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Archives of Applied Science Research, 2013, 5 (2):291-293  
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**Heavy Metal toxicity in Well waters in and around Toranmal (Tribal region) Dist :  
Nandurbar (MS)**

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**ABSTRACT**

*Concentration of heavy metal such as Cu, Zn, Mn, Ni, Pb, Sr, Cd, Hg, As. Together with Na, K in six water sample were estimated by ICP, AES. and data is useful to assess the level of heavy metal in bore wells & open wells the paper deals with determination of 10 heavy metals water quality is an index of health and one of the areas of major concern to environmentalists. Since industrialization urbanization, and modern agriculture practices have direct impact on water resource.*

**Keywords:** water samples, Heavy metal content, ICP – AES.

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**COMMENT**

With the rise in population and steady growth of industries, and urbanization the demand of ground water has increased ground water is sole resource of drinking water for local population in major region of Nandurbar District.

Most of the ground water sources are still supposed to be safe once, source is contaminated, and then practically it would be very difficult to clean that up. Ground water department, public health and engineering department (PHED) agriculture department and other government and private organization measure the quality of ground water on the basis of some limited parameters only like PH, EC, TDS, DO, BOD, COD, Cl<sup>-</sup>, SO<sub>4</sub><sup>2-</sup>, NO<sub>3</sub><sup>-</sup>, CO<sub>3</sub><sup>2-</sup>, HCO<sub>3</sub><sup>-</sup>, Ca<sup>2+</sup>, Mg<sup>2+</sup>, Na<sup>+</sup>, K<sup>+</sup> etc. for ensuring the suitability of water for drinking, domestic agriculture purpose but some other ions if present in large amount in water also affect the quality of water make water unfit for drinking, domestic industrial and agricultural purpose.

The present study has been carried out to evaluate the metal along with Na<sup>+</sup> & K<sup>+</sup> ions in ground water of Tribal area in Nandurbar District.

**MATERIALS AND METHODS**

*Area of study :-* the study was carried out in and around Toranmal. Toranmal is a hill station in the municipal council of Nandurbar District in Indian State of Maharashtra. One can reach through Shahada. It is Hill station located in Satpura Range, it's Gorakhnath Temple is the site of Yatra attended by thousands of devotees on Mahashivratri on that occasion pilgrims walk barefoot, for days from surrounding areas in Nandurbar District, but also from Maharashtra, Madhya Pradesh, and Gujarat. Samples were collected in sterilized bottle ICP, AES, method has been used for the determination of heavy metal, flame photometric method was used for Na, K

**Water analysis results:-** The results of well water samples in and around Toranmal. are presented in table:-

Water samples	Metal ions. (in ppm)									
	Cu	Zn	Mn	Cr	Ni	Pb	Sr	Cd	Hg	As
WS-1	0.267	0.241	0.015	ND	0.078	0.008	ND	0.011	ND	ND
WS-2	0.029	0.027	0.004	ND	0.042	ND	ND	ND	ND	ND
WS-3	ND	0.139	0.043	0.117	0.048	0.048	ND	ND	ND	ND
WS-4	ND	ND	0.022	ND	0.036	0.01	ND	0.005	ND	ND
WS-5	0.002	0.035	0.012	0.062	0.047	0.047	0.016	ND	ND	ND
WS-6	0.022	0.091	0.032	0.045	0.053	0.101	ND	ND	ND	ND

ND – means less than 0.01 ppm.

The major source of heavy metal pollution in well water which are in city, villages it carries lot of untreated sewage, Industrial waste. Metallic solid waste disposal, religious festival waste material human social activity, coal combustion, over use of fertilizers and pesticides invariably discharge in to water result in pollution, the heavy metals are biologically non degradable and though the food chain there may pass on to human and can causes signification health concern.

In the present study the water sample were collected and analyzed for concentration of metals by ICP AES technique.

