OneUpAction International

Healing the Earth one action at a time.



POLLUTION REDUCTION.

Understanding pollutants and their collective effects.



POLLUTION & DIRECT ACTION INFORMATION // A GUIDEBOOK



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pol·lu·tion /pəˈlooSH(ə)n/

The introduction of harmful materials into the environment, either by human activity or from natural occurrences.

These harmful materials are called pollutants. When essential resources like water or air become polluted from car exhaust or plastic, organisms everywhere become threatened. There are five main categories of pollution: water, air, soil, light, and sound pollution.



TYPES OF POLLUTION

Water pollution occurs when harmful chemicals and substances contaminate bodies of water like oceans, lakes, rivers, etc.

Water is a "universal solvent," meaning that it dissolves more substances than any other liquid. Water is especially vulnerable to pollution, as it is easier for pollutants to dissolve in and contaminate water that it is any other substance.

The four most common types of water pollution are agricultural, sewage, and oil. Agricultural production uses more global freshwater resources than any other industry, with farming and livestock consuming around 70% of available surface water.

Water Pollution

TYPES OF POLLUTION

Agriculture is the leading cause of water degradation around the world. Every time it rains, pesticides, fertilizer, and animal waste from livestock operations and farms are washed away from their sources and deposited into both surface waterways and groundwater.

These substances can carry harmful chemicals as well as pathogens and bacteria through the water, which soon becomes dangerous for both humans and wildlife.

Wastewater, including sewage, is water that has been used by people. That can be from common utilities, like sinks, showers, or toilets; from commercial, agricultural, or industrial facilities; or runoff water that carries road salts, oil, or debris into our waterways.

According to the United Nations, about 80% of the world's wastewater flows directly from our facilities back into the environment, where it makes water undrinkable and dangerous for wildlife and people.

Water Pollution





Oil pollution

Every year, an estimated 1 million tons of oil makes its way into our oceans. Nearly half of that comes not from tanker spills, but from landbased sources like factories, farms, and cities. This also includes oil that drips from cars and trucks on our roadways, eventually washed into waterways and seas by rainwater.



Tanker spills actually account for 10% of oil pollution, and the shipping industry is responsible for one third. Additionally, oil is naturally released from the ocean floor through fractures in the earth's crust, called seeps.



TYPES OF POLLUTION

Air Pollution

Air pollution occurs when hazardous substances from both natural and manufactured sources are released into the air, making it difficult and dangerous to breathe. Natural releases of hazardous substances include smoke from wildfires, decomposing organic matter in soil from which methane is released, and ash and gases from volcanic eruptions. Man-made sources of pollution are largely emissions of carbon dioxide, methane, and natural gas from coalpowered factories and power plants, vehicle emissions, electricity.

The two main types of air pollution are smog and soot. Both are a result of combusting fossil fuels, whether that be in power plants, incinerators, or our cars. Smog occurs when combusting fossil fuels react with sunlight, and soot is tiny particles like dust, smoke, or other particulates are carried into the air. Smog and soot can both irritate the eyes and damage the lungs, making them especially dangerous for people with pre-existing health conditions like asthma or allergies.



Soil Pollution

Soil pollution is the presence of toxic chemicals in soil at concentrations high enough to pose a risk to organisms and ecosystems that interact with the soil. All soils contain a natural level of compounds that are considered contaminates, but when the concentration of these compounds exceed the natural levels, they become a risk to the ecosystems in which they reside.

The main cause of soil contamination is human activity. Examples of human degradation of soil are accidental diesel spills, construction, mining, transportation, and agricultural industries. When it rains, toxic chemicals are not only transported from their sources into our waterways, they are also carried into our soils. Organisms will then be harmed should they ever ingest food grown in contaminated soil, breathe dust from the soil, or absorb chemicals from contaminated soil through the skin.

