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Recent Trends in Children's Literature



Prof. Sister Pearl | Ms. Sonal Sharma | Sr. Vinita Xalxo

Recent Trends in Children's Literature



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Recent Trends in Children's Literature

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A Comparative Study on Water Quality Analysis of Lakes in Udaipur City, Rajasthan Using Water Quality Index

LAVEENA GULABCHANDANI AND DR. TARUNA SETHI

ABSTRACT

This study presents an analysis of variation of concentration of pollutants from January, 2021 to December, 2021 and comparing the observed concentration with the recommended water quality standards. Water Quality Index (WQI) was calculated with the help of 12 physicochemical parameters to decide the quality of water and classify it as excellent, good, poor, very poor and unsuitable for drinking purpose. The results of the present study show that Udaisagar lake has a higher value of most of the pollutants as compared to Swaroop Sagar lake. WQI values of Udaisagar Lake was found to be always above 101 which suggest that the water quality of lake is unsuitable for drinking purpose while for Swaroop Sagar Lake the water quality was observed to be very poor as shown by WQI values which were between 76 to 100 except for the month of November. This indicates that Udaisagar lake is more polluted as compared to Swaroop Sagar lake.

Keywords – Water Quality Index, Physicochemical Parameters, Water Quality standards, Udaisagar Lake, Swaroop Sagar Lake

Introduction

Water is one of the most important Natural Resource for the sustenance of life of every living being (Humans, Plants and animals) on this planet. All the processes of life whether biological, industrial or agricultural are directly or indirectly dependent on water. Water is present in every cell of body and helps in transport of nutrients, oxygen to and fro between various cells and organs of body. It is a part of various important processes such as Temperature regulation, Respiration, Photosynthesis, Growth, Digestion, Waste Elimination, Reproduction, and Perspiration. Moreover it is also used for in drinking, bathing, sanitation, in air conditioners, for the generation of power and steam, in irrigation, in various industries for production of various chemicals and many others.

The planet earth has around 326 million cubic miles of water which covers 71% of the earth surface. Out of this 71%, 97% of the water is found in oceans and contains various minerals making it unfit for consumption. The remaining 3% is available as fresh water. 2.5% of this fresh water is locked up in glaciers, ice caps, soil, and atmosphere and hence is unavailable. Only 0.5% of fresh water present in ponds, streams, lakes, rivers, and as groundwater is available for consumptive use (Shyam ,M., Meraj, G., Kanga ,S., Sudhanshu, Farooq, M., Singh, S.K., Sahu, N. & Kumar, P., 2022)

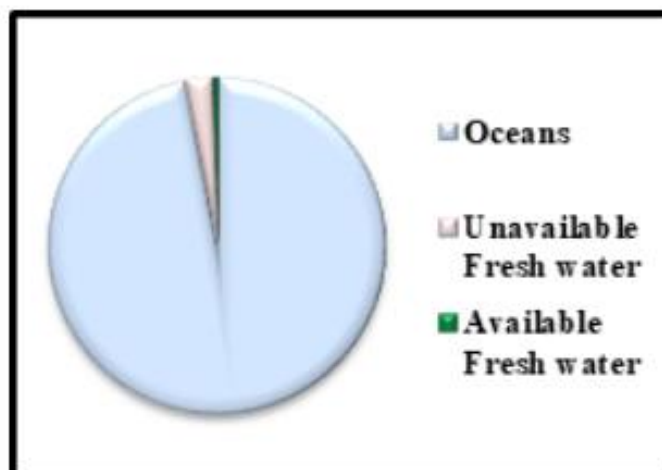


Figure 1 – Various stores of Water on Earth Surface

With such a large importance, water which is used for consumption and other uses should be clean and free from any impurities. But nowadays water quality is being continuously deteriorated due to increase in population, rapid urbanization, industrialization and other developmental activities (Nayar, R., 2020).

In developing countries, plant animal matter, domestic waste, sewage, effluents from various industries, run off from agriculture are directly drained in the nearby water bodies without any treatment (Rathore, D.S. Rai, N. & Ashiya, P., 2014, Dangi, P.L. & Sharma, BK., 2017). Domestic waste is majorly composed of a large amount of organic matter, nitrates, phosphate, chloride, detergents, oil, inorganic salts etc. while industrial effluents include heavy metals, pesticides, detergents, fertilizers, oil, coliforms, organic and inorganic salts etc. (Rathore, D.S. Rai, N. & Ashiya, P., 2014). Run off from farms also contains a large amount of pesticides and fertilizers.

All these wastes discharged due to various anthropogenic activities into the water bodies results in increase the concentration of both organic and inorganic nutrients like nitrogen, phosphorus etc in the aquatic ecosystem (Dangi, P.L. & Sharma, BK., 2017). These nutrients favours the blooming of various aquatic plants and algae on the water surface which is harmful for other aquatic organisms and plants as they utilize dissolved oxygen and also do not allow light to reach in the deepest areas of water bodies (Nayar, R., 2020). According to a study, approximately 70% of the indian water is polluted due to release of industrial effluents and domestic sewage in the freshwater bodies (Naruka, S. & Sharma, M.S., 2017).

Due to all these reasons, periodical monitoring of water quality assumes significance so that appropriate preventive and curative measures can be taken timely. Various physical and chemical properties such as pH, BOD, COD, hardness etc. are used to assess the water quality of a fresh water body.

This study is attempt to assess the water quality of two major lakes of Udaipur City from the months of January to December 2021, the Udaisagar Lake and the Swaroop Sagar lake by comparison of concentration levels of various parameters with the recommended Water quality standards as prescribed by BIS or WHO (BIS, 2012, WHO Drinking water Specifications, Kangabam, R.D., Devi, S., Bhoominathan, Kanagaraj, S. & Govindaraju, M. 2017), as shown in Table 1 and also by computing the Water Quality Index (WQI)

Table 1 - Water quality standards

S. No.	Characteristic/ Parameter	Acceptable or Permissible Limit
1.	pH	6.5-8.5
2	Electrical Conductivity ($\mu\text{S}/\text{cm}$)	250
3	Aluminium	0.03 mg/l
4	Ammonia (as total ammonia-N)	0.5 mg/l
5	Calcium (as Ca)	75 mg/l
6	Chloride (as Cl)	250 mg/l
7	Copper (as Cu)	0.05 mg/l
8	Fluoride (as F)	1.0 mg/l
9	Free residual chlorine (min)	0.2 mg/l
10	Iron (as Fe), mg/l, xiii)	0.3 mg/l
11	Dissolved Oxygen	5 mg/l or more
12	B.O.D.	5 mg/l
13	Magnesium (as Mg)	30 mg/L
14	Nitrate (as NO_3)	45 mg/l
15	Nitrite (as NO_2)	3 mg/l
16	Total alkalinity as calcium carbonate	200 mg/l
17	Total hardness (as CaCO_3)	200 mg/l

Water quality Index is used to determine the water quality of major water bodies and thus classifies the water as excellent, good, medium, bad and unsuitable for drinking purposes (Naruka, S. & Sharma, M.S., 2017) as represented in Table 2.

Table 2 – Water Quality Index (WQI) and Water Quality

WQI	Water Quality
0-25	Excellent
26-50	Good
51-75	Poor
76-100	Very Poor
101 and above	Unsuitable for drinking purpose

Objectives

- To evaluate the water quality of two major lakes (Udaisagar Lake and the Swaroop Sagar lake) of Udaipur City by comparison with Indian Water Quality Standards.
- To decide the suitability of water by computing the Water Quality Index (WQI)

Materials and Methods

Study Area

Udaipur city also known as “City of Lakes” is located between 24.5854oN and 73.7125oE covering an area of about 64 km² and lies at an altitude of 598 m above the sea level. Major lakes of Udaipur include Pichola lake, Fateh Sagar Lake, Goverdhan Sagar lake, Doodh talai, Rangasagar, Swaroop Sagar and the Udaisagar lake. All these lakes are interconnected to each other which presents a great example of Rainwater harvesting and management (Choudhary, S. & Sharma J. 2021). These lakes are an important source of drinking water of the city (Vikal P. 2009). as well as in ground water recharge, for industrial and agricultural use but continuous discharge of various Industrial, Agricultural and domestic wastes lead to deterioration of their water quality.

Site Description

This investigation involves the study of water quality of two major lakes of Udaipur City during the year 2021- the Udaisagar Lake and the Swaroop Sagar lake.

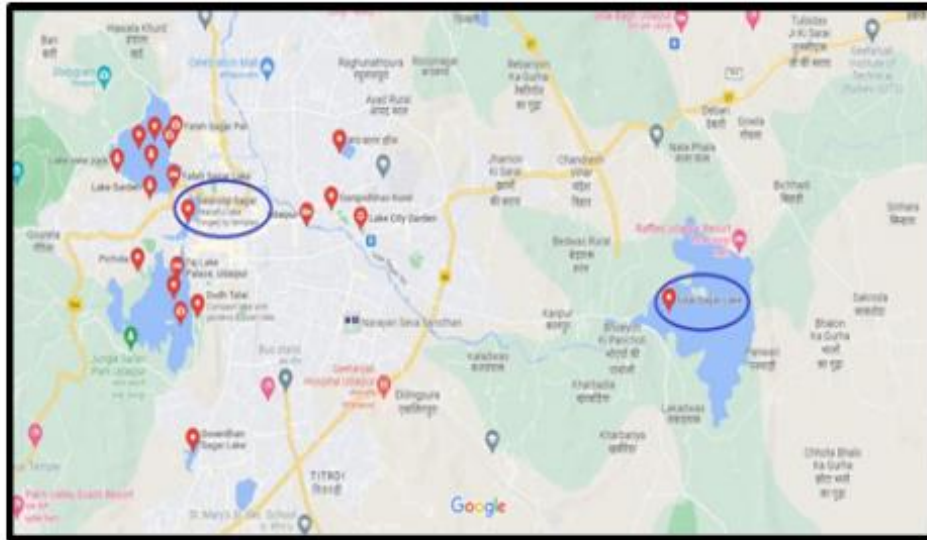


Figure 2 – Map of Udaipur showing Udaisgar and Swaroop Sagar Lake

- **Site A - Udai Sagar lake**

Udaisagar lake was built by Maharaja Udai Singh and is one of most chief sources of water supply to Zinc Smelter, Hindustan Zinc Limited as well as for irrigation. But in present times water quality of the lake has been deteriorated due to the sewage and industrial wastes from Udaipur distillery and Madri Industrial Estate which reach the lake via the drainage of Ahar river. All this has led to the eutrophication of lake (Vijayvergia, R. P., 2012).

- **Site B - Swaroop Sagar lake**

Swaroop Sagar lake also known as Kumharia Talab is an artificial lake created by Maharaja Swaroop Singh and helps to fulfill the water needs of the residents. It is interconnected with Lake Pichola and Fateh Sagar Lake and thus helps in avoiding water congestion and maintaining the water levels of the two adjacent lakes (Swaroop Sagar Lake, Rajasthan, gosahin.com)

Data Set

The data used in this study is secondary data and is obtained from Rajasthan State Pollution Control Board (RSPCB) website for Udaipur City from the Month of January to December, 2021 for the two lakes namely Udaisagar Lake

and the Swaroop Sagar lake for water quality monitoring.

Calculation of WQI

Water Quality Index (WQI) is a method to convert the complex data of water quality in terms of concentration of large number of pollutants into a single number (index value) for people to understand the water quality status easily. A large number of studies have used WQI to assess the water quality (Alam M. & Pathak, J.K., 2010, Ramakrishnaiah, C. R., Sadashivaiah, C. & Ranganna, G., 2009, Katara, P., Mittal, H. K., Maheshwari, B. L, Singh, P. K., & Dashora, Y., 2020)

In this Study, 12 physico-chemical parameters viz. B.O.D., Chloride, Conductivity, Dissolved Oxygen (D.O.), Fluoride, Nitrate, Nitrite, pH, Total Alkalinity, Total Dissolved Solids (TDS), Total Hardness and Turbidity were selected for the estimation of WQI.

The following four steps are involved in computation of WQI: (Alobaidy, A.H.M.J., Abid, H.S., Maulood, B.K., 2010, Chauhan, A. & Singh, S., 2010).

1. In the first step, all the selected parameters were assigned a weight (w_i) ranging from 1 to 4 depending upon its importance in judging the quality of water. A weightage of 1 is considered to be least significant while the parameter with a weightage of 4 is considered to be the most important.
2. The second step involves the calculation of Relative Weight (W_i or RW) for each of the parameters by the following formula-

$$W_i = \frac{w_i}{\sum_{i=1}^n w_i}$$

Where,

RW = Relative Weight

n = number of parameters

The assigned weights (w_i) and the relative weights (W_i) for all the parameters are shown in Table 3.

Table 3 – Assigned Weights and Relative Weights of the selected Physicochemical Parameters

Parameter	Weight (w_i)	Relative Weight (W_i)
B.O.D.	3	0.09091
Chloride	2	0.06061
Conductivity	3	0.09091
Dissolved Oxygen	4	0.12121
Fluoride	3	0.09091
Nitrate	3	0.09091
Nitrite	2	0.06061
pH	4	0.12121
Total Alkalinity	2	0.06061
Total Dissolved Solids	4	0.12121
Total Hardness	1	0.0303
Turbidity(JTU/NTU)	2	0.06061
	$\Sigma w_i = 33$	$\Sigma W_i = 1$

3. In the third step, a Quality rating scale (Q_i) is calculated for all the parameters using the following equation-

$$Q_i = \frac{C_i - V_i}{S_i - V_i} \times 100$$

Where,

C_i = Concentration/ Value of Water Quality Parameter present in the water sample

S_i = Standard Value as per the recommended standards of BIS or WHO (BIS, 2012, WHO Drinking water Specifications, Kangabam, R.D., Devi, S. et. al. 2017)

V_i = Ideal Value which is Zero for all parameters except DO ($V_i=14.6$) and pH ($V_i=7$)

For example – the concentration of Nitrate is 2.28 mg/l in Swaroop Sagar Lake in the sample collected in month of January. While the standard value for Nitrate in water sample is 45 mg/l

$$Q_i = 5.067$$

If the value of Q_i is zero, it show that the pollutant is completely absent in the water sample while a value ranging between 0 to 100 ($0 < Q_i < 100$) confirms the presence of pollutants in the prescribed standard. But if the value of Q_i is greater than 100, it indicates that the concentration of pollutant is more than the permissible value.

4. In the last step the Subindices(SI_i) for each parameter are calculated followed by computation of WQI by the use of the following equations –

$$SI_i = W_i \times Q_i$$

For example – Nitrate has a Relative weight of .09091 and the Quality Rating is 5.067 for the month of January. So, $SI_i = 0.46064$

$$WQI = \sum_{i=1}^n SI_i$$

Resultts and Discussion

According to the data obtained from RSPCB website, the concentration of various physical and chemical parameters from the month of January, 2021 to December, 2021 for the two selected sites namely Udaisagar Lake (Site A) and the Swaroop Sagar Lake (Site B) are summarized in Table 4 and 5.

