iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 8 **Issue:** IV **Month of publication:** April 2020

DOI:

www.ijraset.com

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 8 Issue IV Apr 2020- Available at www.ijraset.com

Review on Assessment of Physio-Chemical Parameters of Well Water of Katol, Nagpur

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Abstract: ***Physio-chemical analysis of Well Water of Katol Tehsil, District Nagpur has been studied, All the samples were analysed to assess the water quality parameters like Temperature, Physical appearance, Odour, Turbidity,. The discharge of industrial effluents without prior treatment has led to the pollution of well water bodies. The present study determined the physicochemical characteristics (pH, electrical conductivity, total dissolved solids, total suspended solids, total solids, carbonate, bicarbonate, alkalinity, phosphate, nitrate, temperature, chloride and turbidity) and concentrations of selected heavy metals (cadmium, copper, chromium, nickel and lead) of water samples from eleven well water bodies in and around Katol. The values of the physicochemical parameters indicate that most of the well water bodies are heavily polluted with the level of pollution, increasing over the period. Out of the five heavy metals analysed, the well water bodies were mainly polluted with copper, cadmium, and lead. A systematic study has been carried out to assess the water quality index of wells in Katol Tehsil. Some water samples from five sampling stations were collected and analysed for physio-chemical parameters (Temp, velocity, pH, dissolved oxygen, free CO2, C.O.D., B.O.D., Carbonate, Bicarbonate, total alkalinity, hardness, turbidity, calcium, magnesium, sodium, potassium, nitrate, phosphate, chloride, sulphate, electrical conductivity, total dissolved solids and total suspended solids.) . It was found that most of the parameters are within the permissible limit as described by W.H.O.***

Keywords: Water pollution, well water, physic-chemical analysis, Dissolved Oxygen, Water quality index, portability

I. INTRODUCTION

Water is next to oxygen as being essential for life. People can survive days, weeks, or even longer without food, but only about few days without water. Water is one of the essential commodities of everyday life and is placed in position just after air. Although it is nature's abundant gift but most of it is present in oceans (97%) and in the icebergs in the Polar Regions (2%) which are of no use for utilization and the remaining (1%) of all earth's water, which is available in lake, rivers and underground for utilization. Also this available water which is found in nature is not H2O alone. Hence it can be considered as a separate entity and can be expressed as (H2 O +X), where 'X' is measurable and controlled. More over this available water is also contaminating day by day by different human activities. These pollutions are mainly due to rise standard of living, urbanization, expansion of agriculture and increase of population. The population of India has exceeded thousand million today and also the urban population more than four million, which indicate the large demand of water for domestic purposes. The ill health in the developing and under developing countries is mainly due to lack of safe drinking water. Drinking water is never pure. Water naturally contains minerals and microorganisms from the rocks, soil and air with which it comes in touch . Human activities can add more substances to water. But beverage doesn't got to be pure to be safe. In fact, some dissolved minerals in water can be beneficial to health. For example, the National Research Council (National Academy of Sciences) states that beverage containing dissolved calcium and magnesium generally contributes alittle amount toward calcium and magnesium human dietary needs. Fluoride, either present or added to the water system , can help protect against cavity . Whether the drinking water is safe or not will depend on impurities which are present and its amount(1).

A survey conducted by WHO in 1975 on community water supplies revealed the fact that in India while 80% of thepopulation in urban areas had access to community water supplies and only 18% of the rural population had reasonable access to safe water. The present paper deals with the drinking water quality analysis of some wells of Katol town, Nagpur (India). The results are compared with W.H.O. and I.S.I Standard

II. LITERATURE REVIEW

Water is abundant on our planet and it is essential for the survival of all form of life. The fresh water is a finite and limited resource. The aggregate sum of worldwide water, just 2.4% is appropriated on the fundamental land, of which just a small portion can be utilized as fresh water The accessible fresh water to man is hardly 0.3-0.5% of the aggregate water accessible on the earth and along these lines, its reasonable utilization is imperative. Water is indispensable and one of the precious natural resources of this

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planet168. In addition to various domestic purposes, water is required for irrigation, power generation, sanitation and industries. To ensure safe well water for drinking in urban and rural areas, a multi faced and comprehensive approach is necessary. The cooperation of government, health staff, industrial management and the people is needed to preserve drinking water quality in our villages. With beginning of life in earth there was no pollution. Nature was in perfect balance. Issue of pollution began with civilization of man35. The demands of water supply have been increasing tremendously due to result of exploding population resulting in urbanization, industrialization, agriculture etc.

