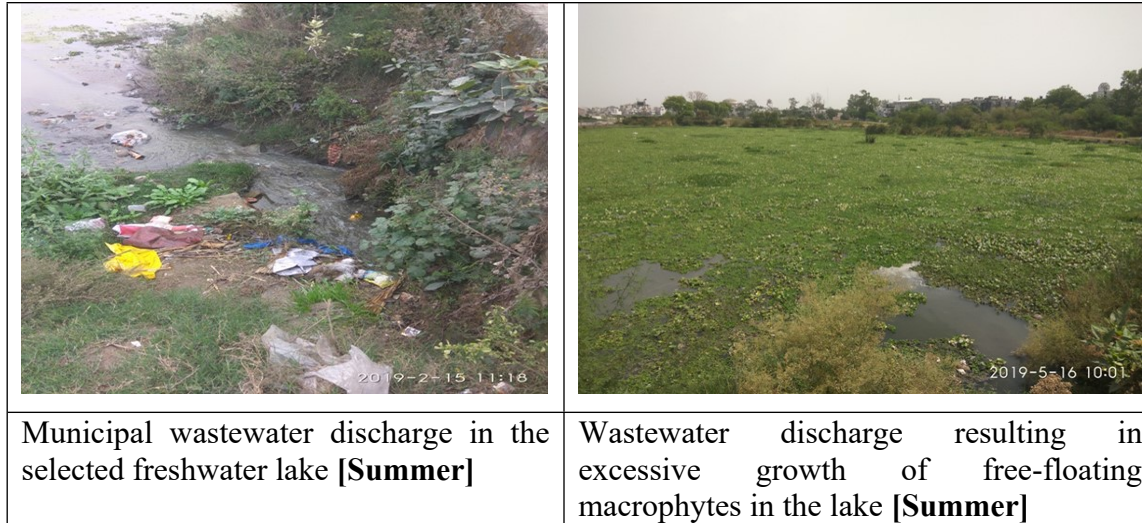


 <p>Monsoon-2018</p>	 <p>Winter- 2019</p>	 <p>Summer-2019</p>
<p>Images depicting the effect of aquaculture activity and fragmentation on the macrophytic diversity of the lake during the first year of sampling</p>		
		
<p>Fragmentation of the lakes for the purpose of chestnut cultivation (left) and for fish rearing (Right)[<b>Monsoon</b>]</p>	<p>Chestnut (<i>Trapa natans</i>) cultivation in the lake [<b>Monsoon</b>]</p>	



**Supplementary Figure 1:** Pictures showing the condition of the selected lake during the first year of the sampling

**Monsoon Season**



**Winter (Pre-Lockdown) Season**



**Monsoon (Post-Lockdown)**



**Supplementary Figure 2:** Pictures showing the condition of the selected lake during the second year of the sampling

**Supplementary Table 1:** Instruments and methods used for estimation of water quality parameter

S. No	Water parameter	Units	Instruments and methods used
1	Temp	°C	Portable meter (TDS-3)
2	pH	-	Hanna portable meter
3	Secchi Depth (SD)	Meter (m)	Secchi Disk
4	TDS	ppm	Portable meter (TDS-3)
5	TSS	mg/l	Oven dry method (Maiti., 2003)
6	Electrical conductivity (EC)	$\mu\text{Scm}^{-1}$	Portable meter
7	Dissolve oxygen (DO)	mg/l	Portable meter (Lutron DO-5509)
8	Biochemical oxygen demand (BOD)	mg/l	Winkler method (APHA, 2017)
9	Alkalinity	mg/l	Titration method (APHA, 2017)
10	Hardness	mg/l	Titration method (APHA, 2017)
11	Nitrate	mg/l	Spectrophotometric method (APHA, 2017)
12	Nitrite	mg/l	Spectrophotometric method (APHA, 2017)
13	Total Phosphorous (TP)	mg/l	Acid digestion method (APHA, 2017)
14	Chlorophyll a	$\mu\text{g/L}$	Spectrophotometric method (Marker., 1972)



1976



December 2003



January 2006



October 2008



April 2009



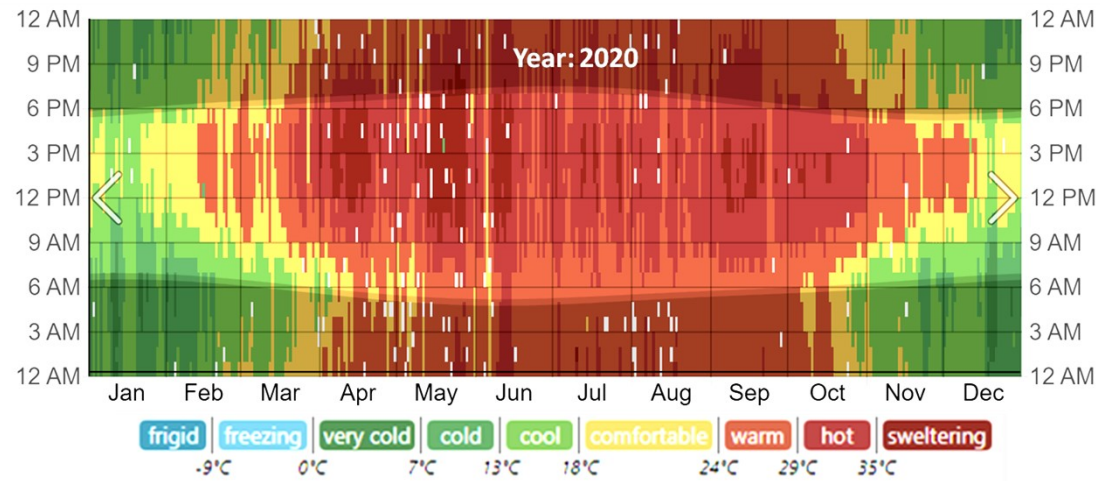
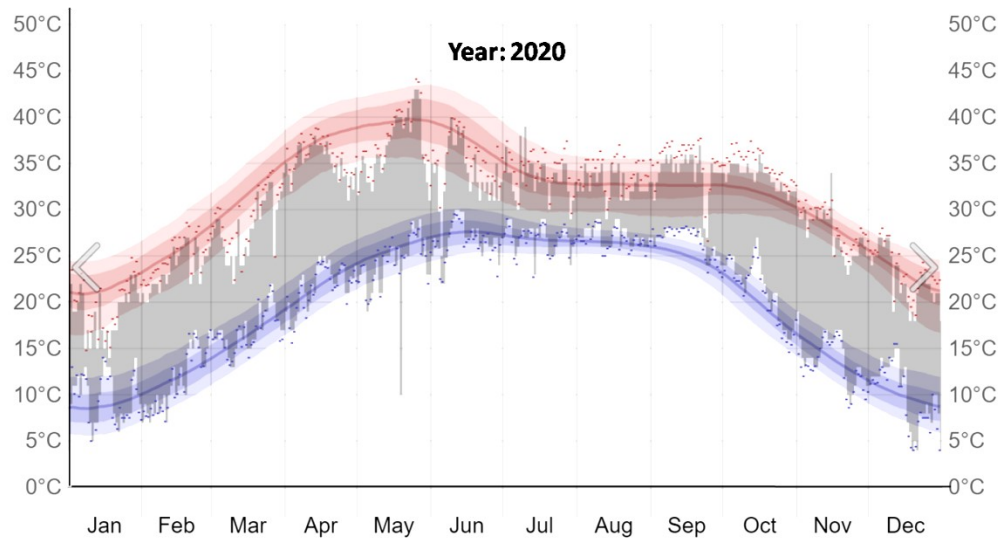
June 2011

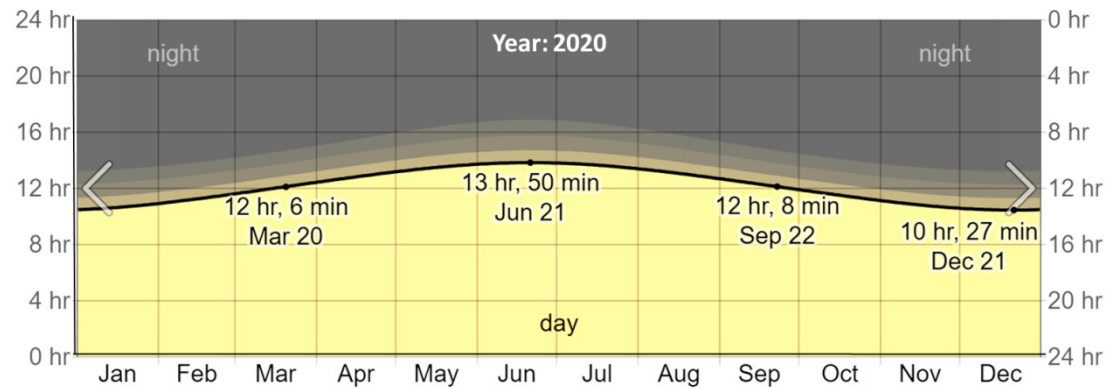


**Supplementary Figure 3:** Satellite images showing the land-use and morphometric changes in the catchment of the Kathauta lake from the year 1976 to 2022