Table 4 – Concentration of various parameters at Udaisagar Lake

Parameter	11/1/ 2021	12/2/ 2021	15/03/ 2021	12/4/ 2021	25/05/ 2021	16/06/ 2021	19/07/ 2021	16/08/ 2021	8/9/ 2021	14/10/ 2021	11/11/ 2021	9/12/ 2021
B.O.D.(mg/l)	2.37	1.62	1.8	2.4	2.8	2.7	2.9	3.1	2.4	2.4	2.3	1.47
Chloride(mg/l)	224	232	248	264	236	248	244	272	256	208	256	302
Conductivity (μ mho/ cm)	1170	1380	1380	1400	1290	1290	1290	1310	1560	1363	1963	1884
Dissolved Oxygen(mg/l)	5.1	4.6	4.8	5.7	5.5	6	5.6	5.7	4.7	5.4	4.9	5
Fluoride As F(mg/l)	0.92	0.76	0.98	1.14	0.8	1.12	0.84	1.02	0.84	0.9	0.92	0.888
Nitrate (mg/l)	3.12	4.56	5.24	3.52	2.8	3.52	3	2.68	3.12	3.4	3.12	7.9
Nitrite (mg/l)	0.0096	0.0116	0.0084	0.0108	0.0052	0.0116	0.0116	0.0096	0.0052	0.0132	0.008	0.024
pH	8.3	7.76	8.35	8.17	8.08	8.39	8.56	8.5	8.03	7.3	7.39	7.52
Total Alkalinity (mg/l)	120	144	132	136	88	84	92	88	104	92	100	96
Total Dissolved Solids(mg/l)	776	942	992	1056	902	916	998	964	1210	886	1276	1224
Total Hardness As CaCO ₃ (mg/l)	340	364	376	392	244	236	260	252	348	356	328	304
Turbidity(JTU/NTU)	4.2	4.8	4.9	5.2	5.7	5.9	8.4	8.3	3.7	2.3	9.55	6.04

Table 5 – Concentration of various parameters at Swaroop Sagar Lake

Parameter	11/1/ 2021	12/2/ 2021	15/03/ 2021	12/4/ 2021	25/05/ 2021	16/06/ 2021	19/07/ 2021	16/08/ 2021	8/9/ 2021	14/10/ 2021	11/11/ 2021	9/12/ 2021
B.O.D. (mg/l)	1.09	2.09	1.6	2.1	2.3	1.9	2.3	1.7	2.1	2.1	2.4	2.1
Chloride (mg/l)	104	68	76	64	72	68	76	76	112	68	128	65.2
Conductivity (μ mho/ cm)	760	570	570	510	510	490	460	510	790	477	750	597
Dissolved Oxygen (mg/l)	5.5	5.5	5.4	4.8	5.3	5.3	5.1	5.7	4.8	4.9	4.1	5.1
Fluoride As F(mg/l)	0.64	0.52	0.4	0.68	1.02	0.84	0.52	1	0.56	0.62	0.56	0.339
Nitrate as N(mg/l)	2.28	2	2.28	3.1	2.36	2.1	2.36	2.28	2.62	2.68	2.46	2.76
Nitrite As N(mg/l)	0.0036	0.0052	0.008	0.0044	0.0084	0.0116	0.0048	0.0096	0.0052	0.0084	0.0012	0.0116
pH	8.41	8.35	8.45	7.97	8.32	8.62	8.22	8.5	8.08	8.87	8.76	8.39
Total Alkalinity (mg/l)	120	88	84	88	76	76	72	76	80	72	80	76
Total Dissolved Solids (mg/l)	504	384	408	388	398	362	354	374	598	310	487	388
Total Hardness as CaCO ₃ (mg/l)	240	188	184	196	124	120	128	136	204	144	156	148
Turbidity (TU/ NTU)	2.9	4	3.6	3.8	3.5	3	5.1	3.5	2.6	3.85	2.8	3.74

It is evident from Table 4 that Conductivity, Total Dissolved Solids, Total Hardness and Turbidity of the **Udaisagar Lake** was above the prescribed water quality standards over the whole study period.

Conductivity of the water was found to be maximum in the month of November (1963 $\mu\text{mho/cm}$) and a minimum value was observed in the month of January (1170 $\mu\text{mho/cm}$). These values along with those obtained for all the other months were very high than the permissible limits which suggest the presence of large amount of ions and dissolved solids in it. With increase in Electrical Conductivity, the corrosive nature of water increases (Nayar, R., 2020). This is also supported by very high observed values of amount of Total Dissolved Solids (TDS) ranging from a minimum value of 776 mg/l in January to a maximum value of 1276 mg/l in November, 2021. Large amounts of total dissolved solids may lead to gastrointestinal irritation (Nayar, R., 2020).

Due to higher amount of dissolved solids which may be due to soil erosion, run off from agricultural activities, Industrial waste, domestic sewage and other anthropogenic activities, the water of Udaisagar lake was found to be highly turbid as is evident from the values of turbidity which were very higher than 1 NTU throughout the year which deteriorates the water quality.

Total Hardness of the lake water has also crossed the permissible limits ranging from minimum value of 236 mg/l in June to a maximum value of 392 mg/l in the month of April. Hardness of water decreases the capability of lathering of soap and deteriorates the water quality (ref) and if consumed for a longer time period poses risk to human health. It may lead to Urolithiasis, anencephaly, certain types of cancer, kidney stones and cardiovascular diseases (Jain, S., Rai, N., & Rathore D.S., 2015)

Surface as well as ground water both contains chlorides. The major source of chloride in water is due to salts such as NaCl, KCl etc. which reaches the water due to erosion or through municipal and industrial wastes (Lodh, R., Paul, R., Karmakar, B., & Das, M.K., 2014). The results obtained in the present study reveal that concentration of chloride was above the maximum permissible limits in the months of April (264 mg/l), August (272 mg/l), September (256 mg/l), November (256 mg/l) and December (302 mg/l). Higher concentration of chloride increases the corrosive property of water.

Dissolved Oxygen (i.e. the volume of oxygen present in a water body) of any lake plays a very important role in deciding the water quality of the lake.

The presence of dissolved oxygen in any lake is due to direct aerial diffusion or the photosynthetic activity of autotrophs. This dissolved oxygen is used by the microorganisms undergoing aerobic respiration to decompose the organic matter present in the water body (Lodh, R., Paul, R. et. al., 2014). Thus a value of DO less than 5 mg/l suggests presence of large organic matter in the water body. In the Present study, amount of dissolved oxygen was less than the standard value in the months of February, March, September and November.

Fluoride when present within limits is essential for human beings to prevent dental cavities and maintaining stronger teeth but when present in excess become a cause of bone fluorosis and other skeletal abnormalities (Nayar, R., 2020). Table 4 shows that the concentration of fluoride exceeds the permissible limits in the months of April (1.14 mg/l), June (1.12 mg/l) and August (1.02 mg/l), but the concentration is still not very high.

The results revealed that the pH of the lake water was always more than 7 suggesting its alkaline nature. The pH exceeds the limits only in the month of July. Apart from this, BOD, Total alkalinity, concentration of nitrate and nitrite are within the permissible limits throughout the study period.

The results shown in Table 5 show that in Swaroop Sagar lake, B.O.D, total alkalinity, concentration of chloride, nitrate and nitrite never crossed the permissible limits while conductivity and turbidity exceeded the permissible limits over the whole year.

Conductivity of the lake water ranges from a minimum of 460 $\mu\text{mho/cm}$ in the month of July to a maximum value of 790 $\mu\text{mho/cm}$ in the month of September. This shows the presence of dissolved salts which can conduct electricity. Owing to the presence of large amount of organic and inorganic matter, turbidity of the lake was found to be higher than the permissible limit which worsens the quality of water. The observed values are less than those observed for Udaisagar Lake.

The amount of Dissolved Oxygen was found to be less than 5 mg/l in April (4.8mg/l), September (4.8mg/l), October (4.9 mg/l) and November (4.1 mg/l) and a highest value of 5.7 mg/l was recorded in the month of August.

Concentration of Fluoride crossed the water quality standards only once during the study period i.e. in the month of May and is on the borderline in July.

Results of the present study revealed that the lake water was alkaline in nature. pH of the water was found to be higher than the permissible limits in June, October and November, 2021 with the highest value of 8.87 obtained in the month of October and a lowest value observed of 7.97 observed in April.

Total Dissolved Solids as well as Total Hardness was above the prescribed water quality standards in the months of January and September only.

The monthly Water Quality Index (WQI) as computed from the method discussed for both the sites is shown in Table 6 and the cooresponding graph is represented in Figure 3.

Table 6 – Water Quality Index (WQI) for Site A (Udaisagar Lake) and Site B (Swaroop Sagar Lake)

Month	Site A – Udaisagar Lake	Site B- Swaroop Sagar Lake
January	136.85	98.38
February	147.18	92.78
March	156.18	89.97
April	160.64	89.02
May	148.56	91.69
June	154.92	86.92
July	172.16	93.43
August	173.22	91.05
September	156.58	97.76
October	125.50	92.39
November	202.99	101.37
December	178.34	90.62

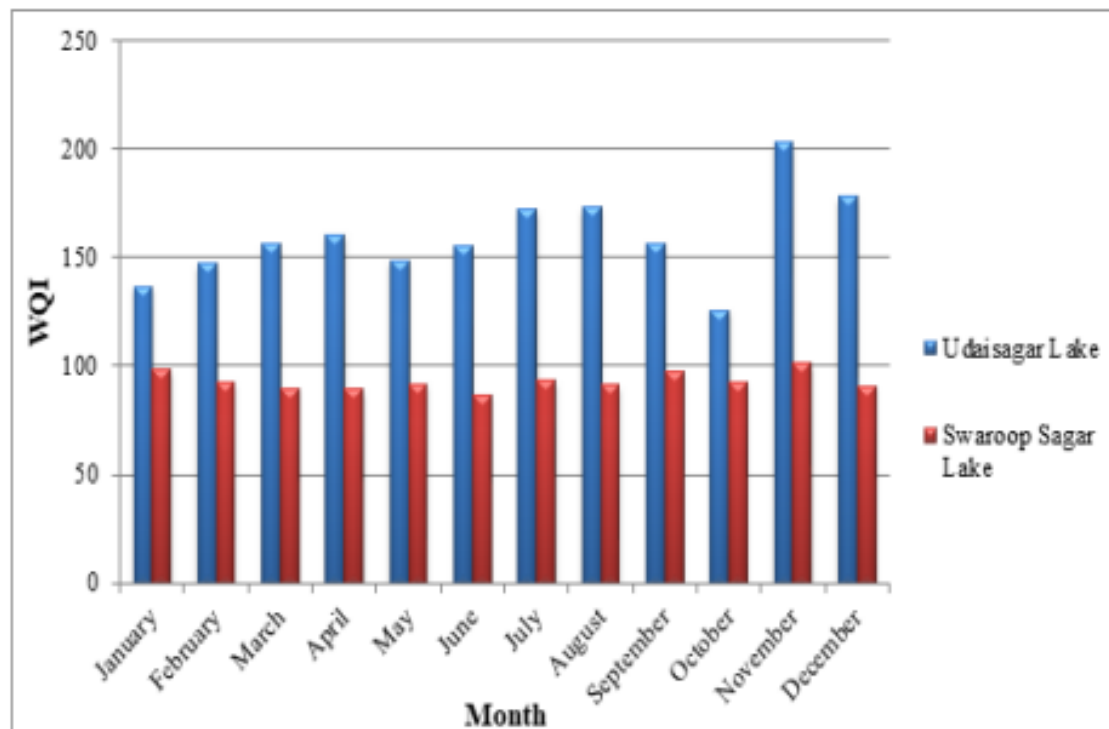


Figure 3 – Water Quality Index (WQI) for Udaisagar and Swaroop sagar lake

Table 6 and Figure 3 represents that the WQI value of Udaisagar lake was above 101 over the whole study period which shows that the water is unsuitable for drinking purpose. The highest value of 202.99 was obtained in month of November and the lowest value of 125.50 in the month of October while for Swaroop Sagar lake, WQI values falls in the range of 76 to 100 during the study period which suggests the water quality to be poor except in the month of november where it was observed to be 101.37 making it to fall in the last class.

Conclusion

Both the WQI values as well as the concentration of pollutants show that Udaisagar Lake is highly polluted as compared to Swaroop Sagar lake. This may be because of the nearby Ahar river which brings domestic and industrial wastes to the lake as well as the plant of Hindustan Zinc Limited situated in the vicinity of lake which releases its effluent into the lake.

References

- Alam M. & Pathak, J.K. (2010). Rapid Assessment of Water Quality Index of Ramganga River, Western Uttar Pradesh (India) Using a Computer Programme. *Nature and Science*, 8(11).
- Alobaidy, A.H.M.J., Abid, H.S., Maulood, B.K. (2010). Application of Water Quality Index for Assessment of Dokan Lake Ecosystem, Kurdistan Region, Iraq. *Journal of Water Resource and Protection*, 2, 792-798. doi:10.4236/jwarp.2010.29093
- Chauhan, A. & Singh, S. (2010). Evaluation Of Ganga Water For Drinking Purpose By Water Quality Index At Rishikesh, Uttarakhand, India. *Report and Opinion*, 2(9). 53-61.
- Choudhary, S. & Sharma J. (2021). Surface Water Quality Trends and Regression Model through SPSS in Udaipur, Rajasthan. *International Advanced Research Journal in Science, Engineering and Technology*, 8(10), 153-160. DOI: 10.17148/IARJSET.2021.81030
- Dangi, P.L. & Sharma, BK. (2017). Water quality status of Lake Pichhola, Udaipur, Rajasthan. *International Journal of Fisheries and Aquatic Studies*, 5(3), 181-187.
- Jain, S., Rai, N., & Rathore D.S. (2015). Water Quality Assessment of certain Marble Mining areas of Udaipur District. *International Journal of Scientific Research and Reviews*, 4(3), 1-11.
- Kangabam, R.D., Devi, S., Bhoominathan, Kanagaraj, S. & Govindaraju, M. (2017). Development of a water quality index (WQI) for the Loktak Lake in India. *Applied Water Science*, 7, 2907-2918. DOI 10.1007/s13201-017-0579-4
- Katara, P., Mittal, H. K., Maheshwari, B. L, Singh, P. K., & Dashora, Y. (2020), Assessment of Water Quality Indices for Irrigation of Dharta Watershed, Udaipur, Rajasthan, India. *International Journal of Trend in Scientific Research and Development*, 4 (3), 340-344.
- Indian Standard, Drinking Water – Specification (Second Revision), (2012). Bureau of Indian Standards. Retrieved from <http://cgwb.gov.in/Documents/WQ-standards.pdf>
- Lodh, R., Paul, R., Karmakar, B., & Das, M.K. (2014). Physicochemical studies of water quality with special reference to ancient lakes of Udaipur City, Tripura, India. *International Journal of Scientific and Research Publications*, 4(6).
- Naruka, S. & Sharma, M.S. (2017). Water quality assessment of Rajsamand Lake, Rajasthan, India. *International Research Journal of Environmental Sciences*, 6(6), 22-28.
- Nayar, R. (2020). Assessment of Water Quality Index and Monitoring of Pollutants by Physico-Chemical Analysis in Water Bodies: A Review, *International Journal of Engineering Research & Technology*, 9(1), 178-185.
- Ramakrishnaiah, C. R., Sadashivaiah, C. & Ranganna, G. (2009). Assessment of Water Quality Index for the Groundwater in Tumkur Taluk, Karnataka State, India. *E-Journal of Chemistry*, 6(2), 523-530.
- Rathore, D.S. Rai, N. & Ashiya, P. (2014). Physico Chemical Analysis of Water of Ayad River at Udaipur, Rajasthan (India), *International Journal of Innovative Research in*

Science, Engineering and Technology, 3(4),11660-11667.

Shyam ,M., Meraj, G., Kanga ,S., Sudhanshu, Farooq, M., Singh, S.K., Sahu, N. & Kumar, P. (2022). Assessing the Groundwater Reserves of the Udaipur District Aravalli Range, India, Using Geospatial Techniques, *Water*, 14, 648. <https://doi.org/10.3390/w14040648>.

Swaroop Sagar Lake, Rajasthan. Retrieved from <https://www.gosahin.com/places-to-visit/swaroop-sagar-lake/>

Vijayvergia, R. P., (2012). Ecological Studies of Lake Udaisagar with Reference to its Physico-chemical Environment. *Nature Environment and Pollution Technology*, 11(1),257-259.

Vikal P. (2009). Multivariant analysis of drinking water quality parameters of Lake Pichhola in Udaipur, India. *Biological Forum – An International Journal*, 1(1), 86-91.

WHO Drinking Water Specifications. Retrieved from <https://cpcb.nic.in/who-guidelines-for-drinking-water-quality/>

HUMAN-ENVIRONMENT INTERACTIONS

The Way People Affect the Environment

In the present times, population increase, rapid urbanization, industrialization and various other developmental activities are increased which pose detrimental impacts on the environment such as air, soil, water and noise pollution, along with depletion of natural resources as well, which directly or indirectly affect human health. This led to increased interest in ways to prevent environment.

The fourteen papers, compiled in this volume, critically examine the interaction between humans and the environment. Analysing the role of humans in the degradation of environment, it assesses the impact of the deteriorating environment on the humans in turn. The book also takes into account the various preventive measures that could be undertaken to improve the quality of environment and thus the quality of life on earth. Nevertheless, it is rightly said that 'prevention is better than cure' and we as humans need to understand that to protect the environment, we need to make changes in our own lifestyle so as to save environment and thus save ourselves.



Ms. Laveena Gulabchandani is presently serving as a Lecturer in the Department of Chemistry, Sophia Girls' College (Autonomous), Ajmer for the last five years. She has to her credit a number of research papers published in various journals of repute. She has also participated in many seminars and conferences. The major areas of her interest include Environmental Chemistry, Biochemistry, Analytical Chemistry and Physical Chemistry.

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RESEARCH, EDUCATION AND SUSTAINABLE DEVELOPMENT :
OPPORTUNITIES AND CHALLENGES
(AN INTERDISCIPLINARY APPROACH)
NOVEMBER 19, 2022 SATURDAY



-: ORGANIZED BY :-
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AND
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Personality and Social Psychology Approaches to Religious and Spiritual Development in Adolescents: A case study of Ajmer City (Raj.)

