Study of Biodiversity in Shyam Ghunghutta Dam of Ambikapur (Surguja) Chhattisgarh

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***Abstract*: In the present study we will focus on the Ghunghutta named dam of the Surguja region in Chhattisgarh India. The water quality of the Ghungutta dam in Surguja region was determined from June 2019 to April 2020. The Ghunghutta dam is located in the Surguja region (220 94N latitude & 830 164E Longitude) north of Chhattisgarh in India. Ghunghutta is a medium-sized irrigation project built in 2002 across the Ghunghutta River in the Rehar Sub basin Sone River in the Ganga district. The dam is 14km. from the quarter of the provincial head of Ambikapur. The use of water in the Dam is for domestic purposes, irrigation, aquaculture etc. The surrounding area of the dam adjacent to agriculture and electricity generation.**

The current study aims to investigate the key factors in water pollution in the Ghunghutta Dam. Monthly intervals between Jun 2019 to May 2020 for the purpose of measuring water quality in the dam at various physico-chemical parameters of total solubility and high turbidity rates at all sites during the rainy months, possibly due to slow density disturbances and dust particles deposited with rainwater it runs. The variance varies between different months. PH values, conductivity, hardness, oxygen dissolution C.O.D. and the demand for oxygen was naturally highest during the summer months. It is in the middle of this study, the variance, and night and predicting the state of the Ghunghutta dam according to physico-chemical parameters.

***Keywords*: Biodiversity, Biological Analysis, Ecology, Algal Biodiversity, Fish Biodiversity, Ghungutta dam, Surguja, Chhattisgarh**

Introduction

Biodiversity are the variety of all living things including plant, animals and micro organisms or it encompasses the total number, variation and variability of life forms, levels and combinations existing within the living world. Its represent the genetic variability and diversity within the species, between the species and of ecosystems. Biodiversity consists of three fundamental and hierarchical components: Genetic, Species, and Ecosystem diversity (Chaudhary, 1999). India is a nation of extraordinary diversity.

The State of Chhattisgarh is bestowed with immense natural resource in the form of forest, mountains mines rivers and reservoirs. Use of aquatic systems for sanitation, use of detergent in bathing, development of modern scientific technology and destroying the natural resources are some main causes of water pollution in India aquatic bio diversity mainly the fishes and human beings are the worst sufferer due to water pollution.

F A Forel (1841-1912) who has been called the father of limnology first coined the world limnology and defined (the oceanography of lakes) as the science which deals exclusively with lakes (Welch 1935). It is an interdisciplinary science combining aspects of hydrology, hydrochemistry, hydrolysis and geology (Gollerman 1975). According to Wetzel 1975 "limnology" in broad terms the study of functional relationship and productivity or fresh water, biotic environmental parameter. Hence it is biological, chemical and meteorological study of ponds, lakes, rivers, swamps, streams and reservoirs that make up inland water system. Water is an essence of life. It governs the evolution and function of life on the earth. Hence is basic and mother component of all living organisms. The availability of water on the earth is mostly saline only 2.7% of the total water is fresh water. fresh water has become a scare commodity due to over exploitation and pollution (Ghosh and Basu 1968, Gupta and Shukla 2006, Patil Ad Tijare 2001, Singh and Mathur 2005).

The present fresh water regime is approximate 2.7% of total global water, out of this river and lakes constitute 0.01% , ground water 0.54% and ice and glacier 2.1%. In origin dam is a variant form of the word lake, also in earlier time dams ware man made and utilitarian. Dam can be defined as a medium and large water body in which littoral zone is relatively large and the limnetic & profundal regions are deep than litoral (Odam 1971). In india dam and pond digging is an ancient culture it is man made water bodies. It is shallow enough for sunlight to reach bottom permitting the growth of rooted plants and its deepest point.

