Original Research Paper

Volume-8 | Issue-1 | January-2018 | PRINT ISSN - 2249-555X

Chemistry

ANALYSIS OF WATER QUALITY OF AGYARA DAM (HANS SAROWAR DAM) AT MATSYA INDUSTRIAL AREA, ALWAR (RAJASTHAN) IN MONTH APRIL 2017.

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ABSTRACT In the present paper we discuss the present study deals with the water quality of Agyara Dam, which is assessed by examine various physio-chemical parameters of polluted water of this Dam. The study reveal that the water quality of Agyara Dam has deteriorated/contaminated over a period of few years because of discharge of untreated or partially treated wastewater/effluents generated from the industries located at Matsya Industrial Area, Alwar and dumping of solid waste in haphazard manner on road sides. The colour of water of Agyara Dam is converting from Muddy to Pink but the waste water flowing from MIA through nallahs appears to be Grey. It may be possible that colour might have changed due to some microbial or bio-chemical reactions. All parameters of water quality viz pH, total dissolved solid (TDS), calcium hardness, magnesium hardness, fluoride, chloride, nitrate etc. should be in permissible limits. If one of these parameters crosses the limits of concentration, it may cause disease and such water is known as impure or contaminated water. It should not be used for drinking/agriculture purposes, because water works as a solvent in all metabolic reactions of human body.

KEYWORDS : Agyara Dam, Water pollution, Health problems, Analytical techniques, Matsya Industrial Area, Alwar.

INTRODUCTION

Alwar, lion gate of Rajasthan is situated between 76^0 38' East longitude and 27^0 34' North longitude which is also located inside the golden triangle of Delhi, Jaipur and Agra. Matsya industrial Area, Alwar located in NCR region is 11 km away from the Alwar Railway Station on Alwar-Delhi road via Ramgarh. Alwar city is undergoing rapid urbanization and industrialization. It has well known industries in the field of vegitable oils, automobile, casting units, detergent, cables, mineral grinding, chemicals, engineering, paper and beverages etc. RIICO Ltd. has developed the industrial area in the name of Matsya Industrial Area at Alwar and allowed to establish water/air polluting industries in the area.

AGYARA DAM (HANS SAROWAR DAM)

A water body known as Agyara Dam(Hans Sarowar Dam) is located at the downstream site of the Matsya Industrial Area. This is a burning issue at present time. This Dam is located at Alwar-Bharatpur road at distance of about 15 km. from Alwar city. The water of Agyara Dam is spread over 20 hectare area and depth of the Agyara Dam is about 10 to 12 feet. The colour of this Dam has changed to light pink.

The industrial and domestic effluents generated from the industries located at MIA, domestic waste water generated from Engineering colleges, domestic waste water generated from commercial activities being carried out at MIA, domestic effluents due to bathing and hand washing of workers generated from the units located at MIA, Alwar is also discharged into RIICO drain, drainage of village Gundpur is ultimately passed through RIICO nallah in the Matsaya Industrial Area and then flow through kachcha drain for about 5 km, which ultimately take path into Agyara Dam. So due to the continuous discharge of contaminated waste water from the industries and factories of MIA region, the water quality of Agyara Dam has deteriorated at large. All the industrial effluents are discharge into this water body.

The treated and untreated waste water discharged from the industries and commercial activities of various units located at MIA, reaching the Agyara Dam through a kachcha nallah, due to which the water of the Dam is being polluted.

Matsya Industrial Area belongs to Rajasthan State Industrial Development and Investment Corporation Ltd.(RIICO) whereas Agyara Dam belongs to Gram Panchayat Ramgarh.

Agyara Dam (HANS SAROWAR DAM) which is situated at Matsaya Industrial Area, is chosen for investigations to find out the effect of industrial effluents on different water sources. The ill effects of pollutants are also affecting people of nearby areas. Many villages are situated in and around this industrial area.

Damaging effects/Problems of polluted water of Agyara Dam (Hans Sarowar Dam):-

The water pollution of Agyara Dam has resulted in the following effects: -

- Dying of fish in Agyara Dam due to chemical waste water discharged from the industries located at MIA, Alwar.
- Water of the Agyara Dam is polluted and is not fit for irrigation purposes.
- Due to contamination of Dam's water, aquatic life is endangered. Cultivation of fish into this water is not possible due to contamination.
- Severe odour problem is also observed around the Dam. Due to this problem, thousands of villagers will migrates from this area and this will also affect the social life of the common peoples.
- Due to this contaminated water, thousands of hectare of nearby lands become unfertile. This contaminated water is also harmful for agriculture practices.
- Due to this problem, there is a severe chance of spread of dangerous diseases. Due to the contamination of Dam's water, domestic animals and human life of the nearby areas are also endangered.

