



STUDY ON WATER QUALITY ASSESSMENT OF NAG RIVER FLOWING THROUGH NAGPUR

Tanmay Digrase¹, Tushar Bhojar², Vaibhav Bijewar³, Rahul Barai⁴

(Student of Civil department Priyadarshani College of Engineering, Nagpur Maharashtra, India)

Bharti Gautam⁵, Assistant professor, Civil Engineering Department, Priyadarshani College of Engineering, Nagpur, Maharashtra, India

Abstract

The name of the Nagpur city taken from the Nag river. Nag river covers total 50 km length. The starting of Nag river is from Ambazari Lake which is situated at upstream of city, then by crossing from various locations such as near NIT swimming pool area, Shankar Nagar square, Dharampeth etc. It joins the tributaries such as Pili river, Pora river, Fultala lake. Nowadays quality of river is decreasing due to human interference and anthropogenic activities like discharge of untreated sewage. The length of river around city boundary is 17 km and this river basin is called central zone. This paper presents the various quality parameters at various locations such as COD (chemical oxygen demand), pH value, EC value, turbidity etc. and history of Nag river.

Keywords: Nag River, Nagpur, Quality assessment, pH, Turbidity etc.

INTRODUCTION

Nag river arises from Ambazari Lake which is situated at upstream of city of Nagpur. Nag river is contaminated due to human interference and anthropogenic activities like discharge of untreated sewage and industrial waste. The length of the river around the city boundary is 17 km and this basin is called as central zone. It is located at west part of city and it flows into Kanan River and from there it meets with Gosikhurd project. Sewage and waste water is the reason for the contamination of quality of river.

There are three tributaries of Nag river :-

1. Pili River :- It arises from Gorewada Lake at north west of city and flows from west to east which joins the Nag river at its lower course and is called as north zone.

2. Futala Nallah :- it originates at Telang khedi lake which is located in hills on west side of city. Then it flows to the north of river and meets at the junction known as sangam.

This junction is well known for temple at a stop called telangkhedi Temple. The Nag river and its tributaries arise within the city limits of nagpur city and flow through main city. It is within the section itself that river is majorly polluting due to influence of developments along its course. This further affects the downstream areas due to contaminated water flowing through rivers.

3. Pora river :- It starts from sonegaon lake at west of city and then from west of city and then from west to south east outside south part of city it drains into kanhan river called as south zone.

OBJECTIVES :

The main objective is to study water quality of nag river at various locations.

- To study the source of pollution of Nag river and its tributaries
- To determine the pollution level of Nag river and check its water quality by various tests performed.
- To compare its current year quality parameters with previous data available.
- To suggest the measure for an improvement in the quality of water in Nag river and its tributaries.

DETAIL STUDIES FOR THE JUNCTION ALONG NAG RIVER:

- 1) Near NIT swimming pool
This junction is situated near ambazarilake which is origin of Nag river less than 1 km distance.
- 2) Shankar nagar square
This junction is situated near shankarnagar chok and general post office nagpur.
- 3) Ramdaspeth canal road
This is located at ramdaspeth area Nagpur. The node is defined by canal road on southern side of the river while the public institution such as library make up the northern boundary of river
- 4) Yashvant stadium
This junction is located near yashvant stadium which is crossed by abhiyankarmarg
- 5) Reshimbagh
This node is one of the few places with the river coming in direct contact with an open space which in this case is to the north of river.
- 6) Mankapur
This junction is located at mankapur area which crosses by koradi road

SITE WORK:

The various locations of Nag river from which water samples can be collected are as follows :-

- Near NIT swimming pool
- Shankar nagar square

- Ramdaspath canal road
- Yashvant stadium
- Reshimbagh
- Mankapur

COLLECTION OF WATER SAMPLE:

- I. NIT swimming :- near ambazari lakewhich is the origin of nag river
- II. Shankar nagar :- near Shankar nagar chouk and general post office .
- III. Ramdaspath :- near canel road onsouthern side of river and public institution such as library.
- IV. Yashwant stadium:- near shiv temple near residential area.
- V. Reshimbagh :- behind jamdar high school and jr college.
- VI. Mankapur :- near Nagpur nagrik sahakribank .

TEST CONDUCTED:

The test which were conducted on water sample for finding out its quality are as follows

- Temperature
- pH value
- Electrical conductivity test
- Colour
- Turbidity
- Chemical oxygen demand (COD)
- Dissolved oxygen

ANALYSIS OF WATER SAMPLE :

The samples from various location are analyzed for various parameters are shown by tabulated from are as follows :-

The values of past records (2013) are also tabulated. At some location

Table 1 :- Analysis Of Water Quality Parameter Near NIT Swimming Pool

Sr Number	Parameters	Units	missiblelimits	2013	2022
1	Temperature	°C	--	20	32
2	pH Value	---	6.5-8.5	7.11	7.71
3	Dissolved oxygen	Mg/l	5	5.5	8.9
4	Electrical Conductivity	µmHos/cm	400		610
5	Colour	--	--	colourless	colourless
6	Turbidity	NTU	1	22	23
7	Chemical oxygen demand	Mg/lit	250	218.6	242