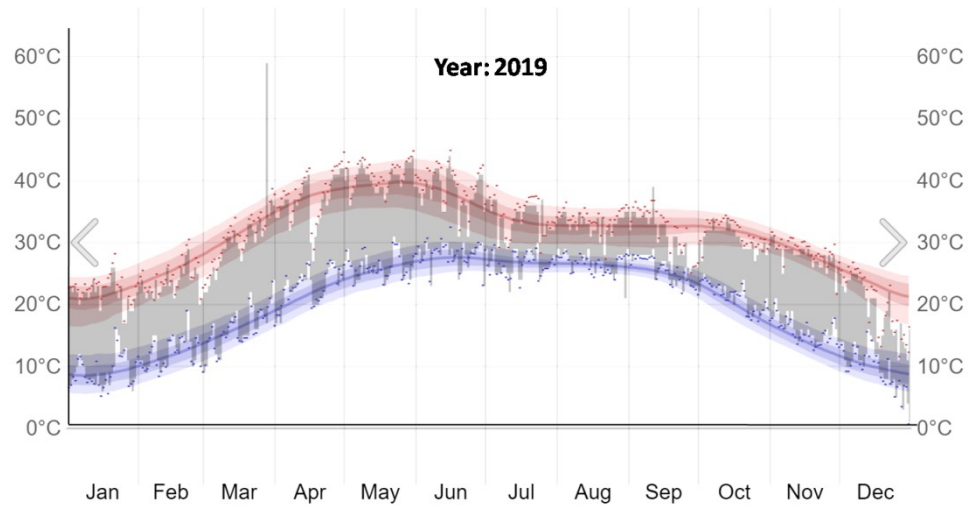


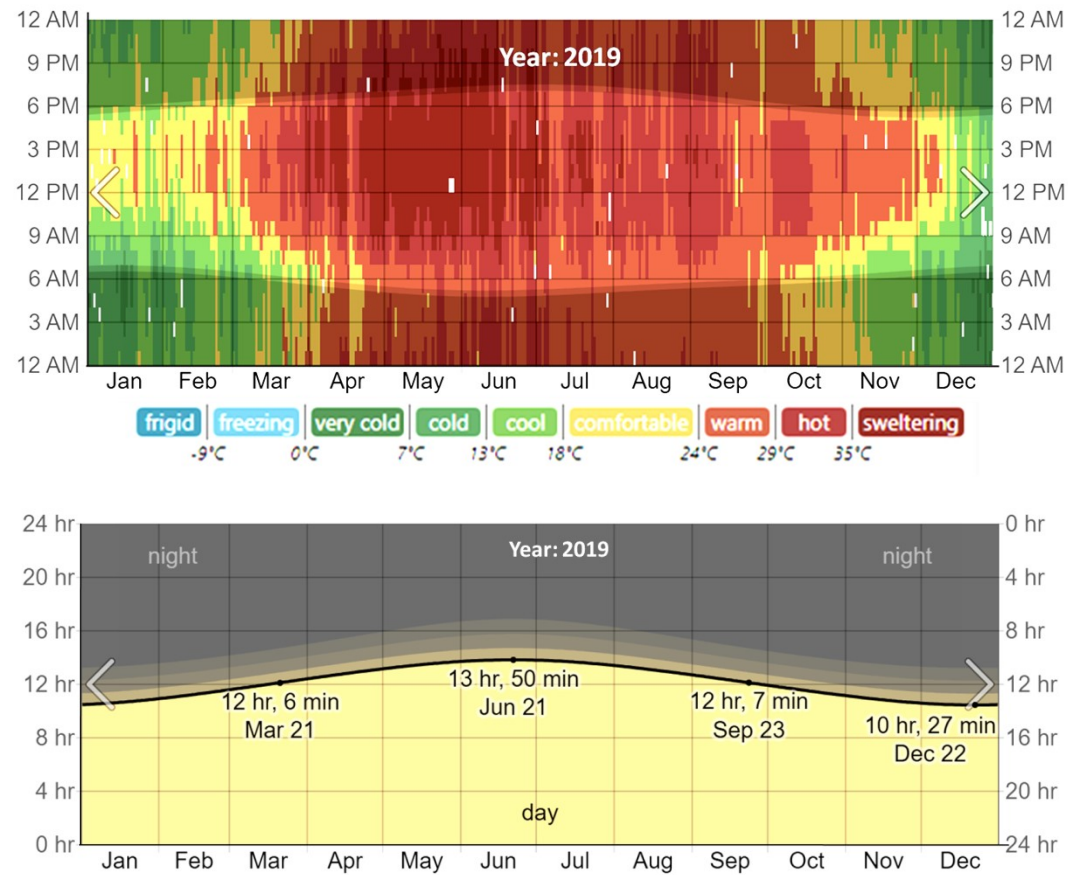
**Temperature, Sunshine Hours and Rainfall data of the Study Area:** Lucknow has a humid subtropical climate with distinct seasons: cool, dry winters from mid-November to February and dry, hot summers from late March to June. The winter season starts in December and extends until the end of February, followed by a hot summer season lasting until the end of June, when the monsoon arrives. The rainy season spans from July to mid-September. In winter, the maximum temperature is around 25°C, while the minimum ranges from 3°C to 7°C. Summers are extremely hot, with temperatures ranging from 40°C to 45°C. The maximum temperature may rise to about 46°C in summer, though the average summer temperature is around 38-39°C. Over 75% of the annual rainfall occurs during the four rainy months from June to September, leading to significant temporal variations. Climate statistics are provided on a monthly basis and for the four seasons: Winter (January-February), Pre-Monsoon (March-May), Southwest (SW) Monsoon (June-September), and Post-Monsoon (October-December). The monsoon continues until September, and the two post-monsoon months of October and November constitute a transition season from monsoon to winter conditions. Most of the rainfall in Lucknow is caused by eastward-moving western disturbances and is often associated with thunderstorms. The average onset date of the southwest monsoon over Lucknow is June 21st. The southwest monsoon typically arrives in the second fortnight of June and withdraws after September 30th. In 2020, the rainfall in Lucknow was 813.86 mm. Although the actual rainfall levels in Lucknow District have fluctuated substantially in recent years, there has been a general decreasing trend from 2001 to 2020, ending at 813.86 mm in 2020. Normal rainfall increases from June with the onset of pre-monsoon activity in the first fortnight and the arrival of the southwest monsoon in the second fortnight. July and August are the rainiest months, but a significant amount of rainfall also occurs in September during the monsoon's retreat. Rainfall decreases drastically from October, with April being the driest month of the year.



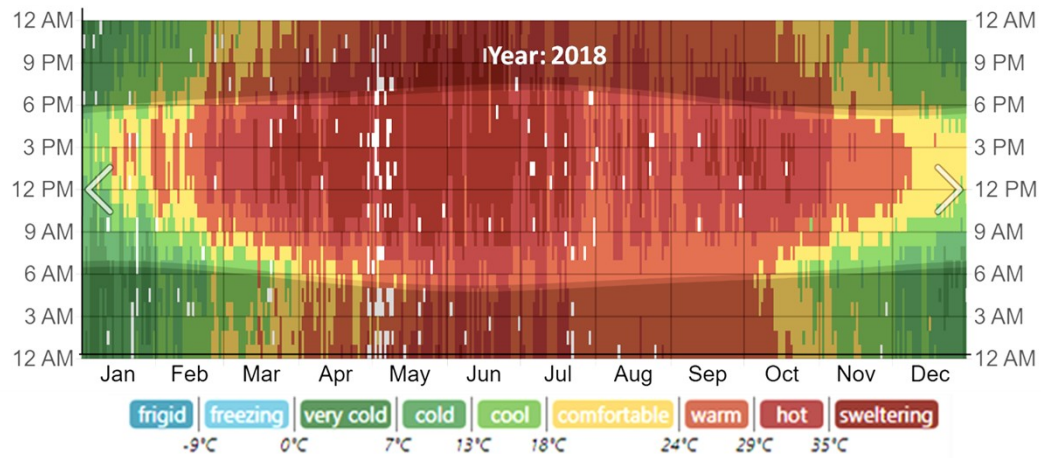
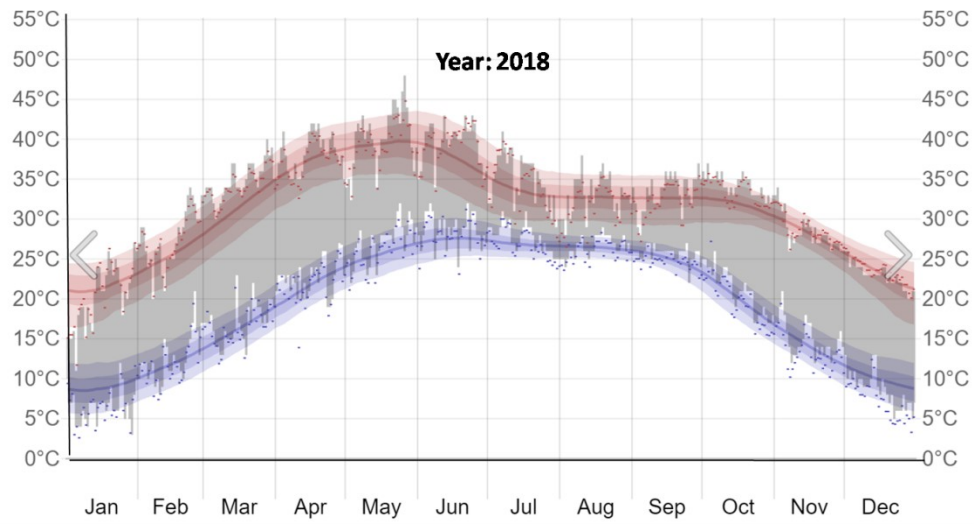


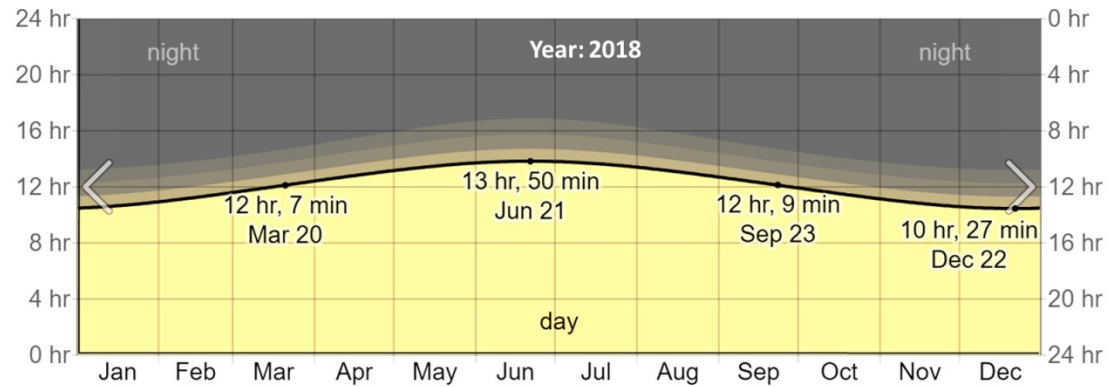
**Supplementary Figure 4 A:** (i) The daily range of reported temperatures for year 2020 (gray bars) and 24-hour highs (red ticks) and lows (blue ticks), placed over the daily average high (faint red line) and low (faint blue line) temperature, with 25th to 75th and 10th to 90th percentile bands (ii) The hourly reported temperature, color coded into bands (iii) The number of sunshine hours during which the Sun is visible (black line)



