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# Studies of the Seasonal Variation in Physicochemical Parameters of a Reservoir with Special Reference of Fishes

**Rita Kumari***

Research Scholar, Department of Zoology, B.R.A. Bihar University, Muzaffarpur

***Abstract – The tidal ponds are one of the most beneficial biological systems on the planet. They are significant monetarily in fishing, biological the travel industry, and farming and for logical investigates. The nature of tidal pond water influences the species organization, their bounty and productivity of water and the human wellbeing too on account of the evolved way of life. Water quality is characterized regarding the chemical, physical and natural substance of the water. Significant physical and chemical parameters impacting the amphibian condition are temperature, pH, saltiness, broke up oxygen and redox potential. Others are all out suspended and broken up solids, supplements, overwhelming metal contaminants, and so on. These parameters are the constraining factors for the survival of sea-going creatures (greenery). In this unique situation, an investigation was directed to assess how the physico-chemical parameters (pH, temperature T, broke up oxygen DO, redox potential E, all out suspended solids TSS, complete disintegrated solids TDS, saltiness and so forth) of water and supplements (N-NO2- , N-NO3-N-NH4+ and P-PO43-) influences the development of fish in Narta Lagoon. This Lagoon, arranged in the southern piece of Albania, is one of the most significant amphibian environments because of its biological qualities and fish ranches. Water tests were gathered in five inspecting focuses as pursues: four examples inside the tidal pond and the fifth one in the channel that associate the tidal pond with the ocean. The physical-chemical parameters of water were resolved following the examples were taken to the research center.***

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## INTRODUCTION

New water is the most valuable asset for the life. Be that as it may, it is the most misused asset moreover. Indeed, out of all out water accessible on the earth, the new water accessibility is simply 3%. It incorporates the groundwater and surface water both. The crisp water accessible superficially is just 1% of it. The Fresh Water assets are being utilized for different purposes, i.e., farming, mechanical, family, recreational, ecological exercises, and so on. For all intents and purposes, these human uses require crisp water. The creative mind of existence without water is unthinkable. The crisp water bodies like streams, lakes, lakes, dams, and so on ought to be kept up appropriately. The contamination of such bodies should be limited.

1. Innate situations and atmosphere of a locale, which choose the structure and elements of the biological systems (2. Fishing Other human prompted impedances like contamination, environmental change and so on., on marine condition and atmosphere. The profitability of a particular water body relies upon the measure of tiny fish present in a similar water body. The microscopic fish development and appropriation rely upon the conveying limit of the earth, accessibility of the inorganic supplements and the physicochemical parameters of the beachfront waters. Every one of these components thus all things considered helping the fishery assets of the beach front biological system. Any progressions including consumption on the physical, chemical and natural parameters would hence influence the soundness of the seaside biological system and on the other hand, lessen the fishery and fish profitability. This consents to the general natural pattern that regular varieties in biological parameters could, in the end, apply significant impacts on the conveyance and populace thickness of both creature and plant species as recommended. The beachfront biological system, narrows, and estuaries are gainful living spaces utilized by an assortment of fishes and different creatures. Practically 60% of the world fish catch is taken from waterfront biological systems. Various marine fishes gather in this zone for propagation, nourishing and cover. Beachfront and nearshore biological systems are the absolute most extravagant regions of marine biodiversity all-inclusive. Since human populaces have expanded, fishing weight in beachfront zones additionally misrepresents radically. Seaside fisheries are assuming a significant job in the financial aspects and occupations of individuals around the globe.

Notwithstanding, during the previous multi-decade, there has been a developing issue concerning the manageability of fisheries around the world. Consequently, Integrated Coastal Zone Management (ICZM) venture is being actualized in seaside conditions of India with the targets of preserving and securing the waterfront assets; dealing with the earth and contamination angles and to guarantee the work security of the beachfront networks.

