

A review study on “Quality Assessment of groundwater resource in centre India region”

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Abstract- Jabalpur experience the ill effects of the crumbling of ground water in both quality and amount, Groundwater is a standout amongst the most valuable natural resources in Jabalpur as it is the wellspring of drinking water for most of the populace. These days there is a water emergency in the district, groundwater defilement has turned into a noteworthy worry in the current years. Groundwater aquifer is viewed as the principle and just water supply hotspot for all sort of human use in Mahakoushal district (residential, farming and modern). This source has been confronted a crumbling in both quality and amount for some reasons, e.g. low precipitation, expanded in the urban regions which prompted an abatement in the revive amount of the aquifer, likewise expanding the populace is draining the groundwater aquifer. Water quality can be estimated in view of an arrangement of physical and substance factors so the general water quality is mind boggling and is difficult to comprehend what is behind these arrangements of information. So in this exploration there is an attempt to perceive the generally speaking and full picture of ground water quality in Jabalpur locale. The aim of this review paper is to study about the previous research conduct an assessment of the quality of groundwater resource in centre India, Jabalpur region.

Index Terms- water quality assessment, quality index, groundwater etc.

I. INTRODUCTION

1.1 General

The ground water conduct in the Indian sub-landmass is exceedingly entangled because of the event of differentiated topographical arrangements with extensive lithological and ordered varieties, complex structural system, climatological dissimilarities and different hydro substance conditions. Studies did throughout the years have uncovered that aquifer bunches in alluvial/delicate shakes even rise above the surface bowl limits. Extensively two gatherings of shake developments have been distinguished relying upon

naturally unique power through pressure of ground water, Viz. Permeable Formations and Fissured Formations.

Madhya Pradesh is located in the central part of India and is a land-locked State, bordered on the west by Gujarat, on the northwest by Rajasthan, on the northeast by Uttar Pradesh, on the east by Chhattisgarh, and on the south by Maharashtra. It has a geographical area of 3,08,252 km² and is situated between north latitudes 21°04' and 26°54' and east longitudes 74°00' and 82° 50'. There are 51 districts and 313 Community Development blocks in Madhya Pradesh. The population of State as per census 2011 is 72597565 with a population density of 236 persons per Km² area. Out of total population, 75% lives in the villages and their main occupation is agriculture. The important urban areas in the State are Bhopal, Indore, Jabalpur, Ujjain and Gwalior. Dhupgarh in Pachmarhi is the highest point in the State.

Madhya Pradesh comprises several linguistically and culturally distinct regions, of which the major regions are Malwa plateau region is located in the northwest of the State and Indore is the major city of the region. Bhopal, the capital city lies on the extension of Malwa Region and on the edge of Bundelkhand region. Nimar region is located in the western portion of the Narmada River valley, lying south of the Vindhya in the southwest portion of the State. Bundelkhand is a region of rolling hills and fertile valleys in the northern part of the State, which slopes down toward the Indo-Gangetic plain to the north. Chambal region is located in the north-western parts of the State. The climate is harsh, and the area is known for murderous pirates who were active in hundreds in the late 1900s. Baghelkhand is a hilly region in the northeast parts of the State, which includes the eastern end of the Vindhya Range.

Mahakoshal (Mahakaushal) is the south-eastern portion of the State, which includes the eastern end of the Narmada river valley and the eastern Satpuras. Jabalpur is the most important city in the region. Katni and Jabalpur districts lie in this region.

For this study *Jabalpur* is considered as the Study area.

Agriculture is the main stay of the people of Madhya Pradesh State. Water is essential for irrigation purposes, but its indiscriminate use can lead not only to shortages, but also to the deterioration of crop yields and soils. Ground water resource of a region is one of the building blocks for balanced economic development of the area, especially in an agriculture based society. Dependence on ground water for irrigation and increasing water requirements in urban areas in Madhya Pradesh has necessitated judicious and planned uses of ground water resources in order to reach sustainability. For proper planning and management of ground water development in a judicious and socioeconomically equitable manner, assessment of ground water scenario is one of the most important prerequisites.

1.2 Ground Water Pollution and Contamination in India: Extends and Impacts

The vital part groundwater plays as a decentralized wellspring of drinking water for millions provincial and urban families can't be exaggerated. As per a few evaluations, it represents about 80% of the country local water needs, and half of the urban water needs in India. Groundwater is for the most part less vulnerable to sully and contamination when contrasted with surface water bodies. Additionally, the natural pollutions in water, which recharges groundwater frameworks, get evacuated while penetrating through soil strata. Be that as it may, In India, where groundwater is utilized seriously for water system and mechanical purposes, an assortment of land and water-based human exercises are causing contamination of this valuable asset. Its over-abuse is causing aquifer defilement in specific cases, while in certain others its informal improvement with deficient learning of groundwater stream dynamic and geo-hydro substance forms has prompted its mineralization. [2]

The rate of fluoride above passable levels of 1.5ppm happen in 14 Indian states, specifically, Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar

Pradesh and West Bengal influencing a sum of 69 areas, as indicated by a few assessments. Some different assessments find that 65 for every penny of India's towns are presented to fluoride hazard.