Dr. Asha Sharma, Associate Professor, Sophia Girls' College (Autonomous), Ajmer (Raj.)

Abstract

The role of religion is paradoxical. It makes prejudice and it unmakes prejudice. . . The sublimity of religious ideals is offset by the horrors of persecution in the name of these same ideals..... (Allport, 1954: p413)

The fields of personality and social psychology, with their focus on specific differences and human society, have much to suggest the study of religious and spiritual development in adolescence. This review describes the ways McAdams and Pals' comprehensive personality theory and Saroglou's Big Four functional account of religion inform the scientific understanding of adolescents' religious and spiritual development. These theories suggest religious/spiritual development of adolescents should be studied at three levels of personality (traits, characteristic adaptations, and narrative identity/objective biography) and account for the potential functions of religion in relation to behaving (moral), believing (cognitive), belonging (social), and bonding (emotional) across diverse cultural contexts. The value of these theories for studying adolescent religious/spiritual development is exemplified through description of empirical studies and lines of research based on methodologies commonly employed in personality and social psychology, including longitudinal studies, religious priming experiments, and experience sampling methods. Similarly, this review highlights areas for future investigation and provides specific suggestions

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and recommendations for inquiry on adolescent religious/spiritual development, which include organizing experimental designs, merging narrative identity with identity status approaches, and adopting a more holistic view of traits through analysis of experience sampling data.

Keywords: Social Psychology, Religious/Spiritual Development, Adolescents.



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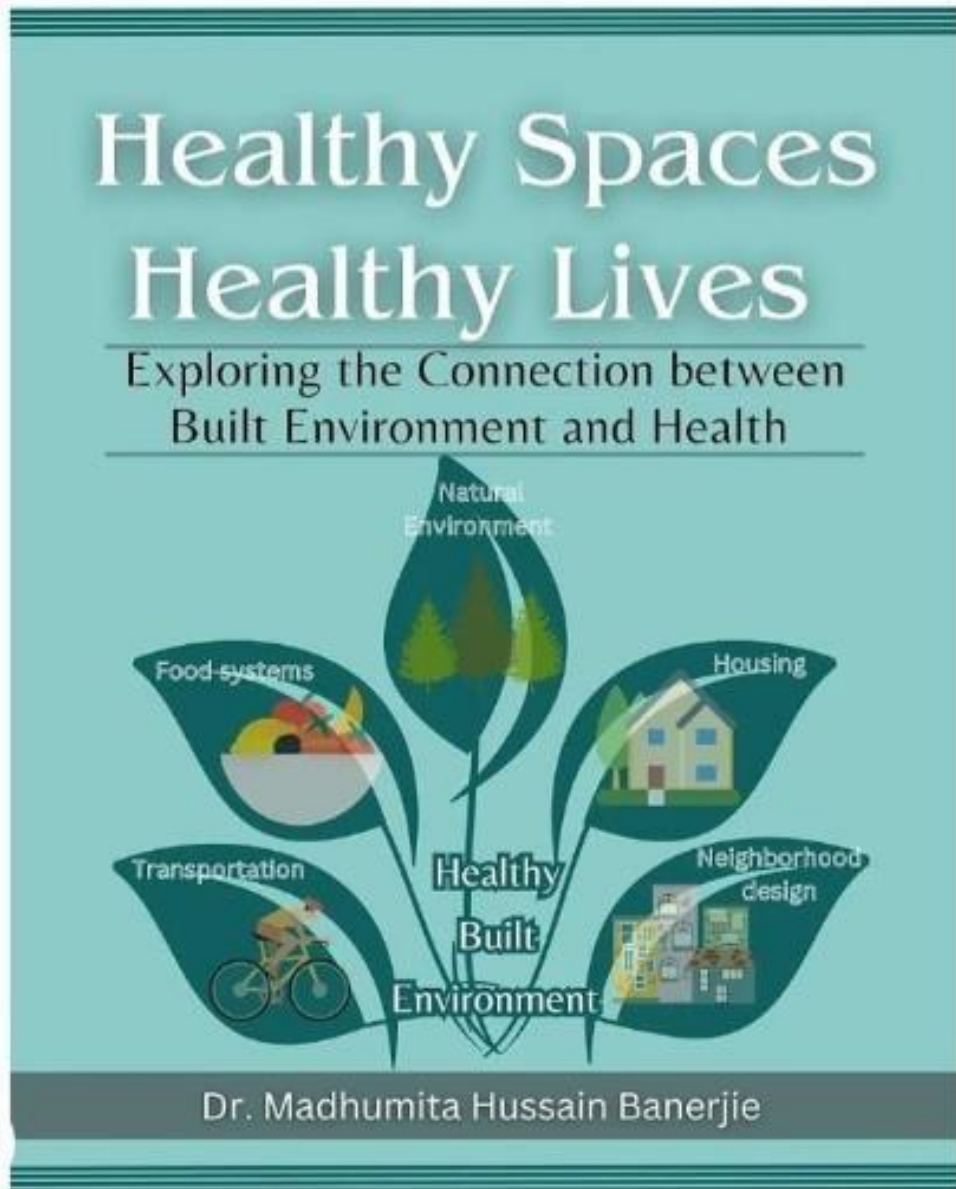
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Dr. Madhumita Hussain Banerjee

Healthy Spaces, Healthy Lives: Exploring the Connection between Built Environment and Health



Healthy Spaces, Healthy Lives

Exploring the Connection between Built Environment and Health

Dr. Madhumita Hussain Banerjee



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Dr. Madhumita Hussain Banerjee

Healthy Spaces, Healthy Lives: Exploring the Connection between Built Environment and Health



Dr. Madhumita Hussain



Dr. Madhumita Hussain is an adept to a deep understanding of Urban, Health, Physical, and Quantitative Geography. She obtained her Ph.D. in Built Environment and Health, which has become the focus of her work.

She is also the Level 3 Certified Teacher and Evaluator in Yoga by Quality Council of India. As an expert in this field, she has conducted extensive research and published several academic papers. Her writing is insightful, informative, and thought-provoking, and easy-to-understand.

Dr. Madhumita Hussain is an Associate Professor, currently sharing her knowledge and expertise with students at Sophia Girls' College (Autonomous), Ajmer. Her passion for her subject matter is evident in both her writing and her teaching.



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“Analyzing The Impact of Presence and Absence of Western Ghats Orography on Indian Monsoon”

Dr. Madhumita Hussain

Associate Professor Department of Geography Sophia Girls' College, Ajmer

Abstract

The Western Ghats is an extensive region expanding over six States, 44 districts and 142 taluks. It is the abode of many endangered plants and animals. Western Ghats host India's richest wilderness in 13 national parks and several sanctuaries. UNESCO has recognized it as one of the world's eight most important biodiversity hotspots. The Western Ghats needs high attention in the sustainability aspect of whole India and especially South India. Ministry of Environment and Forests of India set up in March 2010 an expert panel (Gadgil commission) to find a strategy for conserving these Ghats as the physical feature holds a very important place in advancing monsoon in India. The south west monsoon winds strike against the Western Ghats and shed moisture at the western regions of Western Ghats. These winds move parallel to western ghats and move towards north. Due to the process of urban development as the focal points for rapid growth of economic centers, job creation, culture, creativity, and innovation but the cost of the process is paid by the natural resources in the form of degradation of relief features, exploitation of resources, imbalance, erratic seasonal changes, natural calamities, removal of forest cover, extinction of species to name a few. The urban developmental processes have led to leave the regions in vulnerable state. Floods are now an annual incident in many parts of southern and western India. Valleys in the states of Maharashtra, Karnataka and Kerala that were not considered flood-prone until recently are at risk. Due to heavy rainfall frequent landslides are taking place in this region. Floods and landslides in August 2019, two villages were destroyed killing several people, while a year earlier Kerala saw its worst floods in a century. These floods getting more severe every year. The Western Ghats forested hills are also the source to numerous rivers, including the Godavari, Krishna and Cauvery supplying water to six states.

Keywords: *Climate Change, Indian Monsoon, Western Ghats, Floods, Vulnerability Index.*



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Geo – Spatial & Temporal Analysis of Urban Heat Island Using Remote Sensing And GIS:

A Case Study of Ajmer City (Raj.)

Ms. Shilpi Yadav** Research Scholar, * Dr. S.S. Khinchi** Associate Professor

Department of P.G. Studies in Geography Dr. Bhim Rao Ambedkar Govt. P.G. College, Sri Ganganagar

Abstract

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The earth receives heat energy from three basic sources viz. 1) Solar radiation 2) Gravity, and 3) The endogenetic forces coming from within the earth but the solar radiation is the most significant source of terrestrial heat energy. The research work has been undertaken to evaluate the potential of satellite data in the estimation of surface temperature and to analyze the role of land use/ land cover and vegetation density on the surface temperature and how land use/land cover classes are related with land surface temperatures. There is significant diversity in the temporal and spatial pattern of distribution of temperature in Ajmer District. After the study of 2000 to 2021 year, we observed that the temperature of the Ajmer District has increased since 2000 to 2021. On the other hand, after the analysis of 2003 year LST map we found that this year has a very high temperature in comparison to other LST maps. Causes of the natural disturbance of rainfall in this year and it is also found that distribution pattern of temperature is significantly diverse in different temporal LST maps, spatial pattern of distribution of temperature is not uniform at the places in different temporal LST maps. Region is that dramatic LULC conversions caused by both human beings and natural disasters. The south-west part of Ajmer District has a very low temperature in comparison to other areas of Ajmer District because of the forestland. Forestland has a low temperature in comparison to other categories except water body. Ajmer city center has a low temperature because of the water body (Anasagar lake). In short, conclusion is that the spatial layout of the land use/ land covers in the area has a great impact on the surface temperature.

Keywords: *Urban Heat Island, Land Surface Temperature, Land Use / Land Cover, GIS.*

Performance Evaluation of 13 MLD Sewage Treatment Plant (STP) at Anasagar Lake, Ajmer District (Raj.)

Mr. Sabir Khan, GIS Expert, Department of Forest, Madhya Pradesh

Ms. Shilpi Yadav

Assistant Professor, Department of Geography, Sophia Girls' College (Autonomous) Ajmer, (Raj.)

ABSTRACT

This study has been conducted for performance evaluation of 13 MLD Sewage Treatment Plant (STP) located at Anasagar Lake of Ajmer district, which is based on Sequential Batch Reactor (SBR) process. Performance of Anasagar STP is an important parameter to be monitored as the treated effluent is discharged into Anasagar Lake. The Performance Evaluation will also help for the better understanding of design and operating difficulties (aeration, blowers, etc.) in Sewage Treatment Plant. Sewage samples were collected from different locations i.e. Inlet, Distribution Chamber and Outlet of the Treatment Plant and analyzed for the major waste-water quality parameters, for example pH, Biological Oxygen Demand (BOD), Dissolved Oxygen (DO), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS), MLSS, Total Nitrogen (TN) and Total Phosphates (TP). Actual efficiency of the 13 MLD STP will be evaluated by collecting samples (20 in all) for the period of 3 months (August to October & some dates of November also). The

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conclusions of these evaluations may determine required recommendations and focus on modification requirements for the STP and will also determine whether the effluent discharged into the water body are under limits given by Nagar Nigam of Ajmer. The conclusions drawn from this study will outline the need for continuous monitoring and performance analysis by removal efficiencies of each unit of STP. Administrative potential and capabilities of maintenance systems were evaluated using primary data collection (i.e., questionnaires and by conducting staff interviews).

Keywords: - Domestic waste water, efficiency, evaluation, performance, sequential batch reactor.



Abstract

Measurement of air quality parameters is an important step to evaluate and analyze the actual air pollution of an area. In this laboratory experiment, students take environmental samples at various locations around the college campuses, take geospatial coordinates with a global position systems (GPS) unit, and map their results on a geo-referenced campus map with geographical information systems (GIS) software. This paper mainly focuses on the ambient air quality parameters inside DAV College campuses. It is the duty of an organization that air components like Suspended Particulate Matter, Oxides of Nitrogen, Oxides of Sulphur, Carbon-Di- Oxide and Carbon-Mono-Oxide should not cross the threshold as air pollution is a slow poison. In this study, we have analyzed and evaluated three parameters, suspended particulate matter (PM10), Sulphur dioxide and oxides of Nitrogen. Nitrogen dioxide air pollution sampling is used as an example, although other environmental studies could be mapped as well. In addition, students compare their results to those observed by governmental agencies, such as the Environmental Protection Agency. By studying spatial differences in pollutant concentrations, both indoors and out, and comparing their data to that observed by governmental agencies, students can begin to understand variability and the geospatial relationships in environmental sampling.

Keywords: Air Quality Parameters, Pollution, Particulate matter & Sulphur dioxide, and Oxides of Nitrogen

GIS-based Mapping and Statistical Analysis of Air Pollution and Mortality in Ajmer City, Rajasthan

**Mr. Narendra Kumar¹, Mrs. Shilpi Yadav², Mr. Sabir Khan³
DAV College, Ajmer (Raj.)¹ , Sophia Girls' College (Autonomous), Ajmer²
GIS Expert, Department of Forest, Madhya Pradesh³**

Abstract

In this study, the relationship between air pollution and human health has been investigated utilizing Geographic Information System (GIS) as an analysis tool. The research focused on how vehicular air pollution affects human health. The main objective of this study was to analyze the spatial variability of pollutants, taking Ajmer City in Rajasthan as a case study, by the identification of the areas of high concentration of air pollutants and their relationship with the numbers of death caused by air pollutants. A correlation test was performed to establish the relationship between air pollution, number of deaths from respiratory disease, and total distance travelled by road vehicles in Ajmer. GIS was utilized to investigate the spatial distribution of the air pollutants. The main finding of this research is the comparison between spatial and non-spatial analysis approaches, which indicated that correlation analysis and simple buffer analysis of GIS using the average levels of air pollutants from a single monitoring station or by group of few monitoring stations is a relatively simple method for assessing the health effects of air pollution. A non-spatial approach alone may be insufficient for an appropriate evaluation of the impact of air pollutant variables and their inter-relationships. It is important to evaluate the spatial features of air pollutants before modeling the air pollution-health relationships. **Keywords:** GIS, GPS, Buffer Analysis, Spatial Analysis, Correlation Analysis, Air pollution, Vehicular Pollution, Ajmer City.



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Chapter - 5
**Performance Evaluation of 13 MLD Sewage
Treatment Plant (STP) at Anasagar Lake, Ajmer
District (Raj.)**

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Chapter - 5

Performance Evaluation of 13 MLD Sewage Treatment Plant (STP) at Anasagar Lake, Ajmer District (Raj.)

Shilpi Yadav and Sabir Khan

Abstract

This study has been conducted for performance evaluation of 13 MLD Sewage Treatment Plant (STP) located at Anasagar Lake of Ajmer district, which is based on Sequential Batch Reactor (SBR) process. Performance of Anasagar STP is an important parameter to be monitored as the treated effluent is discharged into Anasagar Lake. The Performance Evaluation will also help for the better understanding of design and operating difficulties (aeration, blowers, etc.) in Sewage Treatment Plant. Sewage samples were collected from different locations i.e. Inlet, Distribution Chamber and Outlet of the Treatment Plant and analyzed for the major waste-water quality parameters, for example pH, Biological Oxygen Demand (BOD), Dissolved Oxygen (DO), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS), MLSS, Total Nitrogen (TN) and Total Phosphates (TP). Actual efficiency of the 13 MLD STP will be evaluated by collecting samples (20 in all) for the period of 3 months (September to November & some dates of December also). The conclusions of these evaluations may determine required recommendations and focus on modification requirements for the STP and will also determine whether the effluent discharged into the water body are under limits given by Nagar Nigam of Ajmer. The conclusions drawn from this study will outline the need for continuous monitoring and performance analysis by removal efficiencies of each and every unit of STP. Administrative potential and capabilities of maintenance systems were evaluated using primary data collection (i.e. questionnaires and by conducting staff interviews).

Keywords: Domestic waste water, efficiency evaluation, performance, sequential batch reactor, total nitrogen, total phosphorous

Introduction

Sewage treatment is an important part for a healthy society as it creates hygienic conditions where people reside. Sewage treatment is the process of

removing contaminants from waste water and basically from household sewage water. It includes physical, biological and sometimes chemical processes to remove pollutants and produce environmentally safe treated wastewater (or treated effluent). It plays a vital role in creating healthier environmental and social conditions of a place supporting a large amount of population. The management of sewerage and waste water is important as the rapid growing population of the world and the limited sources of fresh water on earth surface increase the importance of utilizable water by any means. The following study is in general is a study of sewage treatment plant and the study of STP at Anasagar Lake in specific. India has a total area of about 7 million hectares under different kinds of water bodies such as reservoirs, lakes, tanks, ponds, derelict water brackish water etc. about 1.7 lakh km under rivers and canals. Sewage contains various types of impurities or contaminants.

