

Assessment of Water Quality in Chittorgarh District

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Abstract : *Water is lifeline for all living organism and is the basic need for human beings, whether it is for health, sustenance, agriculture, food production or other activities. Water is an essential natural resource for sustaining life and environment. As a resource, it is under relentless pressure due to the population growth, rapid urbanization and environmental concerns. Excessive use of water in our daily activities has made this resource scarce. The entry of pollutants in our water bodies sets off a progress series of physical, chemical and biological events in the water. Thus a systematic planning of the conservative and judicious use of this resource is very important for the control of water pollution. The present research paper is an attempt to analyze various dimensions of water pollution and its control in Chittorgarh district.*

Keywords : health, sustenance, agriculture, food production, water, Alkalinity

Introduction Water is an important natural resource and basic need for human beings. There is no alternative for this fluid. The importance of water for every major aspect of development is fully recognized but the right quantity and quality of water is difficult to obtain whenever required and whenever needed. As a resource, it is under relentless pressure due to the population growth, rapid urbanization and environmental concerns. Water needs conservation and that water pollution could be a problem.¹ Availability of unlimited amount of clean water was taken for granted. But now this problem has assumed serious proportion world wide. It was estimated that around the world billions people lack access to save drinking water.² The water usage in industry has increased in last few years. Effluent water is generated in industrial process which if discharged untreated can cause land and water contamination. In developing countries upto 95% of sewerage and 70% of industrial waste is being dumped into surface water source adding to the burden of pollutants causing diseases. In did 50% of deaths are caused by eater borned diseases.³ Good quality water is inadequate even for normal living and is getting contaminated due to domestic wastes, industrial wastes, agricultural wastes, runoff from urban areas and soluble effluents.⁴

Chittorgarh is situated in the south-eastern part of Rajasthan. It lies on the Berach River, a tributary of the Banas. The district is adjoining by Bhilwara and Bundi district in the north Kota and MP in the east toward west, it is surrounded by Udaipur and Bhilwara. The topography of the district is generally undulating but the hills belonging to the Aravali range are scattered all over the area. Chittorgarh has an average elevation of 394 metres. Climate is generally dry during the south west monsoon season. Only 0.04% of water is available for human beings use. Ground water is the important source for irrigation and drinking purpose. Water pollution is an important aspect of environmental pollution.⁵ Ground water is an important natural resource world wide that exists only on our planet. Without this precious resource life on earth would be non existent. Human health is threatened by unsanitary

conditions through open drain carrying and disposing waste water into natural water bodies.⁶ Rapid urbanization has affected the availability and quality of groundwater due to its over exploitation and improper waste disposal espically in urban areas.⁷

Methodology

The present research work is based on secondary and primary data. Data on water resource was collected from various government offices. The primary data were collected through questionnaires. Chittorgarh district has been selected as an area of investigation. Villages and tehsils are the basic areal units of research. Water samples collected from 13 tehsils and 70 villages. The research methodology adopted in the research includes the following step- Theoretical study, collection of data, preparation of table, maps and diagrams. The collected data were processed with the help of various quantitative techniques. The principal objectives of the study is to point out highest various possible alternative for the proper management of water resource of the district. The main aim of this research is to analyze the problems of consumers regarding the quality of water. The optimum utilization and conservation of water resource could solve the problem of water pollution.

Result and Discussion

Water is an important part of environment and is found in many forms of life on which human well being depends. The importance of water for every major aspect of development is fully recognized but the right quantity and quality of water is difficult to obtain whenever required and wherever needed.⁸ Water as a resource is under relentless pressure due to the population growth, rapid urbanization and environmental concerns. [In the present research various physic chemical parameters } In urban areas, where there has been a large setup of industrial units, the rivers have suffered a great setback by virtue of effluents, containing chemical constituents in undesirable concentrations and in rural areas where the agricultural practices have switched over from conventional type to mechanized and scientific type, it has received large amounts of pesticides due to their improper use and disposal.⁹ Ground water samples collected from 70 villages of chittorgarh district. The present research provides a detailed description of the chemical criteria of ground water. The quality of ground water varies from place to place. The suitability of natural water for a particular purpose depends upon the standards of acceptable quality for that use. Ground water is valuable only when its quality is suitable for the purpose for which it is being explored. The entry of pollutants in our water bodies sets off a progress series of physical, chemical and biological events in the water. The nature of polluted water body is thus governed by the quality and quantity of polluting substances. Seventy ground water samples are collected systematically from various parts of the chittorgarh district. Collected samples were analyzed for the following physio-chemical parameters.¹⁰

Taste and Odours : The presence of taste and odours is determined by impurities in water. Industrial wastes are major cause of odours of any artificial origin. In the district water has been found unobjectionable from this point of view.

PH : It is a measure of intensity of acidity or alkalinity of water. The standard permissible limit of drinking water is 6.5 to 8.5. In this research pH ranges between 6.4 to 8.8. The studied samples of water are found to have PH values ranging between 7.3 and 8.0, that are in the alkaline range. North-western, northern and southern tehsils come under standard limit. Bari sadri and Gangrar tehsils which are situated in northern and south-western parts of the district, noticed beyond tolerable limit. At village level the range of pH value is noticed between 6.3 to 8.5. Within acceptable limit 7.0 to 8.5 in 61 villages which are distributed in all the directions. In only 2 villages Achnera and Badikhera, pH value has been recorded beyond tolerable limit.

