



# Valuation of groundwater quality and heavy metals impurity in Rural Area in Manendragarh

Renu Prajapati<sup>1</sup>, P. K. Singh<sup>2</sup>

<sup>1</sup> Govt Vivekanand P.G College Manendragarh

<sup>2</sup> Department of Chemistry, TCL Govt. PG College, Janjgir, Champa (C.G.)

**Abstract**— The colouration of malleable and various waste electronic produces out into the water system sources serious well-being issues. The chronic disclosure to Cd produces a varied variety of acute and chronic assets in humans. Cd stores in the human body, mainly in the kidneys, ensuing in kidney harm which is a serious health effect. This study best suited season in pre-monsoon seasons with minimum variation on ground water cadmium concentration and minimum variation on ground water chromium concentration and Arsenic was found to be non-detectable.

**Keywords**— groundwater, arsenic, cadmium and chromium

## I. INTRODUCTION

Groundwater for intake and providing high-grade drinking water has develop one of the major contests of human civilization. Although groundwater is careful as safe, high absorptions of heavy metals like arsenic can pose probable human well-being concerns and dangers Pretreatment options are available to control adversarial geochemical reactions, such as DO removal to avoid oxidation of arsenic-bearing sulfide minerals and associated leak.

Groundwater is one of the most valuable natural resources in our planet. It is being demoralized extensively in many parts of the world with a huge increase in removal in the past few periods due to the accessibility of new and cheaper

drilling and pumping tools. The regularity and harshness of arsenic skin wounds depend on both the absorption of arsenic in drinking water and period of use. We supervised groundwater levels and chemicals in different aquifers in the Manendragarh. Great arsenic groundwater has been initiate universal .Arsenic desorption and reductive closure of its host reserves have occurred as the leading mechanisms for the release of Arsenic into groundwater. Those processes depend on the quality and quantity of available natural matter.

Enlarged urbanization and industrialization are accountable for increases in levels of bit metals, especially heavy metals, in our canals. Conservational pollution is a fresh major worry due to the serious risk to biota. Rapid industrialization and new machinery play a major role in contaminating the atmosphere.

## II. METHODOLOGY

Water samples of Manendragarh its surrounding coal field area were collected from 15 sampling location for the period of pre monsoon, post monsoon, winter and summer seasons year 2016. Manendragarh was invented by some ethnic around 100 centuries ago, later established by British Raj for coal mine. Railway line and road are established by British. National highway 43 has its way through Manendragarh. Amrit Dhara cascade is a nearby desirability. “Sidh-Baba” stand is famous

for the Lord Shiva sanctuary. Manenragarh had a populace of 30,748. Males found 53% of the populace and female 47%. Manendragarh has a regular literacy degree of 72%, advanced than the national regular of 59%, female literateness is 64% and male literateness is 79%. Manendragarh is the center of rural items. The latitude of Manendragrah 23.213890 and the longitude is 82.201279. Procedure for Sample Preparation for Cadmium, Chromium, determination (APHA 22<sup>ND</sup> Ed., 2012).

### III. RESULT AND DISCUSSION

Cadmium is a non- vital non beneficial element known to have a high toxic element. Cadmium high concentration can cause bronchitis, anemia and renal stone formation in animals. Drinking water is generally contaminated with galvanized iron pipe and plated plumbing fitting of the water distribution system. Cadmium concentration can also arrive the atmosphere from a variety of industrial applications, including mining, electroplating and plasticizer production (CPCB, Bhopal). The prescribed limit value of cadmium concentration in drinking water is (0.003 mg/l, WHO, 2011, BIS, 2014). Fig 1 it is inferred that out of four seasons the best suited season in pre-monsoon seasons with minimum variation on ground water cadmium concentration.

Chromium is a crucial nutrient to human and lack may cause diseases such as heart problems, metabolic disorder and diabetes and consumed in left-over can be injurious. It can reason fitness effect such as skin rashes.(CPCB, Bhopal). Fig it is inferred that out of four seasons the best suited season in pre-monsoon season in minimum variation on ground water chromium concentration.

