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Study of Physico-Chemical Properties of Water in Ramgarh Lake in the Light of Good Management Practices of Last Few Years

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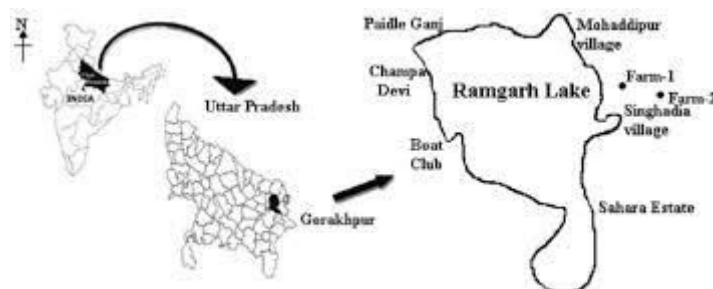
ABSTRACT

Ramgarh Tal is a lake located in Gorakhpur, Uttar Pradesh, India. In 1970, at its largest size, the lake covered an area of 723 hectares (1,790 acres) with a circumference of 18 kilometres (11 mi). Today, it covers about 678 hectares (1,680 acres).^[1] The Ramgarh lake of Gorakhpur is one of the city's main tourist attractions and has a circumference of 18 kms covering about 1,790 acres of area. The lake has a little uncertain history to it- it is believed that there was a village named Ramgarh that collapsed due to a disaster creating a big hole that eventually got filled with water. Lo and behold! A beautiful Lake is formed! The Lake is a beautiful sight- blue water, people enjoying a family picnic, and little villages around it. Ramgarh Tal is a rich source of fish and its water is also used for irrigation, supporting livelihood of many. Government made generous attempts to beautify it by means of a Buddha Museum, a planetarium, a park and some water sports facilities. Unfortunately, the water quality of this Lake has deteriorated over time owing to it being treated as a dumping ground for sewage by nearby residential colonies. However, restoration efforts have paid off and the lake is as beaming with beauty as ever. The bird watchers will have a good time as a number of migratory birds are seen flying over the Taal.

KEYWORDS-Ramgarh, lake, physic-chemical, management, years

INTRODUCTION

According to historian and author Rajbali Pandey, Gorakhpur was called Ramgram in the sixth century B.C. It was in Ramgram where the Kolian Republic was established. During this period, the Rapti River passed through the site of the present-day Ramgarh Tal. However, the direction of the Rapti River was later changed, and Ramgarh Tal came into existence from its remains.^[2]



The lake was under the possession of the prominent zamindar Rai Kamlapati Ray in Gorakhpur. Following the suppression of zamindari, it was taken over by the Government of India, although some portion of the Ramgarh Tal is still under the Rai family's possession today.[1,2,3]

It is believed that there was a village named Ramgarh that collapsed due to a disaster, creating a big hole that eventually got filled with water.^[3] Its also called marine drive of gorakhpur. Famous for its natural beauty and soothy atmosphere anytime of the day. Water sports complex project is about to complete in future to give the place an extra star. Nyc place to hangout with family and friends. Prefer early morning or late evening time for the visit. The musical fountain show in evening is amazing. One must experience it if u r planning to visit this place. A visit to Gorakhpur city is never complete without taking in all of nature's beauty that this region has to offer. Towering mountains, lush greenery and serene water bodies make a sojourn to this city one that can never be forgotten. Among the many natural beauties that should definitely be visited on a trip to Gorakhpur is the Ramgarh Taal. Located in sylvan surroundings



and providing a perfect backdrop to the natural beauty of the region, this lake has stood silent as one of Gorakhpur’s biggest tourist attractions.[4,5,6]

Ramgarh Taal lake is Gorakhpur’s largest lake, with an embankment of 18 kilometers in length and an area of 723 hectares. It is said that there was initially a village named Ramgarh at this location, which had collapsed due to an untold natural disaster, resulting in a huge hole at the spot where the village stood. In time, water had collected in it, forming the Ramgarh Taal lake.

