

# Assessment of fitness of the water for recreational value of ponds of Bihar Sharif

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## ABSTRACT

**KEYWORDS-** Water, pond, sites, natural, fish, seasons

The present work is aimed at addressing the water quality monitoring for selected ponds in and around Bihar sharif and the determination of recreational value especially for fishing of different ponds. This has been determined by collecting surface water samples to a comprehensive Physico- chemical and Bacteriological analysis. In the present study fifteen samples are taken from all the three seasons (Summer season, Post-monsoon, and Winter season) of a year of the ponds (Maa Sheetla talab, Mora talab, Indra talab) in and around Bihar sharif. There are eighteen Water Quality parameters have been considered: D.O., Alkalinity, Acidity, Total Hardness, Calcium Hardness, Magnesium Hardness, Chloride, Temperature, pH, Conductivity, Turbidity, Total Solid, Total Dissolved solid, Total Suspended solid, Iron, Nitrate, Phosphate, ammonia etc. for water quality monitoring of each pond. The objective of my work is to study the condition of pond water at different selected sites of Bihar sharif with reference to recreational value. This project entitled "Assessment of fitness of the Water for recreational value of Different ponds of Bihar sharif", which was under- taken with the main objective to study the physico- chemical analysis and Bacteriological analysis and to determine water quality of selected ponds of Bihar sharif. The selection of sampling sites was done in the town of Bihar sharif and all the sampling sites are at a distance of 8 km in Bihar sharif.

## INTRODUCTION

Water is one of the foremost critical variables for each living life form on this blue planet. Water is basically utilized for washing, drinking, fisheries and other house hold purposes. Lakes are one of the imperative water assets utilized in this region. on the other hand, they too give a living space for spineless creatures, angles and sea-going feathered creatures. Water which is a neutral oxide of hydrogen with formular  $H_2O$  is one of the most important oxide known. It is abundant in the earth's crust. Its presence or otherwise is said to influence human settlement. The importance of water to living things cannot be overemphasized. It is believed to be the reason for life on the earth. Human needs water for various purposes, ranging from domestic to industrial uses. All living things depend on water for its existence. Water being a universal solvent has many substances dissolved in it. These include those that are beneficial and those harmful to man. Its quality therefore depends on factors such as geological morphology, vegetation and land use. Water is the natural habitat of fishes and other aquatic animals, it is therefore of great importance to study water quality of pond in Biharsharif. Ponds could be referred to as man-made or natural water a body which holds water for the year or more . It could also be referred to as a pond maa sheetla talab, mora talab, indra talab, puspikarni talab, maqdam saheb talab and intended for fish breeding. These described a pond as a quiet body of water that is so small for wave action and too shallow for major temperature difference from top to bottom. Generally in a pond, the temperature changes with the air temperature and it is relatively uniform. Lakes are similar to ponds, but their temperature is dependent on the seasons. It is said that the productivity of a pond depends on the quality of water. The importance of the environment to good fish farming practices has been reported. It has been pointed out that animal protein is in shortfall in Bihar sharif. The reason, being the constant pollution of the natural water bodies arising from the activities of exploitation. Fish cultivation is therefore a necessity in order to meet the protein demand of the ever increasing populace. This work is therefore aimed at providing relevant information to fish farmers in order to help improve the quality of fish farming. This work therefore determined some physicochemical properties of selected ponds in biharsharif.

**Sampling Site:** Samples were collected from concrete ponds within biharsharif.

1. MAA SHEETALA TALAB (MAGHRA)
2. MORA TALAB (MORA PACHASA)
3. INDRA TALAB (NALANDA)
4. PUSPKARNI TALAB (KUNDALPUR)
5. MAQDUM SAHEB TALAB (BIHAR SHARIF)

#### **CLIMATE:**

The climate of the whole region is tropical Monsoon in character. The year may be broadly divided into three seasons i.e.

- (i) **SUMMER SEASON:** from March to mid-June.
- (ii) **RAINY SEASON:** from June to October.
- (iii) **WINTER SEASON:** from November to February.

The stormy season more often than not begins suddenly with south-west storm. The monsoon begins within the month of June with the most elevated precipitation within the month of July and August. The typical yearly precipitation of this locale shifts from around 600 mm. to 1900 mm of which more than 80 percent happens amid the south west monsoon.

