



Water Quality Analysis of Krishna River Basin in Kolhapur District, Maharashtra, India

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Abstract:

Clean safe and Healthy fresh water is most important to the existence of life. There is still a serious problem with adequate availability of fresh water for human consumption. The quality of water is degraded due to human activity like removal of vegetation, Industrial activity, discharge of chemical mixed water, sewage, and disposal materials etc. These all problem are largely concentrated in and around urban areas. Keeping this view in the account systematic study has been carried out the water quality of Krishna River basin in Kolhapur district. Water sample data have been collected from India WIRS website 28 sample data from Year 2018 to Year 2019 were use for this analysis. Physic-chemical parameters have been analyzed by standard method. Correlation matrix has been use for examining relationship between the water quality parameters, and the study is conducted to analyze the water quality status of Krishna river basin in Kolhapur district. The results of the concentration were interpreted and compared with World Health Organization (WHO) (2012) and Bureau of Indian Standard (BIS) (2012) Standards. The result of Water Quality Index (WQI) computation infers that the water quality of Krishna River basin is rated as Excellent for human consumption.

Keywords: Water contamination, Water Quality Index, Physio-chemical Parameter.

Introduction:

The Krishna River basin in Kolhapur district holds paramount significance as a vital water resource that sustains agricultural, industrial, and domestic activities. This region, nestled in the western state of Maharashtra, plays a pivotal role in contributing to the overall water dynamics of the Krishna River system. The quality of water in this basin is of immense importance, affecting not only the local ecosystem but also the livelihoods of the communities depending on it. Today there are many cities worldwide facing an acute

shortage of water and nearly 40 percent of the world's food supply is grown under irrigation and a wide variety of industrial processes depends on water, Katakwar, M., &Katakwar, C. M. (2016). In India Ganga, Godavari, Gomti, Cavery, Narmada, and Mahi all are facing pollution problems, Sharma. P. D, (2014), Nayak, J. G. (2016). The outbreak of water borne diseases due to disposal of untreated domestic sewage from cities, towns and villages to the surface water bodies is a major source of pollution in India, Shaheda, N, P, et, al (2021). A change in the chemical, physical, biological,

and radiological quality of water which is injurious to its existing, intended, or potential uses is termed as Water Pollution, Das, A. (2017).

The problem of water quality deterioration is mainly due to human activities such as disposal of dead bodies, discharge of industrial and sewage wastes and agricultural runoff, which are major cause of ecological damage and pose serious health hazards, Meitei NS, Bhargava V, Patil PM, (2004), Katakwar, M., & Katakwar, C. M. (2016). The term generally refers to human induced changes to water quality. Water pollution can threaten human health when pollutants enter the body via skin exposure or through the direct consumption contaminated food, Das, A. (2017). Krishna River is Situated in the western ghats of India, the Kolhapur district encompasses a diverse landscape characterized by hills, plateaus, and the intricate network of rivers and tributaries. The Krishna River basin, a key component of this topography, serves as a primary drainage system for rainwater and runoff. Understanding the geographical features is crucial for comprehending the factors influencing water quality. The degree of pollution is generally assessed by studying physical and chemical characteristics of the water bodies, Duran Mustafa, Menderes Suicmez, (2007). Studies related to water pollution of rivers like Godavari, Krishna and Tungbhdra, Mitra. A. K. (1982), Katakwar, M., & Katakwar, C. M. (2016). The Krishna River basin supports a myriad of functions, ranging from agricultural irrigation to sustaining aquatic biodiversity. Given the increasing anthropogenic pressures and industrial activities in the region, monitoring and maintaining water quality have become essential to ensure the sustainable utilization

of this critical resource. This study aims to analyze and present an overview of the water quality in the Krishna River basin within Kolhapur district. Parameters such as physical, chemical composition and pollutant levels, content will be evaluated to gauge the overall health of the water resources. Additionally, the study will explore potential sources of contamination and their implications for both the environment and human health. The primary objectives of this research include assessing the current water quality status, identifying potential sources of pollution, and proposing measures for the sustainable management and conservation of water resources in the Krishna River basin. This study aims to develop a comprehensive Water Quality Index (WQI) to assess the water quality in the Krishna River Basin by integrating key physicochemical parameters into a unified metric. Additionally, it seeks to analyze the spatial and temporal variations of these parameters to understand how seasonal and regional changes impact water quality trends across the basin. Geographic Information System (GIS) tools will be utilized to map potential pollution sources, providing a spatial framework that visualizes pollution patterns and their relationship to water quality, aiding in targeted management and mitigation efforts.

