7.85	8.3	7.61	7.72	7.2	7.53	6.0 - 8.5
Conductivity	1514	1241	1310	1298	1540	1414	1560	1382	1300	1607	1402	1332	1316	1320	1559	2250 (Max)
TDS	1136	623	730	842	924	920	763	768	839	1055	735	638	746	873	920	-
COD	46	98	100	110	112	84	192	112	126	169	82	100	98	86	111	-
BOD	15	20	30	56	28	31	63	34	57	42	22	35	28	32	28	<3 (Class-C)
DO	3.0	3.0	2.2	1.5	1.1	3.3	1.2	1.6	1.0	0.6	3.4	3.4	2.1	1.1	1.4	4 (Min.)
Heavy Metals																
Zinc	0.28	0.01	0.02	*	**	0.03	0.01	0.04	*	**	0.09	0.01	0.03	*	**	-
Lead	<0.01	0.01	0.01	*	**	<0.01	0.01	0.01	*	**	<0.01	0.01	0.01	*	**	-
Copper	<0.01	0.01	0.01	*	**	<0.01	0.01	0.01	*	**	<0.01	0.01	0.01	*	**	-
Chromium	0.02	0.01	0.01	*	**	0.04	0.01	0.01	*	**	0.03	0.01	0.01	*	**	-

Note: All values are expressed in mg/L except pH and Conductivity (micro S/cm).

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Station: Necklace Road

Parameters	Before immersion					During immersion					After immersion					Basic water quality criteria as per CPCB (Class-E)
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	
pH	7.6	8.1	7.8	7.5	7.6	8	7.47	8.2	7.2	8.01	8.4	7.68	7.9	7.3	7.6	6.0 - 8.5
Conductivity	1517	1255	1310	1280	1346	1403	1500	1350	1360	1602	1379	1312	1310	1340	1592	2250 (Max)
TDS	860	620	820	831	807	910	736	868	812	981	757	570	826	923	875	-
COD	59	122	86	55	65	80	210	94	89	98	68	110	90	88	60	-
BOD	20	34	26	77	16	25	90	28	40	30	30	39	28	33	16	<3 (Class-C)
DO	2.4	3.3	2.1	1.0	1.7	2.9	<1.0	1.2	1.0	1.0	2.9	4.0	1.8	1.3	5.8	4 (Min.)
Heavy Metals																
Zinc	0.412	0.01	0.02	*	**	0.03	0.01	0.03	*	**	0.09	0.01	0.02	*	**	-
Lead	<0.01	0.01	0.01	*	**	<0.01	0.01	0.01	*	**	<0.01	0.01	0.01	*	**	-
Copper	<0.01	0.01	0.01	*	**	<0.01	0.01	0.01	*	**	<0.01	0.01	0.01	*	**	-
Chromium	0.05	0.01	0.01	*	**	0.03	0.01	0.01	*	**	0.03	0.01	0.01	*	**	-

Note: All values are expressed in mg/L except pH and Conductivity (micro S/cm).

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COMPARATIVE STATEMENT OF WATER QUALITY OF HUSSAIN SAGAR LAKE BEFORE AND AFTER IMMERSION OF GANESH IDOLS

Station: Near Budha Statue (midstream - Control Point)

Parameters	Before immersion					During immersion					After immersion					Basic water quality criteria as per CPCB (Class-E)
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	
pH	7.6	8.1	7.92	7.6	7.7	8.16	7.43	8.4	7.2	8	8.2	7.62	8.02	7.3	7.74	6.0 - 8.5
Conductivity	1517	1242	1318		1510	1404	1550	1410		1591	1387	1329	1332	1400	1592	2250 (Max)
TDS	849	690	832	874	960	860	755	890	831	837	799	550	810	875	840	-
COD	60	85	90	101	52	80	130	98	99	89	75	88	86	100	52	-
BOD	14	25	28	52	13	26	43	32	44	24	16	29	26	37	16	<3 (Class-C)
DO	6.3	3.4	2.4	1.2	1.6	6.3	<1.0	1.0	1.2	2.9	6.4	4.8	2.2	1.0	1.6	4 (Min.)
Heavy Metals																
Zinc	0.28	0.01	0.02	*	**	0.04	0.01	0.04	*	**	0.07	0.01	0.02	*	**	-
Lead	<0.01	0.01	0.01	*	**	<0.01	0.01	0.01	*	**	<0.01	0.01	0.01	*	**	-
Copper	<0.01	0.01	0.01	*	**	<0.01	0.01	0.01	*	**	<0.01	0.01	0.01	*	**	-
Chromium	0.01	0.01	0.01	*	**	0.02	0.01	0.01	*	**	0.04	0.01	0.01	*	**	-

Note: All values are expressed in mg/L except pH and Conductivity (micro S/cm).

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