Large amounts of arsenic over the reasonable levels of 50 sections for every billion (ppb) are found in the alluvial fields of Ganges covering six areas of West Bengal. Nearness of overwhelming metals in groundwater is found in 40 regions from 13 states, viz., Andhra Pradesh, Assam, Bihar, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal, and five squares of Delhi. Non-point contamination caused by manures and pesticides utilized as a part of horticulture, regularly scattered over expansive zones, is an incredible danger to crisp groundwater biological communities. Escalated utilization of compound composts in ranches and aimless transfer of human and creature squander ashore bring about draining of the remaining nitrate causing high nitrate fixations in groundwater.

Contamination of groundwater because of mechanical effluents and metropolitan waste in water bodies is one of the significant worry in numerous urban areas and modern groups in India. A 1995 study attempted by Central Pollution Control Board recognized 22 locales in 16 conditions of India as basic for groundwater contamination, the essential driver being modern effluents. A current review attempted by Center for Science and Environment from eight places in Gujarat, Andhra Pradesh and Haryana revealed hints of overwhelming metals, for example, lead, cadmium, zinc and mercury. Shallow aquifer in Ludhiana city, the main wellspring of its drinking water, is contaminated by a stream which gets effluents from 1300 enterprises. Exorbitant withdrawal of groundwater from seaside aquifers has prompted incited contamination as seawater interruption in Kachchh and Saurashtra in Gujarat, Chennai in Tamil Nadu and Calicut in Kerala.

II. LITERATURE REVIEW

2.1 Introduction

A review on previous work and research has been carried out on the physic- chemical parameter analysis of ground water quality at different locations.

2.2 Water Quality

The idea of water quality is unpredictable in light of the fact that such a large number of

elements impact in it. Specifically, this idea is naturally attached to the diverse proposed employments of the water; distinctive utilizations require distinctive criteria. Water quality is a standout amongst the most imperative factors that must be considered while assessing the manageable advancement of a given area. (Cordoba et al., 2010).

Water quality must be characterized in view of an arrangement of physical and synthetic factors that are firmly identified with the water's proposed utilize. For every factor, satisfactory and inadmissible esteems should then be characterized. Water whose factors meet the pre-built up models for a given utilize is viewed as reasonable for that utilization. On the off chance that the water neglects to meet these models, it must be dealt with before utilize. (Cordoba et al., (2010).

Water quality is considered the main factor controlling health and the state of disease in both man and animals.

Water is indispensable to wellbeing, prosperity, nourishment security and financial improvement of humanity. Thusly, the nearness of contaminants in natural freshwater keeps on being a standout amongst the most essential ecological issues in numerous zones of the world, especially in creating nations, where a few groups are far from consumable water supply. Low-salary groups, which depend on untreated surface water and groundwater supplies for residential and horticultural utilizations are the most presented to the effect of poor water quality. Sadly, they are additionally the ones that don't have satisfactory foundation to screen water quality routinely and execute control systems. (Ayoko et al., 2007).

Kazi et al., (2009) revealed that human exercises are a main consideration deciding the nature of the surface and groundwater through environmental contamination, emanating releases, utilization of agrarian chemicals, dissolved soils and land utilize. Natural contamination, predominantly of water sources, has turned out to be open intrigue too.

The synthetic sythesis of ground water is controlled by numerous elements that incorporate the structure of precipitation, mineralogy of the watershed and aquifers, atmosphere and geology. These variables can consolidate to make assorted water writes that adjustment in sythesis spatially and transiently (Chenini I and Khemiri S., 2009). Abuse of groundwater resources past their potential restoration limit, brings about a hydrological

shortfall. By and large, this is communicated as a decrease in groundwater levels yet in beach front aquifers this may cause interruption of seawater.

2.3 Research Paper Related to Ground Water Quality

The following studies have been carried out regarding the ground water quality

1. Sina Zahedi et.al. (2017) "Modification of expected conflicts between Drinking Water Quality Index and Irrigation Water Quality Index in water quality ranking of shared extraction wells using Multi Criteria Decision Making techniques" *Ecological Indicators* 83 (2017) 368–379

Groundwater resources assume a urgent part in most parched/semi-dry areas, for example, Karaj plain, Iran. Unearthing of wells and misusing water resources of aquifers have for some time been known as standard answers for supply water requests for drinking, rural and modern purposes. In numerous horticultural territories, for example, the previously mentioned area, extraction wells have been used for both drinking and agrarian utilizations, while measures taken for water quality checking and ensuring general wellbeing are genuinely restricted.