Study Area:

The study area encompasses the Krishna River basin, situated in the western state of Maharashtra, specifically within the Kolhapur district. The latitude and longitude extension of the Kolhapur district is 16° 41' 28" N and 74° 14' 41" E. Kolhapur district is a located in the southwestern part of the state of Maharashtra. Nestled in the foothills of the Western Ghats, this region is

characterized by diverse topography, ranging from hilly terrain to fertile plains. The Krishna River originates at Mahabaleshwar in the Satara district and passes through the states of Maharashtra, Karnataka, Andhra Pradesh, and Telangana before finally meeting the Bay of Bengal.

Location Map of Study Area:

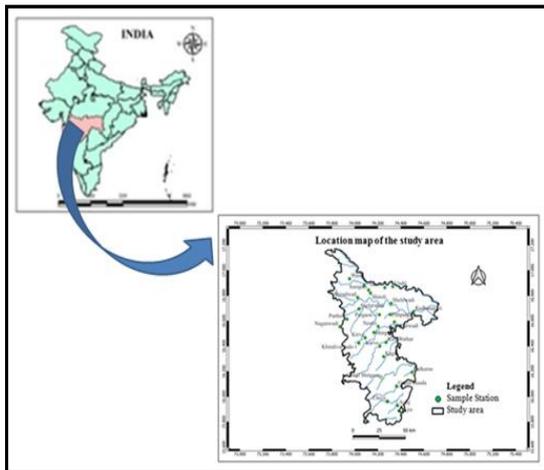


Figure 1: Location map of the study area
(Source: Created by researcher)

Data Base:

This research is mainly based secondary data. Which collected from India WRIS site. The Secondary data come from Various research paper, academic literature, government’s reports and policy documents of planning commission of India (regarding to the Krishna River) or pollution control board etc.

Methodology:

The Water Quality Index (WQI) based on the weighted arithmetic water quality index formula proposed by Horton (1965) and developed by Brown et al. (1972)., Sonawane, A. S., (2025).. This index is used to assess the overall water quality by considering multiple parameters. Following steps involved in calculating the WQI:

Step 1: Calculate Unit Weight (Wn) Factors for Each Parameter

$$W_n = \frac{K}{S_n}$$

$$K = \frac{1}{1/S_1 + 1/S_2 + 1/S_2 + \dots + 1/S_n} = \frac{1}{\sum 1/S_n}$$

Where,

S_n = Standard Desirable value of the nth Parameter

On Summation of all selected parameters unit

Weight factors, W_n=1(unity)

Step .2) Calculate the sub index (Q_n) value by using the formula

$$Q_n = \frac{[(V_n - V_o)]}{[(S_n - V_o)]} * 100$$

Where

V_n = Mean concentration of the nth parameter’s

S_n = Standard desirable value of the nth parameter’s

Actual value of the parameter in pure water (generally V_o = 0, for most parameter except for PH)

$$Q_{pH} = \frac{[(V_{pH} - 7)]}{[(8.5 - 7)]} * 100$$

Step .3) Combining step .1 & step .2

WQI is calculated as follow

Over all

$$WQI = \frac{\sum W_n Q_n}{\sum W_n}$$

Quantitative data will be analyzed using appropriate statistical techniques. Data will be presented using suitable statistical tables, charts, and diagrams. GIS (Geographic Information System) techniques will be used to analyze, represent, and prepare various River Basin

maps and water quality maps. This WQI calculation approach provides a comprehensive assessment of water quality by considering multiple parameters and can be a valuable tool for understanding and managing water quality in a river basin.

