

# WATER POLLUTION

## Household Water Pollution

Safe and readily available water is important for public health, whether it is used for drinking, domestic use, food production or recreational purposes. In 2010, the UN General Assembly explicitly recognized the human right to water and sanitation. Everyone has the right to sufficient, continuous, safe, acceptable, physically accessible, and affordable water for personal and domestic use.

Unfortunately, the world faces an invisible crisis of water quality. Poor water quality threatens growth, harms public health and imperils food security. Its impacts are wider, deeper, and more uncertain than previously thought and require urgent attention.

### Key facts

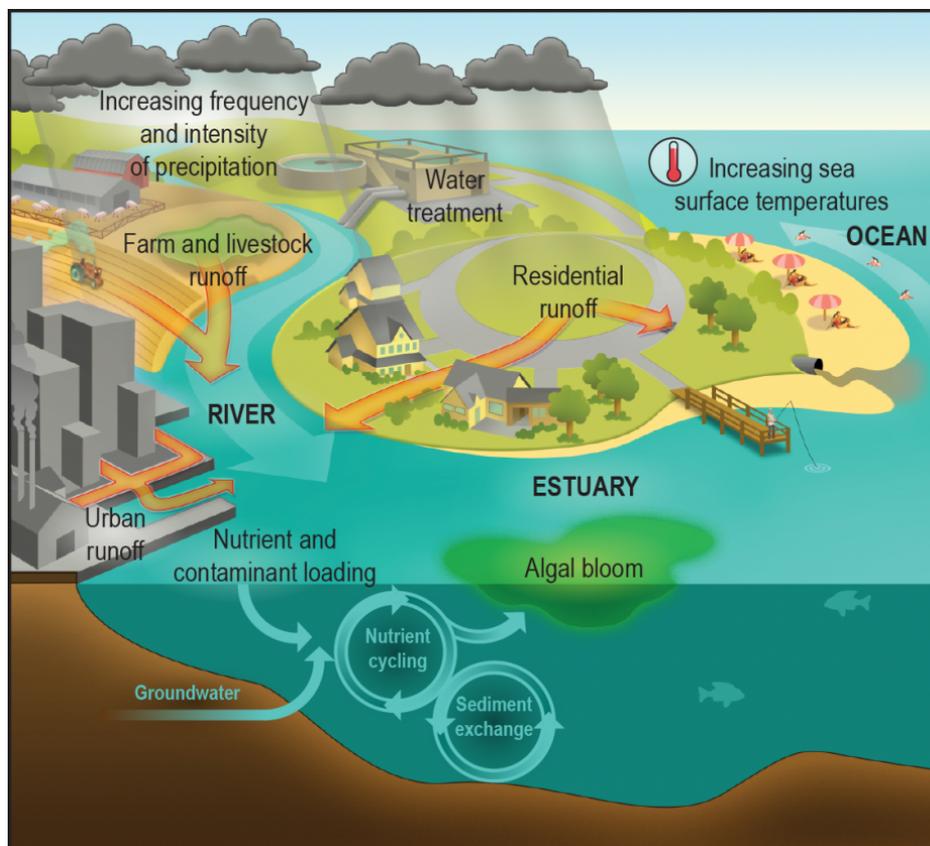
- In 2017, 71% of the global population (5.3 billion people) used a safely managed drinking-water service – that is, one located on premises, available when needed, and free from contamination.
- 90% of the global population (6.8 billion people) used at least a basic service. A basic service is an improved drinking-water source within a round trip of 30 minutes to collect water.
- 785 million people lack even a basic drinking-water service, including 144 million people who are dependent on surface water.
- Globally, at least 2 billion people use a drinking water source contaminated with faeces.
- Contaminated water can transmit diseases such as diarrhoea, cholera, dysentery, typhoid, and polio. Contaminated drinking water is estimated to cause 485 000 diarrhoeal deaths each year.
- By 2025, half of the world's population will be living in water-stressed areas.

