VARSHA RESEARCH ORGANIZATION
ISSN No:
VOLUME 1, ISSUE 1, December -2023

ANALYTICAL STUDY ON SOCIO-ECONOMIC CHARACTERISTICS OF RIVERSIDE FISHERS AND ITS IMPACT ON WATER QUALITY PARAMETERS

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ABSTRACT

Introduction: *Environmental factors are essential to life as we know it. We can't help but give the environmental problem a lot of thought since it is so obvious.*

Aim of the study: *The main aim of the study is Analytical Study on Socio-Economic Characters of River Side Fishers And Its Impact On Water Quality Parameters*

Material and method: *A methodical approach to achieving a research project's objective is known as methodology. It might be seen as the science of going down certain research avenues and understanding their rationale.*

Conclusion: *Although the physical health of the river demonstrates that we have completely failed to maintain our regard for rivers, the spiritual reverence for it is still there.*

1. INTRODUCTION

1.1 OVERVIEW

Environmental factors are essential to life as we know it. We can't help but give the environmental problem a lot of thought since it is so obvious. It lacks all space and physical bounds. When we consider the connection between environment and ecology, the interconnectedness of human life on earth becomes most evident. We are split between the competing interests of ecological balance and sustainable growth. We become aware that man has transformed nature at a previously unheard-of scale when we consider the environment and sustainable ecology. It is worrisome how quickly things are changing. The remarks of E.F. Schumacher are noteworthy in this context. The famous thinker asserts that the issue of environmental degradation is not just technical but also has its roots in the metaphysics and life cycle of the contemporary world. We must recognize the universe's fundamental oneness and the connection of all living forms. The Zulu philosophy of Ubuntu, which translates to "you are; therefore, I am," has to be adopted. The idea that humanity has completely turned the corner in terms of its relationship with nature and the environment at this time has risen to the fore.

There are many who contend that societal decisions like increased consumerism are not the main drivers of environmental damage. On the other hand, its origins may be traced back to historical and social realities that result from the unique features of the contemporary industrial world and its wide range of economic interactions with both individuals and whole countries. The leitmotiv for jeopardising our lovely world, whether it is via the use of fossil fuels or the exploitation of rivers and subsurface water, is the drive to dominate the land we live. A number of ancient civilizations, including the Indus Valley, Greek, Phoenician, Roman, and Mayan, perished due to ecological factors, according to historical and archaeological data. A comparable prospect is there to us once again now and threatens to start the endgame. Humans study the environment. It covers a wide range of topics, including as the security of living things, their safety, and conservation. We must priorities and work to research the biogeochemical cycle, global climate, water purification, and efficient management and soil conservation in detail. Reaching the optimal index of a natural living environment could take a while. Environmental preservation and biodiversity protection are closely related since they are the two sides of the same coin. Due to the impossibility of life under unfavorable conditions, uncommon species of animals are vanishing at an alarming rate.

1.2 WATER AND ITS QUALITY MONITORING

Rivers are credited with giving rise to human civilization. All of the earliest big civilizations in recorded history originated in river valleys. Due to its significance, water has often influenced the pattern of human habitation throughout history. The start of civilizations may be seen in the lush river valleys with plenty of water. The first civilizations existed in the Middle East between 3500 and 2000 BC between the Tigris and Euphrates rivers. This civilization's name accurately describes what it is. Mesopotamian literally translates as "between the rivers." Similar agricultural settlements existed in Egypt's Nile Valley approximately 5500 BC. Around 2600 BC, a different civilization emerged in the valley of the Indus River. Due to their proximity to water supplies, early civilizations prospered along the Nile, Tigris, and Euphrates in ancient Mesopotamia, the Indus in India, and Huang Ho in China.

