North Asian International Research Journal of Social Science & Humanities

ISSN: 2454-9827 Vol. 8, Issue-8 August -2022

IRJIF I.F. : 3.015

Index Copernicus Value: 57.07 Indian Citation Index Thomson Reuters ID: S-8304-2016

NAIRJC A Peer Reviewed Refereed Journal

DOI: 10.5947/2454-9827/nairjc/00009.48

ANALYSIS OF KRISHNA RIVER WATER POLLUTION

[1]PROF. (DR.) P. S. KAMBLE & [2]MR. AMOL CHANDRAKANT KAMBLE

[1] Professor, Department of Economics, Shivaji University Kolhapur.
[2]Research Scholar Department of Economics, Shivaji University Kolhapur.

ABSTRACT

An important aspect of water resources that has not been given due attention is its quality aspect. While rapid industrialization in developing countries has contributed to economic growth, economic well-being has suffered greatly in terms of agricultural activity, human health and the impact on the environment. Largely by air and water pollution. Basically water pollution is a serious challenge because it affects a large number of economic activities. The problem of water pollution is more important in the context of an agrarian economy like India. Although the scale of the problem is limited and widespread, the damage caused by its effects is enormous. This is mainly due to the direct impact on human health and livelihood.

KEYWORDS: - Water, Atmosphere, Environment, Pollution, Climate, Hydrosphere Krishna River.

Citation: Kamble P. S. & Chandrakant Amol (2022) Analysis of Krishna River Water Pollution Vol.8, Issue 8. North Asian International Research Journal of Social Science & Humanities ISSN: 2454-9827

INTRODUCTION

Earth is the only known planet for sustain life. The atmosphere, the hydrosphere and the lithosphere are made up of these elements and play an important role in sustaining life on Earth. In the process of evolution, various living things appeared on the earth. From the very beginning man has been closely associated with the environment for his basic needs. Environmental resources were subject to various values such as utilitarian, cultural, ethical, Beauty, medicine etc. Human beings and nature have been interconnected since time immemorial. This relationship between humans and the environment has changed dramatically in the last 10,000 years. As human culture changes from hunter-gatherer to agricultural to urbanization to industrial, the effects on the environment became clear.

In modern society, especially after industrialization and during the agrarian revolution, great changes took place in the environment. This results in the depletion of natural resources; Deforestation; Increasing industrialization; Air, water and soil pollution; Intensive farming practices using excessive use of chemical pesticides and fertilizers; Increasing urbanization; Ozone depletion; Increasing desertification; Global warming; Climate change; Etc., are a point of concern worldwide. Water has always been an indispensable part of human life; And Rivers have played a vital and sustainable role in human society for thousands of years. Thus many great cities of the world are found on the banks of a great river. The modern world needs plenty of water for various purposes like domestic use, washing, processing, industry, agriculture, power generation, etc. Excessive use of water is causing large amount of wastewater and sewage. Most of this effluent is discharged directly or indirectly into rivers which degrades the quality of river water and further creates serious problem of river pollution.

According to the World Health Organization (WHO) about 1 billion People do not have access to safe drinking water; Diarrhea kills about 2 million people every year. These deaths are due to unsafe drinking water, and unsanitary conditions.

KRISHNA RIVER

The Krishna River originates in Mahabaleshwar and covers an area of 258,948 sq km which is about 8% of the total geographical area of the country (CPCB, 2019). It is located in the states of Karnataka (113,271 km2), Andhra Pradesh (76,252 km2) and Maharashtra (69,425 km2). The details of the basin are as in following table.

Basin Extent	
Longitude	73° 17’ to 81° 9’ E
Latitude	13° 10’ to 19° 22’ N
Length of Krishna River (Km) 1400	1400
Catchment Area (Sq.km.)	258948
Average Water Resource Potential(MCM)	78120
Utilizable Surface Water Resource (MCM)	58000
Live Storage Capacity of Completed Projects (MCM)	50117.00
Live Storage Capacity of Projects Under Construction (MCM)	4287.00
Total Live Storage Capacity of Projects (MCM)	54404.00

Source: - Comprehensive Study Report on Krishna River Stretch (2014)

REVIEW OF RESEARCH LITRATURE

Dr. Niloufer Shaheda et al. (2020) in their article“A Study on Water Quality Chanllenges in River Krishna Due To Interlinking of Krishna and Godavari Rivers” The present investigation on the water quality status prevailing in the river Krishna revealed that the parameters analyzed were within the permissible limits of Indian standards. an important finding from the present study is that quality Water samples collected from Krishna River before interlinking were found to be

better compared to water quality of Krishna River after interlinking with Godavari River. This project recommends a detailed and timely water quality analysis to understand the upcoming challenges in the Krishna River.