- In least developed countries, 22% of health care facilities have no water service, 21% no sanitation service, and 22% no waste management service.



Source: <https://www.fremont.gov/ImageRepository/Document?documentID=46252>

Fig: Links between Climate Change, Water Quantity and Quality, and Human Exposure to Water-Related Illness



Precipitation and temperature changes affect fresh and marine water quantity and quality primarily through urban, rural, and agricultural runoff. This runoff in turn affects human exposure to water-related illnesses primarily through contamination of drinking water, recreational water, and fish and shellfish.

## Household water use

Each person in Switzerland uses an average of **142 litres of water** at home every day



- 29% Flushing the toilet
- 25% Showering / bathing
- 16% Kitchen sink
- 12% Washing machine
- 11% Bathroom sink
- 2% Dishwasher
- 5% Outdoors

Source: SVGW; figures are rounded.

Source:

<https://www.swissinfo.ch/resource/blob/45165372/932af5ec8725864bf104c9fc23b9bdf8/wasserverbrauch-eng-data.png>

## Effects

When discussing the issues that can arise due to water pollution, there are three major areas to consider:

- **Health:** According to the United Nations, every year there are more deaths caused by polluted water than all types of violence combined, including war. Waste from humans and animals that contaminates water carries bacteria and viruses that cause the spread of diseases such as typhoid, cholera, giardia, diarrhoea, dysentery, hepatitis A, typhoid, and polio. Absent, inadequate, or inappropriately managed water and sanitation services expose individuals to preventable health risks. Exposure occurs through ingestion, inhalation, or direct contact with contaminated drinking or recreational water and through consumption of contaminated fish and shellfish.
- **Environment:** All the species in an ecosystem rely on each other in order to survive. Outside substances, such as pollutants found in wastewater, can disrupt the complicated relationships between species that an ecosystem needs in order to thrive.
- **Economy:** Polluted water can have many negative effects on the economy. It directly impacts sectors such as commercial fishing, recreational businesses, tourism and even property values, all of which rely heavily on clean water. Polluted drinking water can also cause treatment costs to rise, which in turn makes the cost of drinking water rise as well.

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### Effects of household practices:

- Soil in runoff carries contaminants that smothers and kills aquatic life.

- Fertilizers, car exhaust, and detergents cause explosive plant and algae growth, which depletes water of oxygen, killing fish and animals as well as creating a terrible smell.
- Loose grass clippings and leaves also add to this and clog drainage systems.
- Pet droppings and septic tank overflows can cause diseases like dysentery, hepatitis, and parasite infections by getting into drinking water and recreation areas.
- Oil, paint, cleaning supplies, and other toxic materials from cars and batteries contaminate drinking water and kill fish, animals, and plants.

## **Causes**

Household pollutants are contaminants that are released during the use of various products in daily life.

Many commonly used household products release toxic chemicals. As an alternative, manufacturers are introducing products, often referred to as green products, whose manufacture, use, and disposal do not become a burden on the environment.

**Examples** of hazardous household products:

- Common Household Cleaners
- Detergents From Washing Your Car
- Fertilizers
- Improper Disposal Of Paint, Oil, or Other Chemicals
- Insecticides, and Fungicides
- Loose Grass Clippings and Leaves
- Pet Droppings
- Poorly Maintained Septic Systems

- Soil From Exposed Areas in the Yard
- Weed Killer
- Pool chemicals
- Health and beauty aids

## HOUSEHOLD PRODUCTS AND THEIR POTENTIAL HEALTH EFFECTS

Product Type	Harmful Ingredients	Potential Health Hazards
SOURCE: Compiled by author.		
Air fresheners & deodorizers	Formaldehyde	Toxic in nature; carcinogen; irritates eyes, nose, throat and skin; nervous, digestive, respiratory system damage
Bleach	Sodium hypochlorite	Corrosive; irritates and burns skin and eyes; nervous, respiratory, digestive system damage
Disinfectants	Sodium hypochlorite	Corrosive; irritates and burns skin and eyes; nervous, respiratory, digestive system damage
	Phenols	Ignitable; very toxic in nature; respiratory and circulatory system damage
	Ammonia	Toxic in nature; vapor irritates skin, eyes and respiratory tract
Drain cleaner	Sodium/potassium hydroxide (lye)	Corrosive; burns skin and eyes; toxic in nature; nervous, digestive and urinary system damage
Flea powder	Carbaryl	Very toxic in nature; irritates skin; causes nervous, respiratory and circulatory system damage