Rivers are the lifelines of civilizations, as shown by the fact that all of these civilizations sprung up in river valleys. There are several explanations for why civilizations emerged in river valleys. The Indians have a unique relationship with rivers. They revere rivers and bathe in them on holy days such as Amavasya, Pooranmasi, and other religious festivals. In addition to being possible sources of drinking water, rivers also contribute to soil enrichment because of flooding. They provide alluvial soil, which usually supports the growth of crops to meet human requirements. The most obvious justification is having access to a steady supply of water for both human and agricultural requirements. People then began cohabitating and indulging in nonagricultural activities like establishing cities and towns, trading and commerce, hunting and fishing, etc. Water comes naturally from rivers. They move over the surface in the form of prolonged hollow formations that naturally drain several primary land regions. A river can only exist if three conditions are met: there must be surface water, a ground channel, and an inclined surface. Due of the aforementioned factors, rivers of various sizes are included under the term. A component of the hydrological cycle are rivers. A river often receives water from two sources. One is from surface runoff from precipitation passing through a drainage basin. The discharge of water that has been held in natural ice, springs, and ground water recharge are among more sources. Rivers have a significant role in geology, biology, history, and culture.

2. LITERATURE REVIEW

Rahman, Flura & Moniruzzaman, Md (2022) The physicochemical and biological characteristics of a river ecosystem often provide insights into the condition of the resident aquatic organisms and the associated measure of species diversity. In order to assess the quality of water, many physicochemical parameters including temperature, pH, dissolved oxygen (DO), transparency, and conductivity were measured. Additionally, the levels of water nutrients such as nitrate and phosphate, as well as the concentration of chlorophyll a, were also analyzed. Samples were obtained from seven distinct sites throughout the Hilsa fisheries zones, each possessing unique characteristics. The research findings indicated a little regional variability in the physicochemical characteristics of river water. Although the metrics were determined to be within acceptable thresholds, more efforts are required to enhance water quality in order to facilitate the effective migration and reproduction of the Hilsa fish. The water quality criterion was determined to be mildly alkaline, with a mean value of 7.4±0.3. The measurement of transparency yielded a value of 38.3±11.11 cm, while the water temperature was recorded as 22.47±01.79 ºC. The alkalinity was determined to be 101.8 ±19.87, conductivity was measured at 2139±2101 µS/cm, CO_2 concentration was discovered to be 6.79±2.43 mg/L, dissolved oxygen (DO) was measured at 7.56±0.38 mg/L, nitrate concentration was determined to be 0.006±0.01 g/L, and phosphate concentration was found to be 0.002±0.0003 mg/L. The estimation of chlorophyll a, which serves as a measure of phytoplankton biomass, yielded a value of 4.58 ± 4.18 mg/L. The Meghna River basin had the highest abundance and taxonomic diversity of plankton, making it the primary source of natural food among the studied rivers. The evaluation of the physical, hydrological, chemical, and biological characteristics of the environment in the Hilsa fishery regions provides significant evidence that is crucial for informing the hilsa fisheries management action plan and promoting sustainable management of the hilsa fishery on a larger scale.

Das, Manas (2022) The rivers, lakes, groundwater, and wetlands that make up India's inland freshwater resources have all been heavily used by people for a variety of urban, agricultural, and industrial activities, exposing these ecosystems to diverse stresses over time and changing the quality of their habitat. Therefore, there has been a significant influence on fish productivity and inland fisheries. The main river Ganga's declining water quality, diminished flow pattern, obstacles that prevent fish from moving, siltation, and sand mining are signs of habitat modification. throughout addition to inland fish production, the 15.3 million acres of wetlands throughout the nation provide a variety of aquatic ecosystem services. These wetlands are vanishing and deteriorating more quickly.

Karolina, Anita & Ardelia, Vera (2022) This study sought to evaluate the physical and chemical characteristics of the water in the Komering River Kayuagung city. The study was carried out in May and June of 2021. Purposive sampling was used to collect water samples from four observation sites: regions with minimal human activity (station 1), areas with sand mining (station 2), places with human activity (station 3), and areas with fish farming in cages (station 4). Several parameters were monitored during sampling, including temperature, transparency, current velocity, TDS, pH, dissolved oxygen (DO), and

BOD. In accordance with South Sumatra Governor Regulation No. 16 of 2005, the measurement findings were then compared to the specifications for Class I river water quality. The temperature, TDS, and BOD typically remained within the first-, second-, and third-class water quality criteria, according to the analysis's findings. The pH and DO values are superior than those required for first-class quality.

