

ASSESSMENT OF POLLUTION AND ITS EFFECT ON FISHES IN BABRIYA POND SEONI

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ABSTRACT:- Ecological studies of Babriya pond with reference to physico-chemical characteristics and pollution have been studied. Present research is related with assessment of pollution and its effect on fishes of Babriya pond of Seoni District (M.P.) for duration of the year from January 2024 to December 2024. The Babriya pond in district Seoni. It is situated 22.08°N 79.53°E. The surrounding area of the dam is semi-urban and partially agricultural. The values of physiochemical parameters were significantly different except temperature between upstream and downstream courses of pond. In this pond different parameters of water indicate the polluted water which directly affect the life cycle and health of different fishes found in the pond.

KEYWORD:- Pollution, Diseases, Babriya pond.

INTRODUCTION:-

India is rich in water resources, being endowed with a network of rivers and blessed with snow cover in the Himalayan range that can meet a variety of water requirements of the country. However, with the rapid increase in the population of the country and the need to meet the increasing demands of irrigation, human and industrial consumption, the available water resources in many parts of the country are getting depleted and the water quality has deteriorated. Indian rivers are polluted due to the discharge of untreated sewage and industrial effluents (Bhardwaj 2005).

Water quality refers to the ability of our water resources to support human, animal, and plant life. Good water quality is necessary for providing us with drinking water that is safe and clean; for providing habitat for aquatic bugs, plants, and animals; for providing recreational opportunities like wading, swimming, and fishing; and for providing a place for us to connect with nature. The quality of water is of vital concern for mankind since it is directly linked with human welfare. In fact, pollution is the result of anthropogenic activities, which has

adverse impact on mankind. Water is regarded as polluted when it is changed in its quality or composition, directly or indirectly as a result of human activities. Consequently, it becomes less suitable for human consumption.

The impact of pollution on aquatic fauna can result in various adverse effects. One such impact is the reduction of food resources for fishes found in lakes due to pollution. Pollution is a significant concern for the health and well-being of aquatic life. Anthropogenic activities, such as industrial and agricultural practices, urbanization, and transportation, have led to the release of various pollutants into water bodies. These pollutants can be in the form of organic and inorganic substances, including pesticides, heavy metals, and plastics, among others. The survival, reproduction, growth and health of fishes depend on water quality, therefore analysis of water quality and the effects of pollutants on fishes were studied.

Nutrients mainly nitrogen and phosphorus act as bio-stimulants causing eutrophication or enhancement of the growth of zooplankton and phytoplankton. This can lead to luxuriant growth of unusual plankton blooms, that may or may not be toxic, but which on decay use up oxygen from the water which also cause deoxygenation. Phytoplanktons are representing the microscopic algal communities at primary level, whereas zooplankton at secondary level. They react quickly to limnological change of aquatic environment. They can be listed and used as pollution indicators (Telkhade et.al. 2008). Uncontrolled domestic wastewater discharge into the pond has resulted in the eutrophication of the pond as evidenced by substantial algal blooms, dissolved oxygen depletion in the subsurface waters, large fish kill and malodour generation. These conditions continued unabated and give rise to monoculture of water hyacinth (*Eichhornia crassipes*) which covered almost the entire pond area.

Present research is related with assessment of pollution and its effect on fishes of Babriya pond of Seoni District (M.P.) for duration of two year from January 2024 to December 2024. The Babriya pond in district Seoni. It is situated 22.08°N 79.53°E.

Objective of study

Therefore, it is imperative to recognize the adverse effects of pollution on aquatic life and take measures to prevent and mitigate its impact. This can be achieved through the implementation of proper waste management practices, the use of eco-friendly products, and the enforcement of environmental regulations. By taking steps to reduce pollution, we can ensure the preservation of aquatic life and the sustainability of our planet's ecosystems.

Review of Literature:-

In India water being spread in a vast area with sea water, costal, estuarine and freshwater, there is a tremendous scope for studies. In limnological studies planktonic life, productivity and physico-chemical studies gained a major thrust to establish the status of water body and quality of water.

Sunil, S K Sharma, M L Ojha, N. Chouhan and L. Jat (2021) studied Primary productivity and plankton diversity of Anasagar lake in relation to fisheries potential.

V.P. Bairwa, B.K.Sharma, S K Sharma, N R Keer and V Kumar (2019) recorded Ichthyofaunal diversity of Goverdhan Sagar Lake, Udaipur, Rajasthan.

