

Review on Krishna River Water Quality Assessment from BAHE to MASUCHIWADI using QGIS Software

¹Sahil J. Mulani, ²Karan S. Babar, ³Rajwardhan S. Patil, ⁴Dhiraj A. Rasanka, ⁵Ruturaj S. Mathane, ⁶Rajvardhan C. Patil, ⁷Avinash B. Hangande

¹⁻⁶Student, Department of Civil Engineering, Rajarambapu Institute of Technology, Rajaramnagar, Maharashtra, India

⁷Faculty, Department of Civil Engineering, Rajarambapu Institute of Technology, Rajaramnagar, Maharashtra, India

Abstract - Contamination in Krishna Stream is one of the foremost genuine contamination issues, particularly in parched and semi-arid areas where ordinarily there is a lack in water assets. Chemical Defilement and wastewater contaminations in stream not ordinarily recognized until some illness has influenced the neighborhood populace. Within the later a long time, Maharashtra has been subjected to contamination quality to mechanical and household source of toxin; most characteristic sea-going biological systems are extremely undermined by human interceded defilement since a few mechanical foundations are concentrated close waterway bowl for self-evident reasons. Such exercises put tall hydrological push on existing groundwater by falling apart its quality.

Keywords: Ground Water Contamination, Water Quality, Krishna River, QGIS Software.

I. INTRODUCTION

Water quality parameters analyses are critical handle for normal checking and to get it the natural conditions. Within the water bodies, unfeasible to gather the water tests in all the focuses and which has exceptionally broad too. River water quality has picked up noteworthy consideration and is being sullied due to different human exercises, and it needs an pressing effort to guarantee its supportability and secure utilize. The most objective of this think about is to arrange spatial distribution maps for water quality parameters in Krishna River.

II. SCOPE AND NECESSITY

- i. Water quality parameters in locations where they are not measured in the study area for comparison analysis between summer and monsoon season.
- ii. In order to improve the results of this study, a higher number of in situ measurements may be needed.
- iii. In this study are easy to implement, we recommend further analyses in different study areas at different seasons of the year in order to get a wider range of values of water quality.

iv. This information could be very useful for the administrative authorities to take certain measures in the management of water resources in the study area.

III. LITERATURE REVIEW

Sahil Mulani - Most natural aquatic ecosystems are severely threatened by human mediated contamination because several industrial establishments are concentrated near river basin for obvious reasons. Such activities put high hydrological stress on existing groundwater by deteriorating its quality. It is with advent of industries and discharge of effluent in injection well, result of this pollutant has entered into the aquifer system. Considering the above facts, the effect of polluted river water on ground water is focused in present research work. This makes it very necessary to investigate level of concentration of physical, chemical water quality parameter of river and groundwater of selected wells along river basin

Karan Babar - Water quality analysis is prime important to understand the wealth of living organism and environmental condition in water bodies. In GIS, ordinary Kriging interpolation method has been applied for surface analysis of water quality parameters such as temperature, salinity, pH, chlorophyll-a (Chl-a) and suspend sediment (SS), to carried comparison analysis between monsoon and summer season.

Rajwardhan Patil - The water quality index indicated that most of the sampling locations come under good category indicating the suitability of water for human use. Due to the industrialization and agricultural disposal, some of the sampling locations became unfit.

Dhiraj Rasankar - In the recent years, India has been subjected to pollution attribute to industrial and domestic source of pollutant, owing to unethical practices and poor enforcement of environmental law and regulation. Most natural aquatic ecosystems are severely threatened by human mediated contamination because several industrial establishments are concentrated near river basin for obvious reasons. Such activities put high hydrological stress on existing groundwater by deteriorating its quality.

Raturaj Mathane - Remotely sensed data can reinforce the abilities of water resources researchers and decision-makers to monitor water quality more effectively. In the past few decades, remote sensing techniques have been widely used to measure qualitative water quality parameters. However, the use of moderate resolution sensors may not meet the requirements for monitoring small water bodies. Water quality in a small dam was assessed using high-resolution satellite data from Rapid Eye and in situ measurements collected a few days apart. The satellite carries a five-band multispectral optical imager with a ground sampling distance of 5 m at its nadir and a swath width of 80 km. Several different algorithms were evaluated using Pearson correlation coefficients for electrical conductivity (EC), total dissolved solids (TDS), water transparency, water turbidity, depth, suspended particulate matter (SPM), and chlorophyll-a. The results indicate strong correlation between the investigated parameters and Rapid Eye reflectance, especially in the red and red-edge portion with highest correlation between red-edge band and water turbidity ($r^2 = 0.92$). Two of the investigated indices showed good correlation in almost all of the water quality parameters with correlation higher than 0.80. The findings of this study emphasize the use of both high-resolution remote sensing imagery and red-edge portion of the electromagnetic spectrum for monitoring several water quality parameters in small water areas.

Rajvardhan Patil - The Nerus River Basin is located on the east coast of Peninsular Malaysia passes through the populated urban area of northern region of Kuala Terengganu, Malaysia. Over the last 10 years, the Nerus River has experienced population growth and rapid development, resulting in large-scale of land use changes. Changes in land use cause deterioration of the water quality of the Nerus River. This study aimed to estimate land use changes from the past condition (2000–2013) and the present condition (2016) within the Nerus River using geographical information system and statistical approaches. Main factors such as seasonal changes and pollution sources were included in the analysis. The monitoring of water quality was done based on three sampling stations during both dry and wet seasons, involving analysis of six water quality parameters (pH, dissolved oxygen, BOD, chemical oxygen demand, NH_3 -N, and total suspended solids). Water quality classification is using the National Water Quality Standard for Malaysia and the Water Quality Index. Multivariate statistical technique such as principal component analysis was conducted to determine sources of water pollution, to evaluate the similarities and dissimilarities between sampling stations, and to determine the influence of sources of pollution on the water quality parameters of the Nerus River based on the available land use database. Overall, the river was classified as Class III (slightly polluted) in accordance with previous studies.