In fish farming fish growth in conducive atmosphere in made available for fish growth. These parameters are important about fish growth. The fish growth plays an important role from the following points of views

1. To overcome the lack of nutrition
2. To increase the national income
3. To increase the public health
4. To avail the chance of employment

There is a special revolution in fish farming for fish growth by introducing the new scientific technology known as the “blue revolution”. There as a great number of people in our country who prefer fish in their diet. Everybody can purchase fish food according to their economical budget. This is mostly available as a pure and nutritive element. There are following nutrient elements available in the fishes

**Protein:** The best proteins are found in the fishes there are fifteen to twenty percent of proteins in the fish flash.

**Minerals:** There are one to two percent of minerals in the fish flash.

**Vitamins:** The A, B and D vitamins are mainly available vitamins in the fish flash. Carbohydrates: The carbohydrates are found in the fish flash in the living fish.

**Enzymes:** Amylase, Lipase, Adenosine, Triphosphate, Nucliase, Butrainase, Glycopranase and Cathorsih enzymes are found in the fish flash.

***The other important role fishes are-***

- Fish as food for cattle
- Fish manure.
- Fish oil.
- Fish leather, fish fin, fish sports, games and for biological control.

To increase the production of fish and fish growth are beneficial to human beings. For increasing the fish growth we are able to obtain the pure seeds of cultivable fishes (rohu, catla and mrigal) the growth of fish is being increased by maintaining the various physico-chemical factors in fish farming. In present research work under the Prof/Head “Effect of water quality parameters on fish growth in Rajghat Dam, Sagar (M.P.)” was under taken. Rajghat Dam in located in the west of Sagar district in Madhya Pradesh at a longitude 24o 20'25" and latitude 81o 15'20" at distance of 13 km from Sagar. The study was started by dividing the selected sampling sites into A, B, C and D. Detail of the biomass levels, fish feeding preferences, related growth rate of the fish populations and fisheries management of the Dam cannot be undertaken on a scientific basis. In the present investigation an attempt has been made to study the physico– chemical and biological aspects of the Rajghat Dam. The brief points of the study are as follows:

1. The general survey of the Rajghat Dam was made in regard to history, geology, geographical situation and local climatic condition.
2. Monthly periodical studies were carried out at four zones from the Rajghat Dam for twelve months. The depth wise data were also collected for physico– chemical and biological characteristics.
3. Study of temporal and spatial variation of various physico–chemical properties of water at different stations. 4. Study of temporal and spatial variation of plankton population.
4. Study of temporal and spatial variation of phytoplankton and zooplankton primary productivity.
5. To work out the possible relationship among abiotic and biotic factors and productivity.
6. To evaluate the trophic status of the Rajghat Dam with reference to the growth of local carp fishes. Carps are fast growing cyprinid fishes. Generally they breed in their natural environment in flooded rivers and Dam. From the point of view the Indian majo carps viz. Labeorohita, Catlacatla and Cirrhinusmrigala were selected for a fish growth.

***Current Fisheries Status of India***

When the lengthy coastline of 8129 km and continental shelf of 2.02 mill. km2 had been a major source of Indian marine capture fisheries, the rivers and the reservoirs constructed across them along with the vast lacustrine and floodplain system became the major source of inland capture fisheries. The contribution of marine capture fisheries to the Indian fisheries is lesser (34%) as compared to

Inland capture fisheries (38.79%). The lack of proper accounting of the contribution of inland

| Type of reservoir | Small | Medium | Large |
|---|---|---|---|
| Number | 19,134 | 180 | 56 |
| Area (ha) | 14,85,557 | 5,27,541 | 11,40,268 |

**Table 1: Reservoir resources of India**

| Type of reservoir | Small | Medium | Large |
|---|---|---|---|
| Average fish yield (Kg/ha) | 174 | 94 | 33 |

**Table 2: Fish yield (Kg/ha) from Indian reservoirs under NFDB scheme.**

Fisheries to the complete fish generation of India have influenced the best possible portrayal of inland catch fisheries, on a national level. In spite of the fact that the generation from inland fisheries is twofold the marine fisheries, the amount contributed as far as catch or catch subculture fisheries might be upgraded from these inland water bodies so as to satisfy the consistently climbing need for fish. The ongoing systems embraced in fisheries creation are named as upgrade techniques. The upgrades are intercessions in the physical or natural working of sea-going assets which are reliant on a progression of biotic and abiotic factors. The reason for fishery improvement methodologies fluctuates from fisheries advancement angles which absolutely manage upgrading the usage of entire biological system and particular fishing down of the nourishment networks, to controls of stock, species and condition which guarantee stock addition and offering of good natural surroundings through territory changes to shut upgrades including confines, pens and raceways.

