

Analysis on improvement of water quality and level with TDS variation in Chhattisgarh

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ABSTRACT

We know that there are various things which are included in the basic requirement for life, and water is one of them. It is required for survival for all living organisms. There are so many water resources in the entire world, but majority of them have been contaminated, and due to this it is reducing the portability of water. Lakes are one of the important water bodies, which make available water on the surface of earth. Hence, we can say that Lakes have a crucial role in maintaining ecology and due to this reason lakes also have a good significance on surroundings which as follows:

- (i) Types of water resource: surface water and groundwater recharge,
- (ii) Some organisms depend on water for food and nutrition,
- (iii) act as control and stream flow maintenance,
- (iv) rain water harvesting,
- (v) life environs, particularly fish and birds,
- (vi) recreation-education, boating, swimming, walking and cardiopulmonary exercise on the lake bundand,
- (vii) others.

1. Introduction

We cannot assume live without water. It is the most important resource present on the earth, moreover it support the existence of life on earth. Well water may be a sensible supply of water offered on the planet. Among different resources, lakes have various properties as compared to the other resources of water on the earth. We need portable water and it can be achieved by having safe water. It is the most important aspect that safe water means that the water should be best on different parameters like physical and social health of the individuals inferred that contaminated surface water continually ends up in associate unhealthy socio-economic surroundings.

There are 26 district levels in Chhattisgarh. Out of all, one is state level and fourteen are Sub Division level laboratories. These all laboratories collect the sample from the rural areas of the state. These labs have responsibility to check the parameters to assess the water quality in the state. It is clear from the previous studies that there are various impurity causing elements present in the water sample collected from state. As analysis reveals that the water resource have halide, Iron, Nitrate, and saltiness etc.

From the data available, it is estimated that there are 4.37 lakhs water sources within the State. These are the units in addition to different community, semi Govt. and public-service corporation sources. Regular water quality watching of those sources in step with desired parameters, victimization existing laboratory facilities isn't attainable. Hence, keeping these points in mind it was planned that there should be some alternative for laboratory testing activities of the PHED. As per this opinion it was assumed that the sources of water will go under 1 time water quality assessment. The same strategies

are followed for water resources assessment of the entire state within last 02 years.

2. Review of Literature

Manish Upadhyaya et al., (2013) studied the chemical & physical properties of Effluents discharged from korba Industrial space. It is known that if industries keep on discharging the wastes in to the water source, then it will cause the damage to the quality of water. In the present paper the major work was done on the analysis of the groundwater quality of korba industrial space in korba town. In the entire study, the total nine different locations were selected for collecting the sample. During the investigation, the sample was collected by hand for the study and compared. In the present study, following parameters were considered:

- hydrogen ion concentration,
- total pH,
- total hardness,
- turbidity,
- chloride, sulphate, fluoride,
- total dissolved solids and
- conduction.

When researchers studied the sample by observing the above parameters, it was concluded that if any of the above mentioned parameters vary, it will affect the physico-chemical parameters. During the study, analysis made by WHO and ICMR were also compared. And thus it was also analyzed that the Surface water is extremely contaminated and it may be responsible for various health problems in human.

Pandey Ambuj et al., (2014) Crosswise over town of Bilaspur, Bharat six key examining stations were gathered over a measure of a half year beginning from March to August 2013 to check the subjective remaining of the groundwater of town.

Seven key symptomatic parameters were hand-picked as pointers of the groundwater quality and these region unit hydrogen particle fixation, conduction, TDS, chlorides, sulfates, nitrates and fluorides. The examination of the outcomes demonstrates that the groundwater quality is wretched and much from the benchmarks set around various worldwide organizations. so it's prescribed that basic precautional estimates should be taken by the administration, network and NGOs consequently on prevent tainting of groundwater assets by waste item and mechanical releases and so on and to support rain assembling and energizing of groundwater assets by regular precipitations.

