

ASSEEMENT OF DRINIKNG WATER SOURCES : PUNGANUR MANDAL, CHITTOR DISTRICT,A.P.,INDIA

K.Mahammad Rafi¹ Dr.M.Umamahesh² Dr.G.V.Ramana Murthy³

1.Research Scholar ,Dept.of Chemistry ,Rayalaseema University,Kurnool,A.P

2.Professor,dept.of Chemistry,RGM College of Engg.&Technology(Autonomous),Nandyal,A.P

3.Sr.Lecturer ,V.R.College ,Nellore

ABSTRACT: as per the previous research observations on water quality assessment by analyze the water samples for various physical & chemical parameters we noticed as water sources are contaminated ,so that here we were also selected four villages in punganur mandal and were taken four ground water samples ,four surface water samples which are used to drinking by local residing human and the sample codes are given as g1,g2,g3,g4 & s1,s2,s3,s4 respectively to assessment of drinking water sources by using standard analytical procedures and after getting analytical results of all samples , compare with water quality standards proposed by BIS .

KEY WORDS: water quality assessment, drinking water sources, ground water, surface water, sample codes

INTRODUCTION : water quality assessment depends upon analysis of water samples for the quality parameters such as chemical, physical, biological, micro biological and radiological Characteristics of water. It is a measure of the condition of water relative to the requirements of one or more biotic species and or to any human need or purpose. It is most frequently used By reference to a set of standards against which compliance can be assessed. The most common Standards used to assess water quality relate to health of ecosystems, safety of human contact, And drinking water. Fresh water has become a scarce commodity due to over exploitation and pollution of Water. Increasing population and its necessities have lead to the deterioration of surface and Sub surface water. for this study we selected four areas named as ethur, vanamaldinne, punganur, mangalam, .in each village we have taken 8 samples viz.4 ground water samples ,4 surface water samples codes are distributed as G1,G2,G3,G4 & S1,S2,S3,S4 .

S.no	Parameter	Desirable mg/l	limit	Permissible mg/l	limits
1	Ph	6.5		8.5	
2	Ec	-		800	
3	Turbidity(ntu)	1		5	
4	Flouride	1.0		1.5	
5	Nitrate	45		100	
6	Sulphate	200		400	
7	Temperature	-		-	
8	Do			8	
9	Tds	500		2000	
10	Total hardness	200		600	
11	Chloride	250		1000	
12	Copper	0.05		1.5	
13	Zinc	5		15	
14	Manganese	0.1		0.3	
15	Iron	0.3		1.0	
16	Alluminium	0.03		0.2	

TABLE.1 : DRINIKNG WATER STANDARDS OF BIS (IS: 10500:1991)

EXPERIMENTAL METHODS :

STUDY AREA:

Punganur town is located at 13°5' n latitude and 78°32' e latitude in the estream western part of chittoor district. 24k.ms from madanapalli and 72 k.ms to district head quarters, on nh – 219 and msl of the town is 2386fts .the main line of madras bombay trunk road having enough passengers and good transport of rtc and private traffic run often to meet the needy situation of the public. The agriculture land 18% under water bodies covered about 71% of total extent of the town. The commercial, recreational areas are 1.1% of the total extent.

SIGNIFICANCE OF RESEARCH IN THIS AREA:

The punganur is a taluk head quarters town and mandal parishad office. Mandal revenue office, sub-treasury office, sub-registrar office, r & b, panchayathi raj, fire station & irrigation etc are located here.

The town has many private & govt. Education centers. In the town there is an agriculture market committee for marketing the agriculture products through from the winter land. The town is well connected with its winter land by road communications.

The town serves as retail as well as whole sale market for all consumer needs .the town is well connected with neighboring areas by road connections .the apsrctc has operating its own bus services from madanapalli & palamaner depots to places like chennai, bangalore, hyderabad, tirupati, kurnool, cuddapah, anantapur, chittoor & madanapalli etc. Industries, employment pattern, etc. These villages depend on punganur for marketing their agriculture produce and for procuring their consumer needs, land surrounding punganur town for highly fertile. The soils in the region on predominately alluvial which are highly fertile and suitable for cultivating paddy, sugar cane, tamarind etc. Therefore, it is very much necessary to do assessment of environment with respect to Water as it a daily consumption and essential for human. Now a day, awareness has been Increased about environmental issues and trace elements play an awfully vital role, either Helpful or harmful to human health. Several metabolic disorders in man among the changes in The level of trace elements in human body substance like blood tissues etc., (mccall et al., 1971). Mainly, lower level of trace element estimation is very much necessary in the field of Environmental studies, nutrition and oxicology.