Malik, Rizwana & Rather, Mansoor (2016) This study's goal was to determine the precise socio-economic characteristics of the fishermen who reside in the region of Kashmir with the greatest concentration of fishers. The research showed that the state's fishing population practices ancient fishing techniques that either need to be improved upon or replaced by cutting-edge scientific technology while living in abysmal poverty. The study also found that 87.5% of people have few sources of knowledge and that 99% of people have only completed their elementary education. Poor living conditions have had a detrimental effect on the fishermen's sociopsychological behavior. Fishers are having difficulty obtaining the bare necessities of life, which indicates that the community has been neglected and deprived of government assistance. Trainings and technical advancements alone won't be enough to assist the community manage its financial stress; instead, some firm support from governmental and non-governmental organizations is essential to their socioeconomic development. The establishment of cooperatives and self-help groups (SHGs) might be a wise decision to improve their lives and assist them in achieving their aspirations.

Guimarães, Maria & Mascarenhas, André (2012) In the southern regions of Spain and Portugal, the Guadiana Estuary, bathing-related tourism is becoming more and more significant economically. Public opinion surveys in the area revealed that the public is aware of the potential and present dangers that untreated/poorly treated urban sewage discharge and river flow management pose to the aquatic ecosystem. Water quality was chosen as the policy problem for our application of the Systems Approach Framework (SAF) due to the great concern for it. We created a comprehensive simulation model of the Guadiana Estuarine System that links the biological and economical aspects of the ecosystem with the beach eco-label (Blue Flag Award), which is reliant on faecal bacterial thresholds. Through the use of an Economic Base Model, which illustrates the impact of rising employment on the resident population as a consequence of a change in coastal water quality, we measured the socioeconomic effects of water quality. Financial indicators are provided through a cost-benefit analysis for scenario assessment. It uses the contingent valuation method to quantify the financial impact of changes in water quality on human wellbeing. We were able to mimic the feedback loop between human activities that impact water quality and those that benefit from it since the population has a large seasonal effect on the wastewater flow into the estuary. In order to better understand the stakeholders' perspectives on the benefits, constraints, and potential for future SAF applications, we organized a critical appraisal of our work with them.

3. METHODOLOGY

A methodical approach to achieving a research project's objective is known as methodology. It might be seen as the science of going down certain research avenues and understanding their rationale. Research methodology, then, considers the rationale behind the methods used in the context of the research study and explains the rationale for using a particular method or technique and not others so that research results can be evaluated by the researcher or by others. Prior to collecting samples for the project, a good strategy is created for sample collection, preservation, and the procedures to be used for analyzing physical, chemical, and microbiological characteristics, as well as for data gathering and representation.

3.1 Sample collection, Processing and Preservation:

Water samples are collected in pre-cleaned polypropylene and borosilicate bottles depending on the situation. Before collection, the bottles were carefully cleaned with 10% HNO3. For physicochemical analysis, one liter of water samples is collected in triplicate from each station. To make sure the sample was representative of each station, the bottle was meticulously cleansed three times with the sample water before collection. In the 300 ml BOD bottles, water samples are taken in triplicate for each parameter for DO and BOD analysis. At the sampling station, 2 ml of MnSO4 solution and 2 ml of alkali-iodide-azide reagent are added to each sample and thoroughly mixed by shaking and inverting the container in order to halt the dissolved oxygen in the sample.

4. RESULTS

4.1 VARIATION OF PHYSICAL AND AGGREGATE PARAMETERS:

4.1.1 Variation of Temperature

The findings of the investigation of the temperature of the river Gomti's water quality at each of the fourteen sample sites are shown in Table 4.1. During the research period, temperatures varied from 18 to 330C, with a mean of 26.50C. In the whole year of 2021, Jaunpur had the highest temperature of 330C in the month of May, while Gomlai recorded the lowest temperature of 180C in the month of January. The atmosphere's temperature and the state of the weather are the key factors influencing the variation.

Table 4.1 Variation of Temperature (0C) in Water Samples

Months	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9	S_{10}	S_{11}	S_{12}	S_{13}	S_{14}
Jan,2021	19	20	18	26	25	23	23	23	22	22	20	21	21	23
Feb,2021	21	22	25	23	22	21	22	22	21	20	21	21	21	22
Mar,2021	23	23	24	23	24	23	25	25	26	26	25	26	27	27
Apr,2021	24	24	27	25	26	26	27	27	28	28	29	31	30	30
May,2021	29	29	30	28	29	30	33	32	32	30	31	30	30	32
Jun,2021	26	26	28	27	28	31	32	31	31	29	30	31	30	31
Jul,2021	26	26	28	28	29	30	31	31	30	29	29	29	28	30
Aug,2021	26	26	26	26	27	27	28	28	29	28	28	27	27	28