The hydro-biodiversity studies include physico-chemical characteristics of water and the organism living in it. Studies of biodiversity of reservoir increasing due to certain important reason such as:

1. The reservoir is economical and eco-friendly management to check the water depletion of ground water level.
2. Because close environment of water reservoir normally develop self contained ecosystem.
3. They provide the most convenient cheapest water for irrigation and industrial use .
4. They are also utilized for recreation, fish culture and other water products.

The pollution in water reservoir is mainly accelerate due to input of fish fertilizer sewage, detergent industrial wastage, bathing of cattle & man human sanitation etc. Hence, the aquatic ecosystem are under stress. This reduce either productivity of suitability.

India is one of the 12 mega diversity centers of Biodiversity .It comprises of 2% of the worlds land mass but is home to 655 of fauna of the world. According to zoological survey of India, there are 81000 species of animals in the country. Biodiversity concept seems to provide a scientific foundation for wide spread desires to preserve natural ecosystem. Fish-diversity in aquatic ecosystem refers to variety of Fish species depending on context and scale. Fish biodiversity can refer to alleles or genotypes within a population, to species of life forms within a fish community and to species or life forms across an aqua regime (Burton et. Al 1992). Biodiversity is essential for stabilization of ecosystem, protection of overall environmental quality for understanding intrinsic worth of all species on the earth (Ehrlin and Wilson 1991). Species diversity is a property at the population level, while the functional diversity concepts is more strongly related to ecosystem stability and stress, physical and chemical factors for determination population dynamics in the lentic ecosystem. Fish diversity and conservation of fishes in lake ecosystem in India in general and north-east India in particular (Jhingran and Tripathy, 1969) as compared to elsewhere in the world. There are three distinct season namely Winter (October-February), Summer (March-June) and Monsoon (July-September). A wide variation of temperature is 4°C-30°C in summer season and the average temperature varied 14°C to 18°C. The Shyam Ghunguta dam of Ambikapur (Sarguja) is more important for study of biodiversity at the present time.

It is a area wise, the 3rd largest country in Asia and the 2nd most populus country on our earth. It has a unique geological history and highly diverse physiographic, monsoon climate with extremes of temporal and spatial variability and high bio-diversity. India is endowed with equally diverse aquatic habitats. The fresh water ecosystems are both lentic and lotic, are being increasingly subjected to greater stress for various human activities. Various physic-chemical and biological characteristics of fresh water bodies have been assessed and activities of living organisms have been studied in Satluj river by Singh and Saharan (2010). According to the Prescott (1969), "Algae are chlorophyll bearing organisms which are thalloid i.e. having no true roots, stems and leaves, or leaf like organs." They are diversed groups of simple, plants like organisms, commonly of lacking true tissues and always bearing unicellular sex organs and none have a saprophytic generation parasitic on the gametophyte (except some red algae). Earth's climate changes every years due to the human activities and naturally occurring processes, by the human activities like industrialization, civilization, use of Pesticides, construction of Dams. Due to Industrial revolution mean surface temperature of Earths increasing at an average of 10 Celsius per century. Due accumulation of green house gases in atmosphere and also due to the water pollution the water qualities is also changing and to adjusting to the changed environmental condition some adaptations occurring in the organisms.

In some organism mutations are also be occurring; these mutations are genetic makeup of the organisms newer species are arising and many species becoming extincts which does not change themselves to changed environments. During last 200 million years 100 to 1,000 species became extinct in each century (Wilson 1988). But evolution also brought forth new life forms replacing species that were lost.

Today we are losing about 1,500 species every two months (Kothari 1992), hence the year 2010 declared as biodiversity year and 2010-20 is declared as the International biodiversity decade. The terms biodiversity were coined by Walter and Rosen (1985) and is the abbreviated word for Biological diversity (Samit Ray and Arun K Ray 2010). Biodiversity referred to the range of life's form on the Earth. Included millions of plants, animals and organisms. Biodiversity can be defined as "Biodiversity from all sources includes, among others, terrestrial, marine and other aquatic organisms and the ecosystems that are part of it, this includes biodiversity, species and ecosystems."