TYPES OF POLLUTION

Noise Pollution is an invisible pollutant, present both on land and under the sea. It is defined as any disturbing sound that is loud enough to affect the health and wellbeing of humans and other living beings. In humans, noise pollution can result in Noise-Induced Hearing Loss, high blood pressure, sleep disturbances, stress, and heart disease.

Long-term exposure to loud noise in children can result in memory impairments, attention level, and reading skill. Noise pollution also impedes on animals' abilities to find food, attract mates, and navigate. Marine mammals that rely on echolocation to find food, mates, and communicate are unable to do so with excess noise from ships, sonar devices, oil drills, and seismic tests.

Light Pollution is a direct result of the creation of the industrial civilization we live in today. The artificial outdoor lighting we use at night is poorly targeted, inefficient, overly bright, and improperly shielded, meaning that excess light spills into the sky instead of focusing on specific objects we want illuminated. This means that the energy used to generate the electricity is also being inefficiently used and wasted.

Tangible negative effects of light pollution are the waste of both energy and money from an inefficient use of power, disruption of natural ecosystems and wildlife, harm to human health, and sometimes negatively affecting crime and safety.









LIGHT POLLUTION

Light pollution has become an essential part of urban life, but there are still small actions that you can take to reduce your affect on the environment as a polluter.

1. Turn off your lights.

Often we keep our porch or spot lights on at night event when we are not outside using them because they give us a sense of security. There is actually no data that proves that lighting reduces crime, but it does contribute to light pollution. To conserve energy and reduce light pollution, turn your lights off when you aren't using them or don't need them.





2. Use motion sensors, dimmers, and timers.

If you are concerned about the security of your home, motion sensors can be a good way to make your home secure while also conserving energy and reducing light pollution. Dimmers and timers can help you use your light as efficiently as possible and reduce average illumination levels.

3. Buy energy efficient light bulbs.

LEDs and compact fluorescents allow for energy efficiency, reduced illumination without reducing visibility, and protection of the environment. (Only warm-colored bulbs should be used).



WATER POLLUTION

It is true that much responsibility falls to the big businesses to clean up and prevent further damage they have done to our waterways. However, there are some accessible ways that you as a citizen can do your part in preventing water pollution

1. Make sure to dispose of toxic chemicals properly.

Household chemicals like bleach, paint, and ammonia can be extremely dangerous to waterways if poured down the drain. You can check to see if there is a community collection or recycling center near you, they will often accept chemicals like old paint or used motor oil and dispose of them properly. Additionally, if you are able, try to buy non-toxic or biodegradable cleaners.





2. Try to cut down on your plastic consumption.

It takes about twenty years for a plastic bag to decompose, and in the meantime, they pose a substantial threat to the health and safety of marine and land animals. For minimal cost, invest in a couple of reusable fabric bags for when you go grocery shopping, or a travel mug for your morning coffee to avoid single-use plastics and the devastating impacts that they have on wildlife.

3. Conserve water.

Not only is it beneficial for habitat conservation, but conserving water can also help reduce pollution. Reducing the amount of water that we use simultaneously reduces the amount of energy that is used to treat that water, energy we get by burning fossil fuels. Conserving and using water and energy more efficiently cuts back on greenhouse gases entering both the atmosphere and our waterways.



AIR POLLUTION

1. Renewable Energy

Burning all fossil fuels is bad, but coal is the worst. When burnt, it releases more carbon dioxide (CO2) per unit of energy than oil or gas – which means it heats up our planet faster. Burning coal releases elements like mercury and arsenic, and small particles of soot which contribute to air pollution. When we breathe it in, that soot harms our heart and lungs and even increases our risk of strokes. Not only this, but coal is the most used energy source. Coal provides more than a third of the world's electricity. That's more than any other single source! These power plants affect air quality for hundreds of kilometres – and are often placed right in the heart of cities – so countless millions of people get little respite from the pollution these plants cause.