Wagh C.H and Kamat R.S (2014) in their research article "Study of Waste Water Characteristics and its pollution for the stretch of Krishna River from Sangli to Haripur" the present study is an attempt to study the wasted water characteristics and analysis of Krishna river stretch from sangli to haripur. Due to the increasing population, the sewage systems as well as the treatment facilities provided by the municipal authorities is becoming inadequate. The existing sewerage system has only 40-50% of the requirement. Effluent from the open sewage area mixes with the natural drains, which flows into the Krishna river, resulting in increased water pollution and public health impacts.

Ray P. (1981), in his article; "Increasing Human Encroachment on the Hooghly River" studied the impact of human and industrial activities on the environment. The environment of the river has been changed due to heavy sedimentation during monsoon season, high amount of suspensoids in the water throughout the year and discharge of industrial, domestic and municipal sewage. The study also mentions the need for environmental impact assessment (EIA) of thermal plants on the estuarine system.

Sharma Y. (1997), in his study "The Ganga River" has analyzed how the holy river gets polluted and how the Ganga Action Plan has helped in solving the pollution problem. He tried to bring forward two factors through his research. The first factor is - Deforestation and urbanization and its consequent contribution to increased pollution. And another factor is -deforestation has led to top soil erosion and increased silt deposits that increase river beds, flood during monsoons and stop flow during dry seasons.

Gaikwad S.S. et al (2016), in their study "Surface water quality of the river Krishna, sangli district, Maharashtra, India" The present investigation was carried out to assess the water quality of Krishna river in Sangli Maharashtra, India. Different physico-chemical parameters were monitored periodically during the assessment period to indicate the level of contamination in the study area. Seasonal variations in the assessed physico-chemical parameters are the result of environmental factors and Anthropogenic input. So, to avoid Periodic monitoring of river water is required for further contamination.

RESEARCH GAP

The foregoing review of some of the research studies reveals that, yes there are some research studies relating to the present topic of the research, i.e. water pollution. But all research studies reviewed above are concerning the identification of the quality of the water by water testing and taking into account its various aspects and

parameters. All these research studies are especially in the subject Environmental science. We did not find a single study in Economics in general and Economics of Environment in particular. there is an urgent need to study water pollution in Economics perspective, more importantly Economics of Environment analysis of Krishna river water pollution in different water stations and different water quality parametric analysis is a very important broader and comprehensive missing area in the above review of research literature; hence it is taken up in the present research study.

RESEARCH METHODOLOGY

Today there is one major problem being faced from the whole world to the small village and it is none other than the problem of 'water'. In the 1950s the world was faced with the problem of how to produce grain and a growing population. Then came the fuel problem in the 1960s-70s. And now days the problem of water scarcity and water contamination has become a major problem. The researcher will use only secondary data for the present analytical and descriptive research study. Secondary data has collected mainly from various reference books, reputed journals and other government websites and reports like Central Ground Water Board.

OBJECTIVES OF THE STUDY

1) To study the Current Status Krishna River water pollution
2) To make an agro- biological assessment of river water quality.

RESULTS AND DISSCUSION

The following table provides monthly water quality status for 2017 and 2018 at nine NWMP locations for various parameters such as pH, DO, BOD, FC and TC Krishna river water quality is assessed at 9 places. It has been found that the range of dissolved oxygen ranges between 2.5 - 7.4 mg / 1 for three years (2016-2018) which does not meet the minimum limit of 4 mg / l. Biochemical oxygen demand (BOD) varies between 2.0-14.0 mg / 1 for the same years, which is higher than the desired level of 3 mg / 1. Chemical oxygen demand (COD) values are between 4.0-44.0 mg / l indicating moderate levels of industrial pollution. Fecal and total coliform numbers for the reference years are in the range of 2-45 MPN / 100ml and 5-1800 MPN / 100ml, respectively, indicating significant contribution of untreated waste water (CPCB, 2019). The details of parameter specific concentration are provided in table 2

Table No.1: Water Quality of Krishna River at Krishna Bridge, (Krishna River at NH-4 Bridge) Karad, District- Satara.

