"Studies on Ground Water Quality at Kamtha Tq. Ardhapur, Dist. Nanded"

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Abstract:
Ground water is nature's magic on earth and is the chief source on the earth surface, where unavailability of surface sources. It is in the pure form because of the purification properties of the soil strata. This vital source is threatened by overuse, anthropogenic activities like seepage pits, refuse dumps and septic tanks. In the present study an attempt has been made to know the underground water quality of Kamtha Tq. Ardhapur, Dist. Nanded. It is observed that the ground water were found to be good for drinking purposes in some sites where as in some sites it is found to be contaminated due to improper disposal of waste and excretory material.

Key words: water quality, Kamtha Tq.Ardhapur, Dist. Nanded, pollution.

Introduction:

Water is not only essential to life but is the predominant inorganic constituent of living matter, forming in general nearly three quarters of the weight of the living cell. The various forms of water are found in every section of ecosphere i.e. the atmosphere, the lithosphere and the hydrosphere. (Gupta –2007) According to one of the current theories planet earth was originated about 4.5 billion years ago, at that time it was very hot and had an atmosphere of many gases such as methane, ammonia, water vapours, Hydrogen sulphide and Hydrogen cynide.

The planet earth and its atmosphere gradually cooled over a period of 1.5 billion years which resulted in the consideration of the water vapour into clouds initiating torrential rain giving rise to lakes, reservoirs, rivers and oceans called hydrosphere. (Sastri, 1999). According to A. J. Oparin the hydrosphere constitutes about three fourth of the earth's surface and it was in water that life is said to have originated first. What led to its origin and how it gradually evolved into various forms leading to the advent of over million of years is now the scientific history. But the fact remains that water is one of five elements so essential for living beings even on land. No wonder the water shade attracted human beings from prehistoric times for habitation and harnessed the water for food and sustains.

Ground water is generally considered to be a very good source of drinking water because of purification properties of the soil. This vital source is threatened by overuse, pollution and by variety of agricultural and domestic contamination. Groundwater reserves in most of the cities are threatened with pollution from seepage pits, refuse dumps and septic tank. Various water borne diseases may arise by such practices. Hence in the present investigation an attempt has been made to know the quality of underground resources in the various sites of Kamtha Tq. Ardhapur,Dist. Nanded and their sources of pollution by using a questioner's method.

Study area:

The study area comprises the Kamtha Tq. Ardhapur, Dist. Nanded. Most of the People from this region have to depend upon the underground water sources for the domestic purposes. The special emphasis is given to the quality of the ground water and their pollution sources of the study area.

Materials and Methods:

Water samples were collected at monthly interval for a period.2012-2013 between 8.00 AM to 10.00 PM from four sampling sites of four direction Kamtha Tq. Ardhapur,Dist. Nanded. Standard method for the examination of water and waste water was used (APHA (7) for analysis. The temperature was recorded at the sites with the help of mercury thermometer the DO water samples were fixed with the help of magnous sulphate and alkali-iodide-azide solution (2ml each) at the sites and analyzed in the laboratory using Winkler's modified iodide- azide method. The water samples were brought to the laboratory in ice boxes and subjected to the analysis of BOD (by incubating diluted sewage samples at 25º c for 5 days in dark) COD (by dichromate reflux method using a ferron indicator). pH using pH meter alkalinity and acidity (by the Potentiometric titration method with the help of pH meter and diluted H2SO4 and NaoH, Chloride by Mohr's argentometric method using Potassium chromate as indicator), Conductivity using conductivity meter), Phosphate (Stannous chloride method) and nitrate using the phenol – di sulphonic acid colorimetric test Jackson).With respect to this a questioner is prepared to know their views about underground water quality and their sources of pollution and effects on human beings.

Result and discussion:

Physico-chemical properties of underground water in different months at respective sites were recorded.

Temperature:

It is the important factor which influences the chemical, biochemical and biological characteristic of the aquatic system .The present investigation reveals that the temperature varied from a minimum 20.1±1.4˚C in Jan to maximum 33.8±1.4 in June in all sites. The Temperature values were significantly higher in April to July and lower in October to December.

pH:

Because most of the chemical and biochemical reaction are influenced by the pH it is of great practical importance. The adverse effects of most of the acids appear below 5 and of alkalis above the pH 9.5.The pH values were significantly higher in March to May and September, November and December with the highest value 8.8 in Jan.

Acidity:

The component of acidity in natural waters is Carbon dioxide. The Acidity values ranged from a minimum of 55.5 mg Caco3/L (Oct) 69.3mg Caco3/L in June at Kamtha Tq. Ardhapur,Dist. Nanded was recorded. A sharp increase in acidity in May and June may be attributed to the high temperature and therefore high microbial activities or discharge of some acidic substances.

Alkalinity:

It constitutes an important parameter in determining the quality of water. A variation in alkalinity values were recorded as a minimum of 260mg Caco3/L (June) maximum of 310mg Caco3/L (Jan). No significant variation was noticed among the values of other months. Furthermore the total alkalinity was significantly higher.

Dissolved Oxygen:

Temperature plays an important role in determining DO in an aquatic body. Dissolved oxygen data is valuable in determining the water quality criteria of an aquatic system. In the system where rate of respiration and organic decomposition are high, the DO values remain lower than those of system where the rate of photosynthesis is high. A high pollution load may also decrease the DO values to considerable level. The DO values range from a minimum of 4.5mg/L (June) to maximum of 9.8mg/L (Jan). Lower DO values during summer may be attributed to the high temperature?

Chloride:

Chloride is one of the major inorganic anion in water and waste water. The chloride written shows variation with a range of 8.2 (July) to 81.5mg/L (Feb), Chloride values remain higher in rainy season.

Questioner:

1. Do you know the water pollution?
   a) Yes b) No
2. Do you have the sewage disposal system?
   a) Yes b) No
3. Do you know the contamination of water?
   a) Yes b) No
4. Do you know the diseases of water pollution?
   a) Yes b) No
5. Is your water hard for use?
   a) Yes b) No

Conclusion:

From the observation made during present study it may be concluded that water from all respective sites were nearby permissible limits, but in rainy season it was found polluted**.** With respect to water quality a questioner is prepared to know their views for environment and its pollution. It is observed that the peoples may know about the pollution but they don't know how to prevent the pollution, also the lack of awareness among environment is responsible for their behavior. Hence a need of the local government to aware the people for environmental perspectives to stop the threats to environment and living beings.

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