Table 1: Yearly Ground Water Quality (2018)

[All units in mg/L, except pH and EC (□S/L)]

Sample Station	Station Name	Cl (Chloride)	Ca (Calcium)	Mg (Magnesium)	F (Fluoride)	EC (Electrical Conductivity)	pH (Potential of Hydrogen)
1	Ajra	40.945	47.0138	10.9368	0.01	451	7.6
2	Aslaj	11.167	10.2204	6.076	0	100	7.9
3	Cheye	43.426	51.102	29.1648	0.03	619	7.6
4	Gagan Bauda	6.2038	12.2645	9.7216	0.01	138	7.9
5	Gokul Shirgaon	63.278	71.5428	36.456	1.07	847	7.8
6	Halkarne	142.69	24.529	133.672	0.04	120	7.7
7	Kagal	55.834	53.1461	42.532	0.2	846	7.7
8	Karve	26.056	14.3086	8.5064	0	190	7.5
9	Khindivarvade-1	8.6853	20.4408	6.076	0.01	234	7.5
10	Kini Wathar	100.5	51.102	77.7728	0.07	133	7.8
11	Kirve	16.13	26.573	6.076	0.01	210	7.6
12	Murgud	63.278	67.4546	19.4432	0.05	782	7.6
13	Naganwadi	21.093	6.13224	9.7216	0	103	7.1
14	Nesari	21.093	34.7494	6.076	0.01	262	7.7
15	Paijarwadi	31.019	24.529	36.456	0.03	507	7.7
16	Panhala	31.019	32.7053	6.076	0.01	306	7
17	Pargaon -1	33.5	42.9257	46.1776	0.16	627	7.9
18	Pimpalgaon	40.945	30.6612	44.9624	0.04	648	7.4
19	Radhanagari	23.574	36.7934	15.7976	0.01	390	7.3
20	Shahuwadi-1	28.537	20.4408	42.532	0.74	508	7.9
21	Shelewadi	26.056	36.7934	27.9496	0.1	474	7.7
22	Shiradwad	110.43	73.5869	61.9752	0.01	130	7.8
23	Shiroli	194.8	63.3665	64.4056	0.04	140	7.9
24	Surupali	40.945	51.102	34.0256	0.04	629	7.6
25	Surute	18.611	20.4408	2.4304	0	134	7.2
26	Undri	40.945	40.8816	14.5824	0.01	400	6.8
27	Wadicharan-1	93.056	87.8954	54.684	0.01	972	8.1
28	Washi	21.093	38.8375	32.8104	0.1	526	7.7

(Source: CGWB)

Table 2: Yearly Ground Water Quality (2019)
[All units in mg/L, except pH and EC (□S/L)]

Sample Station	Station Name	Cl (Chloride)	Ca (Calcium)	Mg (Magnesium)	F (Fluoride)	EC (Electrical Conductivity)	pH (Potential of Hydrogen)
1	Ajra	51.615	20.4408	8.38488	0.02	409	7.9
2	Aslaj	0	2.04408	0.97216	0.05	48	8
3	Cheye	14.641	32.7053	6.92664	0.04	333	7.3
4	Gagan Bauda	14.889	12.2645	6.076	0.05	160	8.1
5	Gokul Shirgaon	69.234	71.5428	13.1242	1.2	687	7.4
6	Halkarne	139.46	85.8514	46.1776	0.05	230	7.6
7	Kagal	66.008	53.1461	23.3318	0.25	743	7.5
8	Karve	27.297	16.3526	2.55192	0.06	221	7.5
9	Khindivarvade-1	21.341	20.4408	5.4684	0.01	216	7.6
10	Kini Wathar	123.33	79.7191	42.0459	0.06	120	7.8
11	Kirve	33.5	26.573	13.4887	0.06	151	7.5
12	Murgud	63.526	59.2783	14.8254	0.06	780	7
13	Naganwadi	22.334	6.13224	4.8608	0.04	104	7.2
14	Nesari	27.297	14.3086	8.5064	0.04	205	7.7
15	Paijarwadi	9.926	6.13224	6.31904	0.03	108	8
16	Panhala	33.5	12.2645	6.076	0.03	230	7.4
17	Pargaon -1	30.771	42.9257	15.433	0.19	520	7.6
18	Pimpalgaon	46.156	30.6612	35.8484	0.04	677	7.6
19	Radhanagari	27.297	36.7934	10.4507	0.01	441	7.7
20	Shelarwadi	13.152	2.04408	4.8608	0.05	129	7.9
21	Shelewadi	25.063	36.7934	22.1166	0.12	519	7.1
22	Shiradwad	111.67	67.4546	21.6306	0.02	928	7.2
23	Shiroli	174.2	63.3665	54.1979	0.03	140	7.9
24	Surupali	21.341	51.102	18.228	0.03	498	7.1
25	Surute	35.237	20.4408	8.74944	0.06	372	7.7
26	Undri	128	44	31.66	0.65	988	7.93
27	Wadicharan-1	75.438	87.8954	3.40256	0.06	450	7.8
28	Washi	32.26	38.8375	17.2558	0.13	446	7.5