There are many species of fish that live in this river and was initially surrounded by lush greenery and jungles. In recent times, though, this greenery has been largely cleared away to make room for residential buildings, that have even sadly encroached on the embankment of the lake itself, in some areas.

Over time, this lake has changed in significance and beauty, primarily due to the changing environment of the city. Periodic maintenance is required to keep this lake free of the weeds and reeds that grow along the embankment. The primary threat to the lack comes from the residential colonies that have sprung up around it. There are around 800 quintals of waste material dumped into the lake on a daily basis, from these colonies alone. The National Lake Conservation Plan has proposed the restoration of the Ramgarh Taal to all its original glory and budgets have been prepared to this effect.[7,8,9]

Table 1. Salient features of Ramgarh Lake

SNo	Salient features	Description
1.	Location	Gorakhpur city
2.	Coordinates	26 ⁰ 42'30" to 26 ⁰ 44'55" N and 83 ⁰ 23'07" to 83 ⁰ 25'0" E
3.	Area of lake	6.78 km ²
4.	Perimeter	14 km
5.	Maximum depth	3.30 m
6.	Total storage capacity	7.36×10 ⁶ m ³
7.	Annual average rainfall	1245 mm

DISCUSSION

In 1985, Vir Bahadur Singh became Chief Minister and formulated a plan to develop Ramgarh Tal as a tourist center. This plan was later abandoned following his death in 1989.

When Yogi Adityanath took over the role of Chief Minister of Uttar Pradesh in 2017, he unveiled plans to develop the lake into an 'international-level' tourist spot.^{[4][5]} The UP government also unveiled plans to notify the lake under the Wetland Management Rules.^[6]

At present, the NGT (National Green Tribunal) manages upkeep and protection of the lake. Due to the activism of the NGT, construction work has been banned within a radius of 500 meters.

The water quality of Ramgarh Tal Lake has decreased over time due to it being used as a dumping ground for sewage by nearby residential colonies.^[3]



"THE MARINE DRIVE OF PURVANCHAL": Due to its latest development and construction of driveway across the lake, it is also being popularized as marine drive along with Nauka Vihar.

The new name is certainly attracting tourists[10,11,12]

	Sep	Oct	Nov	Dec	Jan
	28.5	25.0	23.0	24.0	24.0
	B	B	B	B	C
	20.1	22.2	20.1	20.2	20.0
	970	910	920	910	900
	2040	2000	2300	2000	2100
	1235	1540	1250	1545	1160
	3275	3540	3550	3545	3260
	7.7	7.9	7.6	7.8	7.5
	6.6	6.7	6.8	6.8	6.6
	1.8	3.2	4.1	3.1	4.0
	5.1	7.0	8.0	6.8	7.9
	28.6	56.7	50.2	56.7	65.3

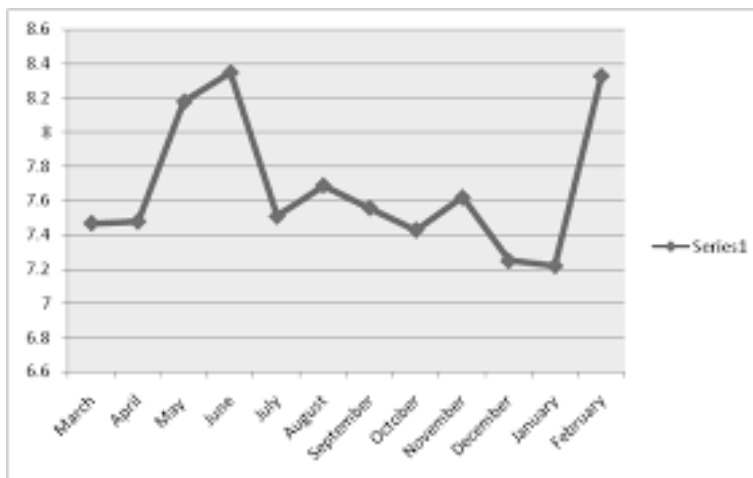
The Ramgarh Taal was primarily a spot of natural beauty, but in recent times it has opened doors to picnickers. Families and friends find it delightful to spend time away from the bustle of the city, and just sit at a serene corner, enjoying nature's company.