Product Type	Harmful Ingredients	Potential Health Hazards
Floor cleaner/wax	Dichlorophene	Toxic in nature; irritates skin; causes nervous and digestive system damage
	Chlordane and other chlorinated hydrocarbons	Toxic in nature; irritates eyes and skin; cause respiratory, digestive and urinary system damage
	Diethylene glycol	Toxic in nature; causes nervous, digestive and urinary system damage
	Petroleum solvents	Highly ignitable; carcinogenic; irritate skin, eyes, throat, nose and lungs
Furniture polish	Ammonia	Toxic in nature; vapor irritates skin, eyes and respiratory tract
	Petroleum distillates or mineral spirits	Highly ignitable; toxic in nature; carcinogen; irritate skin, eyes, nose, throat and lungs
Oven cleaner	Sodium/potassium hydroxide (lye)	Corrosive; burns skin, eyes; toxic in nature; causes nervous and digestive system damage
Paint thinner	Chlorinated aliphatic hydrocarbons	Toxic in nature; cause digestive and urinary system damage
	Esters	Toxic in nature; irritate eyes, nose and throat
	Alcohols	Ignitable; cause nervous system damage; irritate eyes, nose and throat
	Chlorinated aromatic hydrocarbons	Ignitable; toxic in nature; digestive system damage
	Ketones	Ignitable; toxic in nature; respiratory system damage

Product Type	Harmful Ingredients	Potential Health Hazards
Paints	Aromatic hydrocarbon thinners	Ignitable; toxic in nature; carcinogenic; irritates skin, eyes, nose and throat; respiratory system damage
	Mineral spirits	Highly ignitable; toxic in nature; irritates skin, eyes, nose and throat; respiratory system damage
Pool sanitizers	Calcium hypochlorite	Corrosive; irritates skin, eyes, and throat; if ingested cause severe burns to the digestive tract
	Ethylene (algaecides)	Irritation of eyes, mucous membrane and skin; effects reproductive system; probable human carcinogen of medium carcinogenic hazard
Toilet bowl cleaner	Sodium acid sulfate or oxalate or hypochloric acid	Corrosive; toxic in nature; burns skin; causes digestive and respiratory system damage
	Chlorinated phenols	Ignitable; very toxic in nature; cause respiratory and circulatory system damage
Window cleaners	Diethylene glycol	Toxic in nature; cause nervous, urinary and digestive system damage
	Ammonia	Toxic in nature; vapor irritates skin, eyes and respiratory tract

## Solutions

As the international authority on public health and water quality, WHO leads global efforts to prevent transmission of waterborne disease, advising governments on the development of health-based targets and regulations. WHO produces a series of water quality guidelines,

including on drinking-water, safe use of wastewater, and safe recreational water environments.

Aside from international response from organizations such as WHO, there are numerous ways that each of us can help reduce water pollution. The Natural Resources Defense Council has outlined a few:

1. **Don't flush trash.** Being mindful not to flush non-degradable products, such as plastic, down your toilet is one small but great way to stop contributing to the problem and start becoming part of the solution.
2. **Pick up after your pets.** Waste from animals is full of bacteria, and if not disposed of properly, that bacteria can find its way into the water supply through storm drains and runoff. The recommended disposal method is to use a bag made from recycled plastic to throw it in the trash. Never wash pet waste out into the street or into the storm drain.
3. **Maintain your car.** Antifreeze, oil, coolant and other chemicals can leak out of your car if it's not properly cared for. Then, rainwater washes those chemicals into the groundwater supply. Regular maintenance can reduce the amount of pollutants emitted by your car, and it enhances the vehicle's performance as well. Also, wash vehicles at car washes that have water reclamation systems.