The concentration of salts depends upon the environment, and source of the ground water. The concentrations of dissolved constituents are found to be higher in well water than the surface waters. Polluted water used for drinking purposes leads to many diseases which are not water-borne but due to excess salts. The quality and type of mineral matter dissolved in water depend on the physical structure and chemical composition of rocks. Industrial waste discharged into the aquatic system change the physiochemical properties of water such as hardness, conductivity, pH value, total dissolved solids (TDS), chemical oxygen demand (COD) and dissolved oxygen (DO) etc. Discharge of industrial effluents, domestic sewage and solid waste dump causes the well water to become contaminated and create health problems.

The expanding demand of water from fast growth of industries has put pressure on limited water resources. Well water is extreme, most suitable fresh water resource with about adjusted concentration of the salt for human utilization. The well water pollution is in particular area and there is no planned readymade arrangement. Industries serve as another originator of chemicals or well water contamination. The greater part of these sources of well water contamination is localized or non point sources such as solid waste disposal point, leakage from landfills, seepage from well and underground tanks disposal. The mining exercises are additionally a major role in well water contamination. Drainage from underground mines and filters from mine tailing contribute the same.

The significance and importance of well water has been all inclusive surely known by every one of the nations confronting the water related issues. In India with creating financial aspects, the ideal improvement, effective use furthermore, viable administration of their water assets ought to be the predominant technique for monetary development, yet in late year's unscientific administration and utilization of this assets for different reason practically perpetually has made undesirable issues afterward, water logging and saltiness in the instance of agribusiness utilize and environment contamination of different breaking points as an aftereffect of mining, businesses and city utilize. In India, the greater part of the population is reliant on well water as the main source of drinking water supply. The well water is accepted to be comparatively much clean and free from contamination than surface water.

The quality of water can be influenced by various pollutants such as, chemical, biological and physical. Microorganisms, infections, substantial metals, nitrate and salt have discovered their way into water supplies126. The water contamination happens when a waterway is unfavorably influenced because of the expansion of a lot of materials to the water. Ground water crisis is not the result of natural factors. It has been created by human activity quite a bit of sick well being which impacts humankind, particularly in the developing nations can be followed to pool or traced to lake of safe and whole some water supply.

Ground water contains various ions and salts in high concentration, therefore using such type of water as drinking water then it leads to various water- borne diseases. Unsafe drinking water contributed to various health problems in developing countries for example, the one billion or more occurrences of diarrhea that happen yearly. High concentration of chloride is due to the intrusion of domestic wastes and disposals by human activities. The changes in quality of well water response to variation in chemical, physical, and biological environments through which it passes .

Zafar have carried out that the pH value of the water appears to be dependent upon the relative quantities of calcium, carbonates and bicarbonates. The water tends to be more alkaline when it possesses carbonates. The carbonate alkalinity was observed to be absent indicating that the total alkalinity recorded was due to accumulation of bicarbonate only. Fluoride in drinking water causes mild type of dental fluorosis.

Saralakumari D. et al. reported that a significant part of the fluoride entering the human body is obtained from drinking water. Gopal et al. have studied that fluoride samples which exceeded the acceptable limit are not recommended for consumption without treatment. Fluoride is considered as an essential element though health problems may arise from either deficiency or excess amount.

Gupta N. et al. have studied the physio-chemical analysis of drinking water quality from 32 locations in Delhi and reported that most of the water quality parameters slightly higher in the wet season than in the dry season. Drinking water is the major problem faced in the urban areas.

Datta P. S. et al. have carried out assessment of well water contamination from fertilizers in Delhi and reported that the conditions prevailing in the urban area make the water pullulated. Raja G. and Venkatesan P.135 have studied well water pollution and its impact in and around Punnam Area of Karur District, Tamilnadu, India and reported that the water samples are highly polluted, hence suggested to exercise all the necessary precautions before the water is used for drinking and irrigation. Otherwise, it may lead

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to much adverse health effect. Shrivastava N. et al. have made study of physio chemical characteristics of water bodies around Jaipur that Jalmahal lake and found most polluted having high alkalinity, free CO2 , hardness and pH but a low level of DO, endosulfan and zinc contents in Jalmahal lake well also high, thus making it unsuitable for biota and fish and contrarily, Ramgarh lake shown high DO, low alkalinity, free CO2 , hardness pH, endosulfan and zinc concentrations were relatively low throughout theyear.

