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Study of acid rain, its causes and their effect on environment

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Abstract

Water has many unique properties that make it an essential chemical for life. Such properties are not found together in any other substance. This is the reason why the we use of water not only in the form of medium but also for excretory medium and living medium. Water is a polar Solvent. It has the ability to dissolve many types of organic and inorganic substances, due to this property of water, plants are able to absorb nutrients from the root hairs present in the roots. The structure and function of the cell, the unit of life, is also determined by water and the soluble or insoluble substances in it. But the Ground water in Chirawa Tehsil is unfit as a source of drinking water due to the chemical and bacteriological pollution of surface water. It describes the important results of water quality analysis of the ground water samples of the TW, OW and hand pumps of Chirawa Tehsil. A Systematic study has been carried out to assess the water quality index then the analytical data of various Physico Chemical parameters indicates that some parameters like pH, EC, TDS, TSS, Ca^{2+} , and Mg^{2+} are found to be in excess than the prescribed limit in some water samples of the study areas. The WQI value indicates that water samples of some sampling stations are quite unfit for drinking purpose because of high value of Ca^{2+} , Mg^{2+} , and TH etc. suitable suggestions were made to improve the water quality.

Keywords: WQI, Physico-chemical parameters, pollutants industrialization, acidification, El-Nino

Introduction

Pure form of water is disappear day by day due to water pollution. Many gases and pollutants which present in atmosphere spoil the quality of water present in rainfall, pure rain water loss it's original quality and convert into polluted water. The other impurities and pollutants also mix in this water when rain water reach on earth. So we do not get water in pure form. The natural pure water is already spoiled and the human activities convert it in more polluted form.

Human health and system also affected by water. When we drink pure water our system and health become healthy. But when we drink polluted water our health affected and our body system disturbed by many disease. Pure water provide us good development. Accrue ment in pollution in water affect human, animal, plants, insects and living life. The world quality as it is often used in our daily routine means a relative nature of particulars substance. So long as this definition holds good no one on earth can point out dogmatically any particular water sample as the quality water.

There are many factors which are responsible for pollution of water but amongst them acid rain play an important role in water pollution. Acid rain is also called black rain because it is caused due to excess of sulfur – dioxide and nitrogen-oxide in the atmosphere in acid rain sulfuric acid (H_2SO_4). Nitric acid (HNO_2) and carbolic acid dissolve in water and fall on the earth in the form of acid rain.

Acid rain can be expressed as –

1. Sulfur – dioxide + water vapor → Sulfuric acid
2. Carbon –dioxide + water vapor → Carbolic acid
3. Nitrogen – oxide + water vapor → Nitric acid

↓
Acid rain

Cause of acid rain

The important gases of atmospheric pollution are sulfur-dioxide and nitrogen – oxide.

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These gases are the major emissions from motor-vehicles, power houses etc. These oxides can spread for thousands of kilometers. The longer they remain in the environment. The more likely they are turn acidic. The main constituents of acid rain are sulfuric acid and nitric acid, which dissolve in water and fall on the earth when it rains acidification is man-made. The acidity of rain is due to 60-70 percent sulfuric acid and 30-40 percent nitric acid. Industrialization is also the cause of acid rain. Most of the problems of the environment are being created by humans only because of their comforts and luxury.

Effect of acid rain

Acid rain increases the acidity of the soil which poses a threat to the vegetation growing on the earth. It is also effects aquatic organism. There is a danger of corrosion in buildings, railways, bridges etc. due to acid rain. Due to acidity, the amount of heavy metals like Aluminium, Manganese, Zinc, cadmium, lead, copper ect. Also starts increasing in the water. Acid rain has acidified many lakes in Sweden, Canada resulting in significant decline in fish numbers. Many types of bacteria and blue algae are also being affected due to acid rain.

Forests in Germany have declined and soil fertility has also decreased. Acid rain can also cause serious environmental problems in India. Pollution has increased due to increasing industrialization in Delhi, Kolkata and Mumbai. Due to this, the danger of acidity has arisen and it is reaching a serious level of hyperacidity.

Protection from acid rain

1. To avoid acid rain, we have to reduce the pollution in the atmosphere.
2. In pollution especially oxides of sulfur and nitrogen have to be reduced.
3. Public transport should be promoted by reducing motor vehicles. An important step has been taken in this direction by running metro-train in Delhi.
4. Harmful gases should not be released directly into the atmosphere.
5. Solar energy should be used as much as possible.
6. We should be aware of environmental pollution and we all should work at our own level to remove it.

EL Nino Effect

The name Elnino is given by South American Fisherman. The word is derived from the Spanish language meaning "Christ child" meaning the effect that occurs at the end of the year around the birth of Jesus.

The currents of the sea which cause fluctuations in its water. They also effect the environment. One of these effects is called the Elanino effect. Due to this effect the sea water becomes unusually warm. This effect has been observed along the South and Central American coasts at the end of the year. As a result of this change, the number of sea fish starts getting affected and changes in rain and weather also start coming.

Generally, the wind blowing from the west moves the sea warm water towards Australia, while cold water remains towards the American coast, due to which the sea fishes also get nutrition, but after every 3-7 rains, this wind direction ends. As a result warm water gets transferred towards South America.

The Elnino effect causes changes in the topical pacific

region of the marine atmosphere system, as a result of which unusual changes in the weather begin these changes are an increase in rainfall in the South American and Peruvian regions, resulting a floods and droughts in the Western pacific region and the risk of devastating "bush fires" in Australia.

Conclusion

The concentration of acid rain contaminants i.e. sulphate ions, in the water of the chirawa tehsil of the Jhunjhunu district is therefore completely outside of what is ideal, according to the details that are presented above. According to the concentration of sulphate ions, it signifies that the water is becoming increasingly contaminated and must be thoroughly treated to make it sufficiently pure for consumption. The existence of the outermost layer of water level at such a great depth in the ground causes all of the aforementioned issues. It happens because of extremely little or erratic precipitation. As a result, aquifers does not receive the essential salt that is in precipitation, which lowers water quality.

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