(Source: CGWB)

Results and Discussions:

Cl (Chloride): The chlorides contents in the samples range between 6.20 mg/L to 194.80 mg/L natural water contain low chloride ions. The highest Chloride concentrate at Sample No. 6, Sample No. 10, Sample No.

22, Sample No. 23, and Sample No. 27 in year 2018, 2019 and Lowest Chloride Levels found in all other remaining locations. This suggests that these five samples consistently exhibit elevated chloride levels compared to the other

remaining locations. High Chloride level of water have a laxative effect for some people. According to EPA recommendation upper limit of 250 mg/L has been set for chloride ions, Scherer, T., & Dakota, N. (2019).

Ca (Calcium): Calcium is a most abundant elements in the groundwater. Calcium may dissolve readily from carbonate rocks and lime stones or be leached from soils, Sharma, A., & Rout, C. (2011). Calcium is an essential nutritional element for human being and aids in maintaining the structure of plant cells and soils, Sharma, A., & Rout, C. (2011). The range of Ca (Calcium) Concentration of sampling station between 2.0 mg/L to 87.89 mg/L. The acceptable limits of Ca is 75mg/L according to Bureau of Indian Standard(BIS), EPA not set any upper limit of calcium, Scherer, T., & Dakota, N. (2019). Calcium (Ca) concentrations at different water sampling locations over the years 2018 and 2019. Some sampling locations (2, 4, 8, 13, 20, and 25) consistently showed the lowest concentrations, while others (5, 6, 7, 10, 12, 22, 23, 24, and 27) consistently exhibited the highest concentrations during these two years. Additionally, specific sampling stations (4, 7, and 25) maintained the same calcium levels across the mentioned years.

Mg (Magnesium): A trend in magnesium concentration over time and across different sampling locations. The magnesium concentration was highest at sample station no. 6 in the year 2018 and then decreased in subsequent years at all locations; it suggests a general decline in magnesium levels. Changes in magnesium concentration may be influenced by factors such as geological processes, human activities, or natural

variations in the environment. Leena, T. K., et al., (2023). The range of concentration of Mg (Magnesium) is 0.97 mg/L to 133.67 mg/L. According to Bureau of Indian Standard the accepted limit of Mg (Magnesium) is 30mg/L. Magnesium concentration greater than 125 mg/L may have a laxative effect on some people, Scherer, T., & Dakota, N. (2019).