Alkalinity : In normal water the alkalinity may be due to presence of carbonates and bicarbonates. Determination of acidity is significant as it causes corrosion and influences the chemical reactions. The alkalinity value in the district ranges from 80 in Laxmipura and 450 in Kunwaliya. About 65 villages have recorded alkalinity more than standard limit but upto tolerable limit (upto 425 ppm). These villages are scattered all over the region. The villages situated in north, north-west and east have recorded alkalinity value beyond tolerable more than 425 that is cause for rejection for water use.

Total Hardness : Hardness of water depends upon the amount of calcium and magnesium salt. The hard water is not suitable for domestic use. The values of total hardness varies from 60 to 1220 ppm. Only in three villages has been noticed beyond tolerable limit more than 600 ppm.

Total Dissolved Solids : Concentration of dissolved solids is an important parameter in drinking water and other quality standards. They give a particular taste to the water. The T.D.S. nearly 1500 ppm produce distress in animals and other living organisms. Only Rashmi tehsil recorded values, beyond tolerable limit. All the remaining tehsils have noticed values within tolerable limit.

-2: Standard and observed values of the physico-chemical parameters in Chittorgarh district

Conclusion : The main source of water for physico-chemical analyzing are handpump and wells in the district. The analysis of water samples collected from the different area in Chittorgarh district revealed that some villages have complained regarding the colour, taste, smell and clarity of water. More than 10% villages situated mainly in the northern, eastern and southern parts of the district have recorded the examined values of all selected parameters beyond tolerable limit. About 30% villages extending all over the region, have recorded the examined values upto tolerable limit. It was a representative sample study of the ground water quality of Chittorgarh district. Almost all parameters were found within permissible limits. The general taste of water is good. There is some industrial growth in Chittorgarh and Nimbahera and the water of this area is hard because people of this area are prone for the immediate health

problems. Irrigation is the main occupation of the surrounding population and chemical fertilizers are more commonly being used. The proper environment management plan must be adopted to control water pollution.

References :

- i. WHO(1993): *Guideline for drinking water quantity -I. Geneva WHO: Recommendations second edition.*
- ii. APHA(American Public Health Association) 1995. *American Water Pollution Control Federation, Standard Method for Examination of Water and Waste Water.*
- iii. Central Water Commission(1988): *Rates for Surface Water in India, Ministry of Water Resources Govt. of India, New Delhi*
- iv. Chatterjee, G.C.(1967): *Ground Water Resource of India: Present Status and Suggested lines of Future Investigation, Bulletin S.S.I., Sr.B.26P.60.*
- v. Burton, I (1997): *Safe Water for All, National Resource Forum, Vol.I, P.P.95-110* A.R.El.Sharif(1984)
- vi. Grover, V.K. and J.N.Shukla(1993) : *Environmental Quality Control and Water Management at IFFCO Phulpur in : Fertiliser News, 38, P.P.63-66.*
- vii. Dinesh Mohan(1986): *Environmental Guidelines for Planning Water Resource Development Projects p (ed.), Institution of Engineers, Roorkee Local Center, Roorkee*
- viii. Trivedi, RK and Geol PK.(1984): *Chemical and Biological Methods for Pollution Karad(India): Environmental Pollution.*
- ix. Gulta DP Sunita and Saharan JP(2009): *Physico chemical analysis of ground water of selected area of Kaithal city 9 (Haryana) India. Researcher, I(2); 1-5*
- x. Gupta N.L. and R.K. Gurjar (1993): *Integrated Water Use, Management-Jaipur: Rawat Publications, 382 P.*

Table-1 Physico-Chemical Parameters And Their Standard Values

S.NO.	PARAMETRES	STANDARD VALUE	CHARACTERISTICS
1. (i)	PHYSICAL Temperature	7 ⁰ -16 ⁰ C	At higher temperature with less dissolved gasses the water becomes tasteless and does not even quench the thirst.
(ii)	Clarity	Transparent	—
2. (i)	CHEMICAL Taste and Odour	—	It is due to dissolved impurities often organic in nature
(ii)	p ^H	7.5-8.5	It is an important factor in fixing alum dose in drinking water treatment.Changes in ph due to disposal of industrial wastes.
(iii)	Total Hardness	200 ppm	The anions responsible for hardness are mainly bi-carbonat,carbonate, chlorides etc.It prevents the lather formation with soap and increases the boiling point of waters.
(iv).	Calcium Hardness	200 ppm	It is an important nutrient.disposal of sewage and industrial water are the source of calcium.
(V).	Magnesium Hardness	125 ppm	Main sources are rocks,sewage and industrial wastes.
(vi).	Total Alkalinity	120 ppm	A alkalinity of water is its capacity to neutralize a strong acid and is characterized by the hydrozen ions due to dissolution of co ₂ in water.
(vii).	T.D.S.	500 ppm	Minerals are main cause of it. Its high concentration produce distress in livestock and increase the salinity of the soil.

Table-2: Standard and Observed Values Of The Physico-Chemical Parameters In Chittorgarh District

S.NO	Physico-	Range of	Standard	Deviation from	Tolerable Limit
1.	PH	6.4 TO 8.8	7.0-8.5	0.6-0.3	6.5-8.8
2.	Total Alkalinity	110 TO 430	120 PPM	10-310	150 PPM
3.	Total Hardness	180 TO 610	200 PPM	20-410	600 PPM
4.	Calcium	125 TO 400	200 PPM	75-200	500 PPM
5.	Magnesium Hardness	100 TO 310	125 PPM	25-185	500 PPM
6.	T.D.S.	480 TO 1600	500 PPM	20-1100	1500 PPM