***Physicochemical Parameters***

In the late spring season the higher DO was watched. It might be because of increment in temperature. The more drawn out days and serious daylight, during summer quickens photosynthesis rate. The Phytoplankton uses Carbon dioxide and radiates oxygen. The Oxygen level is nearly lesser during winter season might be because of lower photosynthesis rate. It is upheld by other studies. The variety in water temperature differs the pH estimation of water. The vast majority of the bio-chemical and chemical responses are affected by the pH estimation of the water body. The diminished pace of photosynthetic exercises decreases the osmosis of carbon dioxide and bicarbonates which are at last in charge of increment in pH during winter season. Comparative outcomes were likewise seen in an investigation led at a reservoir. The greatest alkalinity was seen in June (summer) because of increment in bicarbonates in the water. Comparative outcomes were likewise announced that the alkalinity was most extreme in summer and least in winter because of higher photosynthetic rate.

## OBJECTIVES:

1. To understand the physico-chemical conditions of the traditional fishing grounds.

2. Study the hydro biological characteristics on the biological productivity of the coastal ecosystem.

## FISH AND FISHERIES OF MANJARA RESERVOIR

Fishes with the end goal of study were collected with the assistance of nearby fishermen disregarding purchasing from the market. Three inspecting destinations were picked for study; the outlet, the delta and an estimated moderate of the water body. The collected fishes were brought to the lab subsequent to taking note of their unique shading and catching photos. The collected fishes were safeguarded in 5% formalin answer for further study. The recognizable proof of fishes was finished with the assistance of standard keys.

A questionnaire and interview method was applied to assemble information on financial status of fishermen network, fish get, getting methods, month to month pay of fishermen and problems in fishing. Questions in the questionnaire were so drafted to get three sorts of data from the fishermen viz. individual, social and efficient. Individual contact method was additionally used to know better their problems and to build up free communication.

## PHYSICO-CHEMICAL ENVIRONMENT OF MANJARA RESERVOIR

For the analysis of physico-chemical parameters tests from three sampling stations were collected month to month in the first part of the day hours in the middle of 8-11am, for a time of two years from June 2015 to May 2017. The water tests were collected in plastic holders of 1litre limit and brought to laboratory for further analysis. Some physical parameters like environmental temperature, water temperature, pH, all out broke up solids and chemical parameters like disintegrated oxygen, free carbon dioxide and alkalinity were dissected at the sampling destinations while remaining parameters like saltiness, chlorinity are examined in the laboratory.

The analysis of physico-chemical parameters was finished with the assistance of methodology by, Trivedy and Goel (1984) and APHA (1985).

***Temperature (°C):***

The climatic temperature just as surface water temperature was recorded with a mercury thermometer having 0.1°C division and a scope of 00 to 50°C.

***Transparency (cm):***

Transparency of water was estimated at the particular sampling locales with the assistance of Secchi plate which is a weighted metallic circle of 20 cm distance across, conceived by an Italian oceanographer in the nineteenth century. The transparency was determined as the mean of the profundities at which the plate vanishes (X) when seen from the concealed side of the vessel and at which it returns (Y) after raising after it has been brought down past perceivability.

Secchi disc transparency (cm) $= \frac{X+Y}{}$

***PotentiaHydrogenii (pH):***

The hydrogen particle focus esteems were estimated with the assistance of Hanna made pH meter at the individual water sample collection destinations.

***Total Dissolved Solids (mg/l):***

The all out dissolved solids were recorded with the assistance of computerized TDS Meter No:CD:600 (Milwaukee) and the outcomes were noted as mg /l.