Due to industrial development in MIDC, domestic effluent and urban run-off contribute the bulk of wastewater generated in Ajmer city. Usually, domestic wastewater contains sludge, which is wastewater generated from washrooms, bathrooms, laundries, kitchens etc. It also contains black water made up of urine, excreta and flush water generated from toilets. Its objective is to produce a waste stream (or treated effluent) and a solid waste or sludge also suitable for discharge or reuse back into the environment ^[1]. In Ajmer city, the common treatment technologies adopted for domestic sewage treatment are sequential batch reactors. According to Ajmer city sanitation plan, the sewage collection system is decentralized one in Anasagar lake area due to new town planning and topographic conditions. Each node has its own sewage collection network, nallas and sewage treatment plants. The efficiency (%) of sewage treatment plants can be illustrated by a study on the evaluation of pollutant levels of the influent (inlet) and the effluent (outlet) at the treatment plant of sewage treatment plants discharging into the environment ^[1].

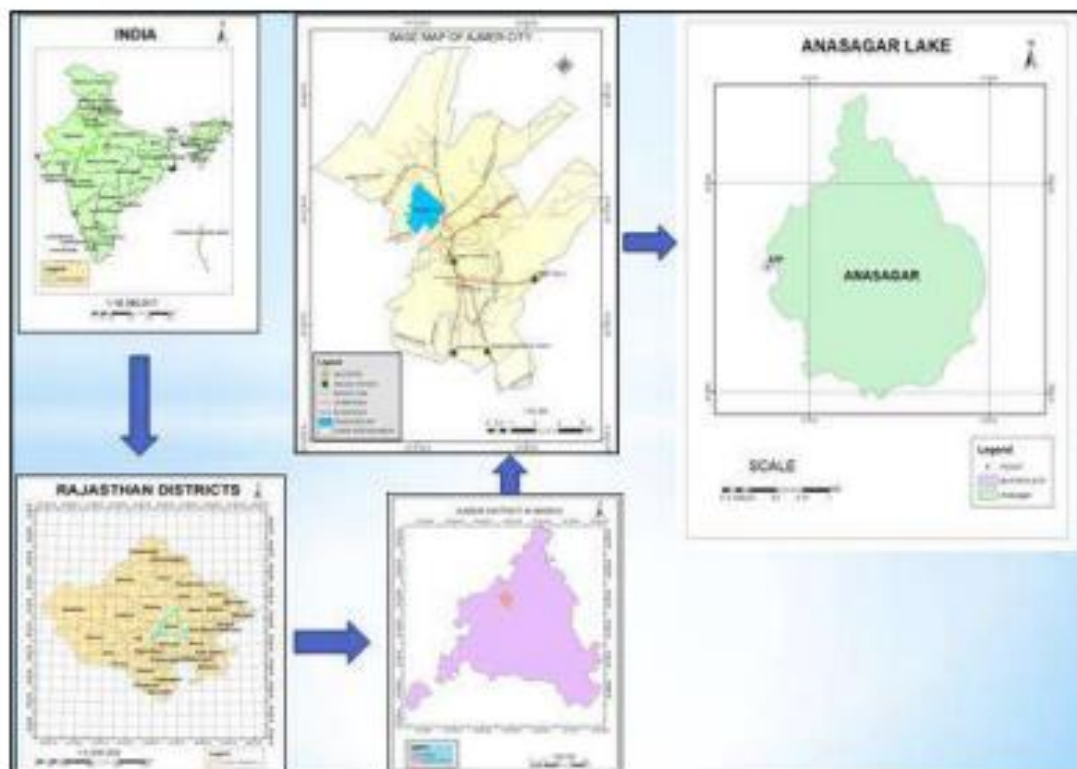
Sewage treatment work: As sewage or nallas enters a plant for treatment, it flows through a screen, which removes large floating objects such as rags and sticks that might clog pipes or damage equipment. After sewage has been screened, it passes into a grit chamber, where cinders, sand, and small stones settle to the bottom. Later this material, known as grit and screenings, is taken to a landfill for environmentally safe disposal. The sewage then flows to primary settling tanks where up to 60% of the solids in the waste stream settle out as a mixture of sludge and water.

Necessity: The major aim of Sewage water treatment is to eliminate the suspended solids (known as effluent), before the remaining water, is

discharged back to the environment. Also, the resulting water pollution causes the quality of the water to deteriorate and affects aquatic ecosystems. Pollutants can also seep down and effect groundwater deposits.

Contaminants	Some Examples
Organic impurities (animal & plant wastes in sewage)	Human faeces, animal wastes (like animal dung), urea, fruit & vegetable wastes, oils.
Inorganic impurities (dissolved chemicals)	Detergent, nitrates, phosphates, phenyl, Lysol, pesticides, herbicides, fertilizers. The nitrates & phosphates act as nutrient for algae to grow in contaminated or polluted water.
Suspended harmful & poisonous chemicals	Heavy metal like lead, mercury, arsenic etc.
Harmful bacteria	Bacteria that cause water-borne diseases like cholera, diarrhea, typhoid etc.
Other microbes like protozoans & viruses	Protozoan like Entamoeba cause dysentery, Hepatitis A virus can cause jaundice.

The treatment plant at Anasagar lake is designed to treat 13 MLD sewage. The efficiency of performance of the plant in stabilizing the sewage to the required standard has not been assessed since its operation. There has not been any research conducted on the plant to ascertain the impact of the final effluent being discharged into Anasagar Lake. State and Local authorities with statutory authority in pollution control have established standards of purity that are necessary to prevent pollution of natural waters.



Present scenario

Municipal wastewater is one of the largest sources of pollution, by volume. Municipal waste-water normally receives treatment before being released into the environment. *“The higher the level of treatment provided by a wastewater treatment plant, the cleaner the effluent and the smaller the impact on the environment”* ^[2]. Treated wastewater may contain grit, debris, disease-causing bacteria, nutrients, and hundreds of chemicals such as those in drugs and in personal care products like shampoo and cosmetics. Therefore it is necessary to analyze the system to determine the overall pollution associated to these activities ^[3]. Rapid growth and urbanization of city over past few decades has given rise to innumerable problems. One of the major problems is the deterioration of water quality in Anasagar Lake due to more or less domestic and industrial wastewater.

Sewage treatment plant at Anasagar

Today, Public Health and Engineering Department (PHED) is the agency responsible for waste water management in the city. Total sewer network is 326 km of which 15 km is main trunk while 311 km is the internal network. RUIDP Phase-1 of the project has been completed. The L & J of sewerage network work in Anasagar area (lying of approximately 95 kms of sewer lines and outfall) is under progress, with commissioning of sewerage treatment plant. The designed capacity of STPs for Anasagar Zone and City Zone are 8 MLD and 50 MLD respectively.

Sewerage zones of Ajmer City

Based on the topography of the city the sewerage system is divided into two zones,

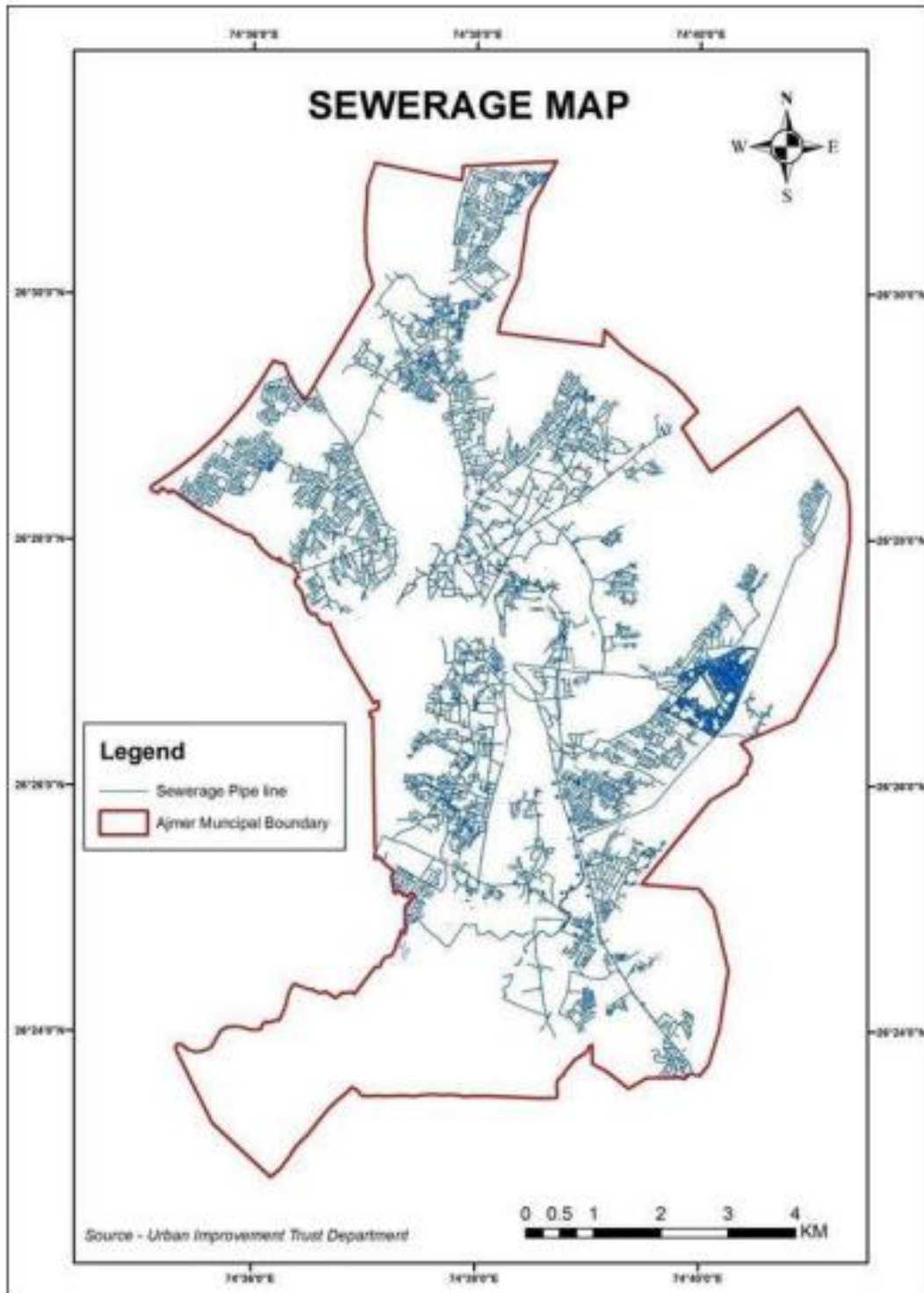
- 1) Anasagar Zone
- 2) City Zone

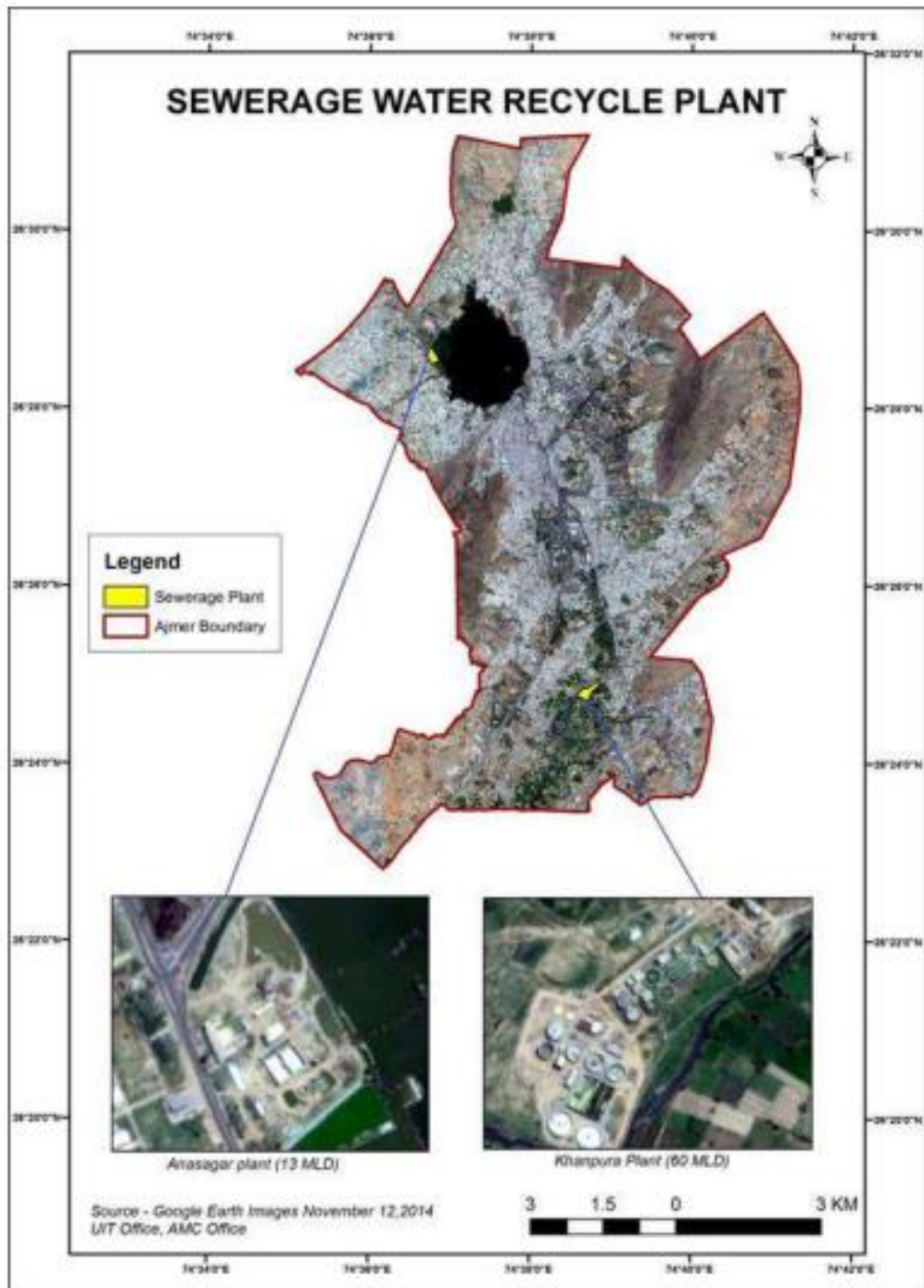
City Zone is further divided into four subzones. The areas covered under each zones are tabulated in below table.

Sewerage zone of Ajmer City

Zone	Area Covered
Anasagar Zone	Vaishali, Foysagar Road, HBU nagar, Regional College, Pushkar Road etc.
City Zone 1	Shastri Nagar, Lohagal Road, Jaipur Road, Christian Ganj, Link Road etc.
City Zone 2	Kundan Nagar, Mayo College, Naka Madar, Mayo Link Road etc.
City Zone 3	Beawar Road, Ajay Nagar, Kesar Ganj, Raja Ganj etc.
City Zone 4	Aadarsh Nagar, Bhajanganj, Subhash Nagar, Nari Shala Road etc.

(Source: RUIDP)





Objectives

Primary objective of the study is to evaluate the efficiency performance of STP at Anasagar Lake.

Others secondary objectives are as follows:

- To examine the different types of processes & methods by which sewage water is being treated.

- To understand the environmental & social concerns & to suggest measures for societal improvement by STP in the city.
- To understand & interpret the functioning & treatment of sewage in STP, Anasagar Lake, Ajmer City.

Methodology

- The design of the STP'S at Anasagar for 13 MLD is based on the Cyclic Activated Sludge Process/SBR Technology, well established process and also approved by Indian Institution of Technology for Treatment of municipal domestic sewage.
- There is 1 no. pumping station and 13 MLD Sewage Treatment Plant at Anasagar, Ajmer based on cyclic activated sludge process/ SBR technology; and 1 no. pumping station & 3.50 MLD Sewage Treatment Plant at Pushkar (Anaerobic & Facultative pond) (under turnkey basis). Here a general study of STP at Anasagar Lake is discussed.

Package No	UIT/JNNURM/STP/Ajmer-Pushkar/WW-02
Name of Contractor	M/s Enviro Infra Engineers P. Ltd, Delhi.
Work order	issued vide letter no. 2471-83 dated 22.3.11
Stipulated date of start	22.03.11
Stipulated date of completion	21.09.12
Date of completion	Dec-2015
Work order amount	Rs. 146967000.00
Work Amt. of 13 MLD STP at Anasagar	Rs. 118267000.00
O & M Amt. of 13 MLD STP at Anasagar	Rs. 5700000.00

- It is advanced version of CPHEEO's proven activated sludge process in which biological process are carried out in Sequential Batch Reactor mode through PLC control. The design of the proposed STP'S at Pushkar for 3.50 MLD is based on the Waste Stabilization pond (Anaerobic & Facultative pond), also well-established process.
- Sewage Treatment Plant at Anasagar and Pushkar Lake are established to increase the environmental and human health conditions, that causes problems such as sewage management of large population, which can further cause more problems within the area.