Dr.B Nakul, Dr. B K Sharma (2017) studied on the biotic and abiotic component of the lake Udai Sagar Ecosystem, Udaipur, Rajasthan.

Manisha Telase and Dr. M. K. Tiwari (2024), limnological studied of Babriya pond Seoni (M.P.). S. Manisha (2025) studied seasonal variation of zooplankton diversity in Babriya pond Seoni (M.P.).

MATERIAL & METHODS:-

In the Indian state of Madhya Pradesh, the city of Seoni is home to the man-made pond known as Babriya pond. The Babriya pond (Babriya Reservoir) in Seoni, Madhya

Pradesh, was constructed by the British administration, with completion in 1916. The primary purpose of its construction was to supply drinking water to Seoni town. It was a monsoon-fed, perennial, shallow freshwater pond that was built as an adaptation to climate variability (Panday et al., 2013). The samples were analysed chemically with of standard methods (APHA1989, Trivedi & Goel1986), The Fishes species were identified by Taxonomy key (Day's volume). Fish diseases studied by (V.G.Jhingran).

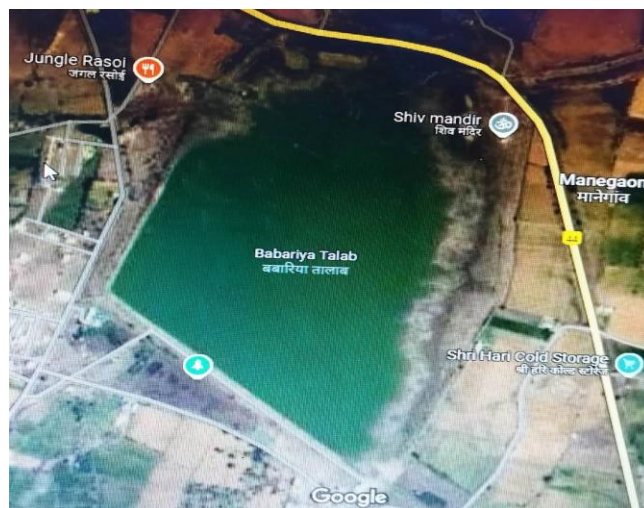


Fig. 1. Satellite view of study site Babriya Pond Seoni (M.P.)

RESULT AND DISCUSSION:-

Factors affecting fishes

Pesticides

Near Babriya pond, Pesticides and other toxic chemicals that are used in the home environment, on farms and in industrial manufacturing run off during rainy seasons, these pesticides get accumulated and cause contamination to fishes. These chemicals can cause disease and death in fishes. Lower levels of discharge may result in an accumulation of the pollutants in aquatic organisms. The end results, which may occur long after the pollutants have passed through the environment, include immune suppression, reduced metabolism, and damage to gills and epithelia.

Nutrients

In Babriya pond, the Nutrients that run off from farms and are leaked from sewage feed algae in the lake. The

algae with increased amounts of nutrients grow at a rapid rate and form what is called red tides. They are called red tides because of the red appearance they give to the foam of the water waves. Red tides release toxins that kill fish.

Sewage Runoff

Pollution runoff into water of Babriya pond. Tones of untreated sewage are dumped in water causing pollution.

This increases the amount of nitrates & phosphates. Sewage runoff from farms and human waste can introduce pathogens into the water that can cause diseases in humans and fish. Fish may be poisoned by a wide range of polluting substances, including, acids, ammonia, phenols, and cresols, compounds of metals, detergents, or cyanides. Many of these substances are released through drains or are accidentally spilled into the pond.

Table 1 : Physiochemical characteristics of Babriya Pond water

Months 2024	Temp.(°C)	pH	DO (mg/L)	FCO ₂ (mg/L)	Nitrate (mg/L)	Chloride (mg/L)	Alkalinity (mg/L)
January	18.04	7.58	6.00	4.20	0.10	38.10	112
February	21.05	7.00	5.25	4.00	0.11	48.52	117
March	22.24	7.65	4.50	3.20	0.11	66.59	162
April	26.19	7.65	4.65	3.25	0.12	60.53	192
May	28.00	8.10	5.00	4.00	0.30	68.00	202
June	33.19	8.35	2.50	4.70	0.21	83.50	262
July	29.00	7.05	2.60	4.36	0.39	58.20	242
August	28.49	6.60	3.00	5.25	0.35	52.50	162
September	28.69	5.05	3.10	5.70	0.31	48.50	152
October	27.09	6.30	4.00	5.25	0.26	44.60	132
November	26.00	7.00	4.70	5.00	0.24	41.04	127
December	23.24	7.20	5.30	4.25	0.22	40.54	120