Sep,2021	28	28	30	28	29	29	29	29	30	30	29	29	28	29
Oct,2021	27	27	28	26	28	29	30	30	28	27	29	30	29	28
Nov,2021	23	23	25	26	25	27	26	26	24	23	25	29	29	28
Dec,2021	21	21	22	21	22	25	27	27	24	25	25	24	24	25
Max	29	29	30	28	29	31	33	32	32	30	31	31	30	32
Min	19	20	18	21	22	21	22	22	21	20	20	21	21	22
Mean	24.4	24.6	25.9	25.6	26.2	26.8	27.8	27.6	27.1	26.4	26.8	27.3	27.0	27.8

4.1.2 Variation Of Electrical Conductivity (EC)

Table 4.2 shows the results of the investigation of the electrical conductivity of the river Gomti at each of the fourteen sample points. For inland surface water that is prone to pollution, the EC's maximum tolerance limits are 1000 S/cm for class D water and 2250 S/cm for class E water (IS: 2296- 1992).

TABLE 4.2 Variation of Electrical Conductivity (μS/cm) Water Samples

Months	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9	S10	S11	S12	S13	S14
Jan,2021	220	440	210	142	127	138	380	230	350	151	153	165	146	155
Feb,2021	200	400	220	138	122	128	320	210	280	142	148	162	141	151
Mar,2021	210	480	240	112	131	127	380	240	360	153	148	157	144	146
Apr,2021	200	500	260	117	128	146	156	148	145	114	132	141	118	130
May,2021	240	480	260	132	157	146	420	260	380	162	158	188	152	141
Jun,2021	200	490	220	148	139	130	310	210	280	135	138	162	136	143
Jul,2021	138	280	126	138	147	138	330	200	320	128	140	159	142	146
Aug,2021	122	200	88	83	98	103	194	143	166	118	143	104	112	121
Sep,2021	118	340	107	98	105	110	123	115	181	114	127	138	118	130
Oct,2021	124	230	126	109	128	134	290	200	220	128	136	140	125	136

Nov,2021	138	240	124	108	112	119	143	137	250	133	158	130	134	139
Dec,2021	176	320	162	111	118	121	320	210	280	130	126	139	127	134
Max	240	500	260	148	157	146	420	260	380	162	158	188	152	155
Min	118	200	88	83	98	103	123	115	145	114	126	104	112	121
Mean	174	367	179	120	126	128	281	192	268	134	142	149	133	139

4.1.3 Variation Of Turbidity

In Table 4.3, the findings of the examination of the turbidity at each of the fourteen sample sites for the river Gomti are shown. According to Indian Standard Drinking Water-Specification, IS 10500: 2020, the acceptable value is 1 NTU, while the allowable maximum is 5 NTU if there is no other source available.

TABLE 4.3 Variation of Turbidity (NTU) in Water Samples

Months	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9	S10	S11	S12	S13	S14
Jan,2021	15.0	30.4	2.1	2.5	10.9	30.5	38.8	13.0	18.6	11.4	10.5	8.6	9.2	2.8
Feb,2021	1.8	49.8	2.0	2.1	2.0	3.8	3.8	2.5	2.1	1.6	1.8	3.1	2.8	4.4
Mar,2021	28.0	224	10.9	8.2	18.6	94.6	41.0	18.5	10.2	14.4	17.6	33.0	14.8	21.6
Apr,2021	6.6	103.4	3.1	1.5	1.8	4.1	10.2	4.8	3.2	21.5	84.0	16.5	5.6	10.3
May,2021	10.3	92.0	3.1	0.6	1.5	0.8	7.8	8.4	3.2	8.6	31.3	0.6	2.8	8.2
Jun,2021	1.3	122	3.2	0.8	1.2	0.4	1.2	0.6	1.8	2.8	11.8	4.3	2.0	3.8
Jul,2021	84.5	255	222	37.0	54.0	48.0	20.0	24.8	33.0	134	118	130	104	86.0
Aug,2021	378	550	468	560	490	445	285	394	306	472	598	485	570	420
Sep,2021	160	154	174	158	167	251	171	552	155	166	218	178	196	202
Oct,2021	85.5	253	242	130	193	208	213	193	178	201	258	202	248	222
Nov,2021	52.0	73.0	31.0	42.0	66.0	71.0	67.0	61.0	20.0	72.0	70.0	72.0	78.0	74.0
Dec,2021	23.0	65.0	3.2	16.6	25.1	28.7	29.5	29.9	8.4	25.5	68.5	24.8	18.4	25.1