Plant specifications

The following section deal with the works of sewage treatment plant which is designed, such that the complete process is completed with least of power consumption, also it is of significant height with respect to MWL of Anasagar Lake. The details of outlet location of outfall sewer available with UIT are as under:

- Outfall sewer diameter-600 mm, IL-483.765, GL 490.05.
- Outfall no. 2-700 mm, IL-485.334 m, GL-488.25m.
- Peak flow of outfall sewer-29.25MLD
- Average Flow of Outfall sewer-13 MLD
- Avg. Ground level of STP Site-491.5 m
- MWL of Anasagar = 492.70 m

Technical parameters

- 1) Capacity of Plant: 13 MLD Average flow, 29.25 MLD Peak flow.
- 2) Capacity of Raw Sewage Sump and Primary Treatment Units- 17.7 MLD average flow.
- 3) Future capacity of complete Plant can be increased to 17.7 MLD Average flow and 40 MLD Peak flow.
- 4) Treatment Process of Plant is based on Cyclic Activated Sludge, Process (Sequential Batch Reactor (SBR) Technology).
- 5) Treated Effluent Parameters.
 - a) The STP is designed for 13 MLD Average Flow & for 29.25 MLD Peak Flow.
 - b) The Plant is on SBR (Sequential Batch Reactor) technology with Chlorination system.
 - c) 95 km Sewer line has laid in Anasagar catchment area and the Sewerage of the following areas that are treated in Anasagar STP and approximately 1.0 lacks population are benefited by this project as follows: Panchsheel Nagar, Hari Bhau Upadhaya Nagar, Kotra, Maharana Pratap Nagar, B.K. Kaul Nagar, R.P.S.C. Colony, Chaudhary Colony, Edgah Road, Kisan Colony, Abhiyanta Nagar.

The cyclic activated sludge process/sequential batch reactor (SBR)

The Sewage treatment plant is designed to treat the raw sewage in a single stage fully automatic Cyclic Activated Sludge Process/Sequential Batch

Reactor (SBR). The technology is based on Activated Sludge process adapted to Sequential Batch Reactor Technology (Cyclic Activated Sludge Process/SBR Technology). Screened, de-gritted and primary clarified sewage is fed into the Cyclic Activated Sludge Process/SBR Process Basins for biological treatment to remove BOD, COD, Suspended Solids, Biological Nitrogen and Phosphorous. The Cyclic Activated Sludge Process/Sequential Batch Reactor (SBR) have inbuilt mechanism for Nitrification, De-nitrification and biological phosphorous removal to degrade nutrients like Total Nitrogen (TN) and phosphorous (TP). The complete system is capable to handle variable flow and load condition. The system is self-adjusting in nature and automatically adjusts to the new feed condition by changing cycle times, aeration intensity etc. Each batch is analyzed with bio degradability and optimum treatment is automatically given to ensure minimum utilization of power and energy. The minimum free board in general is 300mm at peak flow for all units. The freeboard in the aeration tank has 600mm (minimum) at peak flow. All the units and channels the top of the unit/channel is minimum 750 mm or 450 mm+ 500mm handrail above GL.

Process

- The raw sewage is being collected and pumped into the primary treatment units. After primary treatment, the sewage water is taken into the parallel Cyclic Activated Sludge Process/SBR (CASP/SBR) basins for biological de gradation of organics in a single stage CASP/SBR Basins.
- SBR/Cyclic Activated Sludge Process works on Cyclic/Batch mode in single step/it performs biological organic removal, Nitrification, De-nitrification and Biological Phosphorous removal. It is capable of simultaneous sludge stabilization. The oxygen required is supplied through fixed type fine bubble diffused aeration system with auto control of oxygen level in tank. The system contains SVI<120 for higher settling rates and is designed in such a way that growth of filamentous bacteria is restricted. Complete operation of SBR/ Cyclic Activated Sludge Process including decanting rate, sludge recirculation and wasting of excess sludge is controlled by PLC. Treated Sewage from SBR/Cyclic Activated Sludge Process units is controlled in Chlorination tank for its disinfection.
- After grit removal: grit in the sewage must not have size greater than 100 micron with specific gravity of 2.65 or higher.
- Organic content in evacuated grit: not be over 3% on dry basis.

- Solids contents from underflow of sludge digester to be not less than six percent (6%).
- Dissolved oxygen in mixed liquor on exiting the SBR tank measured at the SBR tank out lets chamber, not less than 2.0 mg/l.
- Solid content in the wet cake: not less than 22%.

1 Inlet chamber

- The deep gravity outfall sewers discharge the raw sewage into inlet chamber. The function of the inlet chamber is to distribute the flow for process units. The Inlet Chamber is designed for peak flow of main sewer line i.e. 29.25 MLD. The inlet chamber is of adequate size to meet the requirements of workability inside it. The receiving chamber is open to sky and is water tight to prevent seepage of the sewage out of the inlet chamber.

Total Average Flow	13 MLD
Peak factor	2.25 (one)
Design flow	29.25
Number of units	1
Detention period	60 sec.
Min Free board	0.5m



Coarse screen channels

One mechanical screens working and one manual screen standby of 50 mm clear spacing.

The manual bars screens are made of 8mm thick Stainless Steel (SS 304) flats respectively. The mechanical screens are inclined Rake Type of 50mm opening. Conveyor Belt and chute arrangement is provided to take the screenings to the screenings dropped from chute is collected in a wheel burrow. Manually operated CI gates are provided at the upstream and downstream ends to regulate the flow.



Total Average flow	13 MLD
Peak Factor	2.25
Design Flow	29.25 MLD
Number of Units	1 Mechanical (Working), 1 Manual (Standby)
Approach Velocity at Average Flow (m/sec.)	0.3
Velocity through Screen at Average Flow (m/sec.)	0.6 maximum
Velocity through Screen at Peak Flow (m/sec.)	1.2 maximum
Min Free board	0.5 m
Wheeled Trolley	2 No.

Raw sewage pumping station

Sump and pumps

- Sewage enters into sump well of the pumping station after screening. The sumps are circular/ rectangular in shape and are being designed for an average flow. The capacity of sumps is kept such that the detention time in the sump is minimum 5 minutes of peak flow and the maximum detention time does not exceed 20 minutes at average flow.



Mechanical fine screen and conveyor

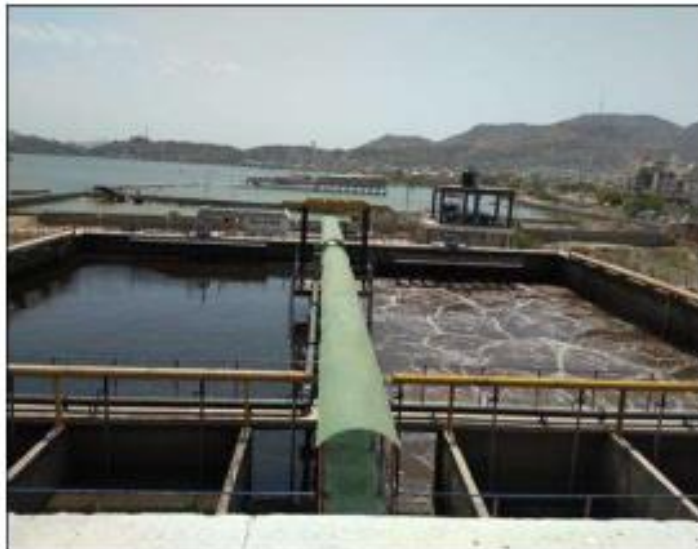
- Two mechanical working fine screens are made in the screen chamber. The screen channels are designed for peak flow.
- The clear opening for mechanical screen is 6 mm. The mechanical bar screens are of 2 mm thick Stainless Steel flats. Conveyor Belt and chute arrangement are made to take the screenings to the screenings dropped from chute will be collected in a wheel burrow. Manually operated CI gates are constructed at the upstream and downstream ends to regulate flow.

Total Average flow	13 MLD
Peak factor	2.25
Designed peak Flow	29.25 MLD
Number of Units	1 Mechanical (Working) + 1 Mechanical (Standby) each of peak flow capacity.
Approach Velocity at Average Flow (m/sec.)	0.3
Velocity through Screen at Average Flow (m/sec.)	0.6 maximum
Velocity through Screen at Peak Flow (m/sec.)	1.2 maximum
Min Free board	0.5 m
Wheeled Trolley	2 No.

Cyclic activated sludge process/ SBR process with diffusers and air blowers

Process design: The biological treatment section comprise SBR (sequencing batch reactors) /cyclic activated sludge process have installed and equipped for standard flow of 13 MLD.

- The complete biological system has designed for handling peak flow capacity.
- 2 nos. tanks in square/rectangular configuration with adequate volume.
- Maximum liquid depth of tank up to 6m. In addition, 0.5 m free board is provided to each tank.
- SBR/ Cyclic Activated sludge cycle times are selected effectively considering minutes 12 hrs per day basin of aeration and not exceeding decanting of 2.6 m liquid depth at any time preferred cycle times containing max. 50% not aerated portion.
- The excess sludge produced has fully digested. Sludge production rate are about 0.6 – 1.0 kg/kg of BOD removed.
- In the SBR/Cyclic activated sludge basins the NO filling during settling of decanting will be acceptable.



Decanting device

- The decanting device is of stainless steel with suitable arrangement around.
- There is maximum 1 decanter per basin.
- The hydraulic design based on design flow rates that were given as per proposed technology for sewage treatment plant.
- Each Decanter mechanism is inclusive of local control boxes with manual operation selection and function buttons, communication to main PLC.



Aeration system

- The Aeration facility is installed for 13 MLD average flows.
- Small bubble EPDM/PU membrane diffusers floor coverage area of 5%. Diffusers are submerged small bubble/ fine pore, high transmit efficiency, low maintenance, non-buoyant type. Diffusers are tabular (membrane), Retrievable type.
- Every set of blower have dedicated stand-in. Minimum One working air blower in each set operates via VFD while others may be operating at a fixed constant speed on soft starter configuration.
- The main air header is supported on saddles at suitable intervals/protected against external corrosion in case they are laid below ground. The header has auto valves to facilitate switch over aeration cycle from one basin to other by PLC operation. The header supply air to diffuser grids at various locations through air supply pipes. The air supply pipe above water is SS and below water level, and in PVC/UPVC as per relevant standards. All under water lateral pipes of PVC/UPVC. Junction between air header and air supply pipe is suitably protected against corrosion due to dissimilar materials.



Return sludge and excess sludge pumps

Dedicated return sludge and excess sludge pumps are provided for each basin. The pumps are of submersible / horizontal centrifugal type suitable for handling biological sludge of 1-2% solids consistency. Capacity and heads are decided based on SBR /Cyclic Activated Sludge Process requirements.



Automation and control

- PLC automation system application software is based on Rockwell hardware or equal to the control SBR System together with all pumps, valves, blowers, VFD, decanters, limit switches and probes as per the design including Inputs/Outputs with 20% spare power supply, UPS.
- HMI Panel to include advanced hardware and software with highly speed internet connection, RS-view, RS-links (gateway version), entire process and operator software with dynamic flow charts, pictures, screens, alarms, historical trends, reports etc.
- SACDA based Automation system to monitor continuously in each SBR tank the followings:

- a) Filling volume
- b) Filling quantity
- c) Discharge quantity
- d) DO-level
- e) Temperature
- f) Oxygen Uptake Rate
- g) Blower speeds
- h) Decanter speed

Sludge handling system

- Sludge sump, to collect the excess sludge from Cyclic Activates Sludge Process/SBR Process Basins. There is one common sludge sump for all basins. There is a auto gate valves on discharge sludge pipe of each Cyclic Activated Sludge Process/ SBR Process basin controlled by PLC.
- The sump are equipped with coarse bubble air grid made from HDPE/ PVC pipes and Air blower assembly to facilitate mixing of contents of sludge sump on continuous basis.
- Above sludge sump there is pump house. Approx min. height of the pump house is 4.5m from the plinth level. It is provided with rolling shutter and doors and windows as per technical specifications. Chain pulley block of minimum 1.5 T capacity is provided in the pump house to lift the pump assembly.

Sewerage and waste water management has emerged as an important aspect of today's world as it focuses on the improvement of water quality within the human settlement, increasing employment, health quality, environmental conditions within the region and focusing on better, hygienic and sanitized environment of a place.

- Through the entire study, it can be said that the parameters that were being laid down in preamble for the STP at Anasagar Lake, has been up to the mark.
- It can be said that the establishment of STP helped in restoration of Anasagar Lake as it treats the sewage water before dumping directly in the lake.
- The sewage treatment reduces water pollution and disease around the lake area.

- Due to sewage treatment, natural fertilizers rather than chemical fertilizers are available to farmers from its residue.
- Capacity of STP at Anasagar Lake can increase, and more areas can also get benefits from STP if more connections are being laid within the city.
- The awareness within the people for sewage treatment plant and proper disposal of sewage can be increased if people get involved more in hygienic practices.
- Sewage treatment plant at Khanpura can also treat sewage and provide sewage treatment facility to society, if put in working condition.

On-site procedure

- 1) Conducted a short meeting between administration staff and the operators by means of questionnaires.
- 2) To explain the purpose of performance evaluation and the evaluation process itself and its advantages.
- 3) To obtain information on maintenance and operational problems at the treatment plant.
- 4) Amount of process control routinely applied at plant should be noted and to be followed.

Sampling locations

Samples were collected after every unit of treatment raw water sump (inlet), SBR tank, and chlorine contact tank (outlet).

Sampling period

20 samples were collected for period of December to February.

Laboratory analysis

Collected samples will be tested by standard methods in the laboratory for the parameters: Sample 1: Raw water: BOD, COD, pH, Total suspended solids, Total Nitrogen, Total Phosphorous. Sample 2: SBR tank: BOD, COD, Total suspended solids, DO Sample 3: CCT tank: pH, BOD, COD, Total suspended solids, Total Nitrogen, Total Phosphorous.