Table 2 :- Analysis Of Water Quality Parameter Shankar Nagar Square

Sr Number	Parameters	Units	missiblelimits	2013	2022
1	Temperature	°C	--	20	32
2	pH Value	---	6.5-8.5	7.2	7.21
3	Dissolved oxygen	Mg/l	5	5.8	1.6
4	Electrical Conductivity	µmHos/cm	400		650
5	Colour	--	--	Greenish	Greenish
6	Turbidity	NTU	1	28	31
7	Chemical oxygen demand	Mg/lit	250	188	251

Table 3 :- Analysis Of Water Quality Parameter Ramdaspeth Canal Road

Sr Number	Parameters	Units	missiblelimits	2013	2022
1	Temperature	°C	--	20	33
2	pH Value	---	6.5-8.5	7.11	7.21
3	Dissolved oxygen	Mg/l	5	5.5	1.69
4	Electrical Conductivity	µmHos/cm	400		610
5	Colour	--	--	Greenish	Greenish
6	Turbidity	NTU	1	24	30
7	Chemical oxygen demand	Mg/lit	250	274	256

Table 4 :- Analysis Of Water Quality Parameter Yashwant Stadium

Sr Number	Parameters	Units	missiblelimits	2013	2022
1	Temperature	°C	--	20	33
2	pH Value	---	6.5-8.5	6.78	7.40
3	Dissolved oxygen	Mg/l	5	5.2	1.8
4	Electrical Conductivity	µmHos/cm	400		620
5	Colour	--	--	Greenish	Greenish
6	Turbidity	NTU	1	29	31
7	Chemical oxygen demand	Mg/lit	250	379	306.6

Table 5 :- Analysis Of Water Quality Parameter Reshimbagh

Sr Number	Parameters	Units	missiblelimits	2013	2022
1	Temperature	°C	--	20	32.5
2	pH Value	---	6.5-8.5	7.05	7.40
3	Dissolved oxygen	Mg/l	5	5.5	1.8
4	Electrical Conductivity	µmHos/cm	400		650
5	Colour	--	--	Greenish	Greenish
6	Turbidity	NTU	1	27	31
7	Chemical oxygen demand	Mg/lit	250	392	233

Table 6:- Analysis Of Water Quality Parameter Mankapur

Sr Number	Parameters	Units	missiblelimits	2013	2022
1	Temperature	°C	--	20	32
2	pH Value	---	6.5-8.5	7.15	7.71
3	Dissolved oxygen	Mg/l	5	5.3	1.6
4	Electrical Conductivity	µmHos/cm	400		650
5	Colour	--	--	Greenish	Greenish
6	Turbidity	NTU	1	30	31
7	Chemical oxygen demand	Mg/lit	250	380	245

DISCUSSION ON VARIATION IN VARIOUS PARAMETERS OF WATER QUALITY :

- 1) TEMPERATURE :- There is less difference found in the Temperature because the sample where collected in the afternoon time at an interval of 20 min at every sampling location.
- 2) pH values:- The pH values at yashwant stadium area are nearly acidic because of the disposal of domestic and industrial waste heavily. And at other location pH value is nearly basic or alkaline which indicate better quality of water.
- 3) Dissolved oxygen (D.O.) :- The D.O. levels at shankar nagar is the lowest but the value D.O goes on increasing up to NIT swimming pool. Basically, the dissolved oxygen gives the amount of oxygen that

should be present in the water for survival of the aquatic life.

- 4) Chemical Oxygen Demand (COD):-The values of COD different the amount of oxygen required to oxidized the organic and inorganic matter chemically. COD values are generally more than BOD values . the values are higher at NIT swimming pool and goes on decreasing up to shankar nagar square.
- 5) Turbidity :- turbidity values determine the clarity of liquid. It is optical characteristic of water and is a measure of the amount of light that is scattered by material in the water when a light is shined through the water sample. The lower turbidity values is found near NIT swimming pool area and in other location turbidity value is much higher than NIT swimming pool.
- 6) E.C value :- electrical conductivity measures the ability for material to conduct electricity which means that how well can liquid carry electric current through it EC values found higher in tow places at shankar nagar and at manapur square which is almost same numbers and the lowest value found in ramdaspath area.

CONCLUSION :

- Due to Anthropogenic activities by human beings and heavily disposal of solid waste water nag river is getting distributed.
- The study would help in determining the pollution level of water sample at various location and also helps in suggesting the improvement in quality of water.
- This comparative study would help an individual to suggest the difference in water quality in different years and mode of treatment that should be given to water before its final disposal.
- This study would help in designing and developing the sewerage system.
- The quality of water of Nag river varies from season to season and day to day. For e.g in summer season some parameter like D.O get decreased and other parameter like BOD, COD and nitrate content increases.

PREVENTIVE MEASURES :

The growing of Typhalatifolia and canna lily plants on the bank of river will give Asthetic appearance to the river and not allow the solidparticles to enter into the river stream there byreducing the pollution of Nag river.

Re-structuring the edge of the bank by constructing divide walls which will separate the residential area and other industries to givethe asthetic appearance to those areas.

The practice of the adoption of the low cost sanitation should be followed at all the location of Nag river to reduce the direct disposal of domestic waste and liquid waste into the river.

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