**Other suggestions to reduce household water pollution are:**

- Surround your garden with native plants and use natural fertilisers. As native plants require less water, they could withstand drought conditions and extreme weather situations. They would cost less to maintain, as you can even use natural fertilisers, such as compost, peat and bone meal. This would eliminate the need for artificial fertilisers that aggravate water pollution. This inclination to use natural products would help you retain the soil's moisture and divert waste from landfills.
- Adjust sprinklers to minimize water from entering the gutter. When possible, use drip irrigation. This will also reduce water usage.

- Don't use the hose to clean walkways, driveways, or gutters. Whenever possible, use a rake or broom to clean the yard, driveway and gutters. Use leaf blowers responsibly and never blow debris into the gutter or storm drain.
- Closely follow manufacture instructions when applying fertilizer, pesticide, or herbicide. Do not apply material onto sidewalks, curbs, streets, or other non-porous surfaces.

### ALTERNATIVES TO COMMON HOUSEHOLD PRODUCTS

Product	Alternative(s)
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SOURCE: Based on information available from various sources including the Web site of Air and Waste Management Association

Air refresher	Open windows to ventilate. To scent air, use herbal bouquets, pure vanilla on a cotton ball, or simmer cinnamon and cloves.
All-purpose cleaner	Mix $\frac{2}{3}$ cup baking soda, $\frac{1}{4}$ cup ammonia and $\frac{1}{4}$ cup vinegar in a gallon of hot water. Doubling all the ingredients except the water can make stronger solution.
Brass polish	Use paste made from equal parts vinegar, salt and flour. Be sure to rinse completely afterward to prevent corrosion.
Carpet/rug cleaner	Sprinkle cornstarch/baking soda on carpets and vacuum.
Dishwashing liquid	Wash dishes with hand using a liquid soap or a mild detergent.
Drain opener	Add 1 tablespoon baking soda into drain and then slowly pour $\frac{1}{3}$ cup white vinegar to loosen clogs. Use a plunger to get rid of the loosened clog. Prevent clogs by pouring boiling water down drains once a week, using drain strainers, and not pouring grease down drains.
Fabric softener	Use $\frac{1}{4}$ to $\frac{1}{2}$ cup of baking soda during rinse cycle.

<b>Product</b>	<b>Alternative(s)</b>
Fertilizer	Use compost and organic fertilizers.
Floor cleaner	Mix 1 cup vinegar in 2 gallons of water. For unfinished wood floors, add 1 cup linseed oil. To remove wax buildup, scrub in club soda, let soak and wipe clean.
Floor polish	Polish floors with club soda.
Furniture polish	Mix 1 teaspoon lemon oil and 1 pint mineral oil. Also, use damp rag.
Insecticides	Wipe houseplant leaves with soapy water.
Laundry bleach	Use borax on all clothes or ½ cup white vinegar in rinse water to brighten dark clothing. Nonchlorinated bleach also works well.
Methylene chloride paint stripper	Use nontoxic products.
Mothballs	Place cedar chips or blocks in closets and drawers.
Oil-based paint, thinner	Use water-based products.
Oven cleaner	Wash the oven with a mixture of warm water and baking soda. Soften burned-on spills by placing a small pan of ammonia in the oven overnight. Sprinkle salt onto fresh grease spills and then wipe clean.
Pesticide	Use physical and biological controls.
Silver cleaner	Add 1 teaspoon baking soda, 1 teaspoon salt and a 2" x 2" piece of aluminum foil to a small pan of warm water. Soak silverware overnight.
Toilet cleaner	Use baking soda, a mild detergent, and a toilet brush.
Window cleaner	Mix ¼ cup ammonia with 1 quart water.

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