Hence the people in this area face acute problem of deterioration of water quality. This is the reason why the author has chosen this topic as his research career and will try to treat the polluted water of Agyara Dam in nation,s interest. The local people and administration are finding it tough to tackle this burning problem. Every effort is being made by the administration not only to check the dam being polluted further but also to make good of the existing reservoir.

To sort out the above problems the author will try to treat the polluted water of the Agyara Dam by various adsorption medias.

EXPERIMENT

Water quality is the physical, chemical and biological characteristics of water in relationship to a set of standards. Water quality is a very complex subject, in part because water is the complex medium intrinsically tied to the ecology of the earth. The physico- chemical quality of Agyara Dam water was assessed during the month of april, 2014 by standard methods as suggested by APHA and compared with the values as guided by ICMR.

Samples for analysis were collected in sterilized bottles using the standard procedure for grab or catch samples in accordance with the standard methods. The various physio-chemical parameters which were analysed are detailed in Table-C & D. The permissible limits laid down by the United States Public Health drinking water standards{USPH} and Indian Standards Institute{ISI} are also listed for comparison.

RESEARCH METHODOLOGY

To analyze/for examination the water sample for different parameters, the following standard methods are used.

Table A: Standards methods for analysis of polluted water of Agyara Dam.

S.No.	PARAMETERS	METHODS
1.	Colour	Human sensory
2.	Taste and odor	Human sensory
3.	Alkalinity	Titrimetric
4.	Hardness	Titrimetric
5.	Ca^{+2}	Titrimetric
6.	Mg^{+2}	Titrimetric
7.	Cl^{-}	Titrimetric
8.	TDS	Water kit
9.	DO	Winkler's Titrimetric methods
10.	COD	Dichromate reflex method
11.	Temperature	Specific Instrument (Thermometer)
12.	Turbidity	Specific Instrument (Turbidity Rod)
13.	pH	Specific Instrument (p^{H} Meter)
14.	BOD	Oxygen difference method
15.	EC	Specific Instrument Conductivity Bridge
16.	F^{-}	Ion selective electrode
17.	SO_4^{-2}	Gravimetrically
18.	CO_3^{-2}/HCO_3^{-}	Titrimetric
19.	NO_3^{-1}	Spectro-photometrically

Table-B: Drinking Water Standards (IS: 10500-1991)

S.No.	Parameters	Desirable limit mg/l(ppm)	Permissible limit in the absence of alternate source(ppm)
1.	Colour (Hazen Units)	5	25
2.	Odour	Unobjectionable	-
3.	Taste	Agreeable	-
4.	Turbidity, NT Units	5	10
5.	pH	6.5 – 8.5	No Relaxation
6.	Total Hardness as $CaCO_3$	300	600
7.	Iron as Fe	0.3	1.0
8.	Chloride as Cl	250	1000
9.	Free Residual Chloride	0.2	-
10.	Total Dissolved Solids	500	2000
11.	Calcium as Ca	75	200
12.	Copper as Cu	0.05	1.5
13.	Manganese as Mn	0.1	0.3
14.	Sulphate as SO_4	200	400
15.	Nitrate as NO_3	45	100
16.	Fluoride as F	1.0	1.5
17.	Phenols as C_6H_5OH	0.001	0.002
18.	Mercury as Hg	0.001	No Relaxation
19.	Cadmium as Cd	0.01	No Relaxation
20.	Selenium as Se	0.01	No Relaxation
21.	Arsenic as As	0.05	No Relaxation
22.	Cyanide as CN	0.05	No Relaxation
23.	Lead as Pb	0.05	No Relaxation
24.	Zinc as Zn	5	15
25.	Anionic detergents as MBAS	0.02	1.0
26.	Chromium as Cr	0.05	No Relaxation
27.	Mineral Oil	0.01	0.03
28.	Pesticides	Nil	0.001
29.	Radioactive materials - Alpha emitters, Beq/l - Beta emitters, Pci/l	 - -	 0.1 1.0
30.	Alkalinity as $CaCO_3$	200	600
31.	Aluminium as Al	0.03	0.2
32.	Boron	1	5
33.	Faecal Streptococci	Nil	-
34.	Coliform M.P.N. (in 100 ml)	1	10
35.	Cyclopes (or Guinea Worms)	Nil	Nil

RESULT AND DISCUSSION

To know the physio-chemical & biological status of water quality of Agyara Dam, one water sample was collected from near the Pal of Agyara Dam/Hans Sarowar Dam and was analyzed in the month april, 2017 as per standard procedures mentioned in the Table A.