The winter season starts from November with lowest temperature in the month of January. The lowest temperature means annual temperature is about 19 degree c while the highest temperature means annual temperature is about 31 degree c, but mean monthly temperature varies between 8.4 degree c in Jan month and 38.2 degree c in April month.

#### **WIND DIRECTION:**

Wind blows in two directions one northeast to easterly amid June to September and other westerly amid the rest of the year. The wind blow speed is generally high from May to August month.

#### **METHODS**

Unstable parameters such as temperature and pH were measured in-situ. Temperature was determined using the mercury in bulb thermometer while pH was measured with a portable pH meter after calibration with pH buffer. Conductivity was determined that measures in microsimens/centimeter ( $\mu\text{s}/\text{cm}$ ). Turbidimeter. Total Dissolved Solids (TDS) and total suspended solids (TSS) were determined gravimetrically. Samples for dissolved oxygen and biochemical oxygen demand were sampled with a 250mL dark coloured reagent bottles. These water samples were fixed at site by adding 1.0 mL of Winkler's solution 1 (Manganese (II) tetraoxosulphate (VI), Monohydrate –  $\text{MnSO}_4 \cdot \text{H}_2\text{O}$ ) and 1.0mL of Winkler's solution II (Sodium hydroxide and Sodium iodide) using a micro-pipette. To this solution 1.0mL of concentrated tetraoxosulphate (VI) acid was added below the solution inside the reagent bottle with a pipette. This is to dissolve the precipitate of Manganese (II) hydroxide formed. All samples were then taken to laboratory for

further determination. Dissolved oxygen (DO)) was then determined on the fixed sample using the Winkler's titration. The biochemical oxygen demand (BOD) was then determined on the DO sample after incubation in the dark for 5 days at  $\pm 20$  degree C .

Alkalinity was determined by titration procedure where a known volume of water sample was titrated with 0.02M HCl. Total water hardness was measured by titrating 0.01N ethylenediammetetracetic acid (EDTA) using Eriochrome black T as indicator. Phosphate – Phosphorous was determined by the ascorbic acid method.

**Nitrate** – nitrogen in water sample was determined using the phenoldisulphonic acid method. Sulphate was determined using the colorimetric method.



### Parameters based on titration

Observed values showed the seasonal variations of the year 2011-12 of all the three seasons (Summer season, winter season, and Post-monsoon season). Observed Values of Different Ponds of Summer Season of Different Parameters –

### Sampling Site : Maa Sheetla Talab

Parameters	First Sampling	Second Sampling	Third Sampling	Average
Temp0C(A/W)	28/26	30/25	22/20	26.6/23.6
Ph	7	7.73	7.54	7.42
D.O.(mg/L)	1.1	3.4	1.4	1.96
Conductivity	740	750	131	540.3
BOD(mg/L)	7	6	5	6
Total Alkalinity(mg/L)	260	250	320	276.66
Chloride (mg/L)	65	125	66	85.33
Total hardness(mg/L)	175	180	200	185
Ca-hardness(mg/L)	90	105	124	106.33
Mg-hardness(mg/L)	81	82	78	80.33
Total solid(mg/L)	440	510	1000	650
Turbidity NTU	40	>20	40	33.33
Nitrogen as Nitrate (mg/L)	0.43	0.121	0.295	0.282
Ammonia (mg/L)	0.920	ND	0.320	0.413

Phosphorous as Phosphate (mg/L)	0.0420	1.310	ND	0.450
TC	>220000	140000	100000	153333.33
FC	>110000	9000	4300	41100

