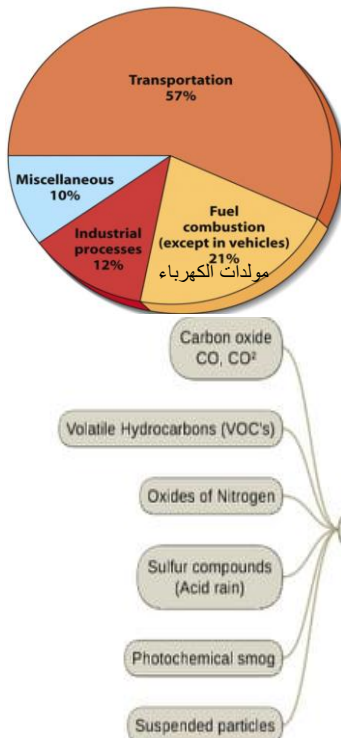
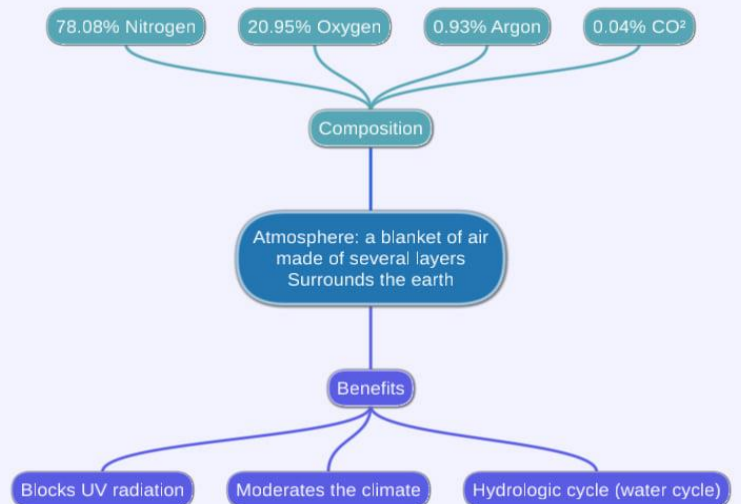


Air pollution:

- ✓ the deadliest form of pollution
- ✓ it costs hundreds of billion of dollars yearly
- ✓ More than nine out of 10 of the world's population (92%) live in places where air pollution exceeds safe limits
- ✓ fourth-largest threat to human health
- ✓ 4.2 million deaths every year as a result of exposure to ambient (outdoor) air pollution and 3.8 of household exposure to smoke from dirty cookstoves and fuels (indoor air pollution)
- ✓ 11.6% of all global deaths

- Almost all deaths (94%) linked to air pollution occur in low- and middle-income countries: Parts of Africa, Eastern Europe, India, China and some part of the Middle East
- Around 3 billion people (more than 40% of the world's population) still do not have access to clean and safe cooking fuels and technologies in their homes
- 80% of air-pollution-related deaths were due to ischemic heart disease and strokes, while 14% of deaths were due to chronic obstructive pulmonary disease or acute lower respiratory infections; and 6% of deaths were due to lung cancer.

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Air pollution

occurs when gases, dust particles, smoke, or odors are introduced into the atmosphere in a way that makes it harmful to humans, animals and plants.

O₃ is found naturally in the atmosphere, but it's harmful once it is near Earth surface

Primary air pollutants	Secondary air pollutants
CO	HNO ₂
SO ₂	HNO ₃
NO	H ₂ O ₂
CO ₂	O ₃
NO ₂	PANs
Most hydrocarbons	Most NO ₃ ⁻ and SO ₄ ²⁻ salts
Most particulates	

Air pollutants: airborne gases, particles and aerosols, that are added to the atmosphere by NATURAL events or human activities in concentrations that threaten the well-being of organisms or disrupt the orderly functioning environment

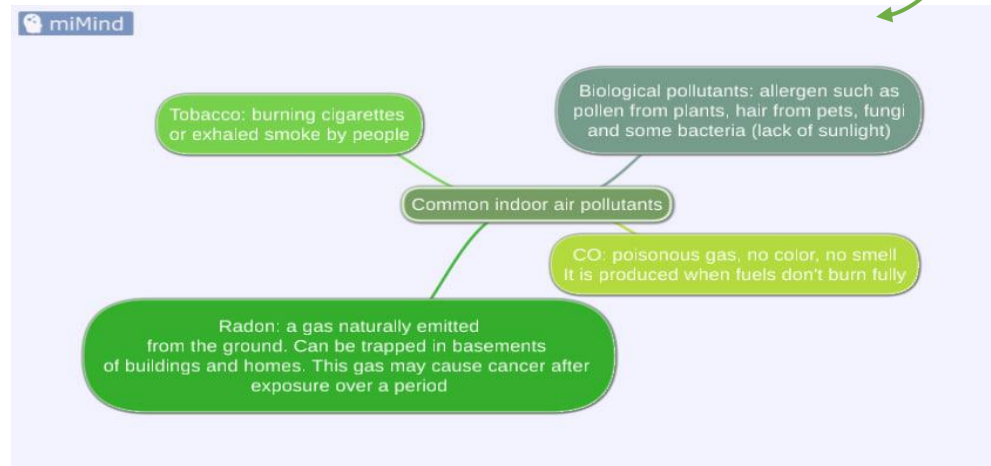
Primary: emitted directly into the atmosphere

Secondary: Created by chemical reactions between primary air pollutants in the atmosphere