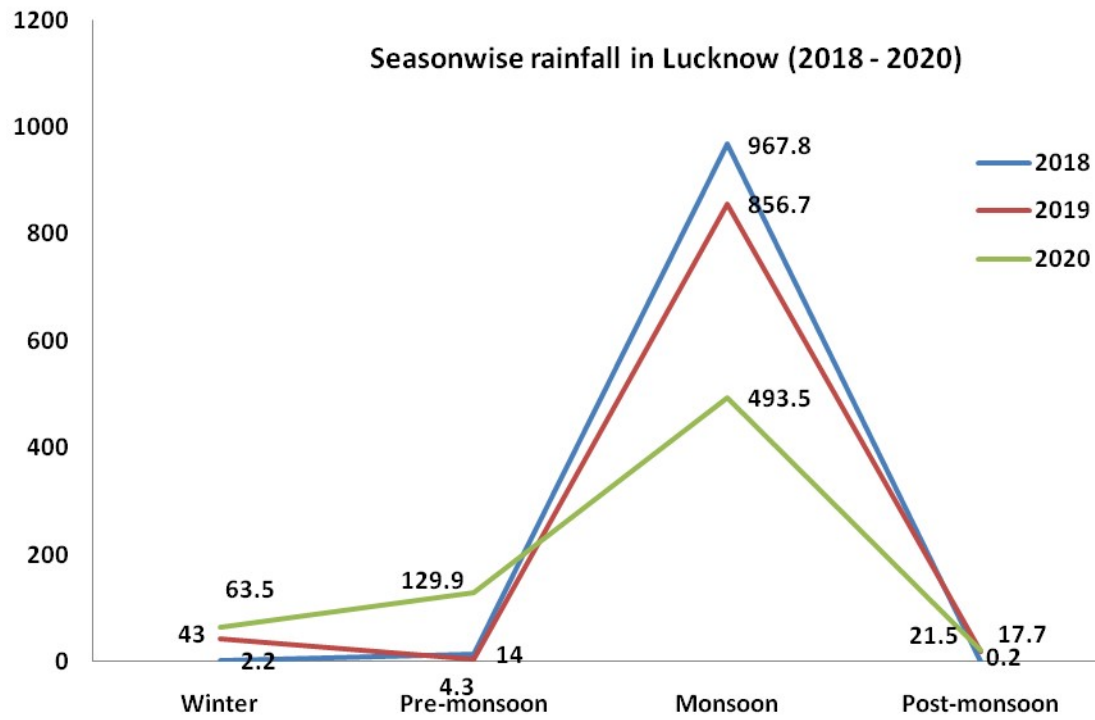


**Supplementary Figure 4B:** (i) The daily range of reported temperatures for year 2019 (gray bars) and 24-hour highs (red ticks) and lows (blue ticks), placed over the daily average high (faint red line) and low (faint blue line) temperature, with 25th to 75th and 10th to 90th percentile bands (ii) The hourly reported temperature, color coded into bands (iii) The number of sunshine hours during which the Sun is visible (black line)

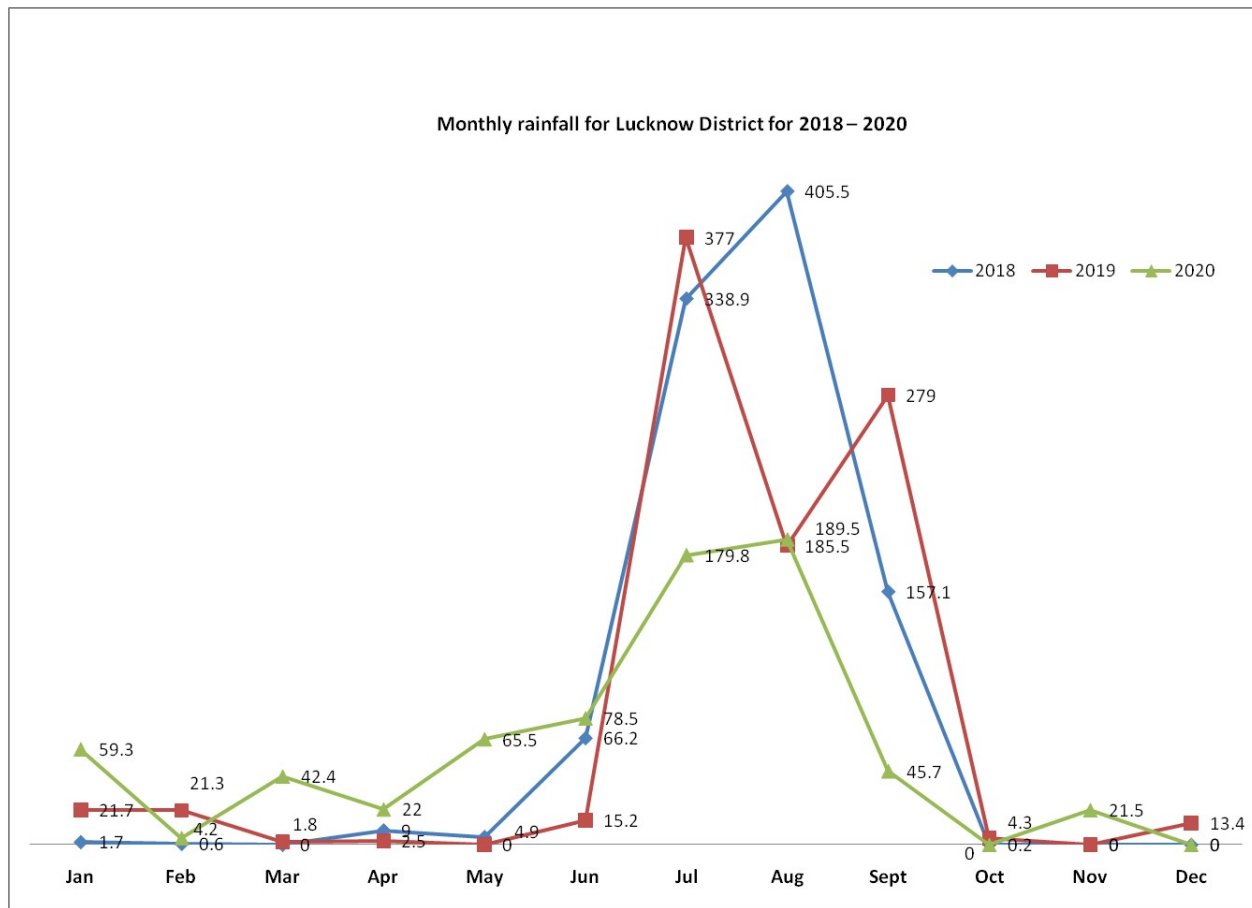




**Supplementary Figure 4C:** (i) The daily range of reported temperatures for year 2018 (gray bars) and 24-hour highs (red ticks) and lows (blue ticks), placed over the daily average high (faint red line) and low (faint blue line) temperature, with 25th to 75th and 10th to 90th percentile bands (ii) The hourly reported temperature, color coded into bands (iii) The number of sunshine hours during which the Sun is visible (black line)



**Supplementary Figure 5A:** Seasonwise rainfall in Lucknow between 2018 and 2020



Supplementary Figure 5B: Monthly rainfall for Lucknow District for 2018 – 2020



**Supplementary Table 2:** Physicochemical analysis of water quality of the lake during Monsoon Season (October, 2018) (Dubey et al., 2020)

Parameter	Temp (°C)	Ph	Secchi Depth (m)	TDS (ppm)	EC	DO (mg/l)	BOD (mg/l)	TSS (mg/l)	Hardness (mg/l)	Alkalinity (mg/l)	Nitrate (mg/l)	Nitrite (mg/l)	TP (mg/l)	Chl a (µg/l)	Chl b (µg/l)
K1	29.67±1.53 <sup>ab</sup>	5.17±0.15 <sup>a</sup>	0.38±0.01 <sup>a</sup>	158.67±1.15 <sup>b</sup>	243.33±5.77 <sup>b</sup>	2.2±0.2 <sup>a</sup>	29.5±1.14 <sup>b</sup>	803.33±5.77 <sup>d</sup>	173.67±3.21 <sup>c</sup>	240.67±1.54 <sup>f</sup>	4.11±0.11 <sup>c</sup>	1.63±0.03 <sup>a</sup>	20.2±0.2 <sup>d</sup>	0.13±0.01 <sup>a</sup>	0.30±0.02 <sup>b</sup>
K2	29.33±0.58 <sup>ab</sup>	7.33±0.12 <sup>c</sup>	0.78±0.06 <sup>c</sup>	176±1.73 <sup>c</sup>	274.67±2.89 <sup>cd</sup>	2.17±0.15 <sup>a</sup>	33.27±0.25 <sup>c</sup>	201.33±2.31 <sup>a</sup>	163.33±2.89 <sup>c</sup>	53.67±1.53 <sup>b</sup>	3.02±0.02 <sup>b</sup>	1.81±0.01 <sup>a</sup>	4.3±0.17 <sup>bc</sup>	0.08±0.01 <sup>a</sup>	0.05±0.03 <sup>a</sup>
K3	28.33±0.58 <sup>a</sup>	7.2±0.1 <sup>b</sup>	0.40±0.01 <sup>a</sup>	121.33±2.31 <sup>a</sup>	189.67±2.89 <sup>a</sup>	2.53±0.12 <sup>a</sup>	18.2±0.2 <sup>a</sup>	603.33±5.77 <sup>b</sup>	155.67±4.04 <sup>b</sup>	41.33±2.31 <sup>a</sup>	2.65±0.01 <sup>a</sup>	1.67±0.02 <sup>a</sup>	4.1±0.09 <sup>ab</sup>	0.16±0.01 <sup>a</sup>	0.23±0.03 <sup>b</sup>
K4	31.67±1.53 <sup>b</sup>	6.77±0.25 <sup>b</sup>	0.42±0.01 <sup>a</sup>	174±3.46 <sup>c</sup>	271.66±5.77 <sup>c</sup>	4.5±0.26 <sup>b</sup>	70.23±0.68 <sup>d</sup>	605.33±5.51 <sup>b</sup>	171±1.73 <sup>a</sup>	172.33±2.52 <sup>e</sup>	4.71±0.18 <sup>d</sup>	2.31±0.02 <sup>b</sup>	4.52±0.03 <sup>c</sup>	5.03±0.03 <sup>e</sup>	4.22±0.02 <sup>d</sup>
K5	29.33±0.58 <sup>ab</sup>	8.43±0.21 <sup>d</sup>	0.64 ± 0.01 <sup>b</sup>	182±1.73 <sup>d</sup>	285.67±4.04 <sup>de</sup>	5.33±0.15 <sup>c</sup>	73.7±1.28 <sup>e</sup>	801.67±2.89 <sup>d</sup>	191±1.73 <sup>ab</sup>	159.67±2.52 <sup>d</sup>	8.18±0.17 <sup>e</sup>	2.35±0.32 <sup>b</sup>	4.02±0.03 <sup>ab</sup>	6.08±0.07 <sup>d</sup>	4.67±0.15 <sup>e</sup>
K6	30.67±0.58 <sup>ab</sup>	8.07±0.06 <sup>d</sup>	0.59 ± 0.01 <sup>b</sup>	184±1 <sup>d</sup>	287±2 <sup>e</sup>	5.9±0.17 <sup>d</sup>	30.27±0.25 <sup>b</sup>	749±3.61 <sup>c</sup>	152.33±2.52 <sup>a</sup>	73.33±1.53 <sup>c</sup>	3.26±0.14 <sup>b</sup>	2.66±0.05 <sup>b</sup>	3.72±0.19 <sup>a</sup>	4.46±0.01 <sup>b</sup>	3.39±0.03 <sup>c</sup>
Average	29.83	7.16	0.54	166	258.67	3.77	42.53	627.33	167.83	123.5	4.32	2.07	6.81	2.66	2.14

Note: Different alphabetical letters as superscript specify significant differences among different sites of the selected lakes at p<0.05.