In this regards, the complete study and assessment of water quality in this town is Required. It will be helpful to the public as well as administration about the status of the Environment of the town. This type of environmental survivalance is most important to know The rural areas water quality, public health, environmental conditions and issues of the country.

PREPARATION OF WATER SAMPLES:

The samples were collected in clean polythene bottles without any air bubbles. The Bottles were rinsed before sampling and tightly sealed after collection and labeled in the field. The temperatures of the samples were measured in the field itself at the time of sample Collection. The samples were kept in refrigerator maintained at 4°C

RESULTS AND DISCUSSIONS:

Here , after completion of all analytical methods to evaluate the quality of taken drinking water samples observed values are mentioned in the given table 2 as ground water sources and surface water sources of drinking water. And also prediction of minimum and maximum observations of parameters in separated rows. In these table.2 are prediction about physico –chemical parameters of drinking water . Prediction about trace metal ions in drinking water also in same table.2

Sample code	Ph	Ec Ms/cm	Turb Ntu	F ⁻ (mg/l)	No ₃ ⁻ (mg/l)	So ₄ ²⁻ (mg/l)	Temp °c	Do Mg/l	Tds (mg/l)	Total Hardness (mg/l)	Chloride (mg/l)
G1	6.8	489	22.31	0.51	39.15	65.23	25	7.9	652	241	156
S1	7.3	278	27.31	0.81	41.26	49.63	26	7.3	521	163	63
G2	8.2	568	23.15	0.16	15.62	136	26	6.1	425	97	114
S2	6.2	746	29.36	0.26	41.23	76.39	26	2.9	964	235	63
G3	8.4	251	12.30	1.2	36.25	35.26	26	5.9	635	136	136
S3	7.6	745	24.23	0.54	46.21	54.63	29	4.9	582	261	69
G4	6.8	489	22.31	0.51	39.15	65.23	25	7.9	652	241	156
S4	7.3	278	27.31	0.81	41.26	49.63	26	7.3	521	163	63

Table 2 : PHYSICO-CHEMICAL ANALYTICAL RESULTS

Sample code	Cu (mg/l)	Zn (mg/l)	Mn (mg/l)	Fe (mg/l)	Al (mg/l)
G1	0.025	0.15	0.015	0.18	0.015
S1	0.018	0.84	0.023	0.002	0.007
G2	0.028	0.89	0.009	0.023	0.024
S2	0.01	1.5	0.001	0.36	0.008
G3	0.04	0.56	0.023	0.12	0.018
S3	0.012	1.15	0.085	0.18	0.028
G4	0.025	0.15	0.015	0.18	0.015
S4	0.018	0.84	0.023	0.002	0.007

TABLE.3 :RESULTS OF TRACE METAL IONS

Ph : As per the above results and as shown in table.2 ph of available drinking water sources is in 6.2-8.4 and as in table.2 where as BIS value is 6.5-8.5 .

Electrical Conductivity: As per the above results and as shown in table.2 ec of available drinking water source is in 251-746 . Where as BIS value is 0-800 $\mu\text{s}/\text{cm}$ (good) .

Turbidity: As per the above results and as shown in table.2 turbidity of available drinking water source is in 12.30-29.36.where as BIS value is 1-5

Fluoride: As per the above results and as shown in table.2 fluoride of available drinking water source is in 0.16-1.2 . Where as BIS value is 1.0-1.5 mg/l

Nitrate : As per the above results and as shown in table.2 nitrate of available drinking water source is in 15.62-41.26 where as BIS value is 45-100 mg/l .

Sulphate : As per the above results and as shown in table.2 sulphate of available drinking water source is in 35.26-136where as BIS value is 200-400 mg/l.

Dissolved Oxygen : As per the above results and as shown in table.2 do of available drinking water source is in 2.9-7.9 . Where as BIS value is <8 .

TDS : As per the above results and as shown in table.2 tds of available drinking water source is in 425-964 where as BIS value is <300 .