Date	Sample	Parameters					
		pH	BOD (mg/l)	COD (mg/l)	TSS (mg/l)	Total Nitrogen (mg/l)	Total Phosphorous (mg/l)
1	2	3	4	5	6	7	8
1/9/22	1	6.8	185	326	376	22	7.9

5/9/22	1	7.6	217	316	477	27.6	8.7
10/9/22	1	7.8	219	457	526	28.4	8.4
15/9/22	1	7.1	217	484	417	27.4	7.8
20/9/22	1	7.6	155	376	305	36.4	7.4
25/9/22	1	7.1	242	495	326	32.4	8.7
30/9/22	1	6.9	177	497	414	27.7	8.7
5/10/22	1	7.8	306	398	391	28.2	8.7
10/10/22	1	8	184	287	376	27.4	6.5
15/10/22	1	6.8	190	381	319	36.5	8.7
20/10/22	1	7.4	155	448	376	32.6	7.7
25/10/22	1	7.4	196	380	405	38.4	4.7
30/10/22	1	7.4	188	408	409	39.4	3.9
4/11/22	1	7.8	184	360	324	34.1	7.2
9/11/22	1	7.8	190	308	381	30.6	5.8
14/11/22	1	7.6	212	324	354	36.4	7.4
19/11/22	1	7.6	196	296	390	34.1	4.8
24/11/22	1	7.4	199	344	374	30.8	5.7
29/11/22	1	7.8	250	292	328	27.2	6.1
4/12/22	1	7.6	208	340	366	34.6	7.5

BOD Removal Efficiency

Date	Inlet (mg/l)	Outlet (mg/l)	Efficiency
1/9/22	185	4	97.83%
5/9/22	217	4	98.15%
10/9/22	219	6	97.26%
15/9/22	217	3	98.61%
20/9/22	155	4	97.41%
25/9/22	242	4	98.34%
30/9/22	177	5	97.17%
5/10/22	306	6	98.03%
10/10/22	184	5	97.28%
15/10/22	190	7	96.31%
20/10/22	155	5	96.77%
25/10/22	196	4	97.95%
30/10/22	188	5	97.34%
4/11/22	184	4.8	97.39%

9/11/22	190	5.4	97.15%
14/11/22	212	7	96.69%
19/11/22	196	4.8	97.55%
24/11/22	199	4.9	97.53%
29/11/22	250	6.7	97.32%
4/12/22	208	4.9	97.64%

COD removal efficiency

Date	Inlet (mg/l)	Outlet (mg/l)	Efficiency
1/9/22	326	39	88.03%
5/9/22	316	39	87.65%
10/9/22	457	25	94.52%
15/9/22	484	26	94.62%
20/9/22	376	29	92.28%
25/9/22	495	39	92.12%
30/9/22	497	39	92.15%
5/10/22	398	36	90.95%
10/10/22	287	32	88.85%
15/10/22	381	27	92.91%
20/10/22	448	36	91.96%
25/10/22	380	36	90.52%
30/10/22	408	40	90.19%
4/11/22	360	32	91.11%
9/11/22	308	32	89.61%
14/11/22	324	34	89.50%
19/11/22	296	32	89.18%
24/11/22	344	39	88.66%
29/11/22	292	28	90.41%
4/12/22	340	44	87.05%

TSS removal efficiency

Date	Inlet (mg/l)	Outlet (mg/l)	Efficiency
1/9/22	376	5	98.66%
5/9/22	477	7	98.53%

10/9/22	526	7	98.66%
15/9/22	417	8	98.08%
20/9/22	305	6	98.03%
25/9/22	326	7	97.85%
30/9/22	414	7	98.30%
5/10/22	391	8	97.95%
10/10/22	376	6	98.40%
15/10/22	319	6	98.11%
20/10/22	376	9	97.60%
25/10/22	405	4	99.01%
30/10/22	409	7	98.77%
4/11/22	324	7	97.83%
9/11/22	381	10	97.37%
14/11/22	354	8	97.74%
19/11/22	390	7.5	98.07%
24/11/22	374	10	97.32%
29/11/22	328	7	97.86%
4/12/22	366	9	97.54%

TN removal efficiency

Date	Inlet (mg/l)	Outlet (mg/l)	Efficiency
1/9/22	22	3.7	83.18%
5/9/22	27.6	5.4	80.43%
10/9/22	28.4	4.7	83.45%
15/9/22	27.4	6.1	77.73%
20/9/22	36.4	3.7	89.83%
25/9/22	32.4	4.7	85.49%
30/9/22	27.7	4.7	83.03%
5/10/22	28.2	4.1	85.46%
10/10/22	27.4	7.9	71.16%
15/10/22	36.5	6.4	87.94%
20/10/22	32.6	4.4	86.50%
25/10/22	38.4	4.7	87.76%
30/10/22	39.4	7.9	79.94%
4/11/22	34.1	4.6	86.51%

9/11/22	30.6	4.9	83.98%
14/11/22	36.4	5.7	84.34%
19/11/22	34.1	5.1	85.04%
24/11/22	30.8	5.1	83.44%
29/11/22	27.2	4.9	81.98%
4/12/22	34.6	5.4	84.39%

TP removal efficiency

Date	Inlet (mg/l)	Outlet (mg/l)	Efficiency
1/9/22	7.9	0.4	94.93%
5/9/22	8.7	0.4	95.40%
10/9/22	8.4	0.4	95.23%
15/9/22	7.8	0.2	97.43%
20/9/22	7.4	0.4	94.59%
25/9/22	8.7	0.9	89.65%
30/9/22	8.7	0.6	93.10%
5/10/22	8.7	0.6	93.10%
10/10/22	6.5	0.4	93.84%
15/10/22	8.7	0.4	95.40%
20/10/22	7.7	0.4	94.80%
25/10/22	4.7	0.2	95.74%
30/10/22	3.9	0.3	92.30%
4/11/22	7.2	0.6	91.66%
9/11/22	5.8	0.4	93.10%
14/11/22	7.4	0.2	97.29%
19/11/22	4.8	0.4	91.66%
24/11/22	5.7	0.7	87.71%
29/11/22	6.1	0.6	90.16%
4/12/22	7.5	0.6	92%

Observation and results

Conclusions

Bases on the laboratory analysis and the operating data of sewage treatment plant, it is concluded that

1. Average BOD at inlet is 203.5 mg/l with maximum of 250 mg/l and

minimum of 155 mg/l respectively. After the advanced treatment, average BOD at outlet was observed to be 5.02 mg/l. Maximum BOD at effluent is 7 mg/l. Effluent BOD is within standard limits of discharging in the creek.

The overall BOD removal efficiency is 97.48%.

2. Average COD at inlet is 375.85 mg/l with maximum of 497 mg/l and minimum of 287 mg/l. After the treatment, average COD at outlet was examined to be 34.02 mg/l. Maximum COD at effluent is 25 mg/l. Effluent COD is within standard limits of discharging in the creek.

The overall COD removal efficiency is 90.61%.

3. The concentration of TSS at inlet was examined to be 346.9 mg/l with the removal efficiency of 98.04% of which about 19.67% of suspended solids were removed in degritor.
4. The overall total suspended solids removal efficiency is 98.04%.
5. The removal efficiencies of TN/ TP were 83.57% and 93.45% respectively.

Suggestions

- Last invention of STP i.e., Manures should be used by farmers as a fertilizers, so productivity will also increased.
- There should be proper check to prevent to disposal of toxic chemical waste from houses and industrial waste in to the water body.
- Drainage nets or trash traps should be placed on the outlet or mouth of open nallas which are flowing into the Anasagar Lake. 11 open nallas of Ajmer City are directly falls into the Anasagar lake, due to the solid waste of nallas the machines of the STP are not working properly because every type of waste material is coming like water bottles, big polythins or any form of plastic.



Drainage net or trash traps

- Capacity of STP at Anasagar Lake can increase, and more areas can also get benefits from STP if more connections are being laid within the city.
- The awareness within the people for sewage treatment plant and proper disposal of sewage, can be increased if people get involved more in hygienic practices.
- Sewage treatment plant at Khanpura can also treat sewage and provide sewage treatment facility to society, if put in more efficient in working condition.

Acknowledgment

We wish to express my sincere thanks to Mr. Amit Bajaj & Mr. Sajan Kathat, the officials and staff of Anasagar STP for the helpful teamwork from time to time during the our research work. Their appropriate suggestions given and dedication shown, made me more confident in successfully completion our research work.

References

1. Metcalf and Eddy. Wastewater Engineering, treatment and reuse, New Delhi: Tata McGraw-Hill Publishing Company Limited, 2003.
2. Prachi Wakode N, Sameer Sayyad U. Performance Evaluation of 25MLD Sewage Treatment Plant (STP) at Kalyan, American Journal of Engineering Research (AJER). 2014;3(3):310-316. e-ISSN: 2320-0847 p-ISSN : 2320-0936 www.ajer.org.
3. Wastewater technology factsheet-Sequencing batch reactor, EPA, 1999.
4. Nolasco D, Irvine D, Manoharan M, Giroux E. Evaluation and Optimization of Design/Operation of Sequencing batch Reactors for Wastewater treatment.
5. Mahvi AH. Sequencing Batch Reactor-A Promising Technology in Wastewater Treatment, Iran Journal of Environmental Health Sciences and Engineering. 2008;5(2):79-90.
6. EPA. Manual on Procedures for evaluating performance of wastewater treatment plants.
7. NEIWP. Control, Sequencing Batch Reactor Design and Operational Consideration, 2005.

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HUMAN-ENVIRONMENT INTERACTIONS

The Way People Affect the Environment

In the present times, population increase, rapid urbanization, industrialization and various other developmental activities are increased which pose detrimental impacts on the environment such as air, soil, water and noise pollution, along with depletion of natural resources as well, which directly or indirectly affect human health. This led to increased interest in ways to prevent environment.

The fourteen papers, compiled in this volume, critically examine the interaction between humans and the environment. Analysing the role of humans in the degradation of environment, it assesses the impact of the deteriorating environment on the humans in turn. The book also takes into account the various preventive measures that could be undertaken to improve the quality of environment and thus the quality of life on earth. Nevertheless, it is rightly said that 'prevention is better than cure' and we as humans need to understand that to protect the environment, we need to make changes in our own lifestyle so as to save environment and thus save ourselves.



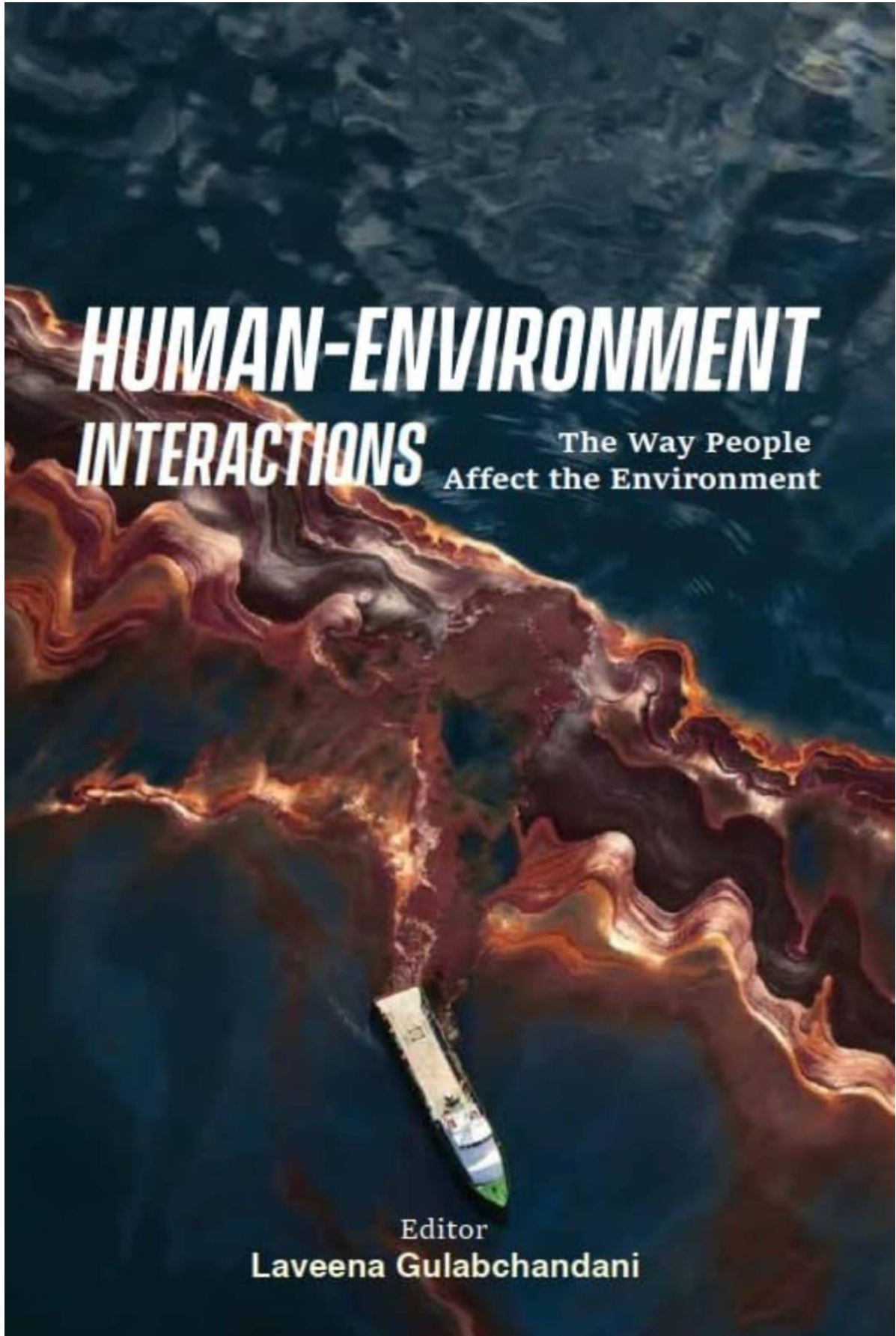
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A Comparative Study on Water Quality Analysis of Lakes in Udaipur City, Rajasthan Using Water Quality Index

LAVEENA GULABCHANDANI AND DR. TARUNA SETHI

ABSTRACT

This study presents an analysis of variation of concentration of pollutants from January, 2021 to December, 2021 and comparing the observed concentration with the recommended water quality standards. Water Quality Index (WQI) was calculated with the help of 12 physicochemical parameters to decide the quality of water and classify it as excellent, good, poor, very poor and unsuitable for drinking purpose. The results of the present study show that Udaisagar lake has a higher value of most of the pollutants as compared to Swaroop Sagar lake. WQI values of Udaisagar Lake was found to be always above 101 which suggest that the water quality of lake is unsuitable for drinking purpose while for Swaroop Sagar Lake the water quality was observed to be very poor as shown by WQI values which were between 76 to 100 except for the month of November. This indicates that Udaisagar lake is more polluted as compared to Swaroop Sagar lake.

Keywords – Water Quality Index, Physicochemical Parameters, Water Quality standards, Udaisagar Lake, Swaroop Sagar Lake

Introduction

Water is one of the most important Natural Resource for the sustenance of life of every living being (Humans, Plants and animals) on this planet. All the processes of life whether biological, industrial or agricultural are directly or indirectly dependent on water. Water is present in every cell of body and helps in transport of nutrients, oxygen to and fro between various cells and organs of body. It is a part of various important processes such as Temperature regulation, Respiration, Photosynthesis, Growth, Digestion, Waste Elimination, Reproduction, and Perspiration. Moreover it is also used for in drinking, bathing, sanitation, in air conditioners, for the generation of power and steam, in irrigation, in various industries for production of various chemicals and many others.

The planet earth has around 326 million cubic miles of water which covers 71% of the earth surface. Out of this 71%, 97% of the water is found in oceans and contains various minerals making it unfit for consumption. The remaining 3% is available as fresh water. 2.5% of this fresh water is locked up in glaciers, ice caps, soil, and atmosphere and hence is unavailable. Only 0.5% of fresh water present in ponds, streams, lakes, rivers, and as groundwater is available for consumptive use (Shyam ,M., Meraj, G., Kanga ,S., Sudhanshu, Farooq, M., Singh, S.K., Sahu, N. & Kumar, P., 2022)

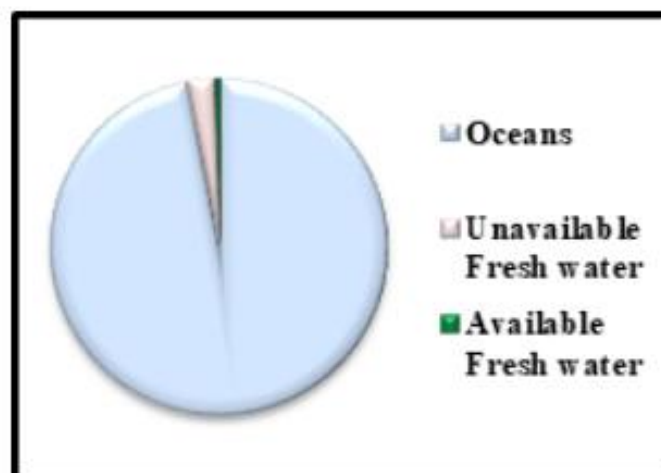


Figure 1 – Various stores of Water on Earth Surface

With such a large importance, water which is used for consumption and other uses should be clean and free from any impurities. But nowadays water quality is being continuously deteriorated due to increase in population, rapid urbanization, industrialization and other developmental activities (Nayar, R., 2020).

In developing countries, plant animal matter, domestic waste, sewage, effluents from various industries, run off from agriculture are directly drained in the nearby water bodies without any treatment (Rathore, D.S. Rai, N. & Ashiya, P., 2014, Dangi, P.L. & Sharma, BK., 2017). Domestic waste is majorly composed of a large amount of organic matter, nitrates, phosphate, chloride, detergents, oil, inorganic salts etc. while industrial effluents include heavy metals, pesticides, detergents, fertilizers, oil, coliforms, organic and inorganic salts etc. (Rathore, D.S. Rai, N. & Ashiya, P., 2014). Run off from farms also contains a large amount of pesticides and fertilizers.

All these wastes discharged due to various anthropogenic activities into the water bodies results in increase the concentration of both organic and inorganic nutrients like nitrogen, phosphorus etc in the aquatic ecosystem (Dangi, P.L. & Sharma, BK., 2017). These nutrients favours the blooming of various aquatic plants and algae on the water surface which is harmful for other aquatic organisms and plants as they utilize dissolved oxygen and also do not allow light to reach in the deepest areas of water bodies (Nayar, R., 2020). According to a study, approximately 70% of the indian water is polluted due to release of industrial effluents and domestic sewage in the freshwater bodies (Naruka, S. & Sharma, M.S., 2017).

Due to all these reasons, periodical monitoring of water quality assumes significance so that appropriate preventive and curative measures can be taken timely. Various physical and chemical properties such as pH, BOD, COD, hardness etc. are used to assess the water quality of a fresh water body.