Table 2 : Disease observed in Fishes

Name of Fishes	Gill disease	Oxygen starvation	Fin rot	White Spot	Dropsy
<i>Labio rohita</i>	**	***	*	***	***
<i>Catla catla</i>	*	**	*	*	**
<i>Mirgal carp</i>	*	**	**	**	**
<i>Tilapia</i>	**	**	*	**	***
<i>Cyprinus carpio</i>	***	***	*	*	***
<i>Hypophthalmichthys molitrix</i>	**	***	**	*	**

*(Rare) **(Common) ***(Abundant)

Trash

Babriya is a piknick spot. Many people come to visit this spot. Trash, especially plastics, is used by thousands of humans, which is then thrown into the lake. This causes a lot of death to fish. Plastics take hundreds of years to biodegrade and therefore remain in the water for a long time. Fish can take plastic for food sources and eat them. When ingested, plastic can cause a blockage in the digestive system and kill the fish. Plastic items get stuck around an animal's mouth making them unable to eat and causing them to starve to death. Plastic items can get stuck around the neck of fish life and cause them to slowly choke to death

Noise Pollution

Noise pollution drilling near Babriya pond causes stress in fish. Fishes are becoming deaf, failing to reproduce and even dying because of under waterman-made noise pollution. Underwater noise especially threatens fish with swim bladders because they can explode, sound-sensitive internal structures, causing internal bleeding and even death.

Constructions

As large number of colonies construction projects are in progress in nearby area of Babriya pond results in the production of silt in the pond. This load of particulates

matters cuts down primary productivity of soil and also prevent the reproduction of fish by smothering egg laid on the bottom. Sewage & silt bring about an early ageing of the ponds.

Eutrophication

As one side of the Babriya pond is used by washer man's so huge amount of detergents & soap foam too get added. Amount of sulphates, chlorides, etc. increases & these compounds favour the growth of algae producing water algal blooms, which consume most of the oxygen from water & causes toxic effects.

Algal bloom triggering fish-killing "dead zone"

Bottom fish are being killed by a recurring "dead zone" of low-oxygen water that appears to be caused by explosive blooms of tiny plants known as phytoplankton, which die and sink to the bottom. The phytoplankton are eaten by bacteria, which use up the oxygen in the water. Dead zones are caused by agricultural runoff, fueling, and bloom of algae that rot and deplete the oxygen.

Suffocation

Suffocation occurs when the oxygen concentration in the water falls below the level at which fish can survive. A common cause is Eutrophication, which is the artificial stimulation of plant growth by pollution with fertilizers, sewage, or atmospheric fallout. When the excess plant growth decays, it lowers the oxygen concentration. The discharge of dead organic matter into a watercourse from a sewer or from an industrial operation causing low-oxygen conditions, cause problems by reducing water clarity, making it hard for marine animals to find food and blocking the sunlight needed by sea grasses, which serve as nurseries for many important fish species. Nuisance algal blooms may also cause suffocation. Bloom sank and decomposed, forming an area with almost no oxygen and with lethal levels of hydrogen sulphide killing hundreds of fishes and other aquatic animals.

Acid rain

Acid rain effects Fishes because when the (acid) rain falls in the pond or the lake, the acid collects in the water becoming stronger and stronger until the fish can't live any longer. Acid rain negatively affects fish by raising the acidity of the water to a level the fish cannot abide

and by leaching metals such as aluminium from the soil that can poison fish.

CONCLUSION:-

The reduction in food availability can diminish the predatory capabilities of these fish. Pollutants present in lakes can have a detrimental effect on fish life, leading to a reduction in fisheries' value. Pesticides, in particular, can interfere with fishes' osmoregulation and ionic regulation processes, which can negatively impact aquatic fauna. Numerous pollutants have been found to hinder the growth and development of fish, as well as interfere with their reproductive cycles, either directly or indirectly. Additionally, pollutants have been observed to impair the reproduction of fish, leading to increased mortality rates. Fish behaviour was also affected by pollutants. Because of the pollutants found in pond water, many types of diseases were observed in the fishes found in the pond.

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