Month	Year	pH	DO (mg/L)	BOD (mg/L)	FC MPN /100ml	TC MPN /100ml
CPCB Norms		6.5-8.5	6mg/l or more	5 days 20°C 2mg/l or less	< 2500 MPN/ 100 mL	MPN/100ml shall be 5000 or less
January	2017	8.4	5.5	7	5	13
	2018	8.2	6	3.8	250	1600
February	2017	7.4	5.8	5.5	25	550
	2018	8.3	6.2	3.8	110	900
March	2017	7.5	5.4	6	4	30
	2018	8.1	5.8	4	80	550
April	2017	7.4	5.2	7	11	70
	2018	7.9	6.1	3.8	195	1600
May	2017	8	5.5	6	8	28
	2018	8.42	6	3.4	225	900
June	2017	7.8	5.3	7	120	900
	2018	8.1	5.9	8	170	1600
July	2017	7.8	6.5	4.2	35	550
	2018	7.7	4.4	7.5		120
August	2017	8.3	6.3	5.8	140	900
	2018	7.6	5.7	3.6	110	900
September	2017	8	5.1	4.8	250	1600
	2018	7.8	6.6	4.4	250	1600
October	2017	8.2	6.1	4.4	110	550
	2018	7.8	6.1	3.4	95	900
November	2017	8.3	5.7	4.2	110	550
	2018	8	3.8	3	195	1800+
December	2017	8.2	5.2	5.4	225	900
	2018	7.7	3.8	4.2	225	1800+
Average		7.955	5.58333	5.00833	128.174	786.864
S.D		0.30771	0.73878	1.46523	86.9612	551.287
C.V		3.86816	13.2319	29.2557	67.8462	70.0613

Source: -Report On Action Plan For Clean-Up Of Polluted Stretch Of Krishna River June, 2019.

The above table No.1 provides monthly water quality status for 2017 and 2018 at Krishna Bridge, (Krishna River at NH-4 Bridge) Karad, District- Satara. NWMP locations for various parameters such as pH, DO, BOD, Focal coliform and Total coliform Krishna river water quality is assessed at the above place. calculation of average rate of PH variation value is 7.955 is in above range compare to CPCB norms it is an good position. Dissolved Oxygen average is not in critical range it is 0.307712 and the coefficient of variation range is 3.868164. the dissolved oxygen average is calculate it is not increase as compare to Cpcb Norms it is 5.583333 not in critical stage and also the SD range is 0.326349 and the calculation of C.V range is not so complicating or Worrying position it is 4.802191 the BOD level and its average range is 5.008333 and S.D range is 1.465225 not in adverse position and C.V range is also 29.25574 is not in position of wary compare to CPCB norms is concern. lastly the average growth of focal and total coliform 128.1739 and 786.8636 which does not meet the maximum range. S.D range of Focal Coliform is in stable from 86.96115 and the variation of focal colifrom is also in a stable position. Lastly the standard deviation of total colifrom is 551.2867 which is not a very huge variation position with compare to the cpcb norms and the coefficient of variation rate is 70.06127 in that above locality there is a little /meager variation will be founded.

Table No.2: Water Quality of Krishna River at Maighat, Village- Gawaligally, Taluka- Miraj, District-Sangli.

Month	Year	pH	DO mg/L)	BOD (mg/L)	FC MPN /100ml	TC MPN /100ml
CPCB Norms		**6.5-8.5**	**6mg/l or more**	**5 days 20°C 2mg/l or less**	**< 2500 MPN/ 100 mL**	**MPN/100ml shall be 5000 or less**
January	2017	7.1	6.8	2.00		
	2018	7.1	6.9	2.2	5.0	70.0
February	2017	7.3	7.1	2.00		
	2018	8.1	6.3	2.8		
March	2017	7.4	5.8	2.80	17.0	150.0
	2018	7.8	6.8	2.4		
April	2017	7.9	6.5	2.6		
	2018	7.2	6.8	2.4	11.0	63.0
May	2017	7.6	6.8	2.2		
	2018	6.9	6.8	2.4		
June	2017	7.6	6.7	2.6	5.0	46.0
	2018	8.1	6.9	2.2		
July	2017	6.8	6.9	2.4		

	2018	7.4	7.0	2.0	4.0	34.0
August	2017	7.3	7.0	2.0		
	2018	7.9	7.1	2.0		
September	2017	7.7	6.9	2.2	5.0	23.0
	2018	7.6	6.1	2.2	17.0	120.0
October	2017	7.2	7.0	2.0		4.5
	2018	7.6	7.1	2.0		58.0
November	2017	7.4	6.9	2.2	21.0	33.0
	2018	7.3	6.8	2.0	7.8	49.0
December	2017	7.5	6.9	2.2	23.0	21.0
	2018	7.6	7.2	2.0	6.1	120.0
Average		7.475	6.795833	2.241667	11.08182	60.88462
S.D		0.342941	0.326349	0.256933	7.121632	43.87015
C.V		4.587843	4.802191	11.46169	64.26411	72.05457

Source: -Report On Action Plan For Clean-Up Of Polluted Stretch Of Krishna River June, 2019

The above table No.2 provides monthly water quality status for year 2017 and 2018 at Maighat, Village-Gawaligally, Taluka- Miraj,District-Sangli. The calculation of average of PH value is 7.475 with compare to CPCB norms there are in good position and the standard deviation value is 0.342941 and also calculating coefficient of variation is not showing high variation. in that particular location Dissolved Oxyzon, BOD, those parameters is not showing huge variation and there are no contamination of water will be found . but the focal and total coliform will showing difference in there numbers for the reference years are in the range of 2-45 MPN / 100ml and 5-1800 MPN / 100ml, respectively, indicating significant contribution of untreated waste water. The details of parameters specific concentration are provided but they do not comply with bathing standards of 3mg / l.