This study is attempt to assess the water quality of two major lakes of Udaipur City from the months of January to December 2021, the Udaisagar Lake and the Swaroop Sagar lake by comparison of concentration levels of various parameters with the recommended Water quality standards as prescribed by BIS or WHO (BIS, 2012, WHO Drinking water Specifications, Kangabam, R.D., Devi, S., Bhoominathan, Kanagaraj, S. & Govindaraju, M. 2017), as shown in Table 1 and also by computing the Water Quality Index (WQI)

Table 1 - Water quality standards

S. No.	Characteristic/ Parameter	Acceptable or Permissible Limit
1.	pH	6.5-8.5
2	Electrical Conductivity ($\mu\text{S}/\text{cm}$)	250
3	Aluminium	0.03 mg/l
4	Ammonia (as total ammonia-N)	0.5 mg/l
5	Calcium (as Ca)	75 mg/l
6	Chloride (as Cl)	250 mg/l
7	Copper (as Cu)	0.05 mg/l
8	Fluoride (as F)	1.0 mg/l
9	Free residual chlorine (min)	0.2 mg/l
10	Iron (as Fe), mg/l, xiii)	0.3 mg/l
11	Dissolved Oxygen	5 mg/l or more
12	B.O.D.	5 mg/l
13	Magnesium (as Mg)	30 mg/L
14	Nitrate (as NO_3)	45 mg/l
15	Nitrite (as NO_2)	3 mg/l
16	Total alkalinity as calcium carbonate	200 mg/l
17	Total hardness (as CaCO_3)	200 mg/l

Water quality Index is used to determine the water quality of major water bodies and thus classifies the water as excellent, good, medium, bad and unsuitable for drinking purposes (Naruka, S. & Sharma, M.S., 2017) as represented in Table 2.

Table 2 – Water Quality Index (WQI) and Water Quality

WQI	Water Quality
0-25	Excellent
26-50	Good
51-75	Poor
76-100	Very Poor
101 and above	Unsuitable for drinking purpose

Objectives

- To evaluate the water quality of two major lakes (Udaisagar Lake and the Swaroop Sagar lake) of Udaipur City by comparison with Indian Water Quality Standards.
- To decide the suitability of water by computing the Water Quality Index (WQI)

Materials and Methods

Study Area

Udaipur city also known as “City of Lakes” is located between 24.5854oN and 73.7125oE covering an area of about 64 km² and lies at an altitude of 598 m above the sea level. Major lakes of Udaipur include Pichola lake, Fateh Sagar Lake, Goverdhan Sagar lake, Doodh talai, Rangasagar, Swaroop Sagar and the Udaisagar lake. All these lakes are interconnected to each other which presents a great example of Rainwater harvesting and management (Choudhary, S. & Sharma J. 2021). These lakes are an important source of drinking water of the city (Vikal P. 2009). as well as in ground water recharge, for industrial and agricultural use but continuous discharge of various Industrial, Agricultural and domestic wastes lead to deterioration of their water quality.

Site Description

This investigation involves the study of water quality of two major lakes of Udaipur City during the year 2021- the Udaisagar Lake and the Swaroop Sagar lake.

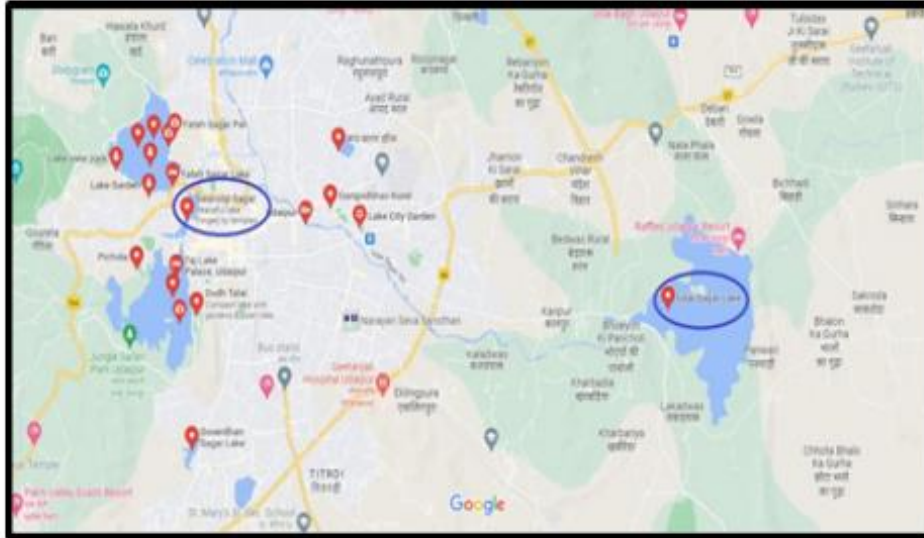


Figure 2 – Map of Udaipur showing Udaigar and Swaroop Sagar Lake

- **Site A - Udai Sagar lake**

Udaigar lake was built by Maharaja Udai Singh and is one of most chief sources of water supply to Zinc Smelter, Hindustan Zinc Limited as well as for irrigation. But in present times water quality of the lake has been deteriorated due to the sewage and industrial wastes from Udaipur distillery and Madri Industrial Estate which reach the lake via the drainage of Ahar river. All this has led to the eutrophication of lake (Vijayvergia, R. P., 2012).

- **Site B - Swaroop Sagar lake**

Swaroop Sagar lake also known as Kumharia Talab is an artificial lake created by Maharaja Swaroop Singh and helps to fulfill the water needs of the residents. It is interconnected with Lake Pichola and Fateh Sagar Lake and thus helps in avoiding water congestion and maintaining the water levels of the two adjacent lakes (Swaroop Sagar Lake, Rajasthan, gosahin.com)

Data Set

The data used in this study is secondary data and is obtained from Rajasthan State Pollution Control Board (RSPCB) website for Udaipur City from the Month of January to December, 2021 for the two lakes namely Udaigar Lake

and the Swaroop Sagar lake for water quality monitoring.

Calculation of WQI

Water Quality Index (WQI) is a method to convert the complex data of water quality in terms of concentration of large number of pollutants into a single number (index value) for people to understand the water quality status easily. A large number of studies have used WQI to assess the water quality (Alam M. & Pathak, J.K., 2010, Ramakrishnaiah, C. R., Sadashivaiah, C. & Ranganna, G., 2009, Katara, P., Mittal, H. K., Maheshwari, B. L, Singh, P. K., & Dashora, Y., 2020)

In this Study, 12 physico-chemical parameters viz. B.O.D., Chloride, Conductivity, Dissolved Oxygen (D.O.), Fluoride, Nitrate, Nitrite, pH, Total Alkalinity, Total Dissolved Solids (TDS), Total Hardness and Turbidity were selected for the estimation of WQI.

The following four steps are involved in computation of WQI: (Alobaidy, A.H.M.J., Abid, H.S., Maulood, B.K., 2010, Chauhan, A. & Singh, S., 2010).

1. In the first step, all the selected parameters were assigned a weight (w_i) ranging from 1 to 4 depending upon its importance in judging the quality of water. A weightage of 1 is considered to be least significant while the parameter with a weightage of 4 is considered to be the most important.
2. The second step involves the calculation of Relative Weight (W_i or RW) for each of the parameters by the following formula-

$$W_i = \frac{w_i}{\sum_{i=1}^n w_i}$$

Where,

RW = Relative Weight

n = number of parameters

The assigned weights (w_i) and the relative weights (W_i) for all the parameters are shown in Table 3.

Table 3 – Assigned Weights and Relative Weights of the selected Physicochemical Parameters

Parameter	Weight (w_i)	Relative Weight (W_i)
B.O.D.	3	0.09091
Chloride	2	0.06061
Conductivity	3	0.09091
Dissolved Oxygen	4	0.12121
Fluoride	3	0.09091
Nitrate	3	0.09091
Nitrite	2	0.06061
pH	4	0.12121
Total Alkalinity	2	0.06061
Total Dissolved Solids	4	0.12121
Total Hardness	1	0.0303
Turbidity(JTU/NTU)	2	0.06061
	$\Sigma w_i = 33$	$\Sigma W_i = 1$

3. In the third step, a Quality rating scale (Q_i) is calculated for all the parameters using the following equation-

$$Q_i = \frac{C_i - V_i}{S_i - V_i} \times 100$$

Where,

C_i = Concentration/ Value of Water Quality Parameter present in the water sample

S_i = Standard Value as per the recommended standards of BIS or WHO (BIS, 2012, WHO Drinking water Specifications, Kangabam, R.D., Devi, S. et. al. 2017)

V_i = Ideal Value which is Zero for all parameters except DO ($V_i=14.6$) and pH ($V_i=7$)

For example – the concentration of Nitrate is 2.28 mg/l in Swaroop Sagar Lake in the sample collected in month of January. While the standard value for Nitrate in water sample is 45 mg/l

$$Q_i = 5.067$$

If the value of Q_i is zero, it show that the pollutant is completely absent in the water sample while a value ranging between 0 to 100 ($0 < Q_i < 100$) confirms the presence of pollutants in the prescribed standard. But if the value of Q_i is greater than 100, it indicates that the concentration of pollutant is more than the permissible value.

4. In the last step the Subindices(SI_i) for each parameter are calculated followed by computation of WQI by the use of the following equations –

$$SI_i = W_i \times Q_i$$

For example – Nitrate has a Relative weight of .09091 and the Quality Rating is 5.067 for the month of January. So, $SI_i = 0.46064$

$$WQI = \sum_{i=1}^n SI_i$$

Resultts and Discussion

According to the data obtained from RSPCB website, the concentration of various physical and chemical parameters from the month of January, 2021 to December, 2021 for the two selected sites namely Udaisagar Lake (Site A) and the Swaroop Sagar Lake (Site B) are summarized in Table 4 and 5.

Table 4 – Concentration of various parameters at Udaisagar Lake

Parameter	11/1/ 2021	12/2/ 2021	15/03/ 2021	12/4/ 2021	25/05/ 2021	16/06/ 2021	19/07/ 2021	16/08/ 2021	8/9/ 2021	14/10/ 2021	11/11/ 2021	9/12/ 2021
B.O.D.(mg/l)	2.37	1.62	1.8	2.4	2.8	2.7	2.9	3.1	2.4	2.4	2.3	1.47
Chloride(mg/l)	224	232	248	264	236	248	244	272	256	208	256	302
Conductivity (μ mho/ cm)	1170	1380	1380	1400	1290	1290	1290	1310	1560	1363	1963	1884
Dissolved Oxygen(mg/l)	5.1	4.6	4.8	5.7	5.5	6	5.6	5.7	4.7	5.4	4.9	5
Fluoride As F(mg/l)	0.92	0.76	0.98	1.14	0.8	1.12	0.84	1.02	0.84	0.9	0.92	0.888
Nitrate (mg/l)	3.12	4.56	5.24	3.52	2.8	3.52	3	2.68	3.12	3.4	3.12	7.9
Nitrite (mg/l)	0.0096	0.0116	0.0084	0.0108	0.0052	0.0116	0.0116	0.0096	0.0052	0.0132	0.008	0.024
pH	8.3	7.76	8.35	8.17	8.08	8.39	8.56	8.5	8.03	7.3	7.39	7.52
Total Alkalinity (mg/l)	120	144	132	136	88	84	92	88	104	92	100	96
Total Dissolved Solids(mg/l)	776	942	992	1056	902	916	998	964	1210	886	1276	1224
Total Hardness As CaCO ₃ (mg/l)	340	364	376	392	244	236	260	252	348	356	328	304
Turbidity(JTU/NTU)	4.2	4.8	4.9	5.2	5.7	5.9	8.4	8.3	3.7	2.3	9.55	6.04

Table 5 – Concentration of various parameters at Swaroop Sagar Lake

Parameter	11/1/ 2021	12/2/ 2021	15/03/ 2021	12/4/ 2021	25/05/ 2021	16/06/ 2021	19/07/ 2021	16/08/ 2021	8/9/ 2021	14/10/ 2021	11/11/ 2021	9/12/ 2021
B.O.D. (mg/l)	1.09	2.09	1.6	2.1	2.3	1.9	2.3	1.7	2.1	2.1	2.4	2.1
Chloride (mg/l)	104	68	76	64	72	68	76	76	112	68	128	65.2
Conductivity (μ mho/ cm)	760	570	570	510	510	490	460	510	790	477	750	597
Dissolved Oxygen (mg/l)	5.5	5.5	5.4	4.8	5.3	5.3	5.1	5.7	4.8	4.9	4.1	5.1
Fluoride As F(mg/l)	0.64	0.52	0.4	0.68	1.02	0.84	0.52	1	0.56	0.62	0.56	0.339
Nitrate as N(mg/l)	2.28	2	2.28	3.1	2.36	2.1	2.36	2.28	2.62	2.68	2.46	2.76
Nitrite As N(mg/l)	0.0036	0.0052	0.008	0.0044	0.0084	0.0116	0.0048	0.0096	0.0052	0.0084	0.0012	0.0116
pH	8.41	8.35	8.45	7.97	8.32	8.62	8.22	8.5	8.08	8.87	8.76	8.39
Total Alkalinity (mg/l)	120	88	84	88	76	76	72	76	80	72	80	76
Total Dissolved Solids (mg/l)	504	384	408	388	398	362	354	374	598	310	487	388
Total Hardness as CaCO ₃ (mg/l)	240	188	184	196	124	120	128	136	204	144	156	148
Turbidity (TTU/ NTU)	2.9	4	3.6	3.8	3.5	3	5.1	3.5	2.6	3.85	2.8	3.74

It is evident from Table 4 that Conductivity, Total Dissolved Solids, Total Hardness and Turbidity of the **Udaisagar Lake** was above the prescribed water quality standards over the whole study period.

Conductivity of the water was found to be maximum in the month of November (1963 $\mu\text{mho/cm}$) and a minimum value was observed in the month of January (1170 $\mu\text{mho/cm}$). These values along with those obtained for all the other months were very high than the permissible limits which suggest the presence of large amount of ions and dissolved solids in it. With increase in Electrical Conductivity, the corrosive nature of water increases (Nayar, R., 2020). This is also supported by very high observed values of amount of Total Dissolved Solids (TDS) ranging from a minimum value of 776 mg/l in January to a maximum value of 1276 mg/l in November, 2021. Large amounts of total dissolved solids may lead to gastrointestinal irritation (Nayar, R., 2020).

Due to higher amount of dissolved solids which may be due to soil erosion, run off from agricultural activities, Industrial waste, domestic sewage and other anthropogenic activities, the water of Udaisagar lake was found to be highly turbid as is evident from the values of turbidity which were very higher than 1 NTU throughout the year which deteriorates the water quality.

Total Hardness of the lake water has also crossed the permissible limits ranging from minimum value of 236 mg/l in June to a maximum value of 392 mg/l in the month of April. Hardness of water decreases the capability of lathering of soap and deteriorates the water quality (ref) and if consumed for a longer time period poses risk to human health. It may lead to Urolithiasis, anencephaly, certain types of cancer, kidney stones and cardiovascular diseases (Jain, S., Rai, N., & Rathore D.S., 2015)

Surface as well as ground water both contains chlorides. The major source of chloride in water is due to salts such as NaCl, KCl etc. which reaches the water due to erosion or through municipal and industrial wastes (Lodh, R., Paul, R., Karmakar, B., & Das, M.K., 2014). The results obtained in the present study reveal that concentration of chloride was above the maximum permissible limits in the months of April (264 mg/l), August (272 mg/l), September (256 mg/l), November (256 mg/l) and December (302 mg/l). Higher concentration of chloride increases the corrosive property of water.

Dissolved Oxygen (i.e. the volume of oxygen present in a water body) of any lake plays a very important role in deciding the water quality of the lake.

The presence of dissolved oxygen in any lake is due to direct aerial diffusion or the photosynthetic activity of autotrophs. This dissolved oxygen is used by the microorganisms undergoing aerobic respiration to decompose the organic matter present in the water body (Lodh, R., Paul, R. et. al., 2014). Thus a value of DO less than 5 mg/l suggests presence of large organic matter in the water body. In the Present study, amount of dissolved oxygen was less than the standard value in the months of February, March, September and November.

Fluoride when present within limits is essential for human beings to prevent dental cavities and maintaining stronger teeth but when present in excess become a cause of bone fluorosis and other skeletal abnormalities (Nayar, R., 2020). Table 4 shows that the concentration of fluoride exceeds the permissible limits in the months of April (1.14 mg/l), June (1.12 mg/l) and August (1.02 mg/l), but the concentration is still not very high.