**Supplementary Table 3: Physicochemical analysis of water quality of the lake during winter season (January, 2019)**

Parameter	Temp (°C)	pH	SD (m)	TDS (ppm)	EC	DO (mg/l)	BOD (mg/l)	TSS (mg/l)	Hardness (mg/l)	Alkalinity (mg/l)	Nitrate (mg/l)	Nitrite (mg/l)	TP (mg/l)	Chl a (µg/l)	Chl b (µg/l)
<b>K1</b>	18.67±1.53 <sup>b</sup>	7.67±0.58 <sup>a</sup>	0.38±0.01 <sup>ab</sup>	182.67±2.52 <sup>a</sup>	285.4±3.93 <sup>a</sup>	1.17±0.21 <sup>c</sup>	12.21±1.05 <sup>a</sup>	221.67±7.64 <sup>b</sup>	170.67±15 <sup>c</sup>	111.33±15 <sup>a</sup>	4.39±0.45 <sup>a</sup>	2.25±0.25 <sup>a</sup>	2.45±0.05 <sup>a</sup>	0.55±0.05 <sup>c</sup>	0.02±0.01 <sup>a</sup>
<b>K2</b>	19.33±0.58 <sup>b</sup>	7.13±0.12 <sup>a</sup>	0.37±0.02 <sup>a</sup>	256.33±1.15 <sup>b</sup>	400.52±1.81 <sup>b</sup>	0.9±0.10 <sup>bc</sup>	31.31±1.75 <sup>a</sup>	265.33±5.03 <sup>c</sup>	189±3.61 <sup>d</sup>	161.33±4.16 <sup>b</sup>	6.25±0.26 <sup>ab</sup>	3.91±0.37 <sup>a</sup>	3.8±0.26 <sup>b</sup>	1.25±0.05 <sup>d</sup>	0.02±0.01 <sup>a</sup>
<b>K3</b>	18.67±0.58 <sup>b</sup>	7.13±0.12 <sup>a</sup>	0.40±0.01 <sup>b</sup>	178.67±1.15 <sup>a</sup>	279.16±1.81 <sup>a</sup>	0.27±0.12 <sup>a</sup>	30.57±0.55 <sup>b</sup>	161.33±4.62 <sup>a</sup>	157±2.65 <sup>a</sup>	187.67±2.52 <sup>c</sup>	8.89±0.36 <sup>abc</sup>	2.81±0.31 <sup>a</sup>	4.66±0.39 <sup>a</sup>	0.32±0.03 <sup>ab</sup>	0.04±0.01 <sup>a</sup>
<b>K4</b>	19.33±0.58 <sup>b</sup>	7.1±0.10 <sup>a</sup>	0.38±0.01 <sup>ab</sup>	277.67±2.31 <sup>c</sup>	433.85±3.61 <sup>c</sup>	0.67±0.06 <sup>ab</sup>	29.29±3.50 <sup>a</sup>	162±10.39 <sup>a</sup>	210±10 <sup>c</sup>	184.33±4.04 <sup>c</sup>	11.17±3.69 <sup>c</sup>	3.77±1.51 <sup>a</sup>	2.5±0.70 <sup>b</sup>	0.22±0.11 <sup>a</sup>	0.04±0.01 <sup>a</sup>
<b>K5</b>	15±1 <sup>a</sup>	7.1±0.10 <sup>a</sup>	0.38±0.01 <sup>ab</sup>	272.67±3.06 <sup>c</sup>	425.75±5.17 <sup>c</sup>	0.63±0.23 <sup>ab</sup>	35.35±1.75 <sup>a</sup>	165.33±4.62 <sup>a</sup>	226.67±5.77 <sup>f</sup>	112±3.46 <sup>a</sup>	6.3±1.93 <sup>ab</sup>	3.85±0.15 <sup>a</sup>	3.77±0.12 <sup>a</sup>	1.22±0.01 <sup>d</sup>	0.25±0.36 <sup>a</sup>
<b>K6</b>	18±1.73 <sup>ab</sup>	7.1±0.12 <sup>a</sup>	0.40±0.01 <sup>b</sup>	272.67±1.73 <sup>d</sup>	448.43±2.71 <sup>d</sup>	1.03±0.15 <sup>bc</sup>	21.21±1.05 <sup>a</sup>	170.33±4.04 <sup>a</sup>	143.33±5.77 <sup>b</sup>	118.67±15 <sup>a</sup>	9.72±0.33 <sup>bc</sup>	2.76±1.08 <sup>a</sup>	3.01±0.86 <sup>b</sup>	0.44±0.04 <sup>bc</sup>	0.02±0.01 <sup>a</sup>
<b>Average</b>	18.17	7.21	0.39	240.11	378.85	0.78	26.66	191	182.78	145.89	7.78	3.23	21.21	0.67	0.07

Note: Different alphabetical letters as superscript specify significant differences among different sites of the selected lakes at p<0.05.

**Supplementary Table 4:** Physicochemical analysis of water quality of the lake during summer season (May, 2020)

Parameter	Temp(°C)	Ph	SD (m)	TDS (ppm)	EC	DO (mg/l)	BOD (mg/l)	TSS (mg/l)	Hardness (mg/l)	Alkalinity (mg/l)	Nitrate (mg/l)	Nitrite (mg/l)	TP (mg/l)	Chl a (µg/l)	Chl b (µg/l)
<b>K1</b>	31.33±1.15 <sup>a</sup>	7.7±0.20 <sup>bc</sup>	0.45±0.02 <sup>ab</sup>	197.33±2.31 <sup>c</sup>	308.33±3.61 <sup>c</sup>	3.8±0.17 <sup>b</sup>	39.06±5.83 <sup>a</sup>	206.67±11.55 <sup>b</sup>	160.33±5.51 <sup>a</sup>	32±3.46 <sup>a</sup>	3.93±0.55 <sup>ab</sup>	2.64±0.78 <sup>ab</sup>	3.73±0.50 <sup>a</sup>	0.37±0.05 <sup>ab</sup>	0.39±0.06 <sup>ab</sup>
<b>K2</b>	31.67±1.53 <sup>a</sup>	7.47±0.25 <sup>ab</sup>	0.44±0.01 <sup>a</sup>	114.67±4.62 <sup>a</sup>	179.17±7.22 <sup>a</sup>	5.88±0.15 <sup>c</sup>	113.13±55.99 <sup>b</sup>	63.33±15.28 <sup>a</sup>	165.67±5.13 <sup>a</sup>	59±16.52 <sup>bc</sup>	3.16±0.66 <sup>a</sup>	2.47±0.16 <sup>ab</sup>	12.72±0.75 <sup>d</sup>	0.55±0.10 <sup>ab</sup>	0.44±0.12 <sup>ab</sup>
<b>K3</b>	31±1 <sup>a</sup>	7.77±0.23 <sup>bc</sup>	0.5 ± 0.02 <sup>bc</sup>	197.33±2.31 <sup>c</sup>	308.33±3.61 <sup>c</sup>	2.4±0.26 <sup>a</sup>	26.93±4.66 <sup>a</sup>	166.67±7.67 <sup>b</sup>	176±14.42 <sup>a</sup>	45±5 <sup>abc</sup>	5.35±0.14 <sup>b</sup>	1.50±0.05 <sup>a</sup>	7.6±0.17 <sup>c</sup>	0.45±0.18 <sup>ab</sup>	0.58±0.07 <sup>bc</sup>
<b>K4</b>	31.67±1.53 <sup>a</sup>	7.13±0.06 <sup>a</sup>	0.55 ± 0.02 <sup>c</sup>	231±5.20 <sup>d</sup>	360.93±8.12 <sup>d</sup>	1.8±0.17 <sup>a</sup>	47.34±13.01 <sup>ab</sup>	193±11.27 <sup>b</sup>	189.67±9.50 <sup>a</sup>	63.33±10.41 <sup>c</sup>	3.48±0.97 <sup>ab</sup>	5.96±0.04 <sup>c</sup>	4.917±1.27 <sup>ab</sup>	0.3±0.05 <sup>a</sup>	0.28±0.07 <sup>a</sup>
<b>K5</b>	31.67±1.53 <sup>a</sup>	7.47±0.25 <sup>ab</sup>	0.69±0.03 <sup>d</sup>	185.33±4.04 <sup>b</sup>	289.58±6.32 <sup>b</sup>	3.4±0.53 <sup>b</sup>	43.09±9.33 <sup>a</sup>	390±36.06 <sup>c</sup>	180±20 <sup>a</sup>	30±10 <sup>a</sup>	3.11±0.71 <sup>a</sup>	3.93±0.51 <sup>b</sup>	6.88±0.77 <sup>bc</sup>	0.43±0.14 <sup>ab</sup>	0.46±0.09 <sup>ab</sup>
<b>K6</b>	31.67±1.53 <sup>a</sup>	8.1±0.17 <sup>c</sup>	0.70±0.01 <sup>d</sup>	187.33±2.31 <sup>bc</sup>	292.71±3.61 <sup>bc</sup>	4.13±0.32 <sup>b</sup>	44.44±6.31 <sup>a</sup>	216.67±28.87 <sup>b</sup>	183.33±15.28 <sup>a</sup>	33.33±5.77 <sup>ab</sup>	2.68±0.83 <sup>a</sup>	2.29±1.16 <sup>ab</sup>	6.59±0.48 <sup>bc</sup>	0.66±0.11 <sup>b</sup>	0.79±0.09 <sup>c</sup>
<b>Average</b>	31.5	7.61	0.56	185.5	289.84	3.57	52.32	206.06	175.83	43.78	3.62	3.13	7.07	0.46	0.49

Note: Different alphabetical letters as superscript specify significant differences among different sites of the selected lakes at p<0.05.