Table No.3: KrishnaRiveratRajapurWeir,Village-Rajapur,Taluka- Shirol,District-Kolhapur.

Month	**Year**	**pH**	**DO (mg/L)**	**BOD (mg/L)**	**FC MPN /100ml**	**TC MPN /100ml**
CPCB Norms		**6.5-8.5**	**6mg/l or more**	**5 days 20°C 2mg/l or less**	**< 2500 MPN/ 100 mL**	**MPN/100ml shall be 5000 or less**
January	2017	7.1	8.30	2.00		
	2018	7.2	6.5	2.6	9	170
February	2017	7.60	6.9	2.20		
	2018	7.5	5.9	2.8		
March	2017	7.80	4.8	3.40	11	120

	2018	7.8	7.0	2.0		
April	2017	7.7	6.5	2.8		
	2018	7.4	6.8	2.4	11	110
May	2017	7.7	6.9	2.0		
	2018	6.6	6.9	2.2		
June	2017	8.2	6.4	3.0	13	94
	2018	8.1	5.2	3.0		
July	2017	6.9	6.7	2.6		
	2018	6.9	7.0	2.0	8	120
August	2017	7.4	7.0	2.0		
	2018	7.3	6.5	2.4		
September	2017	7.5	6.8	2.2	17	120
	2018	7.6	6.2	2.4	21	140
October	2017	7.8	6.9	2.4		
	2018	7.9	7.0	2.0		
November	2017	8.2	7.0	2.0	79	350
	2018	7.4	6.5	2.0	4	79
December	2017	7.2	6.7	2.6	63	150
	2018	6.9	7.1	2.0	8	84
Average		7.4875	6.645833	2.375	22.18182	139.7273
S.D		0.425607	0.668535	0.401356	24.82667	74.9481
C.V		5.684234	10.05945	16.89922	111.9235	53.63885

Source: -Report On Action Plan For Clean-Up Of Polluted Stretch Of Krishna River June, 2019.

The above table No.3 showing monthly water quality status at Rajapur Weir, Village- Rajapur, Taluka- Shirol, District- Kolhapur. The Focal coliform , and Total. Coliform and there average value is 22.18182 there standerd deviation value is 24.82667 and the value of Coefficient of Variation will be 111.9235 are showing Huge variation. on the other hand the water quality parameters just like PH, DO, and BOD are not in position to show high variation. but the focal and total coliform variation is adversely impacted the quality of water of that particular place compare to CPCB Norms and there is also showing significant contribution of untreated waste water are contaminate the water source will found at the above mention place.

Table No.4: Krishna River at Kurundwad near Santaji Ghorpade Ghat, Village-Narshingwadi,Kurundwad,District-Kolhapur.

Month	Year	pH	DO (mg/L)	BOD (mg/L)	FC MPN /100ml	TC MPN /100ml
CPCB Norms		6.5-8.5	6mg/l or more	5 days 20°C 2mg/l or less	< 2500 MPN/ 100 mL	MPN/100ml shall be 5000 or less
January	2017	6.9	8.10	2.20		
	2018	7.5	6.8	2.4	8	130
February	2017	7.80	6.8	2.40		
	2018	7.9	7	2.2		
March	2017	7.90	5.6	3.20	21	150
	2018	7.6	6.9	2.2		
April	2017	7.7	6.3	2.8		
	2018	7.2	6.9	2.2	13	240
May	2017	7.4	6.8	2.2		
	2018	6.7	6.7	2.4		
June	2017	8.3	6.3	3.2	14	150
	2018	7.9	6.2	2.6		
July	2017	6.8	6.8	2.4		
	2018	6.9	5.8	3.2	7	63
August	2017	7.5	6.9	2.4		
	2018	7.1	7	2		
September	2017	7.8	6.7	2.4	22	130
	2018	7.5	6	2.4	17	110
October	2017	7.5	6.5	2.8		
	2018	7.8	6.3	2.4		
November	2017	8.1	6.8	2.4	46	170
	2018	7.7	7	1.8	6.1	84
December	2017	7.8	6.8	2.4	17	70
	2018	7.2	6.2	2.2	6	63
Average		7.520833	6.633333	2.45	16.1	123.6364
S.D		0.423217	0.50361	0.359952	11.48434	53.98939
C.V		5.627257	7.592113	14.69191	71.33129	43.66789

Source: -Report On Action Plan For Clean-Up Of Polluted Stretch Of Krishna River June, 2019.