The results revealed that the pH of the lake water was always more than 7 suggesting its alkaline nature. The pH exceeds the limits only in the month of July. Apart from this, BOD, Total alkalinity, concentration of nitrate and nitrite are within the permissible limits throughout the study period.

The results shown in Table 5 show that in Swaroop Sagar lake, B.O.D, total alkalinity, concentration of chloride, nitrate and nitrite never crossed the permissible limits while conductivity and turbidity exceeded the permissible limits over the whole year.

Conductivity of the lake water ranges from a minimum of 460 $\mu\text{mho/cm}$ in the month of July to a maximum value of 790 $\mu\text{mho/cm}$ in the month of September. This shows the presence of dissolved salts which can conduct electricity. Owing to the presence of large amount of organic and inorganic matter, turbidity of the lake was found to be higher than the permissible limit which worsens the quality of water. The observed values are less than those observed for Udaisagar Lake.

The amount of Dissolved Oxygen was found to be less than 5 mg/l in April (4.8mg/l), September (4.8mg/l), October (4.9 mg/l) and November (4.1 mg/l) and a highest value of 5.7 mg/l was recorded in the month of August.

Concentration of Fluoride crossed the water quality standards only once during the study period i.e. in the month of May and is on the borderline in July.

Results of the present study revealed that the lake water was alkaline in nature. pH of the water was found to be higher than the permissible limits in June, October and November, 2021 with the highest value of 8.87 obtained in the month of October and a lowest value observed of 7.97 observed in April.

Total Dissolved Solids as well as Total Hardness was above the prescribed water quality standards in the months of January and September only.

The monthly Water Quality Index (WQI) as computed from the method discussed for both the sites is shown in Table 6 and the cooresponding graph is represented in Figure 3.

Table 6 – Water Quality Index (WQI) for Site A (Udaisagar Lake) and Site B (Swaroop Sagar Lake)

Month	Site A – Udaisagar Lake	Site B- Swaroop Sagar Lake
January	136.85	98.38
February	147.18	92.78
March	156.18	89.97
April	160.64	89.02
May	148.56	91.69
June	154.92	86.92
July	172.16	93.43
August	173.22	91.05
September	156.58	97.76
October	125.50	92.39
November	202.99	101.37
December	178.34	90.62

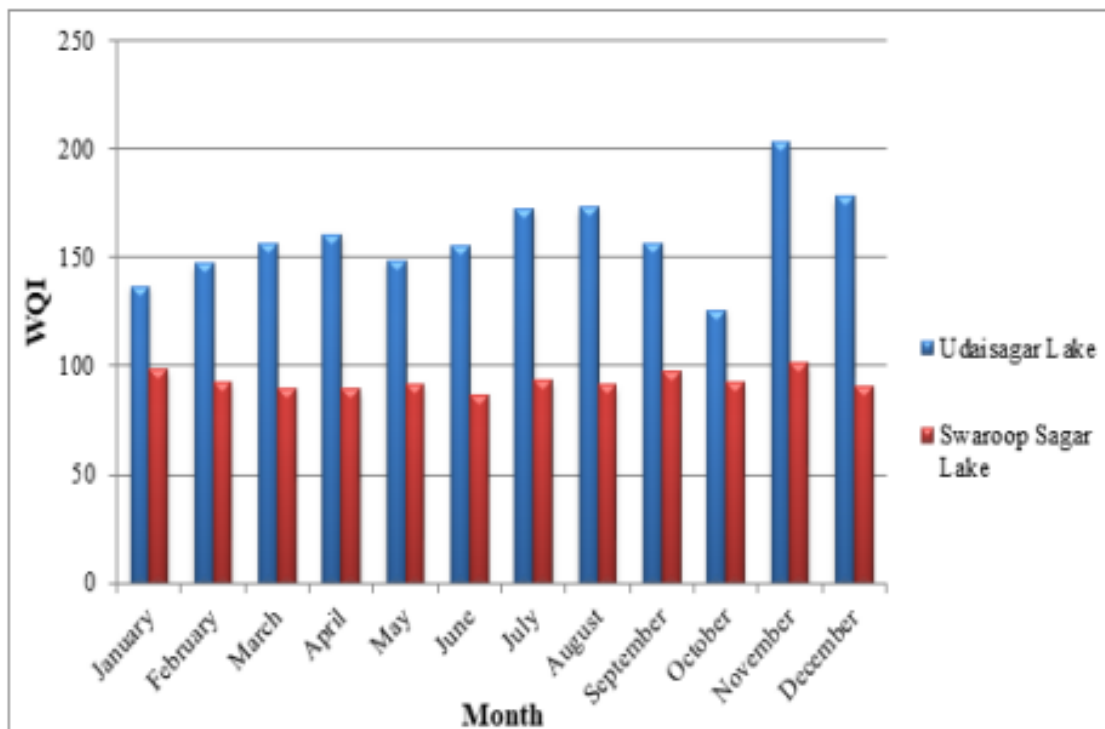


Figure 3 – Water Quality Index (WQI) for Udaisagar and Swaroop sagar lake

Table 6 and Figure 3 represents that the WQI value of Udaisagar lake was above 101 over the whole study period which shows that the water is unsuitable for drinking purpose. The highest value of 202.99 was obtained in month of November and the lowest value of 125.50 in the month of October while for Swaroop Sagar lake, WQI values falls in the range of 76 to 100 during the study period which suggests the water quality to be poor except in the month of november where it was observed to be 101.37 making it to fall in the last class.

Conclusion

Both the WQI values as well as the concentration of pollutants show that Udaisagar Lake is highly polluted as compared to Swaroop Sagar lake. This may be because of the nearby Ahar river which brings domestic and industrial wastes to the lake as well as the plant of Hindustan Zinc Limited situated in the vicinity of lake which releases its effluent into the lake.

References

- Alam M. & Pathak, J.K. (2010). Rapid Assessment of Water Quality Index of Ramganga River, Western Uttar Pradesh (India) Using a Computer Programme. *Nature and Science*, 8(11).
- Alobaidy, A.H.M.J., Abid, H.S., Maulood, B.K. (2010). Application of Water Quality Index for Assessment of Dokan Lake Ecosystem, Kurdistan Region, *Iraq. Journal of Water Resource and Protection*, 2, 792-798. doi:10.4236/jwarp.2010.29093
- Chauhan, A. & Singh, S. (2010). Evaluation Of Ganga Water For Drinking Purpose By Water Quality Index At Rishikesh, Uttarakhand, India. *Report and Opinion*, 2(9). 53-61.
- Choudhary, S. & Sharma J. (2021). Surface Water Quality Trends and Regression Model through SPSS in Udaipur, Rajasthan. *International Advanced Research Journal in Science, Engineering and Technology*, 8(10), 153-160. DOI: 10.17148/IARJSET.2021.81030
- Dangi, P.L. & Sharma, BK. (2017). Water quality status of Lake Pichhola, Udaipur, Rajasthan. *International Journal of Fisheries and Aquatic Studies*, 5(3), 181-187.
- Jain, S., Rai, N., & Rathore D.S. (2015). Water Quality Assessment of certain Marble Mining areas of Udaipur District. *International Journal of Scientific Research and Reviews*, 4(3), 1-11.
- Kangabam, R.D., Devi, S., Bhoominathan, Kanagaraj, S. & Govindaraju, M. (2017). Development of a water quality index (WQI) for the Loktak Lake in India. *Applied Water Science*, 7, 2907-2918. DOI 10.1007/s13201-017-0579-4
- Katara, P., Mittal, H. K., Maheshwari, B. L, Singh, P. K., & Dashora, Y. (2020), Assessment of Water Quality Indices for Irrigation of Dharta Watershed, Udaipur, Rajasthan, India. *International Journal of Trend in Scientific Research and Development*, 4 (3), 340-344.
- Indian Standard, Drinking Water – Specification (Second Revision), (2012). Bureau of Indian Standards. Retrieved from <http://cgwb.gov.in/Documents/WQ-standards.pdf>
- Lodh, R., Paul, R., Karmakar, B., & Das, M.K. (2014). Physicochemical studies of water quality with special reference to ancient lakes of Udaipur City, Tripura, India. *International Journal of Scientific and Research Publications*, 4(6).
- Naruka, S. & Sharma, M.S. (2017). Water quality assessment of Rajsamand Lake, Rajasthan, India. *International Research Journal of Environmental Sciences*, 6(6), 22-28.
- Nayar, R. (2020). Assessment of Water Quality Index and Monitoring of Pollutants by Physico-Chemical Analysis in Water Bodies: A Review, *International Journal of Engineering Research & Technology*, 9(1), 178-185.
- Ramakrishnaiah, C. R., Sadashivaiah, C. & Ranganna, G. (2009). Assessment of Water Quality Index for the Groundwater in Tumkur Taluk, Karnataka State, India. *E-Journal of Chemistry*, 6(2), 523-530.
- Rathore, D.S. Rai, N. & Ashiya, P. (2014). Physico Chemical Analysis of Water of Ayad River at Udaipur, Rajasthan (India), *International Journal of Innovative Research in*

Science, Engineering and Technology, 3(4),11660-11667.

Shyam ,M., Meraj, G., Kanga ,S., Sudhanshu, Farooq, M., Singh, S.K., Sahu, N. & Kumar, P. (2022). Assessing the Groundwater Reserves of the Udaipur District Aravalli Range, India, Using Geospatial Techniques, *Water*, 14, 648. <https://doi.org/10.3390/w14040648>.

Swaroop Sagar Lake, Rajasthan. Retrieved from <https://www.gosahin.com/places-to-visit/swaroop-sagar-lake/>

Vijayvergia, R. P., (2012). Ecological Studies of Lake Udaisagar with Reference to its Physico-chemical Environment. *Nature Environment and Pollution Technology*, 11(1),257-259.

Vikal P. (2009). Multivariant analysis of drinking water quality parameters of Lake Pichhola in Udaipur, India. *Biological Forum – An International Journal*, 1(1), 86-91.

WHO Drinking Water Specifications. Retrieved from <https://cpcb.nic.in/who-guidelines-for-drinking-water-quality/>

HUMAN-ENVIRONMENT INTERACTIONS

The Way People Affect the Environment

In the present times, population increase, rapid urbanization, industrialization and various other developmental activities are increased which pose detrimental impacts on the environment such as air, soil, water and noise pollution, along with depletion of natural resources as well, which directly or indirectly affect human health. This led to increased interest in ways to prevent environment.

The fourteen papers, compiled in this volume, critically examine the interaction between humans and the environment. Analysing the role of humans in the degradation of environment, it assesses the impact of the deteriorating environment on the humans in turn. The book also takes into account the various preventive measures that could be undertaken to improve the quality of environment and thus the quality of life on earth. Nevertheless, it is rightly said that 'prevention is better than cure' and we as humans need to understand that to protect the environment, we need to make changes in our own lifestyle so as to save environment and thus save ourselves.



Ms. Laveena Gulabchandani is presently serving as a Lecturer in the Department of Chemistry, Sophia Girls' College (Autonomous), Ajmer for the last five years. She has to her credit a number of research papers published in various journals of repute. She has also participated in many seminars and conferences. The major areas of her interest include Environmental Chemistry, Biochemistry, Analytical Chemistry and Physical Chemistry.

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New Maldives of India- Kishangarh Dumping-yard A Boon for Humans and a Bane for Nature

Ms. Rakshita Sharma, Lecturer, Sophia Girls' College (Autonomous), Ajmer

Abstract

In this new mobile era world, everything is taken as an opportunity. Platforms like Instagram, Facebook etc., has squeezed the large expanse geographical areas into a small screen of Mobile phones. Locational analysis is transferred to the making of reels where people guess the site and then the light of popularity shines on the visitable place. One such example can be seen in Kishangarh Dumping yard-full of marvelous white expanse of land with shining hills, small turquoise color water bodies which works as a best match for the tourists, Photo-shoots, and Instagram reels as well. The reason for this bright white land is the marble slurry which is seldom degradable and, in this way, it is a more of an extensive disaster. This is surely a bane for Nature as the vast expanse of land degradation, soil erosion, reducing of soil fertility in the peripheral areas due to the presence of fine particles in marble slurry. Fines of Marble slurry flew with air also contributes in the Air pollution making genuine medical issues slowly in the Humans too. Fine particles of marble slurry store over leaves of vegetation, plants and trees making them harmful for animal lives and loss for natural vegetation. This expanse was allocated by the Rajasthan government to the Kishangarh Marble Association in the 1970s as a dumping yard now it has swelled up as a vast region. This study analyses the problems or causes created for the environment, ill-effects effects of this dump-yard and loss of Bio-diversity in the long span of 50 years using data structure from 20th Century to 21st Century.

Keywords: *Kishangarh Dumping Yard, Marble Industry, Air Pollution, Environmental Pollution.*



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OPPORTUNITIES AND CHALLENGES
(AN INTERDISCIPLINARY APPROACH)
NOVEMBER 19, 2022 SATURDAY**



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IN COLLABORATION WITH DEPARTMENT OF GEOGRAPHY,
DR. BHIM RAO AMBEDKAR GOVERNMENT COLLEGE,
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**Game Changing Politics and New World Dominance through Revival of Silk Route
by China**

Ms. Himanshi Parashar, Assistant Professor, Sophia Girls' College (Autonomous), Ajmer

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Abstract

Silk Route was an ancient network of trade path that stretched from China through Central Asia to Mediterranean. It facilitated the exchange of Commodities, ideas, Art, culture, Language, and religion across different civilization during 2nd Century B.C.E spread in a huge extension of 4000 miles both on marine and land routes. Han Dynasty of China motivated explorers to expand the path of silk route. The Silk Route was accessible until the Ottoman Empire declared a trade embargo on China in 1453 since then, it has not been in use for economic, cultural, and intellectual exchange. Despite this it continued to have a significant impact on global trade, history, and civilization. In 2013, One Belt One Road (OBOR), the brainchild of Chinese President Xi Jinping announced constructing a new double trade corridor with the purpose of restoring the ancient Silk Route that connected Asia and Europe, bringing the silk route back into spotlight and trade dominance in the World. This study analyses the historical and present scenario of the trade route, causal effects and outcomes and game changing dominance created by China using data structure of the past and present.

Keywords: *Geopolitics, Silk Road, OBOR, Trade Route, Indian Ocean Region*

The impact of Green Marketing on Customer purchase decision and satisfaction.

Ms. Anjali Pareek, Assistant Professor,

Department of Business Administration, St. Xavier's College, Jaipur

Green revolution, going green, environmental protection, sustainable lifestyle, sustainable development, protecting our earth and many more have become a natural phenomenon in our everyday life. Green marketing is a tool used by many companies in various industries to follow this trend. There have been a lot of literature review on green marketing over the years, this paper analysis the impact of green marketing strategies on customer satisfaction and purchase decision using systematic literature review. As a result, this paper can be used by researchers who need to find out the impact of green marketing on customer satisfaction and purchase decision. The paper will identify the key factors leading as antecedents of customer satisfaction and overall purchase decision of the products.

Keywords: Green marketing, Customer satisfaction and consumer purchase decision.

Remote working and its impact on employee job satisfaction



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▶ Editors

**Dr. Sudheesh B
Dr. Fehmeena Bakht**

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INCLUSIVE DEVELOPMENT: A NEW CONCEPT OF THE SUSTAINABLE DEVELOPMENT CONCEPT

**Dr Vandana Lall, Assistant Professor
Sophia Girls' College (Autonomous), Ajmer, Rajasthan**

Abstract

According to the article, the idea of inclusive development emerged throughout the process of the idea of sustainable development, which is still the dominating idea for the advancement of civilization in the twenty-first century. Although the sustainable development model's versions alter as some of its components are given higher priority, the transition is a continuous process (economy, ecology, or social sphere). In the idea of sustainable development, the objectives of achieving equality and social justice were stated. The idea of inclusive development revitalises and improves the socioeconomic component of sustainable development. The social and economic pillars of sustainable development must compromise in the area of inclusion. The implementation of ecological, territorial inclusion, and inclusivity between the present and future generations should also be prioritised in addition to these areas.

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Economic growth that is inclusive of all people means that everyone gains advantages in various facets of their lives as a result of their active engagement in social processes. A key component of sustainable development initiatives for all people is the creation of conditions that promote solidarity, equality of opportunity, access to resources, etc. Appropriate institutions should be matched by every member of society's behaviour, making them a necessary but insufficient condition for membership. Therefore, it is crucial to foster an atmosphere of acceptance and unity for inclusion.

Even though favourable impacts are clearly prevalent, several inclusion ambiguities are highlighted. Inclusion is a pricey strategy for giving citizens access to and possibilities for growth, including their greater participation in economic activities, however, it is indisputable that the cost of exclusion and lost revenue is far larger.

Keywords: strategies for inclusive development, sustainable development as a concept, inclusive society



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