**Supplementary Table 5:** Physicochemical analysis of water quality of the lake during Monsoon Season (October, 2019)

Parameter	Temp (°C)	Ph	Secchi Depth (m)	TDS (ppm)	EC (µS/cm)	DO (mg/l)	BOD (mg/l)	TSS (mg/l)	Hardness (mg/l)	Phenol (mg/l)	Meth Alk (mg/l)	Total Alk (mg/l)	Nitrate (mg/l)	Nitrite (mg/l)	TP (mg/l)	Chl a (µg/l)	Chl b (µg/l)
<b>K1</b>	28.33 ±0.58 <sub>a</sub>	7.57±0.06 <sup>a</sup>	0.23±0.06 <sup>a</sup>	164±3.61 <sup>bc</sup>	256.25 ±5.63 <sup>bc</sup>	4.63±0.15 <sup>a</sup>	45.5±0.44 <sup>a</sup>	603.33 ±5.77 <sup>d</sup>	145.67 ±0.58 <sup>a</sup>	0	261.08 ±1.16 <sup>c</sup>	261.08 ±1.16 <sup>c</sup>	5.58±0.37 <sup>d</sup>	5.50±0.45 <sup>a</sup>	7.68±4.88 <sup>a</sup>	1.03±0.01 <sup>b</sup>	1.31±0.12 <sup>b</sup>
<b>K2</b>	27±1.73 <sup>a</sup>	7.73±0.21 <sup>ab</sup>	0.28±0.02 <sup>a</sup>	156.33 ±1.15 <sup>b</sup>	244.27 ±1.81 <sup>b</sup>	9.33±0.58 <sup>c</sup>	70.8±1.04 <sup>c</sup>	403.33 ±5.77 <sup>a</sup>	175.67 ±0.58 <sup>bc</sup>	0	246.92 ±3.06 <sup>b</sup>	246.92 ±3.06 <sup>b</sup>	3.56±0.22 <sup>b</sup>	6.27±0.25 <sup>ab</sup>	11.07±10.06 <sup>a</sup>	0.39±0.06 <sup>a</sup>	0.46±0.01 <sup>a</sup>
<b>K3</b>	29.33 ±0.58 <sub>a</sub>	8.13±0.12 <sup>bc</sup>	0.28±0.02 <sup>a</sup>	138.67 ±1.15 <sup>a</sup>	216.67 ±1.80 <sup>a</sup>	7.13±0.06 <sup>b</sup>	60.47 ±0.12 <sup>b</sup>	496.67 ±15.28 <sup>c</sup>	153.33 ±5.77 <sup>a</sup>	0	216.88 ±2.72 <sup>a</sup>	216.88 ±2.73 <sup>a</sup>	2.85±0.13 <sup>a</sup>	7.40±0.52 <sup>b</sup>	9.32±5.58 <sup>a</sup>	1.39±0.09 <sup>c</sup>	1.46±0.03 <sup>b</sup>
<b>K4</b>	28.67 ±1.15 <sub>a</sub>	8.57±0.06 <sup>cd</sup>	0.27±0.12 <sup>a</sup>	167±1.73 <sup>c</sup>	260.94 ±2.71 <sup>c</sup>	6.67±0.29 <sup>b</sup>	52.07 ±2.54 <sup>ab</sup>	603.33 ±5.77 <sup>d</sup>	193.33 ±5.77 <sup>c</sup>	0	265±4.33 <sup>c</sup>	265±4.33 <sup>c</sup>	3.76±0.26 <sup>b</sup>	7.56±0.87 <sup>b</sup>	23.63±15.10 <sup>a</sup>	0.33±0.18 <sup>a</sup>	0.48±0.07 <sup>a</sup>
<b>K5</b>	29.33 ±0.58 <sub>a</sub>	8.4±0.36 <sup>cd</sup>	0.22±0.03 <sup>a</sup>	165.33 ±4.04 <sup>bc</sup>	258.34 ±6.32 <sup>bc</sup>	6.6±0.35 <sup>b</sup>	56.83 ±7.07 <sup>b</sup>	443.33 ±5.77 <sup>b</sup>	180±17.32 <sup>bc</sup>	0	256.46 ±3.07 <sup>c</sup>	256.46 ±2.50 <sup>c</sup>	3.75±0.22 <sup>b</sup>	6.94±0.05 <sup>ab</sup>	4.67±0.89 <sup>a</sup>	0.41±0.03 <sup>a</sup>	0.40±0.02 <sup>a</sup>
<b>K6</b>	28.67 ±1.15 <sub>a</sub>	8.8±0.17 <sup>d</sup>	0.29±0.01 <sup>a</sup>	183.33 ±5.77 <sup>d</sup>	286.46 ±9.02 <sup>d</sup>	6.3±0.17 <sup>b</sup>	55.2±1.56 <sup>b</sup>	503.33 ±5.77 <sup>c</sup>	161.33 ±1.15 <sup>ab</sup>	0	284.17 ±5.05 <sup>d</sup>	284.17 ±5.05 <sup>d</sup>	4.73±0.24 <sup>c</sup>	7.62±0.78 <sup>b</sup>	1.81±0.45 <sup>a</sup>	0.48±0.21 <sup>a</sup>	0.64±0.11 <sup>a</sup>
<b>Average</b>	28.56	8.2	0.26	162.44	253.82	6.78	56.81	508.89	168.22	0	255.09	255.09	4.04	6.88	9.7	0.67	0.79

Note: Different alphabetical letters as superscript specify significant differences among different sites of the selected lakes at p<0.05.

**Supplementary Table 6:** Physicochemical analysis of water quality of the lake during winter season (January, 2020)

Parameter	Temp (°C)	Ph	Secchi Depth (m)	TDS (ppm)	EC (µS/cm)	DO (mg/l)	BOD (mg/l)	TSS (mg/l)	Hardness (mg/l)	Phenol (mg/l)	Meth Alk (mg/l)	Total Alk (mg/l)	Nitrate (mg/l)	Nitrite (mg/l)	TP (mg/l)	Chl a (µg/l)	Chl b (µg/l)
<b>K2</b>	20.67 ±0.58 <sup>a</sup>	8.57± 0.06 <sup>b</sup>	0.37± 0.02 <sup>a</sup>	192±1. 73 <sup>a</sup>	300±2. 70 <sup>a</sup>	5.2±1 .91 <sup>ab</sup>	39.53 ±1.15 <sup>a</sup>	446.67 ±5.77 <sup>b</sup>	140.67± 1.15 <sup>ab</sup>	0	31.66± 2.89 <sup>a</sup>	31.67± 2.89 <sup>a</sup>	4.21±0. 18 <sup>c</sup>	3.27±0 .23 <sup>b</sup>	19.47± 1.27 <sup>b</sup>	2.17± 0.14 <sup>b</sup>	1.33± 0.05 <sup>ab</sup>
<b>K3</b>	20.67 ±0.58 <sup>a</sup>	8.47± 0.06 <sup>b</sup>	0.37± 0.02 <sup>a</sup>	190.67 ±1.15 <sup>a</sup>	297.92 ±1.80 <sup>a</sup>	6.57± 0.06 <sup>b</sup>	65.17 ±1.26 <sup>c</sup>	503.33 ±5.77 <sup>c</sup>	146.67± 5.77 <sup>bc</sup>	0	43.33± 5.77 <sup>bc</sup>	43.33± 5.77 <sup>bc</sup>	3.21±0. 18 <sup>a</sup>	3.49±0 .08 <sup>b</sup>	17±1.7 3 <sup>ab</sup>	1.37± 0.01 <sup>a</sup>	1.21± 0.01 <sup>ab</sup>
<b>K4</b>	20.67 ±0.58 <sup>a</sup>	8.2±0 .17 <sup>a</sup>	0.41± 0.01 <sup>b</sup>	204±5. 20 <sup>bc</sup>	318.75 ±8.12 <sup>bc</sup>	5.33± 0.12 <sup>ab</sup>	71.53 ±1.33 <sup>d</sup>	396.67 ±5.77 <sup>a</sup>	126.67± 5.77 <sup>a</sup>	0	34±3.4 6 <sup>ab</sup>	34±3.4 6 <sup>ab</sup>	4.71±0. 25 <sup>d</sup>	3.38±0 .33 <sup>b</sup>	17±1.7 3 <sup>ab</sup>	1.28± 0.24 <sup>a</sup>	1.37± 0.12 <sup>b</sup>
<b>K5</b>	20.67 ±0.58 <sup>a</sup>	8.07± 0.06 <sup>a</sup>	0.42± 0.02 <sup>b</sup>	212.67 ±2.31 <sup>c</sup>	332.30 ±3.61 <sup>c</sup>	5.4±0 .17 <sup>b</sup>	64.33 ±3.75 <sup>c</sup>	436.67 ±5.77 <sup>b</sup>	173.33± 5.77 <sup>d</sup>	0	43.33± 5.77 <sup>bc</sup>	43.33± 5.77 <sup>bc</sup>	5.13±0. 12 <sup>d</sup>	2.62±0 .54 <sup>a</sup>	16.33± 1.15 <sup>ab</sup>	1.29± 0.01 <sup>a</sup>	1.33± 0.14 <sup>ab</sup>
<b>K6</b>	20.67 ±0.58 <sup>a</sup>	8.07± 0.06 <sup>a</sup>	0.41± 0.01 <sup>b</sup>	206.67 ±5.77 <sup>c</sup>	322.92 ±9.02 <sup>c</sup>	3.57± 0.06 <sup>a</sup>	91.67 ±1.27 <sup>c</sup>	543.33 ±5.77 <sup>d</sup>	163.33± 11.55 <sup>cd</sup>	0	52.67± 2.31 <sup>c</sup>	52.67± 2.31 <sup>c</sup>	3.7±0.1 7 <sup>b</sup>	5.59±0 .10 <sup>c</sup>	15.67± 0.58 <sup>a</sup>	1.43± 0.06 <sup>a</sup>	1.36± 0.02 <sup>b</sup>
<b>Average</b>	20.67	8.34	0.42	200.39	313.11	5.2	63.68	488.33	152.89	0	41.39	41.39	4.62	3.64	16.91	1.47	1.29

Note: Different alphabetical letters as superscript specify significant differences among different sites of the selected lakes at p<0.05.

**Supplementary Table 7: Physicochemical analysis of water quality of the lake during monsoon season (October, 2020)**

Parameter	Temp (°C)	Ph	Secchi Depth (m)	TDS (ppm)	EC (µS/cm)	DO (mg/l)	BOD (mg/l)	TSS (mg/l)	Hardness (mg/l)	Phenol (mg/l)	Meth Alk (mg/l)	Total Alk (mg/l)	Nitrate (mg/l)	Nitrite (mg/l)	TP (mg/l)	Chl a (µg/l)	Chl b (µg/l)
<b>K2</b>	28.67 ±1.15 <sup>a</sup>	8.93± 0.06 <sup>c</sup>	0.21± 0.02 <sup>a</sup>	206.67 ±5.77 <sup>b</sup>	322.92 ±9.02 <sup>b</sup>	5.17± 0.29 <sup>abc</sup>	80.2±1 7.23 <sup>c</sup>	510±10 <sup>b</sup>	134±1. 73 <sup>ab</sup>	0	270.73 ±3.95 <sup>c</sup>	270.73 ±3.95 <sup>d</sup>	3.43±0. 21 <sup>a</sup>	7.7±0. 17 <sup>c</sup>	9.33± 0.58 <sup>b</sup>	1.47± 0.08 <sup>b</sup>	1.41± 0.02 <sup>b</sup>
<b>K3</b>	28±1. 73 <sup>a</sup>	8.63± 0.12 <sup>c</sup>	0.24± 0.02 <sup>a</sup>	193.33 ±5.77 <sup>ab</sup>	302.09 ±9.02 <sup>ab</sup>	6.27± 0.25 <sup>cd</sup>	37.2±6. 75 <sup>a</sup>	473.33± 11.55 <sup>a</sup>	116.67 ±5.77 <sup>a</sup>	0	231.9± 2.71 <sup>ab</sup>	231.9± 2.71 <sup>b</sup>	4.03±0. 15 <sup>bc</sup>	6.83±0 .15 <sup>b</sup>	9.9±0. 1 <sup>bc</sup>	0.51± 0.08 <sup>a</sup>	0.67± 0.03 <sup>a</sup>
<b>K4</b>	29.33 ±0.58 <sup>a</sup>	8.93± 0.06 <sup>c</sup>	0.29± 0.01 <sup>a</sup>	193.33 ±5.77 <sup>ab</sup>	302.09 ±9.02 <sup>ab</sup>	6.97± 0.06 <sup>d</sup>	51.38± 15.63 <sup>abc</sup>	493.33± 11.55 <sup>ab</sup>	123.33 ±2.89 <sup>a</sup>	0	248.5± 3.04 <sup>bc</sup>	248.5± 3.04 <sup>c</sup>	4.67±0. 29 <sup>d</sup>	5.87±0 .12 <sup>a</sup>	6.93± 0.06 <sup>a</sup>	1.67± 0.20 <sup>bc</sup>	1.90± 0.01 <sup>c</sup>
<b>K5</b>	28±1. 73 <sup>a</sup>	8.2±0 .17 <sup>b</sup>	0.27± 0.12 <sup>a</sup>	203.33 ±5.77 <sup>ab</sup>	317.71 ±9.02 <sup>ab</sup>	5±0.5 <sup>a</sup> b	69.22± 2.22 <sup>bc</sup>	513.33± 11.55 <sup>b</sup>	136.67 ±9.43 <sup>ab</sup>	0	231±0. 87 <sup>ab</sup>	231±0. 87 <sup>b</sup>	3.73±0. 23 <sup>ab</sup>	9.87±0 .12 <sup>d</sup>	8.93± 0.06 <sup>ab</sup>	1.68± 0.06 <sup>bc</sup>	1.97± 0.02 <sup>c</sup>
<b>K6</b>	27.67 ±1.17 <sup>a</sup>	7.7±0 .17 <sup>a</sup>	0.25± 0.01 <sup>a</sup>	180±17 .32 <sup>a</sup>	281.25 ±27.06 <sup>a</sup>	5.53± 0.76 <sup>bc</sup>	27.31± 5.21 <sup>a</sup>	490±10 <sup>a</sup> b	168±5. 29 <sup>c</sup>	0	214.27 ±16.42 <sup>a</sup>	203.47 ±4.62 <sup>a</sup>	3.97±0. 21 <sup>abc</sup>	6.83±0 .17 <sup>b</sup>	12±1. 63 <sup>c</sup>	2.07± 0.25 <sup>c</sup>	1.82± 0.11 <sup>c</sup>
<b>Average</b>	28.28	8.55	0.25	196.67	307.3	5.55	51.1	497.22	137.56	0	238.98	237.18	4.04	7.26	9.68	1.45	1.5