Sumant Kumar et al., (2015) studied that lake water is an essential supply for drinking, residential and water system works in rustic and solid Bharat. the ebb and flow contemplate goes for assessing the water nature of differed lakes in Raipur town, Chhatisgarh. There existed 154 lakes inside the town anyway it shranked to eighty five in assortment because of infringement or drying up of lakes. Twenty seven recognized lakes zone unit hand-picked to check and valuate the water quality for drinking and water system capacities. The water tests were gathered and investigated for hydrogen particle focus, Turbidity, Electrical conduction (EC), Total Dissolved Solids (TDS), Alkalinity, Hardness, Sodium (Na^+), Potassium (K^+), Calcium (Ca^{2+}), Magnesium (Mg^{2+}), Bicarbonate (HCO_3^-), sulfate (SO_4^{2-}), Nitrate (NO_3^-), Phosphate (PO_4^{3-}) Fluoride (F^-), Chloride (Cl^-), Chemical nuclear number 8 Demand (COD), natural science nuclear number 8 Demand (BOD), Dissolved nuclear number 8 (DO), Total Coliform (TC) and feculent Coliform (FC). There region unit varieties for hydrogen particle fixation (6.59-8.29), EC (382-2330 $\mu\text{S}/\text{cm}$), muddiness (1-232 NTU), TDS (244-1491 mg/L), pH (120-600 mg/L), Hardness (66-330 mg/L), Na^+ (37-430 mg/L), K^+ (8- 253 mg/L), Ca^{2+} (9-90 mg/L), Mg^{2+} (3-26 mg/L), SO_4^{2-} (5-200 mg/L), NO_3^- (0-19 mg/L), PO_4^{3-} (0.19-5.3 mg/L), F^- (0.18-1.41 mg/L) and Cl^- (46-388 mg/L), DO (1-8.6 mg/L), BOD (0.1-11.3 mg/L), COD (8-118 mg/L), Total Coliform (15-3600 MPN/100ml) and feculent Coliform (4-240 MPN/100 ml). The outcomes are contrasted and the water ordinary recommended by Bureau of Indian typical (BIS). All the physiochemical parameters region unit inside as far as possible aside from sloppiness, feculent and add up to coliform. The nuclear number 11 sorption extent connection (SAR) and saltiness perils region unit concentrated to arrange the water for water system employments. It's discovered that lake water is suitable for water system capacities.

Rachna Pandey et al., (2015) the standard of anyone of surface or well water might be a perform of either every regular impacts and human impacts. while not human impacts water quality would be controlled by the weathering of bedrock minerals, by the environmentally procedures of vanishing, transpiration and in this manner the testimony of mud and salt by twist, by the common activity of natural issue and supplements from soil, by hydrological factors that outcome in spillover, and by organic procedures inside the oceanic surroundings which will change the physical and substance organization of water. Declining water quality has turned into an overall issue of worry as human populaces griesrow, modern and rural exercises grow, and temperature change

debilitates to make significant modifications the hydrological cycle.

3. Water Quality

Effluents produced by businesses region unit wellsprings of contamination. Polluted air, soil, and water by Industrial effluents zone unit identified with ailment trouble like flurosis, looseness of the bowels, diarrhea, typhoid, dengue, jungle fever, hepatitis, skilling, malignancy, intestinal influenza, liver and enteral contamination and so forth. Synthetic defilement of water probably won't cause time admission is additionally lethal for human wellbeing and this may be purposes behind this shorter hope in Chhattisgarh state and inside the nation. Henceforth, quality file appraisal of water is essential to survey the standard of groundwater and surface water in any provincial and solid regions that impacts the quality for drinking, residential, washing, water system and modern needs. The significance of groundwater in drinking and in various utilizations, its ecological angles revere tainting transport are extensively considered.

Water assets zone unit is fundamental for presence and advancement of overall network. The mineral components blessing in water region unit specifically including human wellbeing and horticultural action and its consistent worth chooses the quality for drinking and water system capacities. Expanding urbanization and fabricate region are unit incurring worry to the water assets attributable to boundless release of waste item and civil squanders into water bodies.

