

SOURCES, PHYSICAL, BIOLOGICAL & CHEMICAL EFFECTS OF WATER POLLUTION

INTRODUCTION

Humans have established communities and flourished around sources of clean, drinkable water since the beginning of time. It's vital to our survival.

Do you know that you can survive several days without food but not without water? It's heartbreaking to know that millions of people worldwide do not have access to this most basic need, and are dying of thirst and water borne diseases.

Freshwater sources around the world are threatened by water pollution. Not only are we managing our resources poorly through wastage, we are also thoughtlessly dirtying it.

SOURCES OF POLLUTION

The main sources of water pollution are the following:

- Discharge of untreated Raw Sewage from households and factories Chemicals dumped from Factories
- Agricultural run-offs that make their way into our rivers and streams and Groundwater sources
- Urbanization
- The rising use of synthetic organic substances
- Oil Spills
- Acid Rain caused by the burning of Fossil Fuels
- Human littering in rivers, oceans, lakes and other bodies of water. Harmful litter includes plastics, aluminum, glass and Styrofoam.

Almost everything that is a byproduct of our civilization is polluting our drinking water. Governments, through various Clean Water Acts and water resource policies have sought to regulate the discharges of pollutants in the water to minimize pollution and contamination. From 1990 to 2006, an additional 1.6 billion people had access to safe drinking water. But we are not acting fast enough and most factories still find a way to dump their toxic wastes in the sea, unseen.

EFFECTS OF WATER POLLUTION

Some people believe pollution is an inescapable result of human activity: they argue that if we want to have factories, cities, ships, cars, oil, and coastal resorts, some degree of pollution is almost certain to result. In other words, pollution is a necessary evil that people must put up with if they want to make progress. Fortunately, not everyone agrees with this view. One reason people have woken up to the problem of pollution is that it brings costs of its own that undermine any economic benefits that come about by polluting.

Take oil spills, for example. They can happen if tankers are too poorly built to survive accidents at sea. But the economic benefit of compromising on tanker quality brings an economic cost when an oil spill occurs. The oil can wash up on nearby beaches, devastate the ecosystem, and severely affect tourism. The main problem is that the people who bear the cost of the spill (typically a small coastal community) are not the people who caused the problem in the first place (the people who operate the tanker). Yet, arguably, everyone who puts gasoline (petrol) into their car—or uses almost any kind of petroleum-fueled transport—contributes to the problem in some way. So oil spills are a problem for everyone, not just people who live by the coast and tanker operates.

Sewage is another good example of how pollution can affect us all. Sewage discharged into coastal waters can wash up on beaches and cause a health hazard. People who bathe or surf in the water can fall ill if they swallow polluted water—yet sewage can have other harmful effects too: it can poison shellfish (such as cockles and mussels) that grow near the shore. People who eat poisoned shellfish risk suffering from an acute—and sometimes fatal—illness called paralytic shellfish poisoning. Shellfish is no longer caught along many shores because it is simply too polluted with sewage or toxic chemical wastes that have discharged from the land nearby.

Pollution matters because it harms the environment on which people depend. The environment is not something distant and separate from our lives. It's not a pretty shoreline hundreds of miles from our homes or a wilderness landscape that we see only on TV. The environment is everything that surrounds us that gives us life and health. Destroying the environment ultimately reduces the quality of our own lives—and that, most selfishly, is why pollution should matter to all of us.

EFFECT OF POLLUTED WATER ON HUMANS

How does water pollution affect humans? Try drinking untreated water nowadays and your body will immediately react to it. You will get a stomach ache at the least. Water-borne diseases account for the deaths of 3,575,000 people a year! That's equivalent to a jumbo jet crashing every hour, and the majority of these are children.

Infectious diseases can be spread through contaminated water. Some of these water-borne diseases are *Typhoid, Cholera, Paratyphoid Fever, Dysentery, Jaundice, Amoebiasis and Malaria*.

- **Chemicals** in the water also have negative effects on our health.
- **Pesticides** – can damage the nervous system and cause cancer because of the carbonates and organophosphates that they contain. Chlorides can cause reproductive and endocrinal damage.
- **Nitrates** – are especially dangerous to babies that drink formula milk. It restricts the amount of oxygen in the brain and cause the “blue baby” syndrome.
- **Lead** – can accumulate in the body and damage the central nervous system.
- **Arsenic** – causes liver damage, skin cancer and vascular diseases
- **Flourides** - in excessive amounts can make your teeth yellow and cause damage to the spinal cord.
- **Petrochemicals** – even with very low exposure, can cause cancer.