F (Fluoride): Fluoride is present in all types of natural water at various concentrations. The concentration of fluoride in drinking water is limited by solvency of the fluorite, so that it should be limited to 3.1 mg/L in the presence of 40 mg/L calcium, Nadikatla, S. K., et al., (2020). In the absence of calcium in solution that allows higher fixations to be stable (Singh and Hussian 2016). Groundwater samples collected in the study area the range of concentration of fluoride is 0.001 mg/L to 1.2 mg/L. Highest value of fluoride is 1.2 mg/L, According to BIS (2012) the accepted limit of Fluoride is 1.0mg/L and 1.5 mg/L is permissible limit for fluoride in drinking water, Nadikatla, S. K., et al., (2020). Concentration of fluoride is 0.7 to 1.2 mg/L in drinking water will protect against dental cavities. Scherer, T., & Dakota, N. (2019). However excessive levels (more than 1.5 mg/L) may cause discoloration or mottling of the teeth. Sample Station No 5 has a Highest concentration of F (Fluoride). It indicates a continuous increase in F concentration in the years 2018, and 2019. Sample Station No 20 has a Highest concentration of F (Fluoride) in the year 2018. Sample Station No 26 Highest concentrations of F (Fluoride) in the year 2019. Remaining Sampling Stations Have the lowest concentration of F

(Fluoride). A trend of increasing fluoride concentration over the two years, with specific sample stations (5, 20, and 26) experiencing the highest concentrations in different years. The other sampling stations show lower fluoride concentrations.

EC (Electrical Conductivity): Conductivity is a measure of the conductance of an electric current in water, Scherer, T., & Dakota, N. (2019). The ability of a solution to conduct an electrical current is governed by the migration of solutions and is dependent on the nature and numbers of the ionic species in that solution. This property is called electrical conductivity, Sharma, A., & Rout, C. (2011). It is a useful tool to assess the purity of water, Sharma, A., & Rout, C. (2011). The permissible limit for electrical conductivity (EC) is $300 \mu\text{S cm}^{-1}$, Sharma, A., & Rout, C. (2011). EC of the collected samples ranged from 44 to $1621 \mu\text{S cm}^{-1}$. The electrical conductivity (EC) levels at different sample stations over the years. Sampling data suggests that sample station no 6 had the highest recorded EC level in the year 2018, and other years also showed elevated concentrations at various locations, including stations 10, 12, 22, 23, and 27. On the other hand, some locations exhibited lower concentrations, such as sample stations 2, 4, 8, 9, 11, 13, 14, 16, 20, and 25.

pH (Potential of Hydrogen): Normal water has a pH value ranging between 6.5 - 7.5.

Ichwana, I., et.,al (2016). Sewage into the water can change the hydrogen ion concentration (pH) in the water becomes more acidic or more alkaline depending on the type of waste and chemical substances contained in them, Wardhana, W. A. (1995). For all the sampling stations pH is in the range of 6.8 to 8.4. According to Jadhav, S. D., & Jadhav, M. S. (2016), it is known that pH of water does not has direct effect on health. But lower value below 5.0 produce sore taste and has higher value above 8.5 and alkaline taste USEPA. (2005). Throughout all the sampling stations pH was observed which is well within the permissible limit of World Health Organization (WHO).

Water Quality Index:

Rating scale (Table: 3) was prepared for range of values of each parameter. The rating varies from 0 to 100 and is divided into five intervals. The rating >100 implies that the parameter present in water exceeds the standard maximum permissible limits and water is Unfit for consumption. On the other hand, 0-20 implies that the parameter present in water has the most desirable value and water quality is excellent. The other ratings fall in between 26-50, 51 – 75 and 76-100 standing for Good, Poor, and Very Poor respectively. This scale is modified version of rating scale given by Tiwari and Mishra (1985).

Table 3: Water Quality Index classification with water quality status and colour coding.

Water Quality Index	Water Quality Status
0-25	Excellent
26-50	Good
51-75	Poor
76-100	Very Poor
>100	Unfit for Consumption

Table 4: Water Quality Index rating with colour coding of various sites of Krishna River.