***Dissolved oxygen (mg/l):***

For the calculation of dissolved oxygen altered Winkler's method was utilized. The water samples were collected in glass Stoppard oxygen bottles from the separate sampling destinations and dissected right away. One ml of manganese chloride and one ml of basic potassium iodide was included with the assistance of micropipette. The container was shake appropriately in order to blend the substance completely and afterward kept to settle down the earthy colored accelerate. At that point barely any drops of concentrated hydrochloric corrosive were included drop shrewd through the side of container and were well shake to disintegrate the accelerate. 100 ml of this arrangement was taken in tapered flagon and utilized for titration in the wake of including scarcely any drops of 1% starch as a marker. In the wake of including the marker the arrangement goes to blue shading lastly titrated against N/80 sodium thiosulphate till the shading vanishes.

$$\text{Dissolved oxygen (mg/l)} = \frac{X \times N \times 8 \times 1000}{Y}$$

Where,

X = Volume of sodium thiosulphate used (ml)

Y = Volume of sample taken for titration (ml)

N = Normality of sodium thiosulphate (N)

***Free carbon dioxide (mg/l):***

100 ml of sample was taken in cone shaped jar and scarcely any drops of phenomenological were included. On the off chance that the shading turns pink free carbon dioxide is missing. In the event that it stayed vapid, at that point titrated against 0.05N NaOH till the shading shows up.

Free $CO_2$ (mg/l ) $= \frac{\text{(ml x N) of NaOH x 1000 x 44}}{}$ ml of sample

***Phenolphthalein Alkalinity (mg/l):***

100 ml of water sample was taken in a cone shaped jar at the sampling site and 2 drops of phenolphthalein pointer included it. On the off chance that it stayed boring demonstrates that phenolphthalein alkalinity is missing. On the off chance that it turned pink, at that point titrated against 0.1N hydrochloric corrosive to a lackluster end point.

Where A = ml of HCl used with phenolphthalein

**Total Alkalinity (mg/l):** 2-3 drops of methyl orange pointer were added to the arrangement used to decide phenolphthalein alkalinity and titrated with 0.1N HCl up to the end point, when the shading changes from yellow to pink.

Where, B = ml of HCl used with phenolphthalein and methyl orange.

***Total hardness (mg/l):***

50 ml of water sample was taken in funnel shaped carafe in to which 1ml of smelling salts cushion and a spot of NaCN (inhibitor) was included. A spot of erichrome dark T pointer was added to create wine red shading. The sample was then titrated against 0.01m EDTA answer for end point wine red to blue.

$$\text{Total hardness (mg/l) } (Caco_3) = \frac{T \times 1000}{v}$$

Where

T = Titrant (ml)

v = sample (ml)

***Chlorides (mg/l):***

The chloride focus was broke down in the laboratory. 10 ml of water sample was taken in a conelike carafe and not many drops of K2CrO4 were included to it. The sample was titrated with 0.02 AgNO3 to the end point from yellow to block red.

Where

V = Volume of titrant (ml)

N= Normality of $AgNO_3$ (0.02) v = Volume of sample in ml.

***Salinity (g/l):***

Calculation of the salinity from chloride value:

Salinity (g/l) = 0.03 + 1.805 X chloride value

## RESULTS AND DISCUSSIONS

**Table 1: Checklist of fishes from Manjara Reservoir**

| | |
|---|---|
| **Class** | **Pisces** |
| **Subclass** | **Teleostei** |
| **Order** | **Osteoglossiformes** |
| **Family** | **Notopteridae** |
| | 1.*Notopterus notopterus* (Pallas) |
| | 2. *Notopteruschitala* (Hamilton) |
| **Order** | **Cypriniformes** |
| **Family** | **Cyprinidae** |
| | 4.*Catla catla* (Hamilton) |
| | 4.*Labeo rohita* (Hamilton) |
| | 4. *Labeocalbasu* (Hamilton) |
| | 6.*Labeo boggut* (Sykes) |
| | 7.*Cirrhinus mrigala* (Hamilton) |
| | 8.*Osteobrama cotio* (Hamilton) |
| | 9. *Osteobramabelkeri* (Sykes) |
| | 10.*Chela phulo* (Hamilton) |
| | 11.*Puntius tictoticto* (Hamilton) |
| | 12. *Puntius saranasarana*(Hamilton) |

