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# **Class 7<sup>th</sup>** **Chapter – 13**

## **Wastewater Story**

## **Waste Water**

**Water rich in lather, mixed with oil, black– brown water that goes down the drains from sinks, showers, toilets, laundries is dirty. It is called wastewater.**

## **SEWAGE**

**All of us generate or produce waste water everyday as a result of activities like bathing cooking, cleaning utensils, use of toilets, washing clothes and numerous other activities. Waste water comes from our homes, schools, colleges, markets, industries, hospitals and other commercial places. Waste water also includes rainwater that runs down the streets during heavy rain. Waste water contains dissolved and suspended impurities which it carries with it while flowing over the ground. The impurities present in waste water are called contaminant. This waste water is called sewage**

### **Constituents of Sewage**

**Sewage is a complex mixture. It contains:**

#### **1. Organic Impurities**

**Sewage includes human excreta, animal waste, urine, oil, fruit and vegetable wastes, pesticides, herbicides, etc. as organic impurities.**

#### **2. Inorganic Impurities**

**It includes inorganic impurities in the form of nitrates, phosphates and heavy metals.**

#### **3. Nutrients**

**Sewage also includes nutrients like nitrogen, has lost its phosphorus and potash.**

## **4 Disease-causing Microbes**

**Microbes like bacteria, which cause cholera, typhoid and dysentery are present in the sewage.**

## **SOURCES OF WASTE WATER**

### **1. Domestic Waste Water**

**It includes all kinds of wastes like human stries, hospitals excreta, food waste, soaps, detergents, oil Wastewater also animal excreta, urine etc.**

### **2. Agricultural Waste Water**

**The waste water generated from farms and agricultural fields contains harmful pesticides, weedicides and animal wastes.**

### **3. Industrial Waste Water**

**The waste water generated from various industries contains harmful chemicals such as lead, chromium, arsenic, cadmium, mercury, etc.**

### **4. Petroleum Oil**

**The leakage of petroleum oil into the sea during drilling and shipping pollutes sea water. Oil spill is caused due to release of oil into rivers and oceans knowingly or unknowingly.**

### **5. Mining**

**Waste water is also generated as a result of mining activities.**

### **6. Construction Activity**

**Lot of waste water is generated during various stages of building houses, homes, malls, multiplexes, etc.**

## **WASTE WATER TREATMENT**

**Treatment of wastewater involves physical, chemical, and biological processes, which remove physical, chemical and biological matter that contaminates the wastewater.**

### **Primary Treatment**

**It is the first stage and is called primary treatment. The waste water is passed through rotating screens to remove large objects like rags, sticks, cans, plastics, napkins, etc. The water is then passed through a grit and sand tank to remove small stones and pebbles. The liquid material is then passed through huge sedimentation tanks. The solid wastes such as faeces settle down at the bottom of the tank and are removed with the help of a scraper. This is sludge. The sludge can be used for production of biogas to be used as fuel or for producing electricity. Light materials float on top and are known as scum. The scum is removed with the help of a skimmer.**

**This is a mechanical process. The clarified water then moves on to the secondary treatment stage.**

### **Secondary Treatment**

**It is the second stage and is called secondary treatment. The treatment at this stage involves pumping of air into the clarified water to help aerobic bacteria to grow. The bacteria decompose the suspended waste that includes domestic wastes and other undesirable organic substances present in this clarified water.**

**The activity of the bacteria produces decomposed organic material which settles down at the bottom of the tank as activated sludge. The water at the top is removed. The activated sludge is mostly water. It is**

passed through sand drying beds to separate the solid material out of it. This solid waste can be used as manure.

## **Tertiary Treatment**

It is the third stage where the treated water now undergoes chemical treatment. It varies with the composition of waste water. The water is disinfected with chemicals like chlorine or may be exposed to ultraviolet rays to kill disease-causing organisms. It can also be treated with ozone gas. The water is then discharged into the distribution system.

## **SANITATION AND DISEASE**

Poor sanitation and contaminated drinking water is the cause of a large number of diseases.

Untreated human excreta is a health hazard. It may cause water pollution and soil pollution. Both the surface water and groundwater get polluted. Groundwater is a source of water for wells, tubewells, springs and many rivers. Thus, it becomes the most common route for water borne diseases. They include cholera, typhoid, polio, meningitis, hepatitis and dysentery.

## **ALTERNATIVE ARRANGEMENT FOR SEWAGE DISPOSAL**

To improve sanitation, low cost onsite sewage disposal systems are being encouraged. Septic tanks are suitable for places where there is no sewerage system, for hospitals, isolated buildings or a cluster of 4 to 5 houses.

Some organisations offer hygienic on-site human waste disposal technology. These toilets do not require scavenging. Excreta from the toilet seats flow through covered drains into a biogas plant. The biogas produced is used as a source of energy.