Sewage Treatment

- Cleaning of water is a process of removing pollutants before it enters a water body or is reused. This process of wastewater treatment is commonly known as sewage treatment.
- Sewage is wastewater released by homes, industries, hospitals, offices and other users.
- It also includes rainwater that has run down the street during a storm or heavy rain.
- Sewage is a liquid waste. Most of it is water, which has dissolved and suspended impurities.
- Sewage is a complex mixture containing suspended solids, organic and inorganic impurities, nutrients, saprophytes and disease causing bacteria and other microbes.

Components of Sewage

These include the following:

Organic impurities: Human faeces, animal waste oil, urea, herbicides, fruit and vegetables waste, etc.

Inorganic impurities: Nitrates, phosphates, metals.

Nutrients: Phosphorus and nitrogen

Bacteria: Such as vibrio which causes cholera and salmonella, paratyphi which causes typhoid.

• Other microbes such as protozoans which cause dysentery.

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• Sewage that reaches sewage treatment plants may also contain rubbish such as rags, wooden sticks, cans, plastic bags (polythene bags), napkins, sanitary towels grit and sand.



Treatment of sewage in cities and towns:

If sewage water is allowed to directly flow into the water bodies, it would pollute water. Such polluted water is not suitable for human consumption or for growing crops. It will also harm all kinds of plants and animals living in this water.

Thus, Wastewater must be cleaned before it is released into the water bodies. This is done in Sewage treatment plant or wastewater treatment plant. Treated wastewater can be used for various purposes.

Sewage treatment plant (Wastewater treatment plant)

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

The pre-treatment process: Involves the sewage being sent through grids or vertical bar screens that can remove large solid substances like metal cans, paper and plastic materials.

Primary treatment process:

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In this process, the sewage flows through the grit chamber very slowly so that the sand, pebbles and soil settle down at the bottom.

- It is a mechanical process; the sewage flows into the settling tank of sedimentation tank where the solid wastes like faeces are allowed to settle down.
- The waste material that settles down at the bottom is called the sludge and the floatable material is called the scum.
- The sludge at the bottom is removed with a scrapper every few days and treated further. The water then is left out is called the clarified water.

Secondary treatment process:

- It is a **biological process**. This is done by transferring the clarified water into an aeration tank where air blowers bubble air, which helps the aerobic bacteria to grow and feed on the organic contaminants.
- Microorganisms decompose most of the organic matter still present in the sewage.

The leftover liquid waste is allowed to remain in time so that microscopic organisms settle down at the bottom. This is called the activated sludge. This activated sludge is then left in sand dry beds.

Partiary treatment process:

- The leftover liquid waste is transferred to another large tank where the decomposed waste settles at the bottom. These tanks too are called sedimentation tanks.
- At this stage, most of the solid substances from the water are removed.
- The water is then shifted to a tank where it is treated with chlorine to kill all the microorganisms present in the wastewater and to remove the Phosphorus compounds and nitrogen compounds. Addition of chlorine to wastewater to kill germs is called chlorination. It is a chemical process.
- The dirty water that was brought to the sewage treatment plant is now clean and can be used to cultivate crops, maintain large gardens, and manufacture goods in industries.

The water can also be discharged into oceans, rivers and lakes or used to recharge groundwater.