"Biodiversity, including genetic diversity and richness of all plant and animal species at different levels in the atmosphere, region, globe and diversity, both on land and in water."

Water is a fundamental substance for sustaining a high quality of life in an ecosystem. The water is a natural resource on the earth called as the elixir of life. Living animals need water for his physiological existence. From the civilization of human being, water has been used for drinking, bathing, washing and also utilized for irrigation, industries, generation of power, fish culture etc. Man has used these water bodies as most convenient and cheapest refuse disposal system, for domestic and industrial waste. Aquatic pollution thus brought about by human activities causing alteration in the chemical, physical and biological properties of water. Water pollution could be local, regional and global ecological problem. Weak and poorly enforced water pollution control laws have resulted in transportation of industrial and domestic sewage waste, which carries large quantities of bacteria, virus and toxic chemical substances and harbours diseaseful organisms causing water borne diseases. Due to population explosion, their wide spread, human activities and industrialization have resulted in great demand of good quality of water (Acheson 1983).

Methodology

The present investigation will be conducted in Shyam-Ghungutta Dam Ambikapur (Sarguja). Geographically, the Shyam Ghunghutta Dam is situated 23'12 N latitude and 623 meter of sea level. The Dam was formed by MP State govt., now under jurisdiction of C.G. state govt. The dam is situated at near 15 k.m. from Ambikapur city and has an area 25000 m. width. And 1500-2000 meter, deep in rainy season and 500-600 m. deep in summer season. The reservoir is very rich in both flora and fauna. The rainfall and following by river is main source of water to (dam) reservoir. The dam water is used for irrigation and fish culture. The chemical composition of ground water depends upon soluble products of the area and changes with respect to time and space in addition to polluting agents (Mariappan et. al 2000).

Climate: Meteorological data for climate condition of the dam during study periods was collected from Meteorological Department of National Informatics Centre, Sarguja, Chhattishgarh, India. In Surguja, rainfall varies between 100-200 cms, mean annual temperature 260C-270C and humidity 60-80% resulting monsoon deciduous forests. The tree of such forests loses its leaves in spring and early summer when water retention is extremely difficult. Lowering the groundwater table is not enough to allow trees to retain leaves all year round. These forests are very important forests, producing timber for trade and various other forest products of high value.

Physico-chemical Parameters: During the present work the methods used for analysis of various Physico-chemical parameters are from "Standard methods for the examination of water" (APHA 1985, Trivedy and Goel 1984).

Dissolved Oxygen (D.O.): Dissolved Oxygen used by Aquatic animals for respiration and that's why it is most important water quality parameter. The dissolved Oxygen was determined by modified wrinkle's method (Golterman et al 1978, Trivedy and Goel 1984).

The water sample was collected in glass stoppered Oxygen bottle (125 ml). Then carefully 1 ml of manganous sulphate and 1 ml of alkaline KI solution were placed at the bottom of the bottle to fix the dissolved oxygen. It was thoroughly mixed and then brown precipitate was allowed to settle down. 2 ml of concentrated sulphuric acid was added along the sides of the bottles and the bottle shaked well to dissolve the precipitate. 50 ml of the above solution was taken in a conical flask and titrated with 0.025 N sodium thiosulphate solution using starch as an indicator to a colorless end point.

Dissolved Oxygen (mg/lit) = X x N x 8 x 1000/Y

Where,

X = Volume of sodium thiosulphate used (ml)
Y = Volume of sample (ml)
N = Normality of sodium thiosulphate

Total Hardness: The Total hardness was determined titrimetrically using EDTA (Ethylene Diamine Tetra Acetic Acid Disodium salt) method. 50 ml of sample is taken in a conical flask one ml of Ammonia Buffer and a pinch of Erichrome black T indicator was added and titrated against 0.01 M EDTA titrant, till color changes from the wine red to sky blue.

