
PHYSICO-CHEMICAL AND BIOLOGICAL ASSESSMENT OF DRINKING WATER OF TOWN NAGDA (MADHYA PRADESH) DURING WINTER

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Abstract: Nagda is an industrial town in the Malwa region of Madhya Pradesh and is situated at the bank of Chambal river. The river receives large amount of contaminated industrial effluent and drainage water from various industrial units and municipal sewage water. The study conducted to assess the water quality of different area of Nagda. The study includes the effect on health of the people living in such environment. Samples were collected and the analysis was made involving various physical and chemical parameters. A comparative study was also done between the water supplied in Grasim industries 'township and other colonies of Nagda. A comparison with ISI standards showed that pH, alkalinity, TDS, CaH, DO, COD are different and it is an alarm that lower DO and higher COD TDS and other are not in permissible limit which causes health hazards and death. There should be new and advance filtration plant for all residents of Nagda because person below poverty line cannot afford modern instruments like RO or UV filter etc. The quality of water which is supplied to govt. school and colleges is also poor.

Key words : Physico-chemical and biological analysis, drinking water.

Introduction: Nagda is a city in Ujjain in the Indian state of Madhya Pradesh. It is an industrial town in the Malwa region of western Madhya Pradesh and is situated on the bank of Chambal River.

The name of the town was actually *nag-dah* which means cremation/burning (*dah*) of snakes (*nag*). The ancient city was developed by king Janmejaya. Janmejaya was a Hindu King of Pandava Dynasty. Nagda was mentioned in the literature of Kalidasa. Presently, Nagda is a major industrial town having manufacturing unit of Viscose fibre, thermal power plant and a chemical plant, It is a major ISO granted railway junction on the Delhi-Mumbai railway line. It is exactly 694 km from both Delhi as well as Mumbai. Water is a vital component of eco-system due to binding element between different factors it plays a role in land ecology. In recent years, most of the water resources are degraded due to population, industrialization and urbanization, affecting the aquatic environment. Safe drinking water¹⁻¹⁰ is the basic need of people. The residents of town Nagda are not totally depend on PHED water supply 50% of the population fetch drinking water from the wells hand pumps even though my college is also not getting treated water. In present study water quality was monitored. During survey it was observed that different kind of diseases such as heart, skeleton deformities, diarrhea, jaundice, arthritis etc. prevalent in the resident of Nagda. It is therefore the present investigation has been undertaken to evaluate the quality of drinking water.

Experimental: The water samples have been collected from four different colonies. The appropriate distance among four areas was three to six kilometers. The samples were collected weekly from each area during winter that is **15 Oct. 2013 to**

15 Feb. 2013 Samples were taken in clean and sterilized bottles and analyzed to find out pH, total dissolved solid (TDS), total hardness (TH), calcium hardness (CaH), total alkalinity, fluoride (F), chloride (Cl), chemical oxygen demand (COD), dissolved oxygen (DO). By using methods as given by APHA. Except TDS and pH were analyzed in the laboratory of MP pollution control board Ujjain (MP). Microbiological analysis was carried out in microbiology lab of govt. PG College Ratlam (MP). The Microbiological analysis was carried out by the plate count technique.

Results and Discussion: All the data are presented in table 1. TDS, TH, CaH in water have been found higher to permissible limit in all areas except in the township of Grasim industries. The high TDS is due to ground water pollution by waste water discharged. The high value of TDS, TH and CaH in drinking water have an association with cardiovascular problems which have been observed in the resident of the study area. Higher value of chloride is an indication of organic pollution. The lower value of total alkalinity is due to inflow of rain water in ground and well. Presence of fluoride in all area is also above the permissible limit in it is concern to public health and have serious consequences¹¹⁻¹⁵. In the surveyed area there are evidential and comparative data that children and aged person have dental and skeleton problem as well as reduction in IQ. Higher COD and the lower value of DO are due to washing clothes and mass bathing and chemical and sewage discharge in river and ponds.

Now I come to the point is that in Nagda town the water supplied by two agencies; Grasim industries, which supply water to the own township. The source of water is Chambal river

.There are dames (known as nayan dame and tumni dame) away from industries so the water quality is unpolluted .Long pipeline is there .Filtration plant . The water supplied to the residents of grasim township is good in quality and free from F. The use of water of hand pumps and well is only during summer..

Nagda city gets water from PHED. The sources of water are: Chambal river, Banbana Talab(pond) , hand pumps and well. There are different centre of water supply, The residents of Indu colony get water from hand pumps and well health problems have been monitored like cardiovascular, dental ,skeleton disorder and skin diseases .Water supplied to the residents of 56block and M G road from Chambal river which is polluted because PHED gets water after discharge of chemicals and sewages etc.

The conclusion is The residents of township getting good water quality so they are not suffering from health problems .The residents of 56block and MG road getting poor quality of water but water supply to Indu colony is worst because PHED supply is only in few lane all residents are dependent of hand pumps and well. so they are suffering from health problems.

Finally I would say that the drinking water should be supplied to all areas properly after treatment It is our social responsibility and should be undertaken personally as well jointly.

Before erecting of any chemical plant the environmental issue should be noticed. Water supply should be proper and equal for all residents of any area.

Suggestions: It is suggested that the water quality should be of good quality treated water must be supplied for drinking purpose. Country and town planning must be like that the residential area must be far away from the industrial area. To avoid the wastage of drinking water meter system must be there.

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Area	Type of	pH	TS	CaH	Total	F	Cl	DO	COD	Micro
	water				alkalinity					bial count
			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
1 indu colony	a hand pump	7.14	731	1589	321	4.52	1561	3.53	2.5	112
	b well water	7.61	1711	377	173	4.35	263	3.79	1.24	201
	cPHED water	7.62	2273	371	139	0	380	7.82	1.54	198
2 Township	a hand pump	7.18	2571	140	612	1.3	1508	3.55	1.77	302
	b wellwater	7.55	1733	321	753	1.21	1558	3.66	4.12	336
	cPHED water	7.69	1122	301	382	1	1525	2.25	5.02	150
356 block	a hand pump	7.20	1218	216	342	3.92	796	2.99	3.2	223
	b well water	7.38	531	98	141	3.98	131	1.95	2.56	926
	cPHED water	7.51	2485	299	313	1.22	1917	3.14	1.98	132
4MG ROAD	a hand pump	7.21	6420	935	460	3.85	3985	2.41	6.12	154
	b well water	7.59	2037	517	561	4.02	3714	4.15	5.12	196
	cPHED water	7.44	8650	532	352	1.01	2201	1.66	1.52	112
5Permissible		7.00-8.5	200-600	75-200	200-600	1-1.5	200-1000	3.00-7	0.5-2.00	10
limit ISI Standard										

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