**Lv= Larvivorousfishes,Bt= Bait,MD= Medicinal vslue,Wf= Weed fishes,Pf=Predatory food fishes**

*Catla catla* (Hamilton)

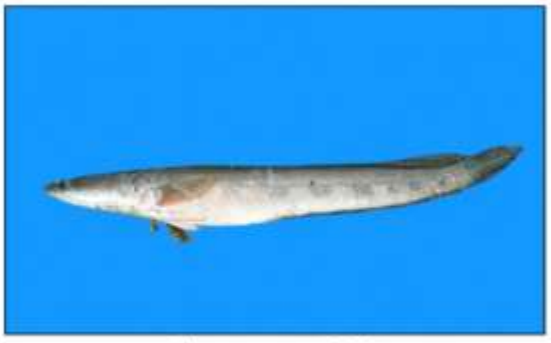
*Ctenopharyngodon idella* (Valenciennes)

**Plate 1: Common fishes recorded in Manjara Reservoir**

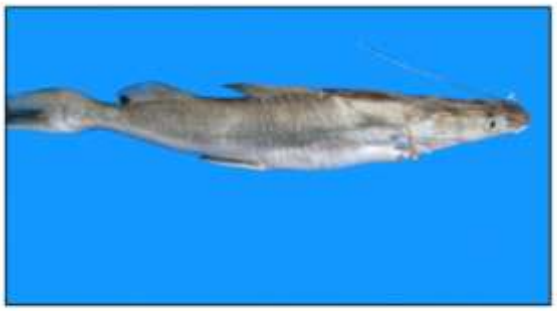
*Hypophthalmichthys molitrix* (Valenciennes)

*Cyprinus carpio* (Linnaeus)

**Plate 2: Common fishes recorded in Manjara Reservoir**



*Channa punctatus* (Bloch)



*Mystus seenghala* (Sykes)

**Plate 3: Common fishes recorded in Manjara Reservoir**

## PHYSICO-CHEMICAL ENVIRONMENT

### 4.3.1. Air Temperature (°C):

Occasional varieties in environmental temperature at three sampling locales along Manjara supply are introduced in Table 4.1 and 4.2 and graphically spoke to in Figs.4.1 and 4.2.

The temperature of Manjara supply followed an example of progress being low in storm and winter and higher during summer. The barometrical temperature of Manjara store ran from 29-40 °C during 2015-2017. The most minimal barometrical temperature was recorded in the long stretch of July (at site III) and during the period of August (at site I and III). The most elevated climatic temperature was noted during the long stretch of May at site II.

In storm, the environmental temperature went from 29-37 °C. The most minimal climatic temperature was recorded in the long stretch of August at site I, in the period of July at site II and in the period of July and August at site III. The most noteworthy barometrical temperature was noted during the long stretch of June at site I. In the event of site II and III the most noteworthy recorded value was 34 and 32 °C recorded in the long stretch of June. The normal air temperature values of month June, July, August and September were found as 34.33, 30, 29.33 and 31.33 separately.

In winter, the environmental temperature ran from 32-35°C. Least value of 32°C was seen in all the winter a very long time aside from January. Most extreme value was found in the long stretch of January at site II and III. The most reduced recorded value was 32°C found in the period of October, November and December (at site I), in the long stretch of

**Table: Monthly values of Atmospheric Temperature (°C) (Year 2015-2016)**

| Site | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I | 37 | 32 | 29 | 32 | 32 | 32 | 32 | 34 | 36 | 38 | 37 | 39 |
| II | 34 | 29 | 30 | 32 | 32 | 32 | 33 | 35 | 38 | 39 | 38 | 40 |
| III | 32 | 29 | 29 | 30 | 34 | 32 | 33 | 35 | 38 | 38 | 36 | 37 |

**Table: Monthly values of Atmospheric Temperature (°C) (Year 2016-2017)**

| Site | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| I | 39 | 31 | 29 | 31 | 32 | 30 | 32 | 34 | 36 | 38 | 39 | 41 |
| II | 34 | 29 | 30 | 33 | 34 | 30 | 30 | 35 | 37 | 39 | 39 | 40 |
| III | 33 | 28 | 31 | 29 | 34 | 32 | 32 | 33 | 36 | 40 | 40 | 37 |