The above tableNo.4 showing monthly water quality status at Kurundwad near Santaji Ghorpade Ghat , Village-Narshingwadi, Kurundwad, District- Kolhapur for the year 2017-2018. there are some kind of variation is found at that purticulare location in fecal and total colifrom and also significant contribution of untreated waste water will adversely impacted the quality of water in that particulare place with above mentioned location PH, DO,

BOD those parameters is in butter position is found and there is no huge water contamination and little water quality parameters variation will be founding at that particular place.

Table No.5: Krishna River at Walwa, D/s of Islampur near Vithal Temple, Village- Walwa, District-Sangli.

Month	Year	pH	DO (mg/L)	BOD (mg/L)	FC MPN /100ml	TC MPN /100ml
CPCB Norms		6.5-8.5	6mg/l or more	5 days 20°C 2mg/l or less	< 2500 MPN/ 100 mL	MPN/100ml shall be 5000 or less
January	2017	7.1	7.2	2		
	2018	7.2	7	2	7	84
February	2017	7.5	6.8	2.40		
	2018	8.0	6.8	2.4		
March	2017	7.7	5.9	2.60	70	220
	2018	7.9	6.7	2.6		
April	2017	8	6.3	3		
	2018	7.4	6.9	2.2	11	84
May	2017	7.4	6.7	2.4		
	2018	6.8	6.8	2.4		
June	2017	7.7	6.8	2.4	20	170
	2018	7.6	6.5	2.2		
July	2017	6.9	7.1	2		
	2018	7.5	7.2	2	13	58
August	2017	7.6	6.9	2.2		
	2018	7.8	7.1	2		
September	2017	7.8	6.7	2.4	8	17
	2018	7.8	6.2	2.2	21	150
October	2017	7.3	6.7	2.2		7
	2018	7.7	7.0	2		70
November	2017	7.6	6.8	2.2	17	49
	2018	7.8	6.5	2	11	58
December	2017	7.3	6.8	2.4	17	25
	2018	7.7	6.2	2	7	110
Average		7.545833	6.733333	2.258333	18.36364	84.76923
S.D		0.320298	0.32925	0.253526	17.83969	62.97374
C.V		4.244695	4.889857	11.22624	97.14683	74.28844

Source: -Report On Action Plan For Clean-Up Of Polluted Stretch Of Krishna River June, 2019.

The above particular table No.5 showing the information about water quality and water quality parametric variation of Krishna River at Walwa, D/s of Islampur near Vithal Temple, Village- Walwa, District- Sangli. the above mention location provide the monthly data of year of water quality status for 2017 and 2018 and we will calculate the average value of focal colifrom that was 18.36364 and total colifrom average value is 84.76923 and also got result of Focal. Colifrom and standard deviation will be 17.83969 and the coefficient of variation value is 97.14683 there are meager variation will be found with compare to Total Colifrom and there average value is 84.76923, Standard deviation is 62.97374 , coefficient variation 74.28844 there are little bit variation will found in those two F.C and T.C water quality parameters and the most important thing is that the other water quality parameters just like PH, DO, BOD are in good form but they do not comply with bathing standards of 3mg / l..

Table No.6: Krishna Riverat Kshetra Mahuli, Village-Kshetra-Mahuli, District -Satara.

Month	Year	pH	DO (mg/L)	BOD (mg/L)	FC MPN /100ml	TC MPN /100ml
CPCB Norms		**6.5-8.5**	**6mg/l or more**	**5 days 20°C 2mg/l or less**	**< 2500 MPN/ 100 mL**	**MPN/100ml shall be 5000 or less**
January	2017	8.7	5.0	6.5		
	2018	7.8	5.2	6	200	900
February	2017	8	5.6	5.5	13	140
	2018	8.2	5.4	5.6	250	1600
March	2017	8.3	5.6	6.0	17	170
	2018	8.1	5.6	4.6	200	1600
April	2017	7.8	5.5	6.5		
	2018	8.4	5.7	4.6	170	900
May	2017	8.6	5.3	7	50	250
	2018	8.42	5.6	4.4	130	900
June	2017	8.5	5.5	6	170	900
	2018	8.4	5.8	6.2	195	1600
July	2017	7.8	5.2	6.4	225	1600
	2018	8.0	5.5	5.0		140
August	2017	8.2	6.0	6.8	195	900
	2018	8.1	4.1	4.2	120	1600
September	2017	8.4	6.8	2.2	250	1600
	2018	8.1	5.7	3.8	35	1800+
October	2017	8.2	5.7	5	225	1600
	2018	8.2	6.4	3.5	225	1600
November	2017	8.6	5.3	2.5	195	900

