

Introduction

The water which has been adversely affected in quality by the presence of various pollutants is called as waste water.

Lather, oil, industrial chemicals, pesticides, global warming can pollute water.

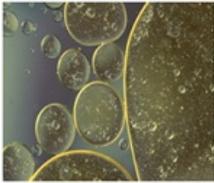


Fig. oil in water

- Waste water from sinks, showers, toilets, laundries flows down the drains.
- Polluted water should not be wasted.
- Pollutants should be removed by cleaning the water.



Fig. waste water

Class 7 Biology Wastewater Story

Water our life line

Water our life line

- Clean water useful for several purposes is not available to all.
- Clean water is a basic need of human being because clean water is useful for drinking, cooking, bathing, watering the plants and also for keeping ourselves clean.



Fig. Water for drinking, cooking, bathing

- 22 March is celebrated as World Water Day.
- The process of removing pollutants before it enters a water body is called as **cleaning of water**.
- The process of cleaning of water is commonly known as **Sewage Treatment**.



Fig. Sewage Treatment

Sewage

- Wastewater released by homes, industries, hospitals, schools and other users is called
- Rainwater which runs down the street during a storm or heavy rain is also included under sewage.



Fig. Sewage

- Harmful substances are present in the water which washes off roads and rooftops.
- Sewage is a liquid waste which contains dissolved and suspended impurities known as



Fig. Contaminants in water

- Contaminants include organic impurities, inorganic impurities, nutrients, bacteria and other microbes.

Organic impurities include human feces, animal waste.

Inorganic impurities include nitrates, phosphates.

Nutrients include nitrogen and phosphorus.

Bacteria include cholera-causing microbes.

Other microbes include dysentery, hepatitis-causing organisms.

- **Sewers** are the network of small and big pipes forming sewerage.



Fig. Sewers

- **Sewerage** is a transport system that carries sewage from the point of being produced to the point of disposal.
- During the treatment of waste water solids like faeces settle down at the bottom and are removed with a scraper called as

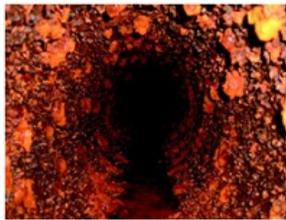


Fig. Sludge

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Waste water treatment plan

Waste water treatment plan (WWTP)

- Physical, chemical and biological processes are involved in the treatment of waste water.
- Treatment removes physical, chemical and biological contaminants.
- Procedure of waste water treatment

Through bar screens waste water is passed and here large objects like rags, cans, sticks, bottles, large food materials are removed.

Water is then passed to a grit and sand removal tank, where sand, grit and pebbles settle down by decreasing the speed of entering wastewater.

- Water is then allowed to settle in a large tank and sludge is removed

The water from which the floatable solids like oil and grease are removed is called **clarified water**.

Clarified water is then transferred to a separate tank for **decomposition** by the **anaerobic bacteria**.

The biogas produced during decomposition can be used as fuel or used to produce electricity.

- Air is pumped into clarified water to grow the bacteria which consume the left out contaminants in the waste water.
- After several hours of decomposition in the tank, the microbes settle down in the bottom as **activated sludge**.

The water is then removed from the top by **sand drying beds** or machines.

The treated water with very low amount of suspended matter is discharged into water bodies where it is further cleaned by nature.

Chlorine and **ozone** are also used sometimes before releasing into the water bodies.



Fig. Water purification

Dried sludge can be used as manure which in turn returns organic matter and nutrients to the soil.

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Ways to minimize waste at their source

Ways to minimize waste at their source

- Oil and fats should not be thrown in the drain as these may block the pipes and can clog the soil pores in open drain by reducing the effectiveness in filtering water.
- Paints, solvents, motor, medicines can kill the useful microbes in the drain which help in purifying water.



Fig. Paints, medicines

- Tealeaves, solid food, cotton, soft toys in the drain do not allow free flow of oxygen and hence can hamper degradation process.



Fig. Tea leaves, soft toy

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Sanitation and disease

Sanitation and disease

- Poor sanitation and contaminated drinking water can cause several diseases like cholera, meningitis, hepatitis, typhoid, polio.
- Large fraction of people defecates on dry river beds, near fields, directly in water which may cause water and soil pollution.



Fig. River bed

- Both ground water and surface water get polluted because ground water is the source of water for wells, springs, rivers etc.

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Alternative sewage disposal system

Alternative sewage disposal system

Low cost onsite sewage disposal has been practiced.

Examples are

- i) septic tanks used where there is no sewerage system for hospitals, isolated buildings.



Fig. Septic tank

- ii) chemical toilets.
- iii) composting pits.

Some toilets do not require scavenging because excreta from the toilet seats flow through covered drains into a biogas plant and biogas is used as a source of energy.

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Sanitation at public places

Sanitation at public places

- In busy places such as railways, bus depots large amount of wastes generate which should be disposed of properly otherwise epidemics could break out.

Fig. railway station, bus stop

- Standards laid down by government are not strictly enforced that is why everyone should contribute to maintain sanitation at public places.
- Adopting good sanitation practice should be our way of life.



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