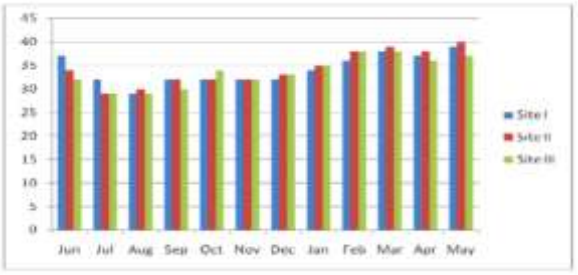



**Fig. Monthly Fluctuations of Atmospheric Temperature (°C) (Year 2015-2016)**

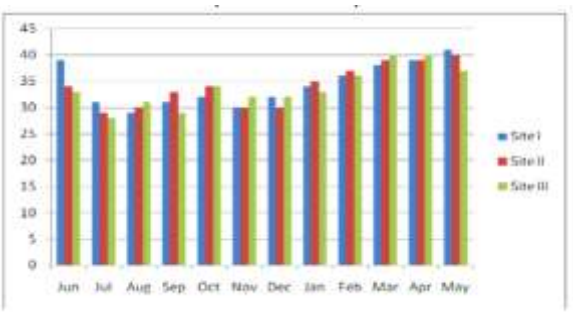



**Fig. Monthly Fluctuations of Atmospheric Temperature (°C) (Year 2016-2017)**

October and November at site II and in the long stretch of November at site III. If there should be an occurrence of site I the most noteworthy recorded value was 34°C found in the period of January. The normal values of month October, November, December and January were found as 32.66, 32 32.66 and 34.66 respectively.

In summer the barometrical temperature extended from 36-40°C. Least temperature was recorded in the long stretch of February and April at site I and III respectively while greatest value was recorded in the

period of May at site II. If there should be an occurrence of site II the most reduced recorded value was 38°C found in the period of February and April. The most noteworthy recorded value at site I and III was 39 and 38°C found in the long stretch of May and February-March respectively. The normal values of month February, March, April and May were found as 37.33, 38.33, 37 and 38.66 respectively.

The climatic temperature of Manjara supply ran from 28-41 °C during 2016-2017. The most reduced barometrical temperature was recorded in the long stretch of July (at site III). The most noteworthy barometrical temperature was noted during the long stretch of May at site I.

**Water Temperature (°C):**

Regular varieties in water temperature at three locales in Manjara store are introduced in Table 4.3 and 4.4 and graphically spoke to in Figs. 4.3 and 4.4.

The water temperature of Manjara supply extended from 22-38°C during 2015-2017.The least air temperature was recorded in the long stretch of August at site III and the most noteworthy during the period of May at site I.

In rainstorm, the water temperature extended from 27-32°C. The least water temperature was recorded in the period of August at site III. The most noteworthy water temperature was noted during the long stretch of June at site II. In the event of site I and III the most elevated recorded value was 30 and 31 °C recorded in the long stretch of June and June-July. The normal water temperature values of month June, July, August and September were found as 31, 29.66, 28 and 30.33 respectively.

In winter, the water temperature extended from 22-29°C. Least value of 22°C was noted in December at site II while greatest in the long stretch of October at site I and II. At site I and III the most reduced recorded value was 24 and 25 °C found in the long stretch of December-January and January respectively. If there should arise an occurrence of site III the most noteworthy recorded value was 28°C found in the long stretch of November. The normal values of month October, November, December and January were found as 28.33, 27.33, 24 and 24.66 respectively.

In summer the water temperature extended from 29-38°C. Least water temperature was recorded in the long stretch of February at all the three locales while most extreme value was recorded in the period of May at site I. The most noteworthy recorded value at site II and III was 36 and 37°C respectively found in the period of May. The normal values of month February, March, April and May were found as 29, 34.33, 34.66 and 37 respectively.