Total Hardness: As per the above results and as shown in table.2 total hardness of available drinking water source is in 97-261where as BIS value is 300-600

Chloride: As per the above results and as shown in table.2 chloride of available drinking water source is in 63-156 where as BIS value is 250-1000

TRACE METAL IONS :

Copper : As per the above results and as shown in table.2 copper of available drinking water source is in 0.01-0.028 where as BIS value is 0.05-1.

Zinc: As per the above results and as shown in table.2 zinc of available drinking water source is in 0.15-1.5. Where as BIS value is 5-15

Manganese: As per the above results and as shown in table.2 manganese of available drinking water source is in 0.001-0.085. Where as BIS value is 0.1-0.

Iron (FE): As per the above results and as shown in table.2 iron of available drinking water source is in 0.002-0.36where as BIS value is 0.3(desirable limit) .

Aluminium : As per the above results and as shown in table.2 aluminium of available drinking water source is in 0.007-0.028 . Where as BIS value is 0.03-0.2 .

DISCUSSION :

As per the above results we noticed in case of ph out of 8 samples all are in limit except s2(6.2) below desirable limit i.e .6.5. In case of ec all samples are under limit 0-800 $\mu\text{s}/\text{cm}$. In case of turbidity all samples are above limit. In case of fluoride all samples are under desirable limit i.e.1.0 mg/l. Except g3 (1.2) under permissible limit i.e.1.5 mg/l. In case of nitrate all samples are under desirable limit i.e.45 mg/l except s3(46.12) under permissible limit i.e.100 mg/l. In case of sulphate all samples are under desirable limit i.e.200 mg/l. In case of do all samples are under limit i.e.,<8mg/l. . In case of tds all samples are above limit i.e.<300mg/l. In case of th all samples are under desirable limit i.e 300 mg/l. In case of chloride all samples are under limit i.e.250mg/l.

In case of copper all samples are under desirable limit i.e.0.05mg/l. In case of zinc all samples are under desirable limit 5mg/l. In case of manganese all are under desirable limit i.e.0.1 mg/l. In case of iron

all samples are under desirable limit i.e.0.3 mg/l.except s2(0.36). Incase of alluminium all samples are under desirable limit i.e.0.03 mg/l.

CONCLUSION :

As per the above discussion on results of water samples some are need to treat before drinking .especially s2,s3,g3, .s2 sample need to treat to reduce ph & iron only . G3 sample need to treat to reduce fluoride .s3 sample need to treat to reduce nitrate . By performing this treatment of water samples water is fit to drinking .

REFERENCES

1. Diersing, nancy. "water quality: frequently asked questions." florida brooks national Marine sanctuary, key west, fl (2009).
2. Johnson, d.l., s.h. Ambrose, t.j. Bassett, m.l. Bowen, d.e. Crummey, j.s. Isaacson, D.n. Johnson, p. Lamb, m. Saul, and a.e. Winter-nelson. "meanings of environmental Terms." journal of environmental quality. 26: 581-589 (1997). Doi:10.2134/jeq1997.00472425002600030002x
3. Jain ck, bhatia kks and vijay t, 1995. Ground water quality monitoring and evaluation In and around kakinada, andhra pradesh, technical report, cs (ar) 172, national Institute of hydrology, roorkee, (1994-1995).
4. Kumar a, water pollution. Nisha enterprises new delhi., pp 1-331 (2004). 5. Isi, indian standard specification for drinking water, is10500, isi, new delhi, (1983).
6. W.h.o, guidelines for drinking water quality, vol.1, recommendations who, geneva, (1984).
7. Sharma m r, j. Pollut res., 23(1), 131-134 (2004).
8. Physico- chemical analysis of drinking water–anantapur district, andhra pradesh k.mahammad rafi et.all. international journal of engineering science invention (ijesi) issn (online): 2319 – 6734, issn (print): 2319 – 6726 www.ijesi.org ||volume 7 issue 2|| february 2018 || pp. 18-27
9. Quality assessment of drinking water: ysr Kadapa district (a.p) K.Mahammad Rafi, 2018, jetir april 2018, volume 5, issue 4
10. Assessment of borewell water quality: puttur mandal, Andhra pradesh, india K. Aruna journal of chemistry and chemical sciences, vol.7(1), 33-38, january 2017