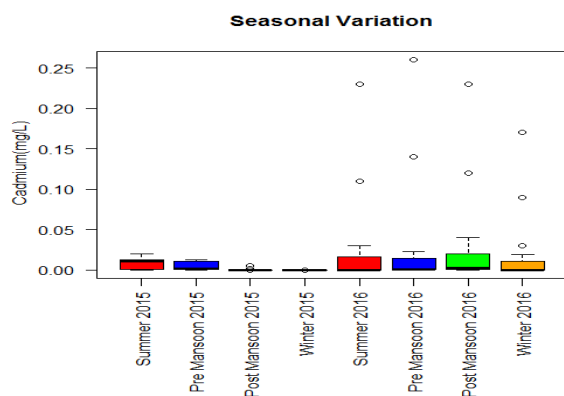


Fig.1. Seasonal variation of cadmium mg/L

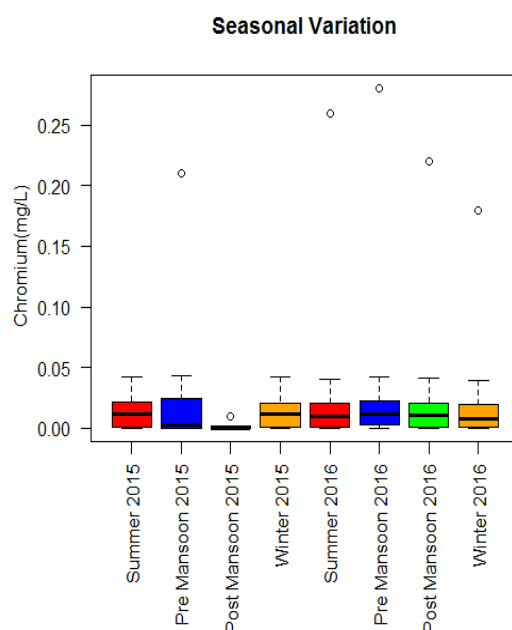


Fig.2. Seasonal variation of Chromium mg/L

The result of arsenic Heavy metals analysis of ground water samples of study area for during years (2016). Arsenic metal concentration of all four season's water samples was found to be non-detectable. . The WHO, 2011 and BIS, 2014



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permissible limit value for arsenic metal in water is 0.01 mg/l.

#### IV. CONCLUSION

The Cr were varied from 0.0 mg/L to 0.08 mg/L. All samples were below the permissible limit WHO (0.05 mg/L) except one sample away from Manendragarh, 13.5 km Dola Gram part-2 colliery area (0.08 mg/L) in winter season. The Cd were varied from 0.0 mg/L to 0.012 mg/L. the uppermost Cadmium was observed in summer season (2016) Loko colony in Manendragarh Arsenic is non detectable. Heavy metals are vastly toxic metals that are habitually present in manufacturing, civic and urban overflow and can be injurious to humans and biotic life

#### REFERENCES

1. Arsenic contamination of groundwater: A global synopsis with focus on the Indian Peninsula volume 12, issue 3, May 2021, 101079.
2. Mechanisms of groundwater arsenic variations induced by extraction in the western Hetao Basin, Inner Mongolia, China journal of hydrology volume 583, April 2020, 124599
3. Maliva, R. G., & Missimer, T. M. (2010). *Aquifer storage and recovery and managed aquifer recharge using wells: Planning, hydrogeology, design, and operation*. Houston: Schlumberger.
4. Health burden of skin lesions at low arsenic exposure through groundwater in Pakistan environmental research Volume109, issue 5, July 2009, Pages 575-581.
5. Groundwater Contamination with Cadmium Concentrations in Some West U.P. Regions, India Saudi Journal of Biological Sciences, July 2018 25(7).
6. The WHO, 2011 and BIS, 2014 permissible limit value.CPCB, Bhopal(APHA 22ND Ed., 2012).
7. Umadevi, A.G., George, M. Dharmalingam, P., Jose P. Abraham, Rajagopalan, M., Dhanya Balakrishnan, Haridasan, P.P. and Pillai B. P.M. (2010)An

Investigation of the Quality of Underground Water at Eloor in Ernakulum District of Kerala, India.E-Journal of Chemistry 7(3):908-914.

8. Varughese S., and Prasad. D. K.V (2012) Physico-Chemical Analysis of Groundwater Samples in the Varahanadi Watershed, India. International Journal of Environmental Sciences 2(3): 1662- 1669.