	2018	7.9	4.4	3	140	1600
December	2017	8.2	5.0	6.8	140	900
	2018	8.1	4.6	3.5	195	1600
Average		8.209167	5.4375	5.066667	159.0476	1095.238
S.D		0.257613	0.576958	1.433047	74.24249	557.2308
C.V		3.138115	10.61072	28.28382	46.67941	50.8776

Source: -Report On Action Plan For Clean-Up Of Polluted Stretch Of Krishna River June, 2019.

The above table No.6 showing the information about the locality of Krishna River at Kshetra Mahuli, Village- Kshetra - Mahuli, District - Satara. in that partculare place we calculate the average value as well as standard deviation ,and coefficient of variation of all water quality parameters and got results of that particular water quality parameters of that particular above mention locality .There are increasing trends in PH average value will be found there value is 8.209167 and the variation will be found in all water quality parameters just like PH, DO, BOD, F.C, T.C so the Dissolved oxygen level is comparing to CPCB norms they are in good average position but the Focal coliform variation is high and there Standard Deviation value and average value is also good and there coefficient of variation is little bit low as compared to CPCB norms.

Table No.7: Krishna Riverat Krishna- Venna Sangam Mahuli, Village- Mahuli, District- Satara.

Month	Year	pH	DO (mg/L)	BOD (mg/L)	FC MPN /100ml	TC MPN /100ml
CPCB Norms		**6.5-8.5**	**6mg/l or more**	**5 days 20°C 2mg/l or less**	**< 2500 MPN/ 100 mL**	**MPN/100ml shall be 5000 or less**
January	2017	8.4	5.30	7.5		
	2018	8.2	6.1	3.8	225	1600
February	2017	7.9	5.70	6.5	35.0	275
	2018	8.2	6.1	4.4	170	900
March	2017	7.9	5.40	7	9.0	50
	2018	8.4	5.5	4.6	170	900
April	2017	7.6	5.70	6.5		
	2018	8.2	5.7	4.6	195	900
May	2017	8.4	3.90	9.5	70	225
	2018	8.19	5.3	4.6	110	900
June	2017	8.4	5.50	6.5	140	550
	2018	8.4	5.5	7.5	140	900
July	2017	7.9	6.20	5.6	200	1600
	2018	7.7	4.9	5.5		130
August	2017	8.2	6.4	6.6	200	1600
	2018	8.1	4.2	4.6	110	900

September	2017	7.8	4.8	6.2	150	1800
	2018	8.0	5.4	6.2	350	1800+
October	2017	8.2	5.8	4.8	250	1600
	2018	8.0	6.8	2.8	95	900
November	2017	8.6	5.0	4.8	220	1600
	2018	8.0	4.1	3.6	130	1800+
December	2017	7.3	5.1	6.6	170	900
	2018	8.1	4.1	3.5	170	900
Average		8.087083	5.354167	5.575	157.5714	956.5
S.D		0.298117	0.75006	1.556822	75.59006	537.0634
C.V		3.686335	14.00891	27.92506	47.97193	56.14881

Source: -Report On Action Plan For Clean-Up Of Polluted Stretch Of Krishna River June, 2019.

The above table No.7 provides monthly water quality status of Krishna River at Krishna- Venna Sangam Mahuli , Village- Mahuli, District- Satara. The water Quality status for year 2017- 2018 Showing water quality fluctuation and its effects on water quality of that particular place. calculating the average of water quality parameter just like PH value there are huge variation will be founding because of result is getting the PH value of that particular locality crossing the limit of CPCB norms (6.5-8.5) calculating the average value it is 8.087083 above range of CPCB Norms and it is adversely impacting the health of water q buality as well as natural environment and also the other water quality parameters just like DO., BOD., FC.,TC., there is little bit variation is found of that particular above mentioned place is there.

Table No.8: Krishna Riverat Wai,Village-Wai,Taluka- Wai,District- Satara.