(Abhijeet Gaikwad, 2020)

We desperately need to wean ourselves off coal, and get our power from clean sources like wind, sun and tides. Some counties have started. In 2019, coal power had its biggest slump ever recorded! But we need every country in the world to move much faster towards renewable energy.

Start using your household appliances during off-hours and weekends (or do these tasks by hand when you can!), like dishwashers, dryers and washers, and irons. Add solar panels to your house, implement tips from our "Light Pollution" section and encourage others to do the same!



AIR POLLUTION



2. Electric Cars

Most cars run on oil – petrol and diesel. And just like burning coal, burning oil comes with a huge environmental price tag. Petrol and diesel cars emit CO2 and other gases which heat our planet. On top of other nasties, the exhaust fumes these cars produce contain Nitrogen Dioxide (NO2), which is another pollutant that harms our health. But there are other ways we can move around, and leave those cars behind.

Cities around the world are waking up to the joys of car-free travel. From pedestrian zones, to proper public infrastructure to comprehensive and affordable public transport, there are so many ways cities can help us go car-free more often. And the benefits are many – from more space and cleaner air to a more active and healthy population.

(Mark Heckner, 2020)

But for those journeys that still need cars, we should start thinking about cars very differently. Rather than petrol and diesel, we should power cars with electricity. Electric cars are zeroemissions 'at the pipe' – the cars themselves don't emit any exhaust fumes. Almost all their emissions come from their manufacture, and in producing the electricity that powers them. If that electricity is renewable, those emissions are essentially zero.

But even in coal-heavy (so carbon-intensive) grid like Poland, it's still a substantial cut in emissions compared with conventional cars. The pollution savings multiply even more when cars are made smaller – so they use less energy to make and move – and for sharing rather than private ownership, so we can all get by with fewer of them.



AIR POLLUTION

3. Mindful Consumerism

Every time we drive to school, use our heater or air conditioner, clean our windows, or even style our hair, we make choices that affect air pollution. These steps, as well as many others, are things we all can do to help reduce air pollution:

- · Combine errands for fewer trips
- · Avoid excessive idling of your automobile
- Drive electric or plug-in hybrid electric vehicles if possible.
- Keep your automobile well tuned and maintained. Follow the manufacturer's instructions on routine maintenance, such as changing the oil and filters, and checking tire pressure and wheel alignment.
- Be careful not to spill gasoline when filling up your car or gasoline powered lawn and garden equipment



(Jack Sparrow, 2020)

- Purchase and use low-polluting outboard marine engines and personal watercraft (4-stroke and direct fuel injection 2-stroke outboard marine engines).
- Advocate for emission reductions from power plants and more stringent national vehicle
 emission standards
- Use water-based or solvent free paints whenever possible and buy products that say "low VOC"
- Seal containers of household cleaners, workshop chemicals and solvents, and garden chemicals to prevent volatile organic compounds from evaporating into the air



SOIL POLLUTION

1. Plant more trees

Soil erosion is activated, when there are no trees to prevent the top layer of the soil from being carried by different agents of nature like water and air.

The effects of acid rain and floods can wipe out healthy soil in the absence of trees, which would otherwise help absorb and maintain these waters and the toxins that come along. Through reforestation efforts and planting new trees and vegetation in areas that are at risk to erosion, soil pollution can be further interrupted.





2. Use natural alternatives to toxic substances.

The World Health Organization estimates that over 3 million people are hospitalized due to pesticide poisoning every year, resulting in a quarter of a million premature deaths. The pervasive use of pesticides in agricultural production can weaken and destroy the community of microorganisms living in the soil, particularly when these chemicals are overused or misused. Current alternatives that promote sustainable agricultural practices include crop rotation, biological pest control and polyculture.

3. Purchase organic produce.

Buying organic products is one of the easiest ways to reduce pollution in our soil. Sustainable agricultural production practices have become vital for overturning the trend of soil degradation and safeguarding current and future global food security. If more people buy organic products the demand for nonorganic food will decline, which means less reason and opportunity to use those fertilizers and pesticides that contribute to land pollution.



