



STUDY OF WATER QUALITY FOR DRINKING AND AGRICULTURE IN AND AROUND A MINES IN VILLAGE DEULGAON, DISTRICT GADCHIROLI (M.S.) INDIA

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Abstract:

This research paper describes the assessment of the water quality status for drinking and agriculture in and around mines in village Deulgaon, district Gadchiroli (M.S.) India during one year October 2011 to September 2012. For optimum utilization of water resources, it is necessary to know both the quantity as well as quality of water. The parameters measured by taking physical, chemical and biological for water quality of seven water sources i.e Gaon talav, Colony (Tutuli) talav, Dewar body, Mud body, River Khobragadi, River Gadhavi and River Vainganga. The suitability of water mainly depends upon the constituents salts and silt content of water and water quality is found in permissible limits when obtained data compared with WHO. The present investigation gives final conclusion it requires the study of biological parameters from the water sources and it is our further prospective.

KEYWORDS:

Physical and Chemical parameters, SAR, OP, PI, SI, RC, Na% and Salinity.

INTRODUCTION

Here the conflict arises between Environment and Man. The benefit of the progress will be felt in other parts where as the effects of pollution will be borne by mining areas. Besides the other pollution like air and noise pollution, water pollution will be very high. The extent of water pollution in the mining depends upon the nature of minerals and the technology of mining operation. It is observed that the water pollution in the mining areas is mainly due to the pressure of a large amount of suspended solids in the effluents of mines. The present study focuses on important aspects which related to water quality for the drinking and agriculture purposes only for the betterments and health hazards of the villagers of Deulgaon. Materials and Methods- The water samples were collected from seven different sampling sites. The sampling sites are located far away from each one another. The samples of water collected in three liters polyethelene cans, which were sterilized earlier. Some physical and chemical water quality parameter assess at local Zoology laboratory and DO, pH, TDS, Turbidity measured at the sited by using 191-E portable water analysis kits. The parameters were determines as per the standard methods of analysis of water (APHA, AWWA, WPCF-1985, 16th Edition) For irrigation purposes the parameters like SAR, OP, PI, SI, RC, Na% and Salinity were calculated.

Study Area and Study sites - Deulgaon is small village on the road of Gadchiroli to Nagpur via Armori, Brahmपुरi, Nagbhir, Umred, The Village Deulgaon is near about 7 to 8 kms away from Armori and 24 to 25 kms from District place Gadchiroli. This Place is very convenient for research visits but seven different sites are very far away from each other but maintained its natural beauty. All sites surrounded by thick forest, valley and mountains as well as private mines are there. Tributary (River Khobragadi, River Gadhavi, River Vainganga) found at village Awalgaon which is on west side of village Deulgaon.

Table no. 1. Seven different Study Sites, Sample Numbers and Types of Sources

Study sites	Sample number	Types of source
River Khobragadi	S-1	Permanent Lentic source
River Gadhas	S-2	Permanent Lentic source
River Vaingang	S-3	Permanent Lentic source
Gaon talav	S-4	Permanent Lentic source
Colony (Tultuli) talav	S-5	Permanent Lentic source
Dewar body	S-6	Permanent Lentic source
Mud body	S-7	Permanent Lentic source

RESULTS AND DISCUSSIONS-

The concentration of sodium, potassium, calcium, magnesium, chlorides, sulphates, carbonates and bicarbonates usually decide the quality of water for irrigation. The amount of different minerals also decides if any possible harmful physical or chemical effects are there in the soil. It is the nature and concentration of different salts present in soil not the irrigated water which affect the changes in soil and influences the growth of plants and production of crops.

During one year investigation thirteen water parameters analyses for drinking purposes and seven parameters assess for agriculture purposes from seven types of sources of village Deulgaon, District Gadchiroli and details of which were given in table no.1, the results of thirteen parameters were summarized in table no.3 and the related standards of drinking water in table no. 2. Water samples also calculated for Agriculture purposes which parameters are summarized in table no.4. Abbreviations used in present paper are given in table no. 5.

Table no. 2. Drinking water standards in mg/l

PARAMETERS	ICMR		WHO		ABBREVIATIONS
	HDL	MPL	HDL	MPL	
Turbidity	5NTU	25JTU	-	-	TH- total hardness
pH	7- 8.5	6.5- 9.2	7- 8.5	6.5- 9.2	TDS- total Dissolved Solids
TH	300	600	200	600	BOD- Biological Oxygen Demands
TDS	500	1500	-	-	Cl- Chlorines
Sulphate	200	400	200	400	SO ₄ - Sulphates
Chloride	200	400	200	400	PO ₄ - Phosphates
Nitrate	20	-	45	45	NO ₃ - Nitrates
BOD	-	-	5	5	SI - Salts Index
Cyanide	0.05	0.05	0.05	0.05	RC- Residual Carbonates
Calcium	-	-	75	200	EC- Electrical Conductivity
Magnesium	-	-	50	150	SP-(Na%) Sodium Percentage
Fluoride	-	-	-	1.5	SAR- sodium absorption Ratios
Chromium	-	-	0.05	-	PI- Permeability Index
Copper	-	-	1.0	1.5	OP- Osmotic Pressure

Table no. 4 Classification of water for irrigation use by various parameters

Sample	Na%	SAR	EC	RC	SI
S-1	Excellent	Excellent	Excellent	Excellent	Suitable for Irrigation
S-2	Excellent	Excellent	Excellent	Excellent	Suitable for Irrigation
S-3	Excellent	Excellent	Excellent	Excellent	Suitable for Irrigation
S-4	Good	Excellent	Good	Excellent	Suitable for Irrigation
S-5	Excellent	Excellent	Good	Excellent	Suitable for Irrigation
S-6	Good	Excellent	Good	Excellent	Suitable for Irrigation
S-7	Good	Excellent	Good	Excellent	Suitable for Irrigation

CONCLUSION-

Keeping the other condition (other than mines) of the densities of population, dense forest etc. in mind during the present study, it concluded that water sample is well within the permissible limit. However turbidity shows marginal increase in specified limit, (Table no. 2, 3, 4) and also concluded that the water under investigation was also found to suitable for irrigation.

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