**Table 4.10: Monthly values of Water Temperature (°C)(Year 2015-2016)**

| Site | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I | 30 | 28 | 28 | 29 | 29 | 26 | 24 | 24 | 29 | 32 | 36 | 38 |
| II | 32 | 30 | 29 | 32 | 29 | 28 | 22 | 28 | 29 | 33 | 35 | 36 |
| III | 31 | 31 | 27 | 30 | 27 | 28 | 26 | 25 | 29 | 35 | 36 | 37 |

**Table 4.11: Monthly values of Water Temperature (°C) (Year 2016-2017)**

| Site | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I | 31 | 28 | 27 | 29 | 29 | 24 | 22 | 28 | 33 | 32 | 33 | 36 |
| II | 32 | 23 | 24 | 30 | 32 | 24 | 24 | 25 | 31 | 31 | 35 | 37 |
| III | 32 | 24 | 25 | 30 | 30 | 23 | 24 | 26 | 31 | 31 | 37 | 37 |

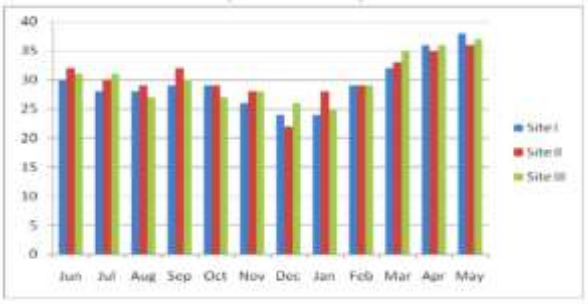



**Fig. 4.3 Monthly Fluctuations of Water Temperature (°C)**

**(Year 2015-2016)**

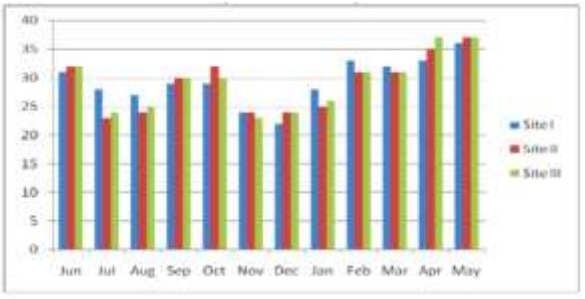



**Fig. 4.4 Monthly Fluctuations of Water Temperature (°C)**

**(Year 2016-2017)**

The water temperature of Manjara supply went from 22-37°C during 2016-2017. The least air temperature was recorded in the period of December at site I and the most elevated during the long

stretch of May and April-May at site II and III respectively.

In storm, the water temperature went from 23-32°C. The least water temperature was recorded in the period of July at site II. The most elevated water temperature was noted during the period of June at site II and III. If there should be an occurrence of site I and III the most minimal recorded value was 27 and 24 °C recorded in the long stretch of August and July. The normal water temperature values of month June, July, August and September were found as 31.66, 25, 24.33 and 29.66 respectively.

In winter, the water temperature extended from 22-32°C. Least value of 22°C was noted in December at site I while greatest in the period of October at site II. At site II and III the most minimal recorded value was 24 and 23 °C found in the long stretch of November-December and November respectively. In the event of site I and III the most noteworthy recorded value was 29 and 30°C found in the period of October. The normal values of month October, November, December and January were found as 30.33, 24.66, 24.33 and 26.33 respectively.

In summer the water temperature ran from 31-37°C. Least water temperature was recorded in the period of February and March at locales II while most extreme value was recorded in the long stretch of May at site II and in the period of April-May at site III. The most elevated recorded value at site I was 36 found in the long stretch of May. The normal values of month February, March, April and May were found as 31.66, 31.33, 35 and 36.66 respectively.

### 4.3.3. Transparency (cms):

Watched occasional varieties in transparency communicated in centimeters for the two years study period are introduced in Table 4.5 and 4.6 and graphically spoke to in Figs.4.5 and 4.6.