Total Hardness (mg/lit.) = X x 1000 x Z/Y

Where,

X = ml of titrant used
Y = ml of sample
Z = mg of CaCO3 equivalent of 1.0 ml EDTA titrant

Total Alkalinity: Two drops of Methyl orange indicator were added to the solution whose Phenolphthalein alkalinity was already determined. This was then titrated against 0.1 N HCL to the end point, when the color changed from yellow to pink.

Total alkalinity (mg/lit.) = X x N x 50 x 1000/Y

Where,

X = ml of titrant
Y = ml of sample
N = Normality of titrant

Biological Analysis

The Physical and chemical parameters of water affects on the abundance, species compositions, stability, productivity and physiological condition of aquatic organisms. The physical and chemical properties of water affect on the occurrence of Aquatic organisms. Biological analysis of water includes collection, counting and identification following aquatic organisms.

Zoo Plankton: For the collection of phytoplanktons and Zooplanktons. Two hundred water samples are filtered through 25-point silk. Collected planktons concentrate in a 50 ml volume and are stored in 4% formalin. Each replicate of phytoplankton and zooplanktons identified under research microscope using suitable keys and standard monographs given by Pennak (1978), Tonapi (1980), APHA (1985).

Macrophytic Studies: The Aquatic macrophytes were collected with the help of string from dam of the different sampling stations, kept in polythene bags and brought immediately to the laboratory, where they were washed in water. Plants treated with 10% silver sulphate (in 90% ethanol) for one minute to prevent Fungal and Bacterial infection. The plants were dried with blotting paper and herbarium sheets were made and identified with the help of standard literature.

Arthropods (Aquatic Insects): Aquatic insects were collected from selected stations of Dam, where by the vegetation was disturbed and circular net was dragged around the vegetation for one minute. (Subramanian and Sivaramkrishnan 2007). Three such draws had a sample. Collected insects were quickly classified and stored in 70% ethyl alcohol. They were later identified using research microscopes with the help of familiar keys such as (Kumar (1973), Bal and Basu (1994), ZSI- (2004).

Mollusca: The collection of Molluscan specimens was carried out on selected station by using scoop net. Molluscan samples were washed thoroughly in running water and slightly decalcified in aqueous acidic medium to find out growth rings on Molluscan shell. The observation in relation to their color pattern, coiling of shell size and number of tentacles, eyes, shape of foot and aperture of the Molluscan shell were carefully noted Identification made on the basis of standard identification keys forMolluscan specimen as Arvind N A, Rajashekhar K P, Madhyastha N A (2008), Benson W (1836), Subbarao N V, Mitra S C (1979).

Fish: The fishes were collected with the help of local fishermen using drag nets. The collected specimens were instantly fixed in 4-5% formalin and subsequently transferred to rectified spirit after 3-4 hours of washing and fixation. The large sized specimens were injected with 10% formalin and given incision on its belly. While identifying specimens, Stress was given mainly on stable characters both meristic and morphometric. The shape of snout, presence or absence of barbels, number of dorsal fin rays, number of scales on lateral line, scales in transverse lines pectoral scale etc. The latest authentic books on fish systematics and fauna volume such as Day (1878, 1889), Jayaram (1981, 1991), Menon (1964, 1987) and Talwar and Jhingran (1991), were referred for fish identification.

Statistical Analysis

Statistical analysis of the various physico-chemical parameters was done. The standard deviation of each parameter calculated. The coefficient of correlation among the various parameters also calculated, and data tabulated. For the statistical analysis the book Introduction Biometry by Anil M Mungikar and the Data tabulated.