Note: Different alphabetical letters as superscript specify significant differences among different sites of the selected lakes at p<0.05

**Supplementary Table 8:** Trophic State Index of lake during first year of the sampling

Phase	First Year of Sampling																	
Seasons	Monsoon (Oct-2018)						Winter (Jan-2019)						Summer (May-2019)					
Site	SD	TSI (SD)	TP	TSI (TP)	Chl-a	TSI (Chl-a)	SD	TSI (SD)	TP	TSI (TP)	Chl-a	TSI (Chl-a)	SD	TSI (SD)	TP	TSI (TP)	Chl-a	TSI (Chl-a)
K1	0.38	73.94	20.2	47.49	0.13	10.59	0.38	73.94	2.45	27.21	0.55	24.74	0.45	71.51	3.73	23.02	0.37	20.85
K2	0.78	63.58	4.3	25.18	0.08	5.82	0.37	74.33	3.8	23.40	1.25	32.79	0.44	71.83	12.72	40.82	0.55	24.74
K3	0.40	73.20	4.1	24.50	0.16	12.62	0.40	73.20	4.66	31.38	0.32	19.42	0.5	69.99	7.6	33.40	0.45	22.77
K4	0.42	72.50	4.52	25.90	5.03	46.45	0.38	73.94	2.5	17.36	0.22	15.75	0.55	68.61	4.92	27.13	0.3	18.79
K5	0.64	66.43	4.02	24.21	6.08	48.31	0.38	73.94	3.77	29.84	1.22	32.55	0.69	65.35	6.88	31.96	0.43	22.32
K6	0.59	67.60	3.72	23.09	4.46	45.27	0.40	73.20	3.01	20.04	0.44	22.55	0.70	65.14	6.59	31.34	0.66	26.52
<b>Average</b>		<b>69.54</b>		<b>28.40</b>		<b>28.17</b>		<b>73.76</b>		<b>24.87</b>		<b>24.63</b>		<b>68.74</b>		<b>31.28</b>		<b>22.67</b>
<b>Carlson Trophic State index</b>	[TSI (SD) +TSI (TP)+ TSI (Chl-a)]/3 [69.54+28.40+28.17]/3 42.04 (Mesotrophic)						[TSI (SD)+TSI (TP)+ TSI (Chl-a)]/3 [73.76+24.87+24.63]/3 41.09 (Mesotrophic)						[TSI (SD) +TSI (TP)+ TSI (Chl-a)]/3 [68.74+31.28+22.67]/3 40.90 (Mesotrophic)					

**Supplementary Table 9:** Trophic State Index of lake during second year of the sampling

Phase	Second year of the sampling																	
Seasons	Monsoon (October 2019)						Winter (January,2020)						Monsoon (October, 2020)					
Parameter	SD	TSI (SD)	TP	TSI(TP)	Chl a	TSI(Chl a)	SD	TSI(SD)	TP	TSI(TP)	Chl a	TSI(Chl a)	SD	TSI(SD)	TP	TSI(TP)	Chl a	TSI(Chl a)
<b>K1</b>	0.23	76.42	7.68	33.55	1.03	30.89	0.54	68.88	16	44.1	1.25	32.79	0.22	81.82	10.97	38.69	1.32	33.32
<b>K2</b>	0.28	78.34	11.07	38.82	0.39	21.26	0.37	74.33	19.47	46.93	2.17	38.2	0.21	82.49	9.33	36.35	1.47	34.38
<b>K3</b>	0.28	78.34	9.32	36.34	1.39	33.83	0.37	74.33	17	44.98	1.37	33.69	0.24	80.56	9.9	37.21	0.51	23.99
<b>K4</b>	0.27	78.87	23.63	49.75	0.33	19.72	0.41	72.85	17	44.98	1.28	33.02	0.29	77.84	6.93	32.07	1.67	35.77
<b>K5</b>	0.22	81.82	4.67	26.37	0.41	21.85	0.42	72.5	16.33	44.4	1.29	33.1	0.27	78.87	8.93	35.72	1.68	35.69
<b>K6</b>	0.29	77.84	1.81	12.71	0.48	23.4	0.41	72.85	15.67	43.8	1.43	34.11	0.25	79.98	12	39.98	2.07	37.74
<b>Average</b>		78.61		32.92		25.16		72.63		44.87		34.15		80.26		36.67		33.48
<b>Carlson Trophic State Index</b>	$\frac{[TSI (SD) + TSI (TP) + TSI (Chl-a)]}{3}$ $\frac{[78.61+32.92+25.16]}{3}$ $45.56 \text{ (Mesotrophic)}$						$\frac{[TSI (SD) + TSI (TP) + TSI (Chl-a)]}{3}$ $\frac{[72.63+44.87+34.15]}{3}$ $50.55 \text{ (Mesotrophic)}$						$\frac{[TSI (SD) + TSI (TP) + TSI (Chl-a)]}{3}$ $\frac{[80.26+36.67+33.48]}{3}$ $50.14 \text{ (Mesotrophic)}$					



**Supplementary Table 10:** Diversity, abundance and distribution of the algal species in the selected three seasons of the Kathauta lake

S. No	Floristic list of algae	First year of Sampling			Second Year of Sampling		
		Monsoon (Oct-2018)	Winter (Jan-2019)	Summer (May-2019)	Monsoon (Oct-2019)	Winter (Jan-2020 Pre-Lockdown)	Monsoon(Oct-2020 Post-Lockdown)
<b>Class: Trebouxiophyceae</b>							
<b>Order: Chlorellales</b>							
<b>Family: Chlorellaceae</b>							
1	<i>Chlorella vulgaris</i> <u>M. Beijerinck</u>	+	+	++	+++	++	+++
2	<i>Micractinium fresenius</i>	+	+	+	+	++	-
3	<i>Micractinium pussillum</i>	-	-	-	+	++	-
4	<i>Dictyosphaerium</i> sp. Nageli, 1849	+	+	+	+	+	-
5	<i>Actinastrum hantzschii</i>	+	++	+++	+++	++	++
<b>Family: Crucigenia (Trebouxiophyceae)</b>							
6	<i>Crucigenia quadrata</i>	-	-	-	+	++	++
<b>Family: Closteriopsis (Chlorellaceae)</b>							
7	<i>Closteriopsis longissimi</i>	-	-	-	++	++	++
<b>Class: Chlorophyceae</b>							
<b>Order: Chlamydomonadales</b>							
<b>Family: Chlamydomonadaceae</b>							
8	<i>Chlamydomonas</i> sp.	+	+	+	-	+	++
<b>Family: Volvocaceae</b>							
9	<i>Pandorina mourm</i>	+	+	+	+	-	-
10	<i>Pandorina</i> sp.	-	+	+	-	-	-
<b>Class: Chlorophyceae</b>							
<b>Order: Sphaeropleales</b>							
<b>Family: Hydrodictyaceae</b>							
11	<i>Pediastrum duplex</i>	+	+	++	-	-	-
12	<i>Pediastrum boryanum</i>	-	-	+	-	-	-
<b>Family: Scenedesmaceae</b>							
13	<i>Scenedesmus quadricauda</i>	++	++	++	++	++	++
14	<i>Scenedesmus dimorphus</i>	-	+	++	+	++	++
15	<i>Scenedesmus opoliensis</i>	-	-	+	-	-	-

16	<i>Scenedesmus pectinatus</i>	-	-	-	++	++	++
17	<i>Coelastrum microsporum</i>	+	+	+	+	+	+
18	<i>Coelastrum astroideum</i>	-	+	+	-	-	-
19	<i>Coelastrum sphaerium</i> Nageli	-	+	++	+	-	++
20	<i>Coelastrum</i> sp	-	-	-	+++	-	-
21	<i>Actinastrum</i> sp	-	--	-	++	++	++
<b>Family: Selenastraceae</b>							
22	<i>Ankistrodesmus falcatus</i>	-	-	+	-	-	-
23	<i>Golenkiniopsis</i> sp.	+	+	++	-	-	-
24	<i>Ankistrodesmus spiralis</i>	+	+	++	-	-	-
25	<i>Monoraphidium circinale</i>	-	+	++	-	-	-
<b>Family: Schroederiaceae</b>							
26	<i>Schroederia robusta</i>	-	+	++	-	-	-
<b>Family: Chaetophoraceae</b>							
27	<i>Stigeoclonium tenue</i>	-	-	-	-	++	-
<b>Family: Oocystacea</b>							
28	<i>Oocystishetero mucosa</i>	-	-	-	++	++	++
<b>Family: Schroederiaceae</b>							
29	<i>Schroederia setigera</i>	-	-	-	++	++	++
<b>Family: Sphaerocystidaceae</b>							
30	<i>Sphaerocystis chroeteri</i> Chodat	-	-	-	++	++	++
Total species recorded (Chlorophyceae)		11	17	20	18	17	14
<b>Class: Zygnematophyceae</b>							
<b>Order: Desmiales</b>							
<b>Family: Desmidiaceae</b>							
31	<i>Cosmarium angulosum</i>	-	-	+	-	-	-
32	<i>Staurastrum</i> sp.	-	-	-	+	-	-
Total species recorded (Zygnematophyceae)		0	0	1	1	0	0
<b>Class: Cyanophyceae</b>							
<b>Order: Chroococcales</b>							
<b>Family: Microcystaceae</b>							
33	<i>Microcystis aeruginosa</i>	-	-	++	-	-	-
<b>Order: Synechococcales</b>							