Sr. No	Sample Location	WQI With Colour Code 2018	WQI With Colour Code 2019
1.	Ajra	09.89	10.16
2.	Aslaj	09.32	12.36
3.	Cheye	13.67	12.29
4.	Gagan Bauda	10.64	14.12
5.	Gokul Shirgaon	115.33	112.84
6.	Halkarne	27.58	20.33
7.	Kagal	31.08	32.86
8.	Karve	9.85	14.06
9.	Khindivarvade-1	10.41	10.58
10.	Kini Wathar	27.79	29.22
11.	Kirve	15.71	12.36
12.	Murgud	13.87	12.31
13.	Naganwadi	09.26	10.01
14.	Nesari	08.74	09.34
15.	Paijarwadi	12.86	10.42
16.	Panhala	11.28	19.82
17.	Pargaon -1	26.03	35.85
18.	Pimpalgaon	12.48	12.66
19.	Radhanagari	15.70	19.67
20.	Shelarwadi	75.79	11.53
21.	Shelewadi	21.78	14.19
22.	Shiradwad	19.90	20.59
23.	Shiroli	22.07	16.50
24.	Surupali	19.07	11.79
25.	Surute	10.21	15.05
26.	Undri	11.89	69.73
27.	Wadicharan-1	16.84	22.35
28.	Washi	23.39	17.25

According to Brown's method Water Quality Index, Year 2018 and 2019. According to browns method calculated water quality index of Krishna River basin in Kolhapur district the water quality at

sample station no.5 has continues decreasing in all two year 2018 and 2019, this station water has a unfit for consumption in year 2018 and 2019.

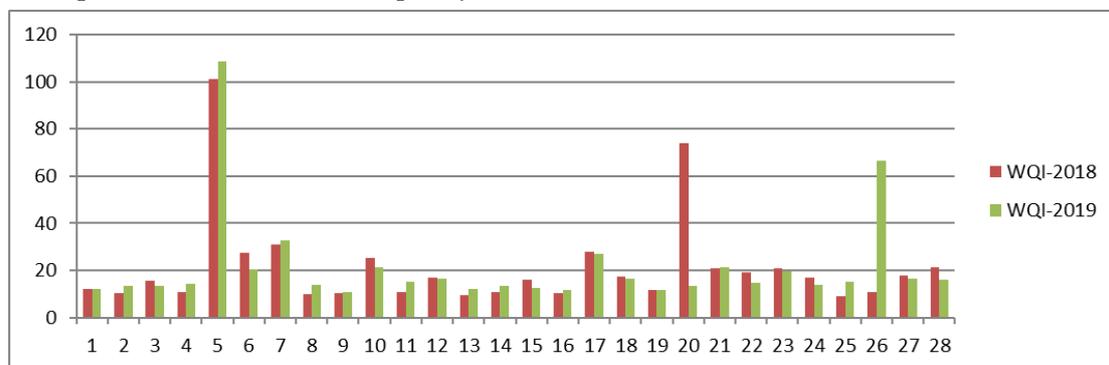


Figure 2: Water quality status (Year-2018 and Year-2019)

Sample station no.20 have a very poor water quality in year 2018. Sample station no.26 has a very poor water quality in year 2019, and remaining sampling station have a fluctuating water quality in every two years. But only sample station no. 5 has an alarming a water is much polluted than other sample station.

Correlation Analysis 2018:

A correlation matrix was prepared to determine the relationships between different parameters (Kharake& Raut, 2021). The highest and most positive correlations

are indicated in highest value. The highest correlation was observed between the TH (Total Hardness) and EC (Electrical Conductivity) (0.98). There is also a positive correlation between EC (Electrical Conductivity) and HCO₃ (Bicarbonate) (0.95). The F (Fluoride) and SO₄ (Sulphate) parameters exhibited a negative relationship (-0.17), in Table 1. Some parameters had a neutral or null correlation between the F (Fluoride) and Cl (Chloride) (0.02), F (Fluoride) and Na (Sodium) (0.09) as indicated in Table 1.