For sampling, four sampling station of Turori dam, Turori worked out during the study period. Phytoplanktons and Zooplanktons collected using plankton nets and preserved in 4-5% formalin solution. Aquatic insects collected by using circular net of mesh size 60 cm by disturbing vegetation and simply dragging the net around vegetation. The specimens immediately sorted and preserved in 70% ethyl alcohol. For identification the standard literature as Kumar (1973), Bal and Basu (1994) used. Molluscan specimens collected using scoop nets. and preserved in 4-5% formalin solution intact animals were washed in running water and slightly decalcified in aqueous acidic medium to find out growth rings on shells. Identification done with the help of keys of Arvind N A (2008), Benson W (1836), Subbarao N V, Mitra S C (1979). The fish specimens collected with the help of fishermen using cast net. The fishes collected were fixed in 4-5% formalin and after 3-4 hours of fixation the specimens were washed with water and then transferred to rectified spirit. The large sized fishes injected with 10% formalin and given incision on its belly. While identifying fishes stress was gives mainly on stable characters both meristic and morphometric, for Identification latest references Day (1878, 1884), Jayram (1981, 1991), Menon (1964, 1987), Talwar and Jhingran (1991) were used.

Physical Parameters: 1. Air Temperature**,** 2. Water Temperature**,** 3. Transparency**,** 4. Turbidity

Chemical parameters: 1. pH**,** 2. Dissolved Oxygen**,** 3. Free Carbon-dioxide**,** 4. Hardness**,** 5. Total Alkalinity

The parameters as temperature and dissolved Oxygen recorded on the spot as these parameters liable to change during transportation. The pH also recorded on the spot by using digital pH pen meter (Krinna made). For the analysis of other parameters sample brought to laboratory and analyzed within possible minimum time.

While collecting sample water following precautions were taken. The plastic bottles of 2 liters capacity which is used for collection of sample washed thoroughly with tap water and then by deionised water. The bottles dried before collecting the sample. Bottles completely filled with sample water and tightly packed and labeled. For dissolved Oxygen the bottles of 300 ml capacity were used for collecting the water sample the bottles were completely filled and locked under the surface of water. All possible precautions here taken to prevent the formation of air bubbles in the bottles. The stoppered and Labeled bottles brought to laboratory in icebox stored at temperature between 6°C to 10°C. The sample water analyzed within 72 hours of collection.

Observation and Result

Physico-Chemical Parameter

During the present study period i.e. Feb-2019 to Jan-2020, the water samples from selected four sampling sites of the dam were taken with an interval of one month. Air temperature, water temperature, Transparency, Turbidity, pH, Dissolved Oxygen, Free Carbon-dioxide, Total Hardness and Total Alkalinity analyzed. The parameters like pH, Temperature, Dissolved Oxygen recorded on the spot and for the analysis of remaining parameters the water sample brought to laboratory and analyzed before 24 hours of sample collection.

Table 1. Monthly variation of water quality parameters during the year 2019-20 of Ghunghutta dam, Surguja (C.G.)

Months	W.T.	Transp.	Turb.	E.C.	pH	ALK.	T.D.S	T.S.	D.O.	C.O.D	B.O.D
	0C	CM	NTU	µs/cm	-	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
June	29.32	70.4	22.82	122.2	7.32	149.3	623.4	195	7.12	33	7.22
July	27.26	30.2	29.32	126.3	7.48	152.7	641	213.7	7.22	34	6.8
Aug.	25.39	23.6	30.65	135.7	7.64	144.4	672	199.7	7.7	41.6	5.69
Sept.	26.17	32.4	29.51	120.8	7.24	144.8	658	189.8	7.24	38.2	5.5
Oct.	21.99	40.5	28.7	121	7.91	129	639	145.2	8.07	26.1	5.23
Nov.	21.11	72.9	17.82	110.6	8.32	143.7	609	148	8.25	23.8	5.25
Dec.	18.64	71.3	12.67	93.5	8.24	71.5	596	127.4	8.1	22.1	5.37
Jan.	18.96	92.6	12.84	67.7	8.21	79.6	578	137.6	7.38	14.7	4.69
Feb.	22.62	86.3	16.7	79.9	7.81	128.6	589	174.8	8.29	21	5.69
Mar.	24.33	77.4	19.6	91	8.29	156.8	625	172.9	7.25	18.6	6.29
April	26.39	75.9	22.86	96.3	8.24	152.2	632	180.4	7.24	24.3	6.7