Then again, a large portion of the mutual extraction wells in the area utilized for drinking reason have been situated close to the farming grounds and they are very under the danger of getting dirtied by Agricultural pesticides.

The *Sina Zahedi et.al.* displayed right off the bat plans to exhibit the outcomes acquired from Drinking water Quality Index (DWQI) and additionally Irrigation Water Quality Index (IWQI) and furthermore decides likely clashes that might be stimulated in positioning of water wells utilizing these two strategies Subsequently, Multi Criteria Decision Making (MCDM) methods, for example, Ordered Weighted Averaging (OWA), Compromise Programing (CP) and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) were utilized to diminish impacts of the contentions. It was elucidated that MCDMs, to some degree, mitigated logical inconsistencies in wells' positions –determined by DWQI/IWQI and validated this system as a fitting technique for water quality positioning in farming social orders.

2.Salam Hussein et.al. (2017) "Water quality index for Al-Gharraf River, southern Iraq" *Egyptian Journal of Aquatic Research* (2017)

In this paper the Water Quality Index has been produced numerically to assess the water nature of Al-Gharraf River, the primary branch of

the Tigris River in the south of Iraq. Water tests were gathered month to month from five inspecting stations amid 2015– 2016, and 11 parameters were examined: natural oxygen request, add up to broke down solids, the grouping of hydrogen particles, disintegrated oxygen, turbidity, phosphates, nitrates, chlorides, and also turbidity, add up to hardness, electrical conductivity and alkalinity.

4. Rekha .S. et.al. (2017) “Assessment of Ground Water Quality Parameters in Gulbarga District” *International Journal of Engineering Science and Computing, March 2017*

In this study area, an endeavor has been made to distinguish the pathway and defilement of real particles, supplements in the groundwater of some of talukas of Gulbarga Districts and Surrounding territory. The unmistakable wellsprings of Pollutants and natural organizations that are in charge of tainting in the investigation zone are Domestic/Municipal sewage and over misuse of Ground water to take care of the demand for crisp water are the noticeable foundations for diminishing nature of Ground water. Henceforth, the accompanying suggestion need to limit or decrease the further weakening of Ground water quality in the present examination.

2.4 Research Paper Related to Ground Water Quality in Jabalpur

Ratna Kumar Srivastava and Deepti Pandey (2012) attempted to describe nature (parameters) of groundwater in Jabalpur city, by taking water tests from six distinct stations situating close to the Omti nallah region. Assessment of physico-synthetic and microbiological parameters of water tests was done amid March – April 2011. To evaluate the nature of groundwater, every parameter was contrasted and the standard attractive point of confinement of that parameter in drinking water as recommended by BIS 10500-91. The examination of various parameters spatially demonstrated an expanding example of alkalinity, add up to broke up solids, add up to hardness, calcium, fluoride and fecal coliform focuses and diminishing grouping of disintegrated oxygen in the groundwater. It is important to apply solid preventions promptly to spare groundwater from crumbling in the region around Omti nallah in Jabalpur city.

As per **Pushpendra Singh Bundela et al (2012)** the standard and the most disregarded reason for water contamination are uncontrolled dumping of Municipal Solid Waste. Invasion of water by

precipitation, water effectively exhibit in the waste, or water created by biodegradation, cause the leachate to leave the dumping ground along the side or vertically and discover its way into the groundwater consequently causing pollution. Ten groundwater tests gathered amid the blustery season 2011 from the investigation district and the examples were examined for different physical and compound properties. Amid the investigation it was discovered that Total Dissolved Solids shifts from 546 mg/L to 907 mg/L and contrasted and passable points of confinement. In this manner, the best acknowledged alternative is to keep away from the likelihood of dirtying the groundwater resources.

III. SUMMARY

An exhaustive writing survey has been done on the evaluation of ground water quality all through the world. There is weakening in nature of groundwater resources in India as well as all through the world. There can be a great deal of purpose behind crumbling of ground water quality however generally the strong waste put in landfills or open dumps, will subject to either groundwater undercurrent or penetration from precipitation or some other plausibility of invasion of water, and furthermore the overabundance utilization of chemicals in agribusiness and so forth. Additionally Review centres around ground water quality effects in the Jabalpur locale. It is obvious from the present survey that continuous ground water quality checking is required.

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