The water was drab, scentless and straightforward during the entire time of study. The transparency of Manjara supply ran from 57-130 cm during whole time of study. The base value (57cm) was recorded in the long stretch of September and July respectively at site II during 2015-13 and 2016-14. The most noteworthy value was recorded in the month of May during 2015-2016 while during 2016-2017 the most noteworthy value was 128 cm found in the month of May at site I.

**Table 4.12: Monthly values of Transparency (cm) (Year 2015-2016)**

| Site | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I | 72 | 78 | 69 | 58 | 69 | 84 | 97 | 102 | 120 | 127 | 129 | 130 |
| II | 74 | 78 | 67 | 57 | 65 | 89 | 97 | 100 | 122 | 118 | 127 | 125 |
| III | 71 | 77 | 67 | 58 | 67 | 83 | 98 | 102 | 119 | 121.5 | 128 | 122 |

**Table 4.13: Monthly values of Transparency (cm) (Year 2016-2017)**

| Site | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I | 72 | 58 | 69 | 78 | 71 | 84 | 102 | 118 | 121 | 120 | 118 | 128 |
| II | 70 | 57 | 70 | 78 | 76 | 89 | 101 | 116 | 119 | 118 | 120.2 | 127 |
| III | 75 | 58 | 66 | 77 | 75 | 88 | 102 | 119 | 115 | 127 | 126 | 123 |


**Fig. 4.5 Monthly Fluctuations of Transparency (cm)**

**(Year 2015-2016)**


**Fig. 4.6 Monthly Fluctuations of Transparency (cm) (Year 2016-2017)**

During 2015-2016 in rainstorm the transparency went from 57-78 cm. Least value was seen in the month of July at site II while greatest value was recorded in the month of September at site I and II. In the event of site I and III the most minimal recorded value was 58cm seen in the month of July. If there should be an occurrence of site III the most noteworthy recorded value was 77cm found in the month of September. The normal transparency values of month June, July, August and September were found as 72.33, 77.66, 67.66 and 57.66 respectively.

In winter the transparency ran from 65-102 cm. Least value was seen in the month of October at site II while greatest in the month of January at site I and III The most reduced recorded values at site I and III were 69 and 67 cm saw in the month of October.In instance of site II the most elevated recorded value was 102 cm found in the month of January. The normal values of month October, November,

December and January were found as 67, 84.33, 97.33 and 101.33 respectively.

In summer the transparency went from 118-130cm. Least value was recorded in the month of May at site I and III and in the month of April at site III while greatest value (260) was recorded in the month of February at site II. If there should be an occurrence of site I and III the most elevated recorded value was 250 cm found in the month of February. The normal values of month February, March, April and May were found as 254.33, 200.3, 190 and 176.66 respectively.

During 2016-2017, in storm the transparency went from 57-78cm. Least value was seen in the month of July at all the three locales with slight vacillations while greatest value was recorded in the month of September. The normal transparency values of month June, July, August and September were found as 72.33, 57.66, 68.33 and 77.66 respectively.

## CONCLUSION

It is a run of the mill case of 'put and take' arrangement of culture-based fisheries. In Manjara supply there is an immediate connection among stocking and yield rates. On an average store created fish yield of 238.29 kg/ha/yr which is very more than the average fish production from little Indian repositories. Steady great arrivals of Indian significant carps and the catfishes propose that they are all around adjusted to the lentic state of the repository. Reservoir is normally supplied by the fry phase of Indian significant carps (catla, Labeorohita, Cirrhinusmrigala) alongside hardly any fascinating like Cyprinus carpio, Hypophthalmichthys Molitrixx and Ctenopharyngodon idella. The size of the fry loaded was generally so little that they fall a simple prey to the ruthless fishes. During the current investigation an aggregate of 33 species of fishes having a place with 5 requests, 11 families and 20 genera have been recorded from Manjara Reservoir. Order Cypriniformes (45.45%) was ruled by 15 species which was followed by perciformes (27.27%) with 9 species, request siluriformes (18.18%) was represented by 6 species, request osteoglossiformes (6.06%) by 2 species and request cyprinodontiformes (3.03%) was represented by a solitary species

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**Corresponding Author**

**Rita Kumari***

Research Scholar, Department of Zoology, B.R.A. Bihar University, Muzaffarpur