Boating had begun earlier at the Ramgarh Taal, was stopped for a while, and has been resumed now. Apart from the serenity of the waters, on a visit to Ramgarh Taal, you can also get to see a number of migratory birds that make this lake and the surrounding greenery a place to stop over.

The lake is rich in numerous varieties of fishes, and it offers livelihood to many people living in nearby regions. On a visit to Ramgarh Taal, you might get a glimpse of a fisherman at work. Fishing for sport is not encouraged in this region. Ramgarh Taal is located to the south eastern part of Gorakhpur city, on the southern side of the road to Kasia. You can reach the lake by hiring a taxi to drive you to one of the entrances from where you can enjoy boat rides or just stand along or walk and enjoy the lake's natural beauty. A few bus services ply to this area, and are not very frequent.[13,14,15]

RESULTS

Ramgarh Taal, a natural lake, is situated to the southeast of Gorakhpur in Uttar Pradesh and covers an area of about 723 ha. The catchment area around the lake is approximately 1632 acres, out of which, 1235 acres land is under Gorakhpur Development authority (GDA). Fishes of different varieties live in this water body. The former MP of the area, Mr. Virbahasur, in 1987 announced the Ramgarh Taal Tourist Complex scheme in 1987. From June 1987 to July 1988, GDA worked on this project. This was a 1200-acre project developed by the state government, to incorporate large number of activities, like water sports complex, buddha museum, planetarium, tourist bungalow and champa vihar park around the area. But in later years, the area began to lose its charm and condition of the lake deteriorated. The area of lake reduced from 723 ha to 669 ha in recent time. The depth of the lake has also reduced from 4.5 m in 1998 to 3.8 m in 2006.[16,17,18]



The threat to the lake comes mainly from the residential colonies that have developed around the lake. According to the report of Gorakhpur environmental action group, around 800 quintals of wastes are dumped into the lake everyday from these colonies. Moreover, the waste is also dumped in and around the lake, resulting in foul smell.

The waste from households contains nitrate and phosphate, which results in eutrophication, leading to low oxygen content in the lake. The lake is leading from eutrophic condition to hyper-eutrophic condition. In May 2009, it was reported that the pH of the lake had become acidic (pH content recorded to be 11.5) and the temperature of the lake had also increased. Consequently there was a decrease in Dissolved Oxygen (DO). The DO was recorded to be 2.5 mg/l and the COD was 125 mg/l. This grave situation led to death of huge quantity of fish in the lake. The lake was found filled with dead fishes, resulting in stinking of the lake. A death of 150 quintals fishes was reported. News of fish death also came in during 2006. In 1998, there were about 28 varieties of fish, which had reduced to 18 in 2006. GDA is responsible for leasing out fishing rights in the lake.[19,20,21]

The restoration of the Taal has been proposed under the National Lake Conservation Plan along with the Mansi Ganga Taal of Govardhan, Mathura, Laxmi Taal of Jhansi and Madan Sagar of Mahoba. Detail Project Reports (DPR) for pollution control works of these lakes costing Rs.142.22 crore had been prepared and submitted to the central government for approval. Money has already been sanctioned for Mansi Ganga Taal and other lakes are under consideration.[22,23,24]

CONCLUSION

Water is the essential part of life and it is assumed that next world war will be based on the scarcity of it. When water is polluted by various ways that means it affects flora and fauna of that area. The people living near the water bodies depend on it for irrigation and pisciculture activities. Water sample collected from Ramgarh Lake located in eastern part of Gorakhpur City of Eastern Uttar Pradesh state. Water is most precious natural resource expected to before from pollution. The physicochemical parameters are atmospheric temperature (AT), water temperature (WT), pH, electrical conductivity (EC), total dissolve solid (TDS), acidity (acid), alkalinity (alk), carbon dioxide (CO₂), dissolve oxygen (DO), were mentioned on monthly basis for period of one time annual cycle that is January 2018 to December 2019. The result revealed that the reservoir water is useful for human use.[25,26,27]

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