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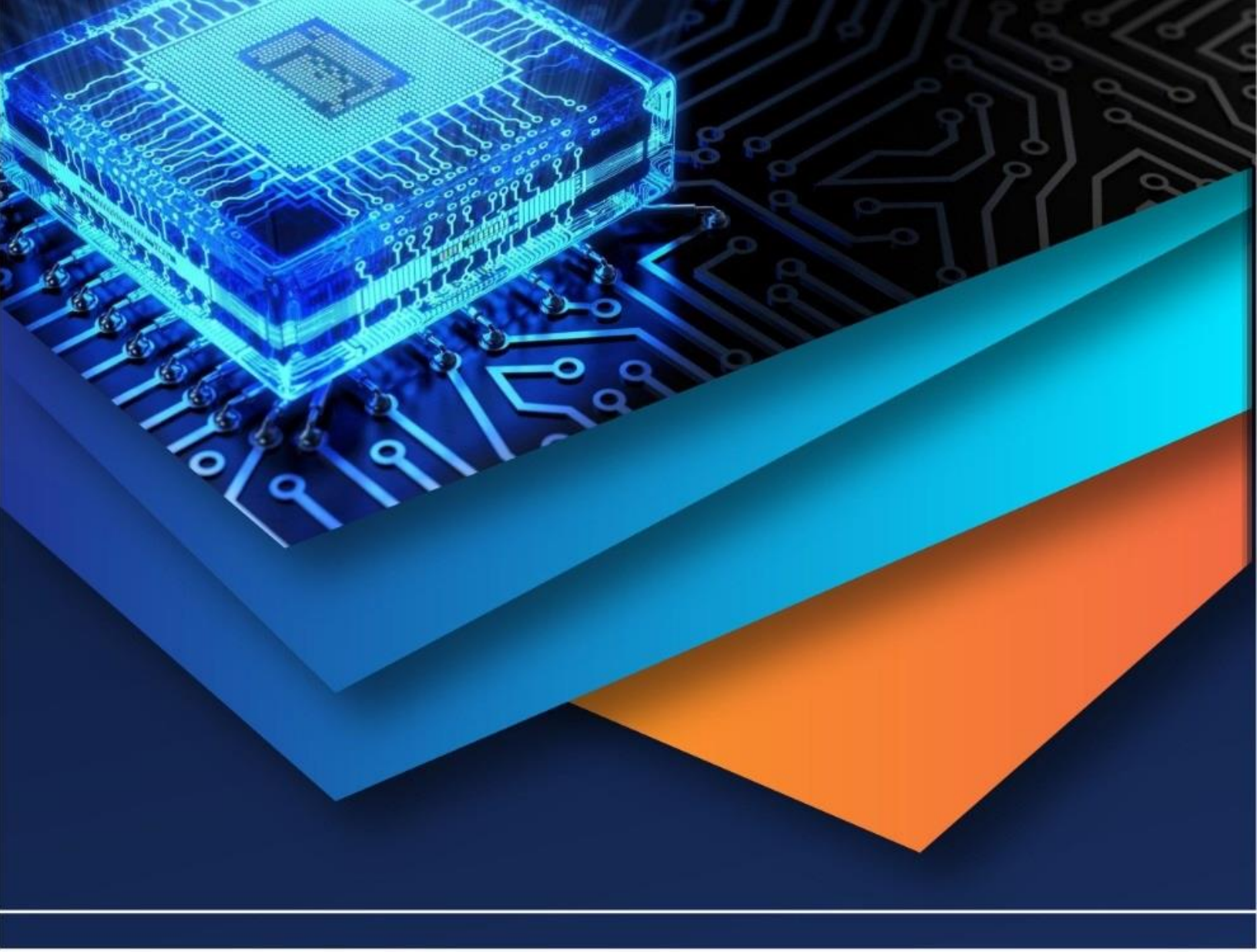

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