Ground Water quality Assessment of Chhattisgarh state : A Review

Komal Chandra
Research Scholar
Atal Bihari Vajpayee university Bilaspur (C.G.)
Email: komalmithleshchandra@gmail.com

Dr. Manish Tiwari
Professor & Head Department of Chemistry
D. P. Vipra College Bilaspur Distt- Bilaspur (C.G.)

ABSTRACT: -
The groundwater is major source of drinking water in India. The availability of good quality water is an indespensable feature for preventing diseases and improving quality of life. groundwater is a important source of water for domestic agriculture and industrial purposes in several countries. due to human and industrial activities the groundwater is polluted. Ground water quality assessment is necessary for observing the suitability of water for various purpose ,ground water is highly valued than surface water. So many studies have been carried out for the groundwater quality assessment using different parameters. The aim of this review paper is to study about the previous research assess ground water quality in Chhattisgarh state.

Keywords: - *Ground water, physico-chemical, Assessment*

INTRODUCTION :- Water is one of the most important and abundant compound of the ecosystem. All living organisms on the earth need water for their survival and growth. The quality of groundwater is a great importance in determining the suitability of particular groundwater for a certain use public water supply, irrigation industrial applications, power generation etc[1].Access to safe drinking water is key to sustainable development and essential to food production, quality health and poverty reduction. Safe drinking water is essential to life and a satisfactory safe supply must be made available to consumers[2].according to WHO organisation, about 80% of all diseases in human beings are caused by water[3].ground water plays in important role in supplying water. for this study Chhattisgarh is considered as the study area. Chhattisgarh is a state in central India. it is the 10th largest state in India with an geographical area of 13790 thousand ha. Chhattisgarh stretches across the latitudinal expanse of $17^0$46' to $23^0$15' North on one hand to the longitudinal meridian of $80^0$30' to $84^0$23' East on the other.

REVIEW OF LITERATURE

A review on previous work and research has been carried out on the physico-Chemical parameter analysis of ground water quality at different locations of Chhattisgarh state.

Vinod jena et al. (2012) carried out "physico-chemical parameters assessment of groundwater in different sites of Bhilai city", Chhattisgarh. In this paper ground water samples are tested for physico-chemical yparameters following the standard method and procedures statistical studies have been carried out by calculating correlation Coefficient between different pairs of parameters and t-test applied for checking significance. The observed value of various physico-chemical parameters of water samples were compared with standard values recommended by WHO for drinking and the extent of deterioration.

Manoj Kumar Ghosh et al.(2013) carried out "A study of water quality index assessment of ground water and pond water in SirsaKala village of Bhilai-3 Chhattisgarh, India. This study focusing on to assess the water quality index (WQI) of ground water and pond water. the study shown that the pH and EC of the ground water was above the permissible limit as prescribed by Indian Council for Medical Research and Bureau of Indian standard. They concluded that the some of the ground water and pond water sample are not suitable for domestic, bathing, drinking purpose and they needs some treatment before consumption and it is also needs to be protected from contamination.

P. Sharma et al. (2013) carried out physico- chemical analysis of surface and groundwater of Abhanpur block in Raipur District, Chhattisgarh, India. In this work has been conducted by monitoring of ground water and surface water i. e. Well water, bore well water of 8 wards of Abhanpur block as well as pond and tap water of the Abhanpur. The aim of this work is study and analyse the physico-chemical characteristics of water i.e. temperature, pH, TDS, Alkalinity, hardness and chloride. The conclusion of this investigation was found that the maximum parameters are not pollution level.

Milan Hait and M. M. Vaishnav(2014) carried out "Assessment of groundwater quality in and around a Madhya Bharat paper mail janjgir-Champa, Chhattisgarh, India. In this paper water samples were collected from four different selected spot in the month of October 2012 to December 2012. Analytical studies of some selected physico-chemical parameters with metallic elements and the statistical parameters like mean, SD, SE, %CV and Corelation Coefficient (r)) and WQI were systematically calculated, around 60% of these parameter were above the maximum permissible limit of IS :10500 and WHO standard of drinking water.