### Mora Talab

Parameters	First Sampling	Second Sampling	Third Sampling	Average
Temp0C(A/W)	34/26	27/24	24/20	28.3/23.3
Ph	8.81	8	8.12	8.30
D.O.(mg/L)	7.4	6	10	7.8
Conductivity	940	120	124	394.66
BOD(mg/L)	5.4	1.4	2.2	3
Total Alkalinity(mg/L)	220	85	110	138.33
Chloride (mg/L)	14	40	20	24.66
Total hardness(mg/L)	104	90	84	92.66
Ca-hardness(mg/L)	52	64	62	59.33
Mg-hardness(mg/L)	54	26	22	34
Total solid(mg/L)	520	80	420	340
Turbidity NTU	20	40	60	40
Nitrogen as Nitrate (mg/L)	0.24	0.1	0.440	0.26
Ammonia (mg/L)	ND	0.2104	0.540	0.250
Phosphorous as Phosphate (mg/L)	0.04	0.184	ND	0.074
TC	46000	20000	9600	25,200
FC	20,000	4600	4000	9533.33

### Indra Talab

Parameters	First Sampling	Second Sampling	Third Sampling	Average
Temp0C(A/W)	29/27	27/24	20/18	25.3/23
Ph	8.01	7.80	7.40	7.73
D.O.(mg/L)	3.1	2.4	6	3.83
Conductivity	360	380	121	287
BOD(mg/L)	6	6.4	3.2	5.2
Total Alkalinity(mg/L)	146	240	52	146
Chloride (mg/L)	16	42	12	23.33
Total hardness(mg/L)	134	160	210	168
Ca-hardness(mg/L)	84	70	176	110

Mg-hardness(mg/L)	52	75	22	49.66
Total solid(mg/L)	204	305	90	199.66
Turbidity NTU	20	30	20	23.33
Nitrogen as Nitrate (mg/L)	0.2	0.070	0.200	0.156
Ammonia (mg/L)	ND	ND	0.240	0.08
Phosphorous as Phosphate (mg/L)	0.1174	0.214	0.014	0.1151
TC	4200	9400	44000	19200
FC	2500	4400	24000	10300

#### Maximum and Minimum Values of Different Parameters:-

Season	Summer		PostMonsoon		Winter	
	Max.	Min.	Max.	Min.	Max.	Min.
Temp degree C(A/W)	29	27	26	22	20	18
Ph	8.91	7.85	8.04	7.36	8.2	7.26
D.O.(mg/L)	7.6	1.1	8.1	2.1	10.5	0.7
Conductivity	7.1	3.1	7.1	1.6	9.5	2.3
BOD(mg/L)	9.6	76.8	52	8	45	2.1
Total Alkalinity(mg/L)	272	66	322	90	446	54
Chloride (mg/L)	12	88	238	42	127	14
Total hardness(mg/L)	234	96	330	92	410	84
Ca-hardness(mg/L)	81.82	9.552	27.87	159.66	125.43	21.64
Mg-hardness(mg/L)	224.44	52.105	170.34	64.128	284.57	62.12
Total solid(mg/L)	548	203	701	82	1053	92
Turbidity NTU	70	20	40	20	100	10
Nitrogen as Nitrate (mg/L)	1.1	0.2	2.675	0.075	2.675	0.200
Ammonia (mg/L)	0.922	ND	0.488	ND	3.6	0.048
Phosphorous as Phosphate (mg/L)	2.32	1.72	1.56	1.12	1.64	1.3
TC	240000	4300	240000	4300	240000	9300
FC	110000	2300	110000	1500	110000	4300

#### OBSERVATION AND CALCULATION

Evaluation of pond leads to distinguishing proof and estimation of inorganic as well as organic considerations in sea-going environment. Be that as it may in Bihar Sharif approximately 63 lakes are there,



but i have chosen as it were 5 lakes for my think about by seeing the time of my investigate work. The physico-chemical and bacteriological characteristics of lake water tests from distinctive ranges of Biharsharif appeared a stamped variety at diverse testing point. In my display ponder, checking of lake water at all testing focuses were done appropriately with most extreme safety measures. The information with respect to the condition of water in numerous regions of Biharsharif has been listed in unthinkable shape. These information are the result of the test carried out within the research laboratory facility. This consider has been conducted within the year 2011-2012 in three seasons for watching the regular variety. The result of all the examining sites of three seasons has been analyzed, watched, calculated and enrolled here.

## CONCLUSION AND RECOMMENDATION

The pond water investigated were in general fit for pond fish productivity except for calcium and magnesium deficiency which could be corrected with some supplement. It is also important to note that regular water monitoring is worthwhile in order to improve water quality.

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