Max	378	550	468	560	490	445	285	394	306	472	598	485	570	420
Min	1.3	30.4	2.0	0.6	1.2	0.4	1.2	0.6	1.8	1.6	1.8	0.6	2.0	2.8
Mean	70.5	164.3	97.1	79.9	85.9	98.8	74.0	75.2	61.6	94.2	124.0	96.5	104.3	90.0

4.1.4 Variation Of Total Dissolved Solids (TDS)

Any minerals, salts, metals, cations, or anions found dissolved in water are referred to as dissolved solids. It is everything contained in water that is not suspended particles or molecules of pure water (H2O). The findings of the total dissolved solid analysis of the river Gomti's fourteen sample sites' water quality are shown in Table 4.4. For inland surface water that is exposed to contamination, the maximum tolerance limits for TDS are 500 mg/l for class A water and 1500 mg/l for class C water (IS: 2296- 1992). According to Indian Standard Drinking Water-Specification, IS 10500: 2020, the acceptable maximum is 500 mg/l, while the permitted limit is 2000 mg/l if there is no other source available.

TABLE 4.4 Variation of Total Dissolved Solid (mg/l) in Water Samples

Months	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9	S10	S11	S12	S13	S14
Jan,2021	154	264	138	84	84	84	211	158	244	103	93	91	89	102
Feb,2021	136	267	134	76	86	77	192	145	153	80	87	92	79	98
Mar,2021	142	322	146	72	79	84	222	164	228	106	101	93	83	88
Apr,2021	126	330	183	78	84	84	104	94	95	80	84	87	83	85
May,2021	156	300	153	86	93	96	260	178	241	112	111	106	89	94
Jun,2021	136	333	124	85	90	73	200	146	190	95	92	100	83	95
Jul,2021	83	176	81	77	104	78	210	138	190	88	86	92	84	88
Aug,2021	77	126	51	48	55	58	131	98	102	80	90	62	66	76
Sep,2021	68	204	66	60	67	66	79	70	106	65	73	80	70	86
Oct,2021	82	151	71	64	74	83	177	135	130	73	79	84	71	78
Nov,2021	95	160	78	63	75	76	84	94	153	76	99	76	78	87
Dec,2021	110	177	97	67	74	71	180	145	170	77	79	83	72	83

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ISSN No:

VOLUME 1, ISSUE 1, December -2023

Max	156	333	183	86	104	96	260	178	244	112	111	106	89	102
Min	68	126	51	48	55	58	79	70	95	65	73	62	66	76
Mean	114	234.2	110	71.7	80.4	77.5	171	130	166.8	86.3	89.5	87.2	78.9	88.3

4.1.5 Variation Of Total Suspended Solids (TSS)

Table 4.5 shows the results of the water quality analysis for total suspended solids at each of the river Gomti's fourteen sample sites. The range of total suspended solids throughout the research period is 22 to 554 mg/l, with a mean value of 101.5 mg/l. Hasinipur records the highest TSS value (554mg/l) in the month of August, while Rengali records the lowest value (22mg/l) in the month of June.

TABLE 4.5 Variation of Total Suspended Solid (mg/l) in Water Samples

Months	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9	S10	S11	S12	S13	S14
Jan,2021	32	115	57	36	51	62	92	88	104	49	25	29	26	78
Feb,2021	57	98	49	30	55	34	61	54	56	44	52	47	30	65
Mar,2021	42	102	38	34	57	62	72	64	52	56	54	52	40	71
Apr,2021	26	74	47	25	36	37	28	30	34	66	54	50	46	80
May,2021	58	69	36	25	32	36	48	50	62	86	62	48	36	88
Jun,2021	41	73	30	22	28	40	62	68	65	42	38	42	29	61
Jul,2021	116	175	161	35	173	110	138	166	120	176	122	103	115	92
Aug,2021	204	468	341	362	495	284	197	287	209	424	503	388	554	336
Sep,2021	235	318	212	158	189	218	157	274	138	139	164	158	160	176
Oct,2021	110	223	142	162	153	103	110	149	108	91	115	132	126	119
Nov,2021	58	106	72	45	56	53	50	59	52	61	58	57	46	82
Dec,2021	30	73	24	33	42	35	59	61	36	39	42	46	38	63
Max	235	468	341	362	295	284	197	287	209	424	503	388	554	336