Table 5: Correlation Matrix Analysis 2018

	Cl (Chloride)	Ca (Calcium)	Mg (Magnesium)	F (Fluoride)	EC (Electrical Conductivity)	pH (Potential of Hydrogen)
Cl (Chloride)	1					
Ca (Calcium)	0.57	1				
Mg (Magnesium)	0.78	0.35	1			
F (Fluoride)	0.02	0.20	0.13	1		
EC (Electrical Conductivity)	0.84	0.63	0.92	0.16	1	
pH (Potential of Hydrogen)	0.32	0.33	0.42	0.27	0.40	1

Correlation Analysis 2019:

A correlation matrix was prepared to determine the relationships between different parameters (Kharake & Raut, 2021). The highest and most positive correlations are indicated in highest value. The highest correlation was observed between the TH (Total Hardness) and EC (Electrical Conductivity) (0.95). There is also a positive correlation between TH

(Total Hardness) and HCO₃ Bicarbonate (0.94). The pH (potential of hydrogen) and Ca (Calcium) parameters exhibited a negative relationship (-0.23). Some parameters had a neutral or null correlation between the pH (potential of hydrogen) and Na (Sodium) (0.01), pH (potential of hydrogen) and Mg Magnesium (0.01) as indicated in Table 1.

Table 6: Correlation Matrix Analysis 2019

	Cl (Chloride)	Ca (Calcium)	Mg (Magnesium)	F (Fluoride)	EC (Electrical Conductivity)	pH (Potential of Hydrogen)
Cl (Chloride)	1					
Ca (Calcium)	0.75	1				
Mg (Magnesium)	0.82	0.62	1			
F (Fluoride)	0.21	0.28	0.08	1		
EC (Electrical Conductivity)	0.91	0.82	0.89	0.23	1	
pH (Potential of Hydrogen)	0.08	-0.23	0.01	-0.03	-0.07	1

The degree of linear correlation between any two parameters of water quality is measured by a simple correlation coefficient (R^2). In the present analysis, the following classifications were used: perfectly correlated ($R^2=1$), very strongly correlated ($\pm 0.9 \leq R^2 \leq 1$), strongly correlated ($\pm 0.7 \leq R^2 < \pm 0.9$), moderately correlated ($\pm 0.5 \leq R^2 < \pm 0.7$), and ($R^2 < \pm 0.5$) as poorly correlated (Sojobi,2016), Nadikatla, S. K.,et.,al., (2020).

Water Quality:

Year 2018: The water quality in the Krishna River in Kolhapur district for the year 2018. It seems that different sampling locations have been categorized into various water quality levels. According to Brown's method water quality meets the standards sampling locations. Excellent (Locations 1, 2, 3, 4, 8, 9, 11, 12, 13, 14, 15, 16, 18, 19, 21, 22, 23, 24, 25, 26, 27): These locations exhibit the highest water quality. Good (Locations 6, 7, 10, 17, 28): Water quality at these locations is considered good, although not as high as the excellent category. Poor (Location 20): This location has poor water quality. Very

Poor: There are no locations with very poor water quality. Unfit for Consumption (Location 5): Water quality at this location is deemed unfit for consumption, suggesting a serious concern.

Year 2019: The water quality assessment using Brown's method in 2019 for the Krishna River in Kolhapur district yielded positive results overall. Excellent: Water quality at sampling locations: 1, 2, 3, 4, 6, 8, 9, 11, 12, 13, 14, 15, 16, 18, 19, 21, 22, 23, 24, 25, and 27 was classified as excellent. This suggests that the water at these locations met or exceeded the standards set by Brown's method. Good: Water quality at sampling locations 7, 10, and 17 was classified as good. Although not excellent, it indicates that the water at these locations still meets the standards and is of satisfactory quality. Poor: Water quality at sampling location 26 was classified as poor. This may indicate that the water at this location did not meet the standards as per Brown's method. Very Poor: It is mentioned that there is no sampling location with very poor water quality. This is a positive aspect as very poor water quality could indicate

severe contamination. Unfit for Consumption: Water quality at sampling location 5 was classified as unfit for consumption. This is a serious concern as it suggests that the water at this location may be contaminated to a level that makes it unsafe for human consumption. It is important to note that this assessment provides valuable information about the

water quality in different areas along the Krishna River in Kolhapur district. Addressing any issues related to poor or unfit water quality is crucial for the well-being of the local population and the ecosystem. Regular monitoring and appropriate measures may be required to maintain or improve the water quality in the region.