S. Sharma et al.(2014), Carried out "Chemical properties of drinking water in Bhilai district Durg, Chhattisgarh, India and its impact on human health". This research paper deals the effect of drinking water quality on health of people living in Bhilai City Dist Durg, water sample analysed by some physico-chemical parameters.

D. K. shrivtastav and A. L. S. Chandel (2014), carried out "Assessment of groundwater quality in NTPC Seepat area of Chhattisgarh state". Analysis of result showed that the most of the physico-chemical parameters were within the permissible limits, however at a few sites water is not suitable for public health.

Rubina khan and Dalchand jhariya(2017), worked on groundwater quality of Raipur city for drinking purpose utilizing Water Quality Index (WQI) and Geographic Information System (GIS) techniques. This study reveals that 76% area is falling under excellent, very good and good category and 24% area is falling under poor, very poor and unfit category as per the WQI classification.

Deepak Sinha(2018) have done their research work on "Physico-Chemical analysis of drinking water quality of Bemetara town of Chhattisgarh state. In this study drinking water samples of three sources Hand pump Municipal tap and bore well) were collected from different sites of Bemetara district and have been analysed some physico-chemical parameters. The aim of this work is to evaluate the quality of ground water for rural, semi urban and urban area based on ground water characteristics and quality assessment. They concluded that the value of all parameters were observed within recommended limit.

M. K. Tiwari and K. Vajapai(2019) carried out "Analysis of water by physico-chemical parameter adjacent rustic area in Bilaspur Chhattisgarh, India. The observation of study strongly suggest that water is of high TDS and needs to be lowered down within prescribed limits before using it for drinking purposes.

Aekesh Kumar et al.(2020), have done their research work on "Assessment of groundwater quality using GIS in kurud block of Dhamtari district, Chhattisgarh. This paper examines the groundwater quality parameters namely pH, EC, TDS, chloride, calcium, magnesium, Sodium, Potassium, Sulphate, total hardness, carbonate, bicarbonate, nitrate, manganese and arsenic were analysed at CGWB, NCCR Raipur. In this study shows that 10% of simples were falling under the excellent category, 70% samples were falling under the good categories and rest 20% simple were falling under the poor category as per the WQI classification.

Harshita Tiwari and Sanyogita Shahi(2021), carried out "groundwater pollution and contamination as well as pollution types and the effects of groundwater contamination and pollution on public health.

Manoj Kumar Ghosh and Harsha Tiwari (2021), studies on the groundwater contamination due to fly ash disposal of coal-fired thermal power plant into a non-liner ash pond. The observed results revealed the exceeding value of heavy metals prescribed by WHO for groundwater.

Nupur prithviraj et al.(2021) Carried out "Quality assessment of groundwater in the western part of Chhattisgarh (Rajnandgaon district), India. The main aim of this work is

hydrochemical analysis of ground water samples and monitor the pollution level of ground water samples. from different places of Rajnandgaon District. The assessment of the possible Geohydrologic controls on water chemistry, indicate that the over all hydrochemistry of groundwater is controlled by the chemical inputs. From the result of this paper indicates that the groundwater of this region can be successfully utilised for the longer period of time.

RESULT:- The largest available water storage area on Earth is found in groundwater. Groundwater quality was lowered as a result of excessive extraction. Groundwater quality characteristics need to be measured and controlled because of their remarkable implications [16]. Aquifer and groundwater pollution is typically irreversible[17]. Water quality and health are directly related to one another**.** The study has been conducted on the previous research that carried out an assessment of groundwater quality in Chhattisgarh state. Based on the results obtained from the previous research paper, it can be concluded that some areas of groundwater are polluted and need proper monitoring and treatment before consumption. This study is alarming for the management system of drinking water and the need for water quality analysis in other parts of Chhattisgarh.