Min	26	69	24	22	28	34	28	30	34	39	25	29	26	61
Mean	84.1	157.8	101	80.6	97.25	89.5	89.5	113	86.33	106.1	107.4	96.0	103.8	109

4.1.6 Variation Of Total Solids (TS)

The findings of the total solids analysis of the river Gomti's fourteen sample sites' water quality are shown in Table 4.6. Total solids (TS) ranged from 100 to 620 mg/l over the research period, with a mean value of 214.6 mg/l. Hasinipur has the highest value of 620 mg/l in the month of August, while Rengali records the lowest value of 100 mg/l in the month of December.

TABLE 4.6 Variation of Total Solid (mg/l) in Water Samples

Months	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9	S10	S11	S12	S13	S14
Jan,2021	186	379	195	120	135	146	303	246	348	152	118	120	115	180
Feb,2021	193	365	153	106	141	111	253	199	209	124	139	139	109	163
Mar,2021	184	424	184	106	136	146	294	228	280	162	155	145	123	159
Apr,2021	152	404	230	103	120	121	132	124	129	146	138	137	129	165
May,2021	214	369	189	111	125	132	308	228	303	198	173	154	125	182
Jun,2021	177	404	154	107	118	113	262	214	255	137	130	142	112	156
Jul,2021	199	351	242	112	277	188	348	304	310	264	208	195	199	180
Aug,2021	281	594	392	410	350	342	328	345	311	504	593	450	620	412
Sep,2021	303	522	278	218	256	284	236	344	244	204	237	238	230	262
Oct,2021	192	374	213	226	227	186	287	284	238	164	194	216	197	197
Nov,2021	153	266	150	108	131	129	134	153	205	137	157	133	124	169
Dec,2021	140	250	121	100	116	106	239	206	206	116	121	129	110	146
Max	303	594	392	410	350	342	348	385	348	504	593	450	620	412
Min	140	250	121	100	116	106	132	124	129	116	118	120	109	146

Mean	198	392	208	152	178	167	260	243	253	192	197	183	183	198

4.1.7 Variation Of Total Hardness (TH)

Table 4.7 shows the results of the water quality study for total hardness at each of the fourteen Gomti river sample sites. 300 mg/l for class A water is the maximum tolerance level of TH for inland surface water exposed to contamination, according to IS: 2296- 1992. According to Indian Standard Drinking Water-Specification, IS 10500: 2020, the acceptable maximum is 200 mg/l, while the permitted limit is 600 mg/l if there is no other source available.

TABLE 4.7 Variation of Total Hardness (as CaCO3 mg/l) in Water Samples

Months	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9	S10	S11	S12	S13	S14
Jan,2021	88	153	85	56	48	52	137	93	133	64	56	60	60	56
Feb,2021	84	133	84	56	48	52	121	88	97	52	56	68	56	56
Mar,2021	80	153	81	44	48	44	133	93	133	60	52	56	60	52
Apr,2021	81	181	101	48	48	60	56	56	52	40	52	52	48	52
May,2021	97	165	93	52	60	60	153	113	161	68	64	72	64	52
Jun,2021	81	165	81	56	56	52	113	81	113	52	48	64	56	56
Jul,2021	52	97	52	56	56	48	129	80	129	52	52	56	56	52
Aug,2021	48	72	32	32	36	36	76	56	65	48	56	36	44	44
Sep,2021	48	113	40	40	40	40	44	44	72	44	48	52	48	48
Oct,2021	52	76	48	44	44	48	113	80	84	52	52	52	48	48
Nov,2021	52	80	44	44	40	44	56	52	97	56	60	48	56	52
Dec,2021	77	89	77	48	48	48	125	89	117	52	52	56	52	52
Max	97	181	101	56	60	60	153	113	161	68	64	72	64	56
Min	48	72	32	32	36	36	44	44	52	40	48	36	44	44
Mean	70.0	123.0	68.2	48.0	47.7	48.7	105	77.1	104.4	53.33	54.0	56.0	54.0	51.7