EFFECTS OF CHEMICAL WATER POLLUTION

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EFFECTS OF PHYSICAL WATER POLLUTION

A common form of physical water pollution is thermal pollution. This includes warm water from cooling towers, floating debris, foam, and garbage. ... The discharge of high-temperature water into a natural body of water can affect the downstream habitats, therefore altering the ecological balance

EFFECTS OF BIOLOGICAL WATER POLLUTION

Biological pollutants are substances in our environment which come from living organisms and can affect our health. They include things such as pollen from trees and plants, insects or insect parts, certain fungi, some bacteria and viruses, and even animal hair, animal skin scales, saliva, and urine.

Biological pollutants include bacteria, viruses, and parasites that are responsible for waterborne diseases, such as typhoid fever, cholera, dysentery, polio, hepatitis, and schistosomiasis. The presence of Coliform bacteria is indicator of recent fecal pollution.

Biological contaminants include bacteria, viruses, animal dander and cat saliva, house dust, mites, cockroaches, and pollen. There are many sources of these pollutants. ... Standing water, water-damaged materials or wet surfaces also serve as a breeding ground for molds, mildews, bacteria and insects.

For coliform bacteria: may include diarrhea, cramps, nausea, and other gastrointestinal problems. Giardia lamblia, which is found in untreated water and carried by human or animal fecal matter.

HOW CAN WE STOP WATER POLLUTION?

There is no easy way to solve water pollution; if there were, it wouldn't be so much of a problem. Broadly speaking, there are three different things that can help to tackle the problem—education, laws, and economics—and they work together as a team.

1. EDUCATION

Making people aware of the problem is the first step to solving it. In the early 1990s, when surfers in Britain grew tired of catching illnesses from water polluted with sewage, they formed a group called Surfers Against Sewage to force governments and water companies to clean up their act. People who've grown tired of walking the world's polluted beaches often band together to organize community beach-cleaning sessions. Anglers who no longer catch so many fish have campaigned for tougher penalties against factories that pour pollution into our rivers. Greater public awareness can make a positive difference.

2. LAWS

One of the biggest problems with water pollution is its transboundary nature. Many rivers cross countries, while seas span whole continents. Pollution discharged by factories in one country with poor environmental standards can cause problems in neighboring nations, even

when they have tougher laws and higher standards. Environmental laws can make it tougher for people to pollute, but to be really effective they have to operate across national and international borders. This is why we have international laws governing the oceans, such as the 1982 UN Convention on the Law of the Sea (signed by over 120 nations), the 1972 London (Dumping) Convention, the 1978 MARPOL International Convention for the Prevention of Pollution from Ships, and the 1998 OSPAR Convention for the Protection of the Marine Environment of the North East Atlantic. The European Union has water-protection laws (known as directives) that apply to all of its member states. They include the 1976 Bathing Water Directive (updated 2006), which seeks to ensure the quality of the waters that people use for recreation. Most countries also have their own water pollution laws. In the United States, for example, there is the 1972 Clean Water Act and the 1974 Safe Drinking Water Act.

3. ECONOMICS

Most environmental experts agree that the best way to tackle pollution is through something called the **polluter pays principle**. This means that whoever causes pollution should have to pay to clean it up, one way or another. Polluter pays can operate in all kinds of ways. It could mean that tanker owners should have to take out insurance that covers the cost of oil spill cleanups, for example. It could also mean that shoppers should have to pay for their plastic grocery bags, as is now common in Ireland, to encourage recycling and minimize waste. Or it could mean that factories that use rivers must have their water inlet pipes downstream of their effluent outflow pipes, so if they cause pollution they themselves are the first people to suffer. Ultimately, the polluter pays principle is designed to deter people from polluting by making it less expensive for them to behave in an environmentally responsible way.

3. OUR CLEAN FUTURE

Life is ultimately about choices—and so is pollution. We can live with sewage-strewn beaches, dead rivers, and fish that are too poisonous to eat. Or we can work together to keep the environment clean so the plants, animals, and people who depend on it remain healthy. We can take individual action to help reduce water pollution, for example, by using environmentally friendly detergents, not pouring oil down drains, reducing pesticides, and so on. We can take community action too, by helping out on beach cleans or litter picks to keep our rivers and seas that little bit cleaner. And we can take action as countries and continents to pass laws that will

make pollution harder and the world less polluted. Working together, we can make pollution less of a problem—and the world a better place.