IV. TYPES OF TEST

- 1. Ph** – The analysis of the water samples collected from the study area indicated that the average value of pH ranges from 6.7 to 8.03 in both surface water and groundwater.
- 2. Total Alkalinity (TA)** – Measuring alkalinity is important in determining a stream's ability to neutralize acidic pollution from rainfall or wastewater. It is one of the best measures of the sensitivity of the stream to acid inputs.
- 3. Total Hardness (TH)** – Calcium hardness is the measure of how hard or soft your river water is, and measures the amount of dissolved calcium and magnesium in river. Just like pH and total alkalinity, it is important to keep the calcium hardness balance.
- 4. Calcium (Ca)** – Calcium is an important determinant of water hardness, and it functions as a pH stabilizer, because of its buffering qualities. Calcium also gives water a better taste.
- 5. Magnesium (Mg)** – It can also be used to determine the total hardness of fresh water provided the solutions used are diluted. The combined concentration of calcium and magnesium ions is considered the measure of water hardness. The method uses a very large molecule called EDTA, which forms a complex with calcium and magnesium ions.
- 6. Chloride (Cl)** – The presence of chlorine residual in drinking water indicates that: 1) a sufficient amount of chlorine was added initially to the water to inactivate the bacteria and some viruses that cause diarrheal disease; and, 2) the water is protected from recontamination during storage.
- 7. Total Dissolved Solids (TDS)** – The total dissolved solids test is used as an indicator test to determine the general quality of the water. The sources of total dissolved solids can include all of the dissolved cations and anions, but the following table can be used as a generalization of the relationship of TDS to water quality problems.

V. OPEN SOURCE QGIS SOFTWARE

- QGIS may be a open source GIS tool that gives capabilities and instruments to assist you visualize, oversee, alter, analyze information and compose printable maps.
- QGIS capacities as geographic data framework (GIS) computer program, permitting clients to analyze and alter spatial data, in expansion to composing and sending out graphical maps.
- Both raster and vector layers; vector information is put away as either point, line, or polygon highlights. Numerous designs of raster pictures are bolstered, and the program can geo referenced images.

- QGIS underpins shape records, inclusions, individual geo databases, dxf, MapInfo, PostGIS, and other groups. Web administrations, counting Web Outline Benefit and Web Highlight Benefit, are moreover upheld to permit utilize of data from outside sources.
- Since QGIS is open source, community driven extend, the complete computer program code with a bug tracker is kept up from the QGIS site that's overseen and worked by a directing committee that incorporates individuals from all around the world.



VI. HOW TO PREPARE QGIS MAP

- To make a map we have to go first project tab then create a new print composer then Choose a name (i.e. map 1) then click ok.
- Then add a new map then draw a rectangular of the size you want also you change the Scale manually.
- Then click the move item content tool with scroll of the mouse you can zoom out or zoom in.
- Also this option is chosen you can move the map center or someone else.
- Then go to the item properties the one that says grades click here the plus symbol so.
- Appears the grid number one where they said interval you can chose the interval of grid in x-axis choose the number u want.
- Also you want to see the coordinates then select draw coordinates also change the size of the latter. You can also change the size number in the case of map u choose the sigma.
- Also you can change frame size and color.
- Then click new scale bar tool then add the scale bar in map.
- Then click the add legend tool and add the legend in map also you change the symbols.
- Also you can change the size of legend also u can add image.
- Then click the add label option and add the map name (i.e. map 1) also u can change the font size or background.
- Then after completion of map you can click the export as pdf option and export file.



VII. METHODOLOGY

1. First, collect the samples and also collect latitude and longitude degrees at every 500M from BAHE to MASUCHIWADI.
2. To conduct (PH test, chloride test, salinity, dissolved oxygen test, turbidity test, hardness test metal test) test on water sample.
3. Prepare a excel sheet based on water test result.
4. Check the excel sheet result per test conducted on water sample.
5. Then learn the QGIS software.
6. After learning the QGIS software, we upload the test result data then we got the map of Krishna river assessment from BAHE to MASUCHIWADI.
7. After that we analysis water parameter from BAHE to MASUCHIWADI.

VIII. RESULTS AND DISCUSSION

- i. From this project, we study the river water parameters analysis.
- ii. At the same time, we learn QGIS software.
- iii. The use of QGIS software is Necessary for mapping river water assessment.

IX. CONCLUSION

From This project, we study the river water parameters analysis & we learn how to calculate chemical contamination of river water. At the same time, we learn QGIS software & features of various tools used in this software. The use of QGIS software is Necessary for mapping river water assessment.

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Citation of this Article:

Sahil J. Mulani, Karan S. Babar, Rajwardhan S. Patil, Dhiraj A. Rasanka, Raturaj S. Mathane, Rajvardhan C. Patil, Avinash B. Hangande, "Review on Krishna River Water Quality Assessment from BAHE to MASUCHIWADI using QGIS Software" Published in *International Research Journal of Innovations in Engineering and Technology - IRJIET*, Volume 5, Issue 6, pp 118-121, June 2021. Article DOI <https://doi.org/10.47001/IRJIET/2021.506023>