**Copper (Cu)-** concentration of Cu in water sample is 0.001 to 0.267 ppm. (In Table) the daily human consumption of copper is around 2-5 mg, 1 to 1.6 mg / day for child and adults 2mg / day while less than 0.3 mg./ day produce deficiency Cu is mainly in the liver, kidney, and intestine.

**Zinc (Zn)-** zinc concentration in water samples 0.01 to 0.241 ppm (In Table) In water samples the concentration of 'Zn' was found to be less than 0.2 mg / Lit. Zn compounds are as stringent, corrosive to skin, eyes, and mucus membranes. They cause special type of dermatitis known as 'Zinc fox' Zn is also irritating to the digestive tract causing nausea vomiting.

**Manganese (Mn)-** concentration of Mn in water sample is 0.001 to 0.004 ppm. (In Table) 'Mn' enters the water bodies through domestic waste, Industrial effluents and dry cell batteries it is lethal to man in higher concentration. Its chronic exposure leads to neurological disorder. Which is found in permissible limit (0.10-0.50ppm)

**Chromium (Cr)** concentration in water sample is 0.001 to 0.0062 ppm. 'Cr' of those heavy metals the environmental concentration of which is staidly increasing due to industrial growth chemicals and tanning industries it still present some risk to human health since chromium can be accumulated skin, lung, muscles fat & liver dorsal spine, hair, nails.

**Concentration of Nickel** in water sample 0.001 to 0.0078 ppm. (In Table) the permissible limit 0.2ppm. as high 450 ppm. In some clay & loamy soils.

Foodstuffs naturally contain small amounts of nickel, chocolates and fats are known to contain nickel uptake will boost when people eat large quantities of vegetable from polluted soils nickel found in detergent also. an uptake large quantities of nickel higher chances of lung cancer, nose cancer, prostate cancer, Respiratory failure, Birth defeats heart disorder.

**Lead** is toxic ion. It has deleterious effect on gastro intestinal renal. Nervous and hemopetic system lead poising is serious, sometimes present pregnant and young children are more susceptible for lead poisoning. In present observation lead is found to 0.001 to 0.1 ppm which is grater than prescribed limit (0.05ppm).

**Strontium (Sr)** concentration in water sample is 0.016 ppm. (In Table) and cadmium concentration in water sample is 0.005 to 0.01 ppm. 'cd' maybe found in reservoirs containing shellfish, cigarettes also contain 'cd' inhalation account for 15-50% of absorption through the respiratory system. Target orgens are liver, placenta, kidneys, lungs, brain and bones.

**Mercury (Hg)** concentration in water is ND, acute mercury exposure may occure in the mining industry and manufacturing of fungicides. Liquid mercury is particularly attractive to children because of it's beautiful silver colour. Symptoms of acute exposure are cough, sore throat, metallic taste in mouth, abdominal pain, nausea, vomiting and diarrhea, weakness and hyper tension. People who consume more than two fish meals a week are showing very high serum level of 'Hg'

## CONCLUSION

It can be said that lead appeared to be well below the threshold limits as recommended by World Health Organization (WHO 1993, 94, 2004) and thus at present poses no such alarming situation to the ecosystem of in and around Toranmal. However there is greater likelihood that we may detect changes in trace contaminant concentration with an increase in the length of time due to rapidly destroying forest is facing the environmental pollution problem and rapid growth urbanization suitable there by causing serious hazardous for which suitable remedial measure should be taken central, state government and private sectors. With the introduction of pollution reduction plants.

## Acknowledgements

The authors are grateful to principal G.T.P. College, Nandurbar, The Principal Arts, commerce's & Science College Songir, Dist. Dhule (M.S.) for providing necessary Laboratory facilities and Mr. Patil R. V. for fruitful discussion and keep interest in the work the authors are also thankful Prof. Soumya Mukherji Head SAIF IIT Powai Mumbai for ICP AES Facilities.

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