Water temperature (°C):
The temperature of water is an unique property of its high specific heat, which is three times that air consequently. Temperature remains more or less steady over vast areas of the water body in contrast to the terrestrial environment, where is fluctuate hourly because of its tremendous capacity to store and to release the heat. The larger water bodies one arose to change the atmospheric condition around then self. During the presents study period water temperature ranged from 18.64° C to 29.32° C. Similar results were found by Singhai et al. (1990) Jayabhayeet et. al. (2006), Salve and Hiware (2006) and Baghel R K (2017), observed that during summer, water temperature was high due to low water level and clear atmosphere.

Algal Biodiversity
Chara: Chara is a type of green chlorophyte algae in the family characeae collected in harsagar in the lake ambikapur they are multicellular and appear similar to earth plants due to the stem and leaf as structures. The chara thallus has branches, multicellular and macroscopic plants in appearance similar to Equisetum which is why Chara is called a water horsetail. The thallus is highly divided by rhizoids and the main axis.

Spirogyra: Spirogyra is a type of filamentous charophyte algae green of the order Zygnematales, called helical or spiral layout of chloroplasts which is a feature of the species found in joda pond-1st Ambikapur. Spirogyra fibers are smooth and float in large quantities. Spirogyra is a type of green algae under the order Zygnematales.These free-flowing, fibrous algae are characterized by ribbon-shaped chloroplasts arranged in a helical pattern inside the cells.

Volvox: Volvox is a polyphyletic type of chlorophyte green algae in the family Volvocaceae found in the Ambikapur dam. They live in areas with plenty of fresh water. The Volvox colony is round and about 0.5 mm wide. The colon rolls in water, which is why it is best known as 'rolling alga'. The Volvox colony called coenobium contains 500 to 60,000 cells present on the surface of the colon.

Ulothrix: Ulothrix species of green algae in the family Ulotrichaceae was found in Harsagar lake, Ambikaour. Ulothrix is a type of green algae, found in freshwater and seawater. Its cells are usually as wide as they are long, and they thrive when temperatures are low in spring and winter. Per cell contains a distinct nucleus, a central vacuole and a big thin chloroplast with at least one pyrenoid. The special attachment cell is called the holdfast, and the fibers are usually not cleaned.

Vaucheria: Vaucheria species Xanthophyceae or yellow-green algae. It is one of only two species in the Vaucheriaceae family found in the joda lake in the second lake Ambikapur. Types of species of the genus Vaucheria disperma. Vaucheria exhibits apical growth from the ends of mattresses in terrestrial or freshwater areas. Vaucheria thallus has branches, a septic-free and multinucleate structure that appears as a single large cell but Vaucheria cannot be considered as a single cell.

Pediastrum: Pediastrum is a genus of green algae, in the family Hydrodictyaceae found in Divan pond Ambikapur. It is a photoautotrophic, nonmotile coenobial algae green that lives in freshwater Colonial chlorophytes with sharp cells, squarish or H- or X-rays grouped together in concentrated rings to form disc-like colonies. Outer X-shaped cells give the disc a speaker frame. Green chloroplasts, net-like, each contain one large pyrenoid. Pediastrum has recently been divided into several types, but the differences between these are hidden.

Scenedesmus: Scenedesmus is a genus of green algae, in the class Chlorophyceae found in the Lamik Ambur pool. They are colonized and non-motorized Scenedesmus species that are not compatible with vehicles and usually contain 4, 8, 16, or 32 cells arranged in sequence. Some species have spiny or bristles. Reproduction is done by non-motorized compounds called autospores.

