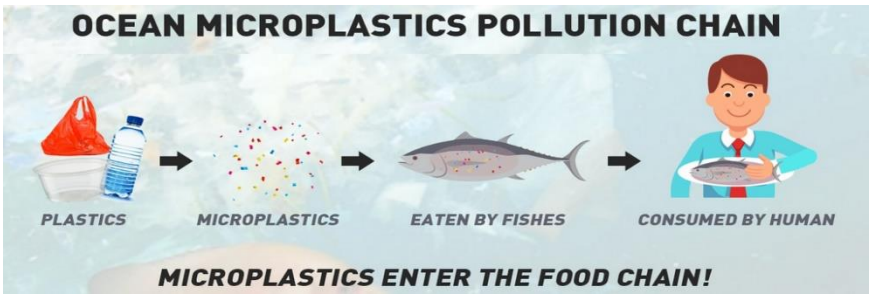
Setting the scene for Water Pollution

Source: https://www.water-pollution.org.uk/dangers-of-water-pollution/

The problems of water pollutions

Health **Economy** **Environment**

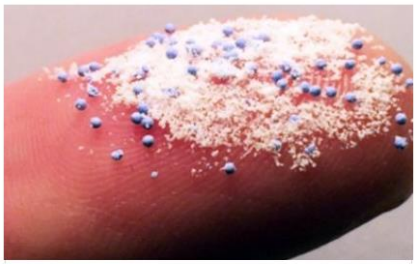
Impact on health and environment: Water pollution are harmful to the health of humans and animals after long term exposure and different forms of water pollutants have the following impacts:



- **Heavy metals from industrial processes and toxic industrial waste** can accumulate in nearby lakes and rivers. These are toxic to marine life such as fish and shellfish and aquatic animals, and subsequently to the humans who eat them. They can cause immune suppression, reproductive failure or acute poisoning. Toxics to marine life such as fish and shellfish, and can affect the rest of the food chain. This means that entire animal communities can be badly affected by this type of pollutant. Some toxins affect the reproductive success of marine life and can therefore disrupt the community structure of an aquatic environment.
- **Microbial pollutants from sewage** often result in infectious diseases that infect aquatic life and terrestrial life through drinking water. Microbial water pollution is a major problem in the developing world, with diseases such as cholera and typhoid fever being the primary cause of infant mortality.
- **Organic matter and nutrients** causes an increase in aerobic algae and depletes oxygen from the water column. This causes the suffocation of fish and other aquatic organisms.
- **Sulfate particles from acid rain** can cause harm the health of marine life in the rivers and lakes it contaminates, and can result in mortality.
- **Suspended particles in freshwater** reduces the quality of drinking water for humans and the aquatic environment for marine life. Suspended particles can often reduce the amount of sunlight penetrating the water, disrupting the growth of photosynthetic plants and micro-organisms.

Impact on Economy: Water pollution can be damaging to the economy as it can be expensive to treat and prevent contamination. Waste that does not break down quickly accumulates in the Earth's waters and eventually makes its way to the oceans. Water pollution can be prevented by stopping pollutants from contaminating nearby waters. There are a number of water treatments to prevent pollution such as biological filters, chemical additives sand filters. These simple techniques cost money to maintain, but prevention is much cheaper than cleaning up water pollution that has already occurred.

The types of water pollutions



Microplastic

The Giant Issue of Microplastics First, we will have a look at the background story on micro-plastics, and then we will go into detail on how the situation regarding micro-plastics in our environment impacts us today. What are micro-plastics? A...

Chemical Water Pollution

Industrial and agricultural work involves the use of many different chemicals that can run-off into water and pollute it. Metals and solvents from industrial work can pollute rivers and lakes. These are poisonous to many forms of aquatic life and may slow their...

Suspended Matter

Some pollutants do not dissolve in water as their molecules are too big to mix between the water molecules. This material is called particulate matter and can often be a cause of water pollution. The suspended particles eventually settle and cause a thick silt...

Microbiological water pollution

Microbiological water pollution is usually a natural form of water pollution caused by microorganisms. Many types of microorganisms live in water and cause fish, land animals and humans to become ill. Microorganisms such as: Bacteria Viruses Protozoa Serious diseases...

Nutrients and their Effect on Water

Nutrients are essential for plant growth and development. Many nutrients are found in wastewater and fertilisers, and these can cause excess weed and algae growth if large concentrations end up in water. This can contaminate drinking water and clog filters....

Groundwater Pollution

A lot of the Earth's water is found underground in soil or under rock structures called aquifers. Humans often use aquifers as a means to obtain drinking water, and build wells to access it. When this water becomes polluted it is called groundwater pollution....

The causes of water pollutions

Eutrophication and Water Pollution

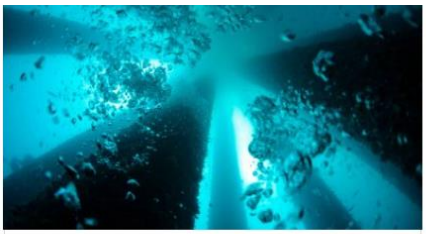
Eutrophication is when the environment becomes enriched with nutrients. This can be a problem in marine habitats such as lakes as it can cause algal blooms. Fertilisers are often used in farming, sometimes these fertilisers run-off into nearby water causing an...

Global Warming and Water Pollution

An increase in water temperature can result in the death of many aquatic organisms and disrupt many marine habitats. For example, a rise in water temperatures causes coral bleaching of reefs around the world. This is when the coral expels the microorganisms of which...

Atmospheric Water Pollution

Atmospheric deposition is the pollution of water caused by air pollution. In the atmosphere, water particles mix with carbon dioxide sulphur dioxide and nitrogen oxides, this forms a weak acid. Air pollution means that water vapour absorbs more of these gases...