4. Water Resources of Chhattisgarh

Surface Water in Million Cubic Meter

Estimated Utilisable Potential	41720 MCM
Potential Area that can be Irrigated	43 Lakh ha
Actual Irrigation Potential Created	13.4 Lakh ha

Ground Water

Net Utilisable Potential	11960 MCM
Actual Potential Utilised	NA

The towns are underneath ecological pressure because of human infringement, high full scale phytic populace and waste item contribution from various sources. Entirely unexpected worth of hydrogen particle focus, TDS, Hardness, conduction, Chloride, sulfate, nitrates and fluorides demonstrates that water of those very surprising assets aren't proper for drinking reason anyway can be utilized for rural reason. New formed territory of Chhattisgarh has offered ascend to complex populace focus. Being the zenith quarter of coal fields and railroads, deluge of significant assortment of spirits inside the town to genuine fabricate (NTPC, wipe press plants, coal washeries, concrete businesses and associated ventures), ground water sources region unit being utilized cleave slash.

As of late, relate expanding danger to well water quality because of human exercises has happened to pleasant significance. The unfriendly impacts on well water quality zone unit the consequences of man's movement at ground surface, unintentionally by agribusiness, local and modern effluents, out of the blue by sub-surface or surface transfer of waste item and mechanical squanders. In India, wherever groundwater is

utilized seriously for water system and mechanical capacities, a spread of land and water-based human exercises region unit dispensing contamination of this valuable asset. Its over-abuse is dispensing land arrangement tainting in bound examples, though in bound others its informal improvement with pitiful data of groundwater stream dynamic and geo-hydro-synthetic procedures has intersection rectifier to its mineralization. The standard of well water is of decent significance in choosing the nature of unequivocal well water for a specific utilize (open establishment, water system, mechanical applications, control age and so forth) five. The standard of water is likewise depict in venture with their physico-synthetic and smaller scale natural attributes.

Hence, the standard of well water differs from place to put, with the profundity of arrangement, and from season to season and is principally controlled by the degree and synthesis of disintegrated solids blessing in it. For compelling upkeep of water quality through relevant administration measures, persistent viewing of immense assortment of value parameters is critical. In any case, it's appallingly troublesome and rebuffing errand for typical viewing of the considerable number of parameters despite the fact that satisfactory work force and research center offices zone unit advertised. In this manner, as of late another methodology upheld connected arithmetic connection, has been acclimated create numerical relationship for correlation of physico-synthetic parameters.

All the substance science factors of well water at each private and modern site of Bhilai town territory unit inside the simple best entrancing point of confinement or most reasonable breaking point set by WHO. Relate significant vital connection has been recorded for chloride with hydrogen particle fixation, TDS and dangerous stun and SO₄²⁻-with hydrogen particle focus and poisonous stun.

5. Discussion

Water quality record evaluation portrays the general nature of the water bolstered many water quality factors. The standard of water may depend upon earth investigation of unequivocal space and also fluctuate with profundity of arrangement and

regular changes and is governed by the degree and sythesis of the disintegrated salts endless supply of the salt and soil-surface environment. The objective of water quality list appraisal is to display information to human race identifying with the standard of a chose water body for utile uses. When all is said in done, water quality record evaluation strategy gets data from many water quality factors into a numerical condition and rates out the standard of water as far as assortment.

It demonstrates that a few parameters indicated higher qualities in summer and winter seasons and that don't inside the limits of guidelines and moreover water quality file. In this way most astounding need should slope to water quality viewing and there autochthonic innovations should be embraced to frame water suited household, washing and drinking reason when treatment.

6. Conclusion

The entire study uncovers that hydrogen particle centralization of the water tests from all the inspecting stations were inside as far as possible as recommended by ISI, WHO and so forth. The electrical conduction records for water from these testing stations were a considerable measure of higher than WHO ordinary. Water tests at Uslapur and Ameri street sampler records moderately higher worth of E.C. that demonstrates nearness of frightfully high grouping of cations and anions making these water tests inadmissible for drinking and water system reason. The high worth of Total Solid Contents (TDS) were recorded at Nehru Nagar, Uslapur, Mangla and Bhartiya Nagar (above reasonable breaking point i.e. 500 mg/lit) and most at Uslapur. Our examination uncovers a noteworthy heap of contamination on these water bodies. Waters with higher strong substance have purgative outcome and same time invert result upon people whose bodies aren't specially designed to them. The nearness of anions like sulfate, chlorides, nitrates and fluorides have also been recorded in same water tests, here it's found out that normally the grouping of those particles fall well beneath as far as possible so water tests of some of these stations on account of the lesser convergence of sulfate, nitrate and chloride can be utilized for water system reason.

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