Month	**Year**	**pH**	**DO (mg/L)**	**BOD (mg/L)**	**FC MPN /100ml**	**TC MPN /100ml**
CPCB Norms		**6.5-8.5**	**6mg/l or more**	**5 days 20°C 2mg/l or less**	**< 2500 MPN/ 100 mL**	**MPN/100ml shall be 5000 or less**
January	2017	8.6	4.60	6	8	20
	2018	8.1	5.4	5.6	170	900
February	2017	7.6	6.00	5	20	95
	2018	8.3	6.3	5.2	170	900
March	2017	7.8	5.20	6.5	5	14
	2018	8.3	5.9	4.4	195	900
April	2017	7.4	5.00	7.5	35	140
	2018	8.4	5.8	4.4	195	1600
May	2017	8.2	5.10	6.0	50	250
	2018	8.26	5.4	4.8	120	900
June	2017	7.8	5.60	6.0	195	900

	2018	7.8	5.7	7.5	110	900
July	2017	7.9	6.20	3.6	110	900
	2018	7.8	4.8	6.5		115
August	2017	8.4	6.0	6.8	95	900
	2018	7.8	4.7	3.6	110	900
September	2017	7.6	4.9	6.4	110	900
	2018	8.1	6.4	3.2	200	1800+
October	2017	8.0	5.9	5.0	110	900
	2018	8.1	3.6	5.5	170	900
November	2017	8.5	5.2	5.8	170	900
	2018	7.1	4.7	3.0	200	1600
December	2017	7.9	5.2	5.8	195	1600
	2018	7.8	4.6	3.5	120	900
Average		7.981667	5.341667	5.316667	124.4783	784.087
S.D		0.360527	0.67109	1.30039	65.31662	476.0024
C.V		4.516939	12.56331	24.45875	52.47231	60.70786

Source: -Report On Action Plan For Clean-Up Of Polluted Stretch Of Krishna River June, 2019.

The above table No.8 provides monthly information about water Quality status at Wai, Village- Wai, Taluka-Wai, District- Satara.in year 2017-2018. The above mentioned locality /place will provide information about water quality parameters and there variations. the water quality parameters are namely PH,DO,BOD,Focal Coliform and total coliform. As compare to CPCB water Quality norms of PH value (6.5-8.5) monthly variation are found they are adversely impactful for water health and natural calamities (heath problems of human being) as well. As per the study of that particular locality there are increasing trends or fluctuation is in the level of PH value and there other parametric values (WHO, 1993).

Table No.9: KrishnaRiveratDhomDam, Village-Wai, Taluka-Mahabaleshwar, District-Satara.

Month	Year	pH	DO (mg/L)	BOD (mg/L)	FC MPN /100ml	TC MPN /100ml
CPCB Norms		**6.5-8.5**	**6mg/l or more**	**5 days 20°C 2mg/l or less**	**< 2500 MPN/ 100 mL**	**MPN/100ml shall be 5000 or less**
January	2017	8.1	5.8	4	7.0	14.0
	2018	7.7	6.4	2.2	6	20.0
February	2017	7.8	5.9	4.5	13.0	45.0
	2018	8.3	6.7	2.8	9	45.0
March	2017	7.6	6.1	4	20.0	170.0
	2018	8.3	6.5	2.6	6	30.0
April	2017	7.3	5.6	5	50	275.0
	2018	8.1	6.4	2.8	8	250.0

May	2017	8.1	5.5	4.5	45	275.0
	2018	8.34	6.5	2.6	14	250
June	2017	7.3	5.2	3.5	13	115.0
	2018	8.4	6.1	4.6	4.0	900.0
July	2017	7.9	6.4	3	4	45.0
	2018	7.9	4.9	5.5		220.0
August	2017	7.6	7.4	4.2	4	17.0
	2018	8.2	4.9	4	110	900
September	2017	7.5	7.1	2.2	10	120.0
	2018	7.7	4.4	7.5	110.0	900.0
October	2017	7.9	6.7	3.6	6	30.0
	2018	7.9	8.5	2	6	70.0
November	2017	8.3	6.6	2.8	7	40.0
	2018	8.2	2.1	8.5	95.0	900.0
December	2017	7.9	6.8	2.2	6	30.0
	2018	7.5	3.6	4.5	195.0	900.0
Average		7.91	5.920833	3.879167	32.52174	273.375
S.D		0.331741	1.307164	1.614063	49.06107	339.6751
C.V		4.193946	22.07736	41.6085	150.8562	124.2525

Source: -Report On Action Plan For Clean-Up Of Polluted Stretch Of Krishna River June, 2019.