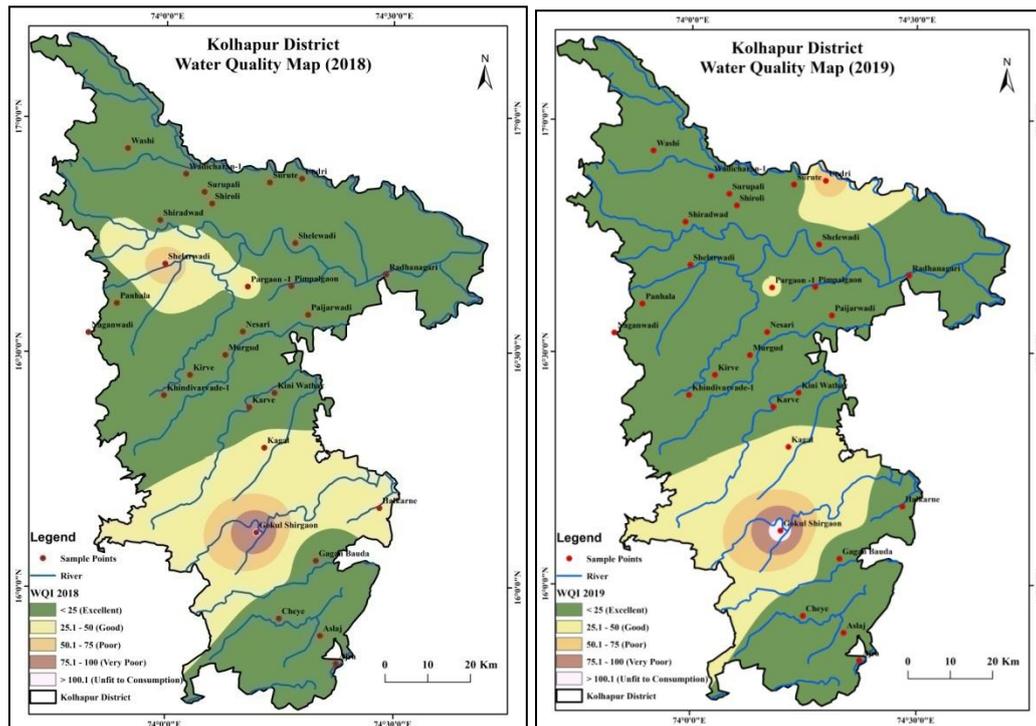


Figure 3 Kolhapur District Water Quality Map year 2018 and 2019.

(Source: created by researcher)

Conclusion:

The findings reveal both encouraging aspects and areas of concern. While most of the locations consistently maintain Excellent and Good classifications, localized issues demand targeted interventions. The absence of Very Poor categorizations in all two years is a positive trend, reflecting the effectiveness of implemented measures. The study's correlation with international and national standards, particularly surpassing WHO, BIS

and EPA benchmark, reaffirms the high standard of cleanliness and safety for human consumption in the Krishna River basin.

Over the two-year period spanning 2018 and 2019, the water quality index based on Brown's method reveals dynamic patterns in the Krishna River within the Kolhapur district. In 2018 and 2019, paint a more nuanced picture. While several locations consistently maintained their Excellent and Good classifications, variations emerged, highlighting the

dynamic nature of water quality. In 2018, the emergence of a location with Poor water quality and another deemed Unfit for Consumption signals localized concerns, demanding attention, and remedial measures. Despite this, the absence of Very Poor categorizations remains a positive aspect. In 2019, the overall trend leans towards positive outcomes, with most of the locations retaining Excellent and Good classifications. Nevertheless, the identification of a location with Poor water quality and another marked as Unfit for Consumption underscores the need for continued vigilance and targeted interventions.

These two years of water quality assessments underscore the importance of ongoing monitoring and proactive management. The dynamic nature of water quality in the Krishna River emphasizes the need for adaptability in environmental policies and practices. The positive strides made in certain areas demonstrate the efficacy of implemented measures, while the localized concerns necessitate a focused and responsive approach.

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