<b>Family: Merismopediaceae</b>							
34	<i>Merismopedia glauca</i>	+	+	++	++	+++	-
35	<i>Merismopedia</i> sp.	+++	+++	+++	+++	+++	++
<b>Family: Pseudanabaenaceae</b>							
36	<i>Limnothrix</i> sp.	+++	+++	+++	++	+++	++
<b>Order: Oscillatoriales</b>							
<b>Family: Microcoleaceae</b>							
37	<i>Planktothrix peronata</i>	-	+	++	-	-	-
<b>Family: Oscillatoriaceae</b>							
38	<i>Oscillatoria</i> sp.	++	++	++	++	++	++
Total species recorded (Cyanophyceae)		<b>4</b>	<b>5</b>	<b>6</b>	<b>4</b>	<b>4</b>	<b>3</b>
<b>Class: Mediophyceae</b>							
<b>Order: Thalassiosirales</b>							
<b>Family: Thalassiosiraceae</b>							
39	<i>Thalassiosira weissflogii</i>	+++	-	+++	-	-	-
<b>Order: Stephanodiscales</b>							
<b>Family: Stephanodiscaceae</b>							
40	<i>Stephanodiscus gas sizensis</i>	+++	+++	+++	-	-	-
41	<i>Cyclotella stelligera</i>	+++	+++	+++	+	++	++
42	<i>Cyclotella meneghiniana</i>	++	++	+++	+	++	-
43	<i>Cyclotella</i> sp.	++	++	+++	-	++	+
<b>Class: Coscinodiscophyceae</b>							
<b>Order: Melosirales</b>							
<b>Family: Melosiraceae</b>							
44	<i>Melosirasp C.A Agardh</i>	+++	+++	+++	+++	+++	+++
<b>Class: Bacillariophyceae</b>							
<b>Order: Bacillariales</b>							
<b>Family: Bacillariaceae</b>							
45	<i>Nitzschia</i> sp.	+++	+++	+++	++	++	++
<b>Class: Bacillariophyceae</b>							
<b>Order: Naviculales</b>							
<b>Family: Naviculaceae</b>							

46	<i>Navicula sp</i>	+++	+++	+++	++	++	++
47	<i>Caloneis sp</i>	-	-	-	+	+++	++
<b>Class: Bacillariophyceae</b>							
<b>Order: Thalassiophysales</b>							
<b>Family: Catenulaceae</b>							
48	<i>Amphora ovalis</i>	++	++	++	-	-	-
<b>Class: Bacillariophyceae</b>							
<b>Order: Cymbellales</b>							
<b>Family: Gomphonemataceae</b>							
49	<i>Gomphonema sp.</i>	++	++	+++	-	++	+
<b>Class: Bacillariophyceae</b>							
<b>Order: Fragilariales</b>							
<b>Family: Fragilariaceae</b>							
50	<i>Synedra ulna</i>	+	+	++	-	+	-
Total species recorded (Bacillariophyceae)		<b>11</b>	<b>10</b>	<b>11</b>	<b>6</b>	<b>9</b>	<b>7</b>
<b>Class: Euglenophyceae</b>							
<b>Order: Euglenida</b>							
<b>Family: Phacaceae</b>							
51	<i>Phacustortus</i>	+	+++	++	-	-	-
52	<i>Phacuscrassus</i>	-	++	+++	++	+++	-
53	<i>Phacus orbicularis</i>	-	+	+++	++	+++	+++
54	<i>Phacus pleuronectis</i>	-	-	-	++	+++	+++
<b>Family: Euglenidae</b>							
55	<i>Euglena acus</i>	++	++	++	-	-	-
56	<i>Euglena viridis</i>	+++	+++	++	+++	+++	+++
57	<i>Euglena srinagari</i>	+++	+++	++	-	-	-
58	<i>Euglena sp.</i>	+++	+++	++	--	-	-
59	<i>Euglena gracilis</i>	-	-	-	+++	+++	+++
60	<i>Euglena caudata</i>	-	-	-	+++	+++	+++
61	<i>Euglena granulate</i>	-	-	-	+++	+++	+++
Total species recorded (Euglenophyceae)		<b>5</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>6</b>

Note- +++: Dominant; ++: Common; +: Rare; -: Absent

**Supplementary Table 11:** Palmer diversity indices for the algal species reported in the selected Kathuta lake

S. No	Floristic list of algae	First Year of Sampling			Second Year of Sampling		
		Monsoon (Oct-2018)	Winter (Jan-2019)	Summer (May-2019)	Monsoon (Oct-2019)	Winter ( Jan-2020 Pre-Lockdown)	Monsoon( Oct-2020 Post-Lockdown)
<b>Class: Trebouxiophyceae</b>							
<b>Order: Chlorellales</b>							
<b>Family: Chlorellaceae</b>							
1	<i>Chlorella vulgaris</i> <u>M. Beijerinck</u>	+2	+2	++2	+++2	++2	+++2
2	<i>Micractinium fresenius</i>	+1	+1	+1	+1	++1	-0
3	<i>Micractinium pussillum</i>	-0	-0	-0	+1	++1	-0
4	<i>Dictyosphaerium</i> sp. Nageli,1849	+	+	+	+	+	-
5	<i>Actinastrumhantzschii</i>	+	++	+++	+++	++	++
<b>Family: Crucigenia (Trebouxiophyceae)</b>							
6	<i>Crucigenia quadrata</i>	-	-	-	+	++	++
<b>Family: Closteriopsis (Chlorellaceae)</b>							
7	<i>Closteriopsis longissima</i>	-	-	-	++	++	++
<b>Class: Chlorophyceae</b>							
<b>Order: Chlamydomonadales</b>							
<b>Family: Chlamydomonadaceae</b>							
8	<i>Chlamydomonas</i> sp.	+4	+4	+4	-	+4	++4
<b>Family: Volvocaceae</b>							
9	<i>Pandorina mourm</i>	+3	+3	+3	+3	-	-
10	<i>Pandorina</i> sp.	-	+1	+1	-	-	-
<b>Class: Chlorophyceae</b>							
<b>Order: Sphaeropleales</b>							
<b>Family: Hydrodictyaceae</b>							
11	<i>Pediastrum duplex</i>	+3	+3	++3	-	-	-
12	<i>Pediastrum boryanum</i>	-	-	+3	-	-	-
<b>Family: Scenedesmaceae</b>							
13	<i>Scenedesmus quadricauda</i>	++4	++4	++4	++4	++4	++4
14	<i>Scenedesmus dimorphus</i>	-	+	++4	+4	++4	++4

15	<i>Scenedesmus opoliensis</i>	-	-	+4	-	-	-
16	<i>Scenedesmus pectinatus</i>	-	-	-	++4	++4	++4
17	<i>Coelastrum microsporum</i>	+	+	+	+	+	+
18	<i>Coelastrum astroideum</i>	-	+	+	-	-	-
19	<i>Coelastrum sphaerium</i> <i>Nageli, 1849</i>	-	+	++	+	-	++
20	<i>Coelastrum sp</i>	-	-	-	+++	-	-
21	<i>Actinastrum sp</i>	-	--	-	++	++	++
<b>Family: Selenastraceae</b>							
22	<i>Ankistrodesmus falcatus</i>	-	-	+3	-	-	-
23	<i>Golenkiniopsis sp.</i>	+	+	++	-	-	-
24	<i>Ankistrodesmus spiralis</i>	+	+	++	-	-	-
25	<i>Monoraphidium circinale</i>	-	+	++	-	-	-
<b>Family: Schroederiaceae</b>							
26	<i>Schroederia robusta</i>	-	+	++	-	-	-
<b>Family: Chaetophoraceae</b>							
27	<i>Stigeoclonium tenue</i>	-	-	-	-	++3	-
<b>Family: Oocystaceae</b>							
28	<i>Oocystishetero mucosa</i>	-	-	-	++	++	++
<b>Family: Schroederiaceae</b>							
29	<i>Schroederiasetigera</i>	-	-	-	++	++	++
<b>Family- Sphaerocystidaceae</b>							
30	<i>Sphaerocystis schroeteri</i> <i>Chodat, 1897</i>	-	-	-	++	++	++
<b>Total species recorded (Chlorophyceae)</b>		<b>11</b>	<b>17</b>	<b>20</b>	<b>18</b>	<b>17</b>	<b>14</b>
<b>Class: Zygnematophyceae</b>							
<b>Order: Desmidiiales</b>							
<b>Family: Desmidiaceae</b>							
31	<i>Cosmarium angulosum</i>	-	-	+	-	-	-
32	<i>Staurastrum sp.</i>	-	-	-	+	-	-
<b>Total species recorded (Zygnematophyceae)</b>		<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>Class: Cyanophyceae</b>							
<b>Order: Chroococcales</b>							

<b>Family: Microcystaceae</b>							
33	<i>Microcystis aeruginosa</i>	-	-	++1	-	-	-
<b>Order: Synechococcales</b>							
<b>Family: Merismopediaceae</b>							
34	<i>Merismopedia glauca</i>	+	+	++	++	+++	-
35	<i>Merismopedia</i> sp.	+++	+++	+++	+++	+++	++
<b>Family: Pseudanabaenaceae</b>							
36	<i>Limnothrix</i>	+++	+++	+++	++	+++	++
<b>Order: Oscillatoriales</b>							
<b>Family: Microcoleaceae</b>							
37	<i>Planktothrix peronata</i>	-	+	++	-	-	-
<b>Family: Oscillatoriaceae</b>							
38	<i>Oscillatoria</i> sp.	++5	++5	++5	++5	++5	++5
<b>Total species recorded (Cyanophyceae)</b>		<b>4</b>	<b>5</b>	<b>6</b>	<b>4</b>	<b>4</b>	<b>3</b>
<b>Class: Mediophyceae</b>							
<b>Order: Thalassiosirales</b>							
<b>Family: Thalassiosiraceae</b>							
39	<i>Thalassiosira weissflogii</i>	+++	-	+++	-	-	-
<b>Order: Stephanodiscales</b>							
<b>Family: Stephanodiscaceae</b>							
40	<i>Stephanodiscus agassizensis</i>	+++	+++	+++	-	-	-
41	<i>Cyclotella stelligera</i>	+++ 1	+++1	+++1	+1	++1	++1
42	<i>Cyclotella meneghiniana</i>	++2	++2	+++2	+2	++2	-
43	<i>Cyclotella</i> sp.	++1	++1	+++1	-	++1	+1
<b>Class: Coscinodiscophyceae</b>							
<b>Order: Melosirales</b>							
<b>Family: Melosiraceae</b>							
44	<i>Melosirasp</i> C.A Agardh, 1824	+++ 1	+++1	+++1	+++1	+++1	+++1
<b>Class: Bacillariophyceae</b>							
<b>Order: Bacillariales</b>							
<b>Family: Bacillariaceae</b>							