NOISE POLLUTION

1. Turn off electronic devices or reduce volume

Game systems, computers, Hi-fi systems, and televisions can contribute to noise pollution when on high volumes. The solution is to turn them off when not in use and also keep them on moderate volume to reduce noise pollution.





2. Plant Trees

We've said it before, but it is especially important for noise pollution too. Trees have been established to be effective in reducing noise levels within urban settings, around major highways, and even at the places, we stay. Therefore, numerous plants and trees in an area mean less noise pollution. In addition to that, trees have various aesthetic advantages and improve air quality.

3. Put pressure on city/governing bodies to introduce noise regulation policies.

Governing and city authorities hold the power to introduce policies that can help reduce noise pollution. The laws should limit the amount of noise in public and private places to cut noise pollution. The policies can also be integrated into transportation network construction and activities such as low-noise road surfaces, lownoise tracks, redesigning street spaces, enforcing speed limits, and reducing traffic volume.



ORGANIZATIONS TO SUPPORT

For Light Pollution:

- International Dark-Sky Association
- Saving Our Stars

For Air Pollution:

- Greenpeace
- Coalition for Clean Air
- Union of Concerned Scientists
- Earthjustice

For Air Pollution:

- Antarctic and Southern Ocean Coalition (ASOC)
- The Wilderness Society
- Green Skies
- Vessel Watch Project

For Water Pollution:

- World Wildlife Fund (Global)
- Charity: Water (Global)
- Water.org (Global)
- Oceana (Global)
- Heal the Bay (Los Angeles, CA)

For Soil Pollution:

- TreePeople
- Sierra Club
- Red Soil Project
- Trees For The Future



Pollution reduction, also known as source reduction, is simply the act of preventing or reducing any form of pollution at its source. There are several methods of pollution reduction in industry, energy, agriculture, consumer, domestic, and federal sectors.

The United States has identified that there are significant opportunities for industries to implement cost-effective alterations in raw material use, pollution control, and workers' health and safety. Some specific approaches include:

- Utilizing renewable energy as an efficient source of electricity
- Increasing energy efficiency to prevent waste
- Cultivating crops using less environmentally harmful pesticides
- Reducing mass production of consumer goods in order to maintain control of inventory
- Promoting the use of reusable bottles and containers rather than single-use plastics
- Regulating the amount of CO2 that is released into the atmosphere to meet mandatory emission targets.



Although many of these methods may seem obvious, many industries overlook simple source reduction opportunities because current regulations tend to focus more on reactive treatment and disposal rather than proactive procedures. In 2017, the Environmental Protection Agency (EPA) found that the U.S. produced 267.8 million tons of solid waste, meaning each person generated roughly 4.51 pounds of garbage per day. On the EPA's waste management hierarchy, source reduction has been found to be the most preferred solution for regulating pollution levels.

Additionally, the benefits of pollution reduction have been proven to drastically reduce financial costs of waste cleanup as well as the environmental costs pollution has on the general health and safety of the human population and climate damage. Pollution prevention is an incredibly vital practice for conserving natural resources and reducing exploitation and effectively bolsters economic prosperity and growth by utilizing more efficient, eco-friendly and inexpensive methods of production.



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SAYAN BANERJEE, 18

For about one and a half years, Sayan has been passionate about solving the climate crisis through environmental justice by joining various environmental groups in LA, California such as Fridays For Future, etc.



LODEN CROLL, 16

Loden has been passionate about environmental justice and the climate crisis for most of their life and has been a part of various Minnesota-based, national, and international climate organizations for around a year and a half.



DELANEY MICHAELSON, 18

Delaney began her activism efforts while she lived abroad in London, England in 2012 when she realized the intersectionality of the climate crisis.

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