. The analyzed data were compared with the water standards given in the Table B. Results of water samples of Agyara Dam of month april, 2017 are summarized in the Table: C and D .

Table C: Physical & Biological Parameters of polluted water of Agyara Dam: Month April 2017

Date of Water sample collection	Location / Source	pH	Color	Odour	Turbidity	Conductivity	Total Coliform
14 /04/2017	Near the Pal of Agyara Dam/Hans Sarowar Dam	8.16	Light Pink	Odourful	152	4555	12

Table D: Chemical parameters of polluted water of Agyara Dam: Month April 2017

Date of Water sample collection	Location / Source	DO	Cl^-	TDS	SO_4^{-2}	F^-	Fe	Hardness	Ca-Hardness	Mg-Hardness	No_{3-}	TDS	BOD	COD
14/04/2017	Near the Pal of Agyara Dam/Hans Sarowar Dam	0.8 mg/l	585 mg/l	2184 mg/l	312 mg/l	1.8 mg/l	1.62 mg/l	975 mg/l	705 mg/l	405 mg/l	52 mg/l	4580 mg/l	138 mg/l	752 mg/l

CONCLUSION

The different physical and chemical parameters are high in the source. The water is pink coloured, turbid and odourous. The parameters like turbidity, conductivity, nitrate, fluoride, sulphate, total dissolves solid and hardness are higher in comparison to the prescribed limits. The dissolved oxygen is zero in all the samples of this source. The high values of BOD and COD indicate that the water is polluted due to industrial effluents and organic nature of pollutants. The higher values of all the parameters are due to different industries like marble, chemical, automobile operative in the Matsya Industrial Area, Alwar. The polluted water of Agyara Dam is harmful for human beings and animals.

REFERENCES

1. De, A.K.; Environmental Chemistry, Seventh Edition, New Age International Pvt. Ltd.: New Delhi (2010).
2. Pawar, C.T.; Joshi, M.V.; "Impact of urbanization and industrialization on water quality: A case study Ichalkaranji city of Maharashtra", Nature Environment and Pollution Technology. Volume 1, No. (4) pp 351-355 (2002).
3. Bhargava, S.K.; Practical Methods for Water and Pollution Monitoring, First Edition, New Age International Publishers: New Delhi (2009).
4. Kudesia, V.P.; Kudesia,R.; Water Pollution, Principles of distinfection of drinking water and its analysis. Pragati Prakashan, Meerut (2007).
5. Parmindar, K.; "Physico-chemical parameters of effluent water coming out from industries Durg (C.G.)", Acta Ciencia Indica ,xxxiii C ,4, 385-387, (2007).
6. Ubale, M.B.; Mazahar,F.; Pathan, M.A.; Arif , Ahmed,Z.; and Dhule, D.G.; "Regression analysis of ground water quality data of Chikalthana industrial area, Aurangabad (Maharashtra)" , Oriental J. Chem., 17 (2), 347-348,(2001).
7. Jamode, A.V.; Sapkal, V.S.; and Jamode, V.S.; "Defluoridation of water using inexpensive adsorbents", Indian J. Sci., 84, 163-171 (2004).
8. Lenore, S.; Arnold, E.; Andrew, D.; Standards Methods for the examination of water and waste Water, 20th Edition, APHA, AWWA, WPCE, American Public Health Asso.: Washington D.C. (1998).
9. Amagloh, F.K.; Benang, A.; "Effectiveness of Moringa oleifera seed as coagulant for water purification", Afr.J.Agric.Res., 4, 119-123 (2009).
10. Muyibi, S.A.; Ong, D.T.; and Kai, K.W.; "Moringa oleifera seeds as a flocculant in waste sludge treatment", International J. Environ. Studies, Vol.58, pp. 185-195 (2001).