REFERECES:-

1.Ahemed E. Hassan, Gedham M. Bekhit, jenny B. Chapman J. Hydrol. 362(1), (2008).
2. M. Ackan, A. K. Anim, E. T. Gyamti, J. Acquah and E. S. Nyarko, Advances in Applied Science Research (2012), 3,2120-2127.
3. R. Kavithaand K. Elangovan, "Groundwater quality characteristics at Erode District, Tamilnadu, India. International journal of Environmental Sciences, 1(2), 145(2010).
4. M. K. Ghosh, S. Ghosh & R.Tiwari, "A study of water quality index assessment of groundwater and pond water in sirsakala village of Bhilai -3 Chhattisgarh, India. International general of civil, structural Environmental and Infrastructure, Engineering Research and Development (IJCSEIERD) : ISSN(p) 2249-6866, 5(3) 65-76, (2013).
5. M. K. Tiwari and K. Vajapai, "Analysis of water by physico-chemical parameter adjacent rustic areas in Bilaspur, Chhattisgarh, India". Journal IJCESR. 1(6): 1273-1276.(2019).
6. D. Sinha, " Physico-chemical analysis of drinking water quality of Bemetara town of Chhattisgarh state. International Journal of Research and Analytical Reviews(IJRAR) eISSN2348-1296,5(3), 171-178.(2018).
7. N. Prithviraj, j. Tripathi, S. Panda and K. K. Barik "Quality assessment of groundwater in the western part of Chhattisgarh (Rajnandgaon district) India. Journal of EM International 40(1): 97-103, (2021).
8. V. Jena, s. Dixit and S. Gupta, " Physico-chemical parameters assessment of groundwater in different sites are Bhilai city, Chhattisgarh". Rasayan J. Chem (RJC) 5(4) 506-509, (2012).
9. M. Hait and M. M. Vaishnav, " Assessment of ground water quality in around of Madhyabhart paper mills, janjgir-champa (CG), India". Recent Research in science and technology 6(1), 287-292, ISSN: 2076-5061.(2014).
10. S. Sharma, V. K. Jain, H. S kar, " chemical properties of drinking water in Bhilai district - Durg Chhattisgarh and its impact on human health". research Journal of Science and Technology; 6(2) 63-65 (2014).

11. A. K., M. P. Tripathi, D. Khalkho, S. Baghel "Assessment of groundwater quality using GIS in kurud block of Dhamtari district Chhattisgarh". Journal of soil and water conservation in India 19 (4) 426 -435 ISSN: 2455-7145 (2020).
12. D. K. shrivtastav, A. L. S. Chandel, "Assessment of ground water quality in NTPC seepat area of Chhattisgarh state, India". International general of Science and Research (IJSR), ISSN: 2319-7064, 3(10) 2014.
13. R. Khan, D. Jhariya, "Groundwater Quality Assessment for Drinking Purpose in Raipur City, Chhattisgarh Using Water Quality Index and Geographic Information System",Journal of the Geological Society of India 90(1):69-76(2017).
14.Harshita Tiwari, Sanyogita Shahi, "A Study of Ground Water Contamination In Janjgir Champa District of Chhattisgarh", International Journal of Aquatic Science ISSN: 2008-8019 ,Vol 12, Issue 03,(2021) .
15. Manoj Kumar Ghosh, Harsha Tiwai ,"Heavy Metal Concentration in underground water due to Fly Ash at Janjgir Champa region in Chhattisgarh", Research J. Science and Tech. 13(2), (2021).
16. Loaiciga H. A. An optimization approach for groundwater quality monitoring network design. Water Resources Research 25(8): 1771-1782.(1989) .
17. Singh P K, Tiwari A K, Painigarhy B P and Mahato M K, Water quality indices used for water resources vulnerability assessment using GIS technique, a review, International J. of Earth Science and Engineering, 6(6-1), 1594-1600, (2013).