45	<i>Nitzschia sp.</i>	+++ 3	+++3	+++3	++3	++3	++3
<b>Class: Bacillariophyceae</b>							
<b>Order: Naviculales</b>							
<b>Family: Naviculaceae</b>							
46	<i>Navicula sp.</i>	+++ 3	+++3	+++3	++3	++3	++3
47	<i>Caloneis sp.</i>	-	-	-	+	+++	++
<b>Class: Bacillariophyceae</b>							
<b>Order: Thalassiophysales</b>							
<b>Family: Catenulaceae</b>							
48	<i>Amphora ovalis</i>	++	++	++	-	-	-
<b>Class: Bacillariophyceae</b>							
<b>Order: Cymbellales</b>							
<b>Family: Gomphonemataceae</b>							
49	<i>Gomphonema sp.</i>	+++1	+++1	+++1	-	+++1	+
<b>Class: Bacillariophyceae</b>							
<b>Order: Fragilariales</b>							
<b>Family: Fragilariaceae</b>							
50	<i>Synedra ulna</i>	+3	+3	++3	-	+3	-
<b>Total species recorded (Bacillariophyceae)</b>		<b>11</b>	<b>10</b>	<b>11</b>	<b>6</b>	<b>9</b>	<b>7</b>
<b>Class: Euglenophyceae</b>							
<b>Order: Euglenida</b>							
<b>Family: Phacaceae</b>							
51	<i>Phacus tortus</i>	+2	+++2	++2	-	-	-
52	<i>Phacus crassus</i>	-	++2	+++2	++2	+++2	-
53	<i>Phacus orbicularis</i>	-	+2	+++2	++2	+++2	+++2
54	<i>Phacus pleuronectis</i>	-	-	-	++2	+++2	+++2
<b>Family: Euglenidae</b>							
55	<i>Euglena acus</i>	+++6	+++6	+++6	-	-	-
56	<i>Euglena viridis</i>	+++6	+++6	+++6	+++6	+++6	+++6
57	<i>Euglena srinagari</i>	+++5	+++5	+++5	-	-	-
58	<i>Euglena sp.</i>	+++5	+++5	+++5	--	-	-
59	<i>Euglena gracilis</i>	-	-	-	+++1	+++1	+++1
60	<i>Euglena caudata</i>	-	-	-	+++5	+++5	+++5
61	<i>Euglena granulata</i>	-	-	-	+++5	+++5	+++5
<b>Total species recorded (Euglenaceae)</b>		<b>5</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>6</b>



Palmer Index Total	61	66	81	57	66	53
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**Supplementary Table 12:** Macrophytes found in the lake in all the three seasons

S. No	Macrophytes	Family	Year of Sampling			First Year of Sampling			Second Year of sampling		
			Type of plant	Common Name	Native Range	Monsoon (Oct-2018)	Winter (Jan-2019)	Summer (May 2019)	Monsoon (Oct-2019)	Winter (Jan-2019 pre-lockdown)	Monsoon (Oct-2020 post-lockdown)
1	<i>Eichhornia crassipes</i> (Mart.)	Pontederiaceae	Perennial free floating aquatic plant	Water Hyacinth	South America	+	+	+	+	+	+
2	<i>Trapa natans bispinosa</i> (Roxb.) Makino	Lythraceae	Floating plant	Water chestnut	Taiwan, China, Korea and Japan	+	-	-	-	-	-
3	<i>Pistia stratiotes</i> L.	Araceae	Free-floating aquatic plant	Water Lettuce	Uncertain, probably pantropical, first found from Africa or South America	+	+	+	+	+	+
4	<i>Azolla pinnata</i> R.Br	Salviniaceae	Floating plant	Mosquito fern	Africa, Asia and parts of Australia	-	-	-	-	-	-
5	<i>Lemna minor</i> L.	Araceae	Free-floating aquatic plant	Common duck weed	Africa, Asia, Europe and North America	+	+	+	+	+	+
6	<i>Lemna gibba</i> L.	Araceae	Free-floating aquatic plant	Duckweed	Ireland	+	+	+	+	+	+

7	<i>Wolffia globosa</i> (Roxb.) Hartog and Plas	<u>Araceae</u>	Free-floating aquatic plant	Asian water meal	Asia	-	+	+	+	+	+
8	<i>Ipomea hederacea</i>	Convolvulaceae	Semi-aquatic floating plant	Ivy-leaved morning glory	Tropical parts of America	+	-	-	-	-	-
9	<i>Ipomea aquatica</i> Forssk.	Convolvulaceae	Semi-aquatic floating plant	Water Morning Glory	South East Asia	+	+	+	-	-	-
10	<i>Potamogeton crispus</i> L.	Potamogetonaceae	Submerged aquatic perennial plant	Curly leaf pondweed	Eurasia	+	+	-	-	-	-
11	<i>Vallisneria spiralis</i> L.	Hydrocharitaceae	Submerged aquatic plant	Eel grass	Southern Europe	+	+	+	-	-	-
12	<i>Ceratophyllum demersum</i> L.	Ceratophyllaceae	Submerged aquatic plant	Common hornwort	All continents except Antarctica	+	+	+	-	-	-
13	<i>Hydrilla verticillata</i> (L.f.) Royle	Hydrocharitaceae	Submerged perennial aquatic plant	Indian star-vine	Probably Africa and Europe	+	+	+	-	-	-
14	<i>Elodea canadensis</i>	Hydrocharitaceae	Submerged perennial aquatic plant	American Waterweed	North America	+	+	+	-	-	-
15	<i>Egeria densa</i>	<u>Hydrocharitaceae</u>	Submerged perennial aquatic plant	Brazilian waterweed	warm temperate South America in southeastern	-	+	+	-	-	-

					Brazil, Argentina, Chile and Uruguay						
16	<i>Myriophyllum spicatum</i>	Haloragaceae	Submerged aquatic plant	Eurasian watermilfoil or spiked watermilfoil	Europe from Ireland and Portugal to Finland and Bulgaria and in Russia, Ukraine, Siberia, Japan, Turkey, China, India, Australia, Vietnam and the Caucasus	-	+	+	-	+	-
17	<i>Sagittaria sagittifolia</i>	Alismataceae	Rooted emergent plant	Arrowhead	Temperate Europe and Asia	+	+	+	-	-	+
18	<i>Typha latifolia</i> L.	Typhaceae	Perennial emergent herbaceous plant	Broad-leaf cattail	North and South America, Europe, Eurasia and Africa	+	+	+	+	+	+
19	<i>Typha augustifolia</i> L.	Typhaceae	Emergent plant	Narrow-leaf cattail	North America, Europe and Asia	+	+	+	+	+	+
20	<i>Typha elephantica</i>	Typhaceae	Emergent plant	Bora. Elephant grass, Indian reed-mace	Algeria, Egypt, Libya, Mauritania, Senegal, Chad, Eritrea, Ethiopia, Turkmenista	-	+	+	-	+	+

					n, Tajikistan, Uzbekistan, Palestine, Israel, Saudi Arabia, Yemen, Yunnan, Assam, Bangladesh, India, Bhutan, Nepal, Pakistan and Burma						
21	<i>Ranunculus cantoneinsis</i>	Ranunculaceae	Herbaceous plant	Chinese Buttercup	North America	+	+	+	+	+	+
22	<i>Alternanthera philoxeroides</i> (Mart.) Griseb	Amaranthaceae	Herbaceous plant	Alligator weed	Temperate region of South America	+	+	+	+	+	+
23	<i>Marsilea quadriflora</i>	Marsileaceae	Herbaceous plant	Water clover	Caucasia, Western Siberia, Afghanistan, Southwest India, China, Japan and North America	+	+	+	+	+	+
24	<i>Polygonum glabrum</i>	Polygonaceae	Perennial amphibious shrub	Marsh Buckwheat, Dense flower Knotweed	North America and Eurasia	-	+	+	-	+	+
25	<i>Bulbostylis barbata</i>	Cyperaceae	Sedges	Watergrass	Western Australia	-	+	+	-	+	+
26	<i>Cyperus rotundus</i> L.	Cyperaceae	Sedges	Nut sedge	Africa, southern and central Europe	+	+	+	+	+	+

					(north to France and Austria), and Southern Asia						
27	<i>Scirpus velidus</i>	Cyperaceae	Perennial sedges	River Club-Rush	North America	+	+	+	+	+	+
28	<i>Cyperus dives</i>	Cyperaceae	Perennial sedges	Papyrus sedges, flat sedges, nutsedges, umbrella-sedges and galingales	Syria to Africa, Pakistan to Vietnam	+	+	+	+	+	+
29	<i>Panicum repens</i>	Poaceae	Littoral zone grasses	Torpedo grass, creeping panic, panic rampant, couch panicum, wainaku grass, quack grass, dog-tooth grass, and bullet grass	Africa and Eurasia	+	+	+	+	+	+
30	<i>Euphorbia hirta</i>	Euphorbeacea	Littoral zone weed	Dove Milk. Garden Spurge	Native to tropical and subtropical America	+	+	+	+	+	+
31	<i>Dicanthum annulatum</i>	Poaceae	Littoral zone grasses	Marvel grass, Diaz bluestem, Kleberg bluestem, Hindi grass, ringed dichanthium, she da grass, medio bluestem, jargu grass, Delhi grass, vuda bluegrass, two-flowered golden-beard, Santa Barbara grass.	Tropical Asia, the Middle East, and parts of Africa	+	+	+	+	+	+

32	<i>Dactyloctenium aegyptium</i>	Poaceae	Littoral grasses	Crowfoot grass	Africa	+	+	+	+	+	+
33	<i>Ludwigia repens</i>	Onagraceae	Aquatic perennial herb	creeping primrose-willow	North and Central America	+	+	+	-	-	+
34	<i>Cannabis sativa L.</i>	<i>Cannabaceae</i>	Littoral grasses	hemp, grass, hashish, Mary Jane, pot, marijuana	Eastern Europe, India, and Iran	-	+	-	-	+	-
35	<i>Chenopodium album</i>	<u>Amaranthaceae</u>	Littoral grasses	common lamb squatters, white goosefoot, meal weed, fat he	Europe and Asia	-	+	+	-	-	-
36	<i>Parthenium hysterophorus</i>	Asteraceae.	Invasive Shoreline weed	carrot grass, congress grass or Gajar ghas	American tropics	-	+	+	+	+	+
37	<i>Cyperus eragrostis</i>	Cyperaceae	Sedges	tall flat sedge	South America and parts of Western USA (Tropical America)	-	+	+	-	-	-