Diatoms: Diatoms are single-celled algae. Algae diatoms living in glass houses are found in Zin pond Ambikapur. The only living thing on earth with cell walls is a transparent structure, opaline silica. The walls of the diatom cells are adorned with intricate and intricate silica patterns. A unique feature of diatom anatomy is that it is surrounded by a cell wall made of silica (hydrated silicon

dioxide), called a frustrate. These disturbances have structural colors due to their photost nanostructure, which makes them described as "sea gems" and "living opal".

Preservation of Algae Sample
Sample was than preserved using standard preservative of iodine solution and 4% formalin and was stored in glass containers for further use.

Fish Diversity

Conclusion

S.O.	Families	Fish Species	Months		
			Winter Oct 2019 to Jan 2020	Summer Feb 2020 to May 2020	Monsoon Jun 2020 to Sep 2020
			No. of Fish Found		
1.	Notopteridae	Notpterus notopterus	-	++	+++
2.	Cyprinidae	Labeo bata	+	++	++
		Labeo potal	++	++	++
		Labeo rohita	++++	+++	+++
		Oxygaster gara	++	++	+++
		Punctius phutunio	-	+	++
		Punctius ticto	+	+	++
3.	Cobitidae	Lepidocep halichthys guntia	+	++	+++
4.	Siluridae	Ompok bimaculatus	-	++	++
5.	Bagridae	Mystus tengara	+	++	+++
		Mystus seenghala	++	++	++
6.	Saccobranchi dae	Heteropne ustes fossilis	++	+++	+
7.	Belonidae	Xenentodo n cancila	-	+	+
8.	Ophiocephali dae	Channa stewartii	-	+	++
		Channa gachua	+	+	++
9.	Mastacemph alidae	Mastacem balus armatus	+	+	+
		Macrogna thus aculeatus	+	-	+

Water temperature plays vital role to control most abiotic as well as biotic factors particularly water microbes and faecal coliform however turbidity, phosphate and sulphate also accelerate the growth of such micro-organism. The inverse relation in between dissolved oxygen and water temperature exhibited in the cluster showed favourable growth of faecal coliform as well as water microbes. Similarly soil microbes showed positive correlation with carbon-dioxide, silicate, sulphate and phosphate also helps in growing soil bacteria. The total zooplanktons and total phytoplankton are also shown good lines of fitness with total alkalinity therefore it is suggested that alkaline water is more productive. The Shyam Ghunghutta dam can be therefore utilized for irrigation and other culture. The water pH increased or decreased could not effective on biotic components of water. However their co-relationship with chlorides was found highly significant from the observed cluster it was found that, dissolved oxygen supports in flurshing the biotic factor but due to inverse correlation with water temperature it remain unaltered.

Therefore, water body may affect the life span of living organism in the water body hence it is suggested that periodical silting of water body is necessary to maintain the high amplitude of dissolved oxygen. The hardness of water are caused by the large extent of minerals like calcium, magnesium, chlorides and silicate. They are found at present below the permissible limit but in future, the extent can be reduced by replacing mud. Physico-chemical parameters like water temperature, total alkalinity, pH, chloride, dissolved oxygen and availability of nutrients like nitrate, sulphate and phosphate are responsible for productivity of ecosystem. Investigation suggested that the biotic components are depending on several abiotic parameters. Rich flora and fauna found in Ambadi irrigation dam indicate that at present the water body is fresh. The pollution indicator phytoplanktons and zooplanktons species though rarely found at dam where, human activities are more confirming that water is unsafe for drinking purpose. However,

rich biotic communities present in it particularly, rotifers and other zooplankton and phytoplankton in the dam water favoured fish culture. Provided proper measures such as siltation.

Interference of human activities like idol immersion, washing of the cattle and grazing activities of domestic animals should be restricted for the reclamation of dam. So that more migratory birds may visit in coming years and the water can be utilized further for better irrigation and fishery activities.

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