Underground Storage Leakages

A tank or piping network that has at least 10 percent of its volume underground is known as an underground storage tank (UST). They often store substances such as petroleum, that are harmful to the surrounding environment should it become contaminated. Many UST's...

Oil Pollution in Water

Oceans are polluted by oil on a daily basis from oil spills, routine shipping, run-offs and dumping. Oil spills make up about 12% of the oil that enters the ocean. The rest come from shipping travel, drains and dumping. An oil spill from a tanker is a severe...

Nuclear Waste and Water Pollution

Nuclear waste is produced from industrial, medical and scientific processes that use radioactive material. Nuclear waste can have detrimental effects on marine habitats. Nuclear waste comes from a number of sources: Operations conducted by nuclear power...

Industrial Water and Water Pollution

Industry is a huge source of water pollution, it produces pollutants that are extremely harmful to people and the environment. Many industrial facilities use freshwater to carry away waste from the plant and into rivers, lakes and oceans. Pollutants from industrial...

Marine Dumping & Water Pollution

Dumping of litter in the sea can cause huge problems. Litter items such as 6-pack ring packaging can get caught in marine animals and may result in death. Different items take different lengths of time to degrade in water: Cardboard – Takes 2 weeks to degrade....

Sewage and Wastewater Pollution

Domestic households, industrial and agricultural practices produce wastewater that can cause pollution of many lakes and rivers. Sewage is the term used for wastewater that often contains faeces, urine and laundry waste. There are billions of people on Earth,...

Prevention of water pollutions

1. Water Pollution Treated

- **Industrial water treatment:** Before raw sewage can be safely released back into the environment, it needs to be treated correctly in a water treatment plant in which sewage goes through a number of chambers and chemical processes to reduce the amount and toxicity of the waste.
- **Denitrification** is an ecological approach that can be used to prevent the leaching of nitrates in soil, this in turn stops any ground water from being contaminated with nutrients.
- **Septic tanks and sewage treatment:** Septic tanks treat sewage at the place where it is located, rather than transporting the waste through a treatment plant or sewage system. Septic tanks are usually used to treat sewage from an individual building.
- **Ozone wastewater treatment** is a method that is increasing in popularity. An ozone generator is used to break down pollutants in the water source. The generators convert oxygen into ozone by using ultraviolet radiation or by an electric discharge field. Ozone is a very reactive gas that can oxidise bacteria, moulds, organic material and other pollutants found in water.

Ozone treatment can sometimes produce by-products such as bromate that can harm human health if they are not controlled.

2. Water Pollution Prevention

People can prevent water pollution of nearby rivers and lakes as well as groundwater and drinking water by following some simple guidelines in everyday life.

- Conserve water by turning off the tap when running water is not necessary. This helps prevent water shortages and reduces the amount of contaminated water that needs treatment.
- Be careful about what you throw down your sink or toilet. Don't throw paints, oils or other forms of litter down the drain. Use environmentally household products, such as washing powder, household cleaning agents and toiletries.
- Take great care not to overuse pesticides and fertilisers. This will prevent runoffs of the material into nearby water sources.
- By having more plants in your garden you are preventing fertiliser, pesticides and contaminated water from running off into nearby water sources.
- Don't throw litter into rivers, lakes or oceans. Help clean up any litter you see on beaches or in rivers and lakes, make sure it is safe to collect the litter and put it in a nearby dustbin.

Laws and conventions

There are many laws that protect the world's oceans, rivers and lakes from unnecessary water pollution. Each continent and country may differ in which laws they enforce but they aim to have the same overall positive influence.

In Europe, there have been a number laws enforced to protect the surrounding ocean from marine dumping.

- In 1989, the dumping of industrial waste was terminated in all countries in North-Western Europe, apart from the UK. Dumping was terminated in the UK in 1993.
- In 1990, the dumping of sewage sludge was terminated in all countries in North-Western Europe, apart from the UK. Dumping was terminated in the UK in 1998.
- Guidelines have been developed and are currently being reviewed regarding the dumping of polluted materials.
- Dumping of nuclear waste in European waters has been terminated since 1986.

There are a number of directives given in the European Union Environmental Legislation:

- The **proposed water framework directive** aims to achieve a number of objectives regarding health and environmental issues:
  – Enforce sufficient drinking water provisions.
  – Enforce sufficient provisions if water for other economic requirements.
  – Protection of the environment from water pollution.
  – Provide alleviation of the adverse impacts of floods and droughts.
  – The directive aims to achieve a good status for ground waters and surface waters in Europe by the year 2010.
- The **urban waste water directive** aims to protect surface inland waters and coastal waters from pollution by regulating the collection and treatment of urban waste water.
- The **nitrate from agricultural sources directive** aims to protect waters against pollution caused by nitrates, especially nitrates from agricultural sources such as fertilisers. This will enable marine and freshwaters to be protected from eutrophication.

- The **drinking water directive** aims to establish strict standards regarding the quality of drinking water. The directive provides parameters and analysis methods, these standards must be met to ensure safe drinking water.
- The **surface water for drinking water abstraction directive** and measurement and sampling of surface waters directive and information exchange decision are integrated to form a framework that deals with wate protection of all waters, not just those used by humans.
- The **fish water directive and shell water directive** aims to protect waters from pollution that are primarily used for fishing.
- The **groundwater directive** aims to protect groundwater from dangerous pollutants by controlling the direct and indirect discharges of certain substances into the groundwater.
- The **bathing water directive** aims to keep good standards in the quality of bathing water in freshwater and coastal water areas.