4.1.8 Variation Of Total Alkalinity (TA)

Table 4.8 shows the results of the water quality study for total alkalinity at each of the fourteen sample locations along the river Gomti. According to Indian Standard Drinking Water-Specification, IS 10500: 2020, the acceptable maximum is 200 mg/l, while the permitted limit is 600 mg/l if there is no other source available. The river Brahmni's alkalinity ranges from 17.3 mg/l to 119.6 mg/l, with a typical value of 49.3 mg/l. Tarkera had the highest alkalinity reading of 119.6 mg/l in the month of April, while Rengali recorded the lowest reading of 17.3 mg/l in the month of August.

TABLE 4.8 Variation of Total Alkalinity (as CaCO3 mg/l) in Water Samples

Months	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8	S_9	S10	S11	S12	S13	S14
Jan,2021	72.0	90.0	54.0	45.0	36.0	45.0	90.0	58.5	99.0	54.0	40.5	49.5	45.0	49.5
Feb,2021	72.0	67.5	63.0	49.5	36.0	36.0	67.5	45.0	63.0	45.0	45.0	45.0	45.0	45.0
Mar,2021	67.5	94.5	67.5	31.5	36.0	31.5	76.5	58.5	76.5	45.0	45.0	36.0	40.5	45.0
Apr,2021	73.6	119.6	59.8	41.4	46.0	46.0	46.0	46.0	46.0	36.8	41.4	46.0	41.4	41.4
May,2021	82.8	96.6	69.0	41.4	46.0	50.6	101	69.0	78.2	55.2	55.2	64.4	55.2	46.0
Jun,2021	73.6	82.8	55.2	46.0	41.4	41.4	78.2	59.8	82.8	41.4	46.0	50.6	46.0	50.6
Jul,2021	34.6	64.8	30.2	43.2	38.9	38.9	73.4	51.8	82.1	30.2	34.6	38.9	34.6	30.2
Aug,2021	38.9	30.2	21.6	17.3	21.6	21.6	43.2	34.6	38.9	34.6	38.9	25.9	30.2	25.9
Sep,2021	34.6	69.1	30.2	25.9	30.2	34.6	34.6	34.6	51.8	34.6	38.9	43.2	38.9	38.9
Oct,2021	30.9	48.6	36.4	30.9	35.4	39.8	75.1	66.3	61.9	44.2	35.4	39.8	35.4	39.8
Nov,2021	48.6	57.5	44.2	35.4	35.4	35.4	39.8	44.2	79.6	39.8	44.2	39.8	44.2	44.2
Dec,2021	61.9	79.6	48.6	35.4	39.8	35.4	66.3	53.0	88.4	39.8	35.4	39.8	39.8	39.8
Max	82.8	119.6	69.0	49.5	46.0	50.6	101	69.0	99.0	55.2	55.2	64.4	55.2	50.6
Min	30.9	30.2	21.6	17.3	21.6	21.6	34.6	34.6	38.9	30.2	34.6	25.9	30.2	25.9
Mean	57.6	75.1	48.2	36.9	36.9	38.0	66.0	51.8	70.7	41.7	41.7	43.2	41.3	41.4

5. CONCLUSION

Although the physical health of the river demonstrates that we have completely failed to maintain our regard for rivers, the spiritual reverence for it is still there. Our rivers are now more polluted than ever because of the country's rapid industrialization boom in response to its expanding economy and population. According to studies, the river Gomti has been contaminated by home and industrial sewage. The river has been converted into a system of sewage drains. As millions of people continue to rely on this contaminated river water, this creates a severe health concern. In India nowadays, illnesses are often caused by waterborne infections. It goes without saying that if the water in our surroundings is maintained clean, then 98 percent of illnesses may be eliminated on their own. Since river water provides most of the population's nutrition, the quality of river water is a major issue for those who live in the cities, towns, and villages that are situated along river banks. The negative impacts of river pollution do not only affect people. River pollution has a negative impact on aquatic species, notably fish, and may even endanger their very survival. Polluted water greatly damages the reproductive capabilities of fish species in rivers hence rendering them extinct in future.

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