The above table No.9 showing monthly information about water Quality status at Krishna River at Dhom Dam,Village-Wai,Taluka-Mahabaleshwar,District-Satara.that above particular place will be showing average of 7.91 about the PH value and is standard deviation is 0.331741 and the total coefficient of variation value is 4.193946 is it not in above range of CPCB valuation Norms but little bit variation will be there. Dissolved oxygen range is in good condition its average value is 5.920833 is in normal condition and also calculating the standard Deviation its value is 1.307164 is in normal range coeifficent of variation value is 1.307164 there is little variation will be there we will also calculate the BOD average value is 3.879167 and also its Standard deviation value is 1.614063 it coefficient of variation valuation is 41.6085.Focal colifrom average variation is 32.52174 it standard deviation value calculation is 49.06107 and it coefficient of correlation value is 150.8562 lastly total coliform average value calculation is 273.375 and its standard deviation value calcualtion339.6751 and coefficient of variation 124.2525 those calculation showing there is meager variation will be in above mention water quality parameters.

The above all 9 tables analysis shows that the maximum BOD values recorded at all places except Maighat, Krishna River at Sangli and Krishna River at Islampur near Vitthal Temple and Krishna River at Walva do not comply with bathing standards of 3mg / l.This may be due to non-availability of disposal water in the river basin. The required immersion will be achieved by immersing the amount of water required to maintain e-flow

from the dam from time to time.The usual watering frequency is 21 days to 45 days for most irrigation and domestic purposes (CPCB, 2019).Sustainable e-flow will be achieved on the availability of water in the dam.

In 2016, 2017 and 2018, BOD was found to be less than 16mg / l. The level of BOD is due to discharge from the non-effluent area of Sangli and there was no dilution was available at the time of sampling. Installation of STP at Mirah Bedag Road Miraj is in progress and is proposed to be completed as earliest in September 2019.The State Government and Sangli, Miraj and Kupwad Municipal Corporations are providing funds for STP (CPCB, 2019).

CONCLUSIONS AND SUGGESTIONS

The pollution crisis and the need for energy are two different sides of the same coin. Industries have polluted the surrounding villages in many ways. Pollutants released from industry degrade soil quality. Soil is degraded and this results in loss of crop yield. Aquarius The surrounding industrial area is highly polluted. Therefore, it is suggested to develop alternative sources of water for irrigation. This can be mainly in the form of developing canal irrigation, making proper use of available surface water and storing excess rainwater by constructing irrigation tanks.

The researcher has given a important suggestions to control or reduced water pollution; Always avoid discharging untreated sewage into lakes and rivers as it mixes with water and pollutes it. Do not throw any solid waste into the watercourse as it clogs the watercourse leading to pollution. Avoid dumping construction waste into rivers. Use organic gardening techniques and avoid using pesticides and other herbicides. Avoid releasing harmful chemicals and oils into storm drains or rivers. Those suggestions will useful to protect our environment.

REFERENCES

1. CPCB. (2019). Action Plan for Clean up of polluted streth of Krishna River. New Delhi: CPCB.
2. Gaikwad, S. S., Chavan, P. P., & Kamble, N. A. (2016). Surface Water Quality of the River Krishna, Sangli District, Maharashtra, India. Octa Journal of Environmental Research, 167-177.
3. Kamble, P. S., Ambedkar, V. V., & Ovhal, V. V. (2022). Empirical Analysis of Health Status of Western Maharashtra. North Asian International Research Journal of Business Economics & Management, 6 (7), 6-15.
4. Kamble, P. S., Ambedkar, V. V., & Ovhal, V. V. (2022). Health Infrastructure Development in Rural Maharashtra. North Asian International Research Journal of Social Science & Humanities, 8 (7), 5-14.

5. Niloufer, S., Sumalatha, P., & Lakshmi, V. B. (2020). A Study on Water Quality Chanllenges in River Krishna Due to Interlinking of Krishna and Godavari Rivers. Waffen-Und Kostumkunde Journal, 329-348.
6. Ovhal, V. V. (February, 2019). Inclusive Health Development in Rural Maharashtra, Aarhat Multidisciplinary International Education Research Journal (AMIERJ), ISSN-2278-5655/ Vol. VIII Special Issue No-X /Impact Factor:6.236/Pp-419-428
7. Panda, P. K., Panda, R. B., & Dash, P. K. (2018). The River Water Pollution in India & Abroad-A Critical Review to Study the Relationship among Different Physico-chemical Parameters. American Journal of Water Resources, 25-38.
8. Vadrale, K. S., & Ovhal, V. V. (April, 2016). Facts About Child Mortality in India with Special Reference to Kolhapur District (Maharashtra), EPRA International Journal of Environmental Economics, Commerce and Educational Management, ISSN:2348-814X/ Vol.3/Impact Factor:4.138
9. Wagh, C. H., & Kamat, R. S. (2014). Study of Waste Water Characteristics and its pollution for the stretch of Krishna River from Sangli to Haripur. International Journal of Science and Research (IJSR), 93-101.