Urban Outdoor Air Pollution	Children and Air Pollution	Agricultural Effects of Air pollution
Photochemical Smog: Brownish-orange haze formed near the surface by chemical reactions involving sunlight, nitrogen oxide, and hydrocarbons, e.g: Los Angeles, Beijing	• Greater health threat to children than adults • Air pollution can restrict lung development • Children breath more often than adults their respiratory system are more vulnerable to these threats • Several lung respiratory conditions develop in children because of certain type pollutants e.g high ozone → asthma	• seriously affect the growth of plants and crops • It is easy to find chemical residues in plants that grow alongside highways. • Increase CO₂ → global warming → a major impact on the world's agriculture (reducing crop yields in some places but potentially increasing yields elsewhere but mostly it has negative effect)
Air Pollution Around the World	Long Distance Transport of Air Pollutants	Indoor Air Pollution
• Air quality is deteriorating rapidly in developing countries • Shenyang, China (more products but less quality of air for Chinese breath) so residents see sunlight few weeks each year. • Developing countries have older cars (more emissions than newer cars which're more eco-friendly) • Still use leaded gasoline	So the polluted air spread all over the world Because of : 1) Wind they go all over the planet 2) rotation of Earth around itself	• Around 3 billion people (40% of people) cook and heat their homes using open fires and leaky stoves, and burning biomass (wood, animal dung and crop waste) and coal • Nearly 3.5 million people die prematurely (mostly are children) from illness attributable to indoor air pollution • Nearly 50% of pneumonia deaths among children under five are due to particulate matter inhaled from indoor air pollution. • Both women and men exposed to heavy indoor smoke are 2-3 times more likely to develop COPD

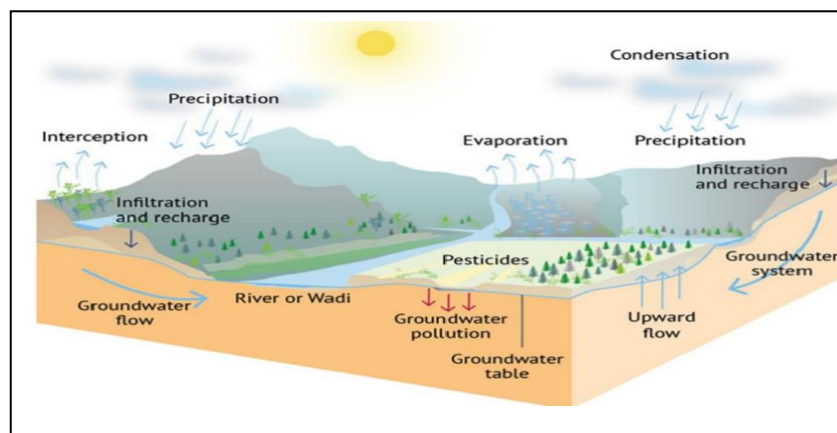
Solutions:

1. Technological Solutions: cars and factories with less pollution, and using renewable energy
2. Laws and Regulations
3. Raising awareness and changing behavior
4. Plant trees which are the lung of earth, which helps creating the balance of the air composition

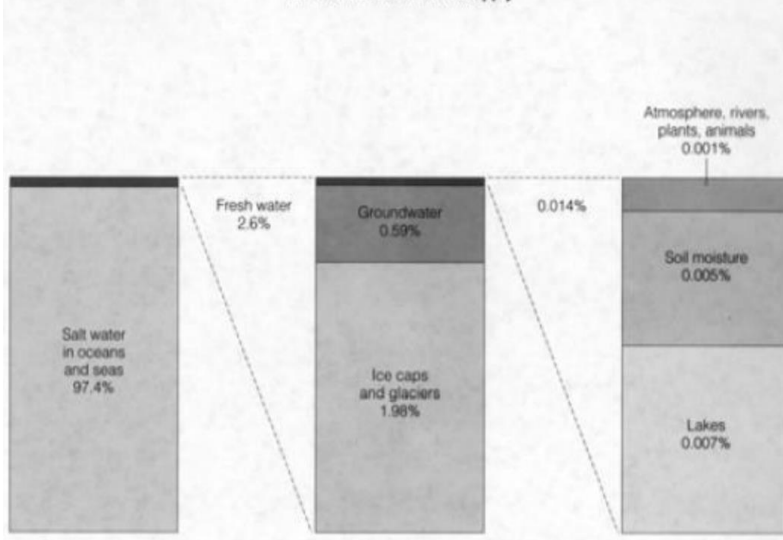


Water pollution:

- 85% of the world population lives in the driest half of the planet where less water is available and accessible
- 1 billion people do not have access to clean water to drink and almost 2.5 billion do not have access to adequate sanitation
- 2 million people die each year due to unsafe water, sanitation and hygiene



The world's fresh water supply



- 97.4 %of water in earth is sea and ocean water (it cannot be used for drinking without desalination)
- remaining 2.6% most of them is glaciers/ice caps and small percent is groundwater
- very small percent 0.014% is liquid water at the surface
- lakes0.007% (readily to use)

So very limited amount of water is readily available for safe drinking which exist in certain (not in the most) area in the world

Water Pollution:

foreign materials either from natural or other sources are contaminated with water supplies and may be harmful to life because of their toxicity, reduction of normal oxygen level of water, aesthetically unsuitable effects and spread of epidemic diseases”.

Main Sources

Effects

Infectious agents through sewage, human waste, and animal excreta (**bacteria, viruses, and parasites**)

Radioactive waste: highly toxic materials (**uranium, thorium, and radon**)

Chemical substances: the most dangerous one

Inorganic: domestic and industrial effluents
acids, metals, salts

Organic: coming from domestic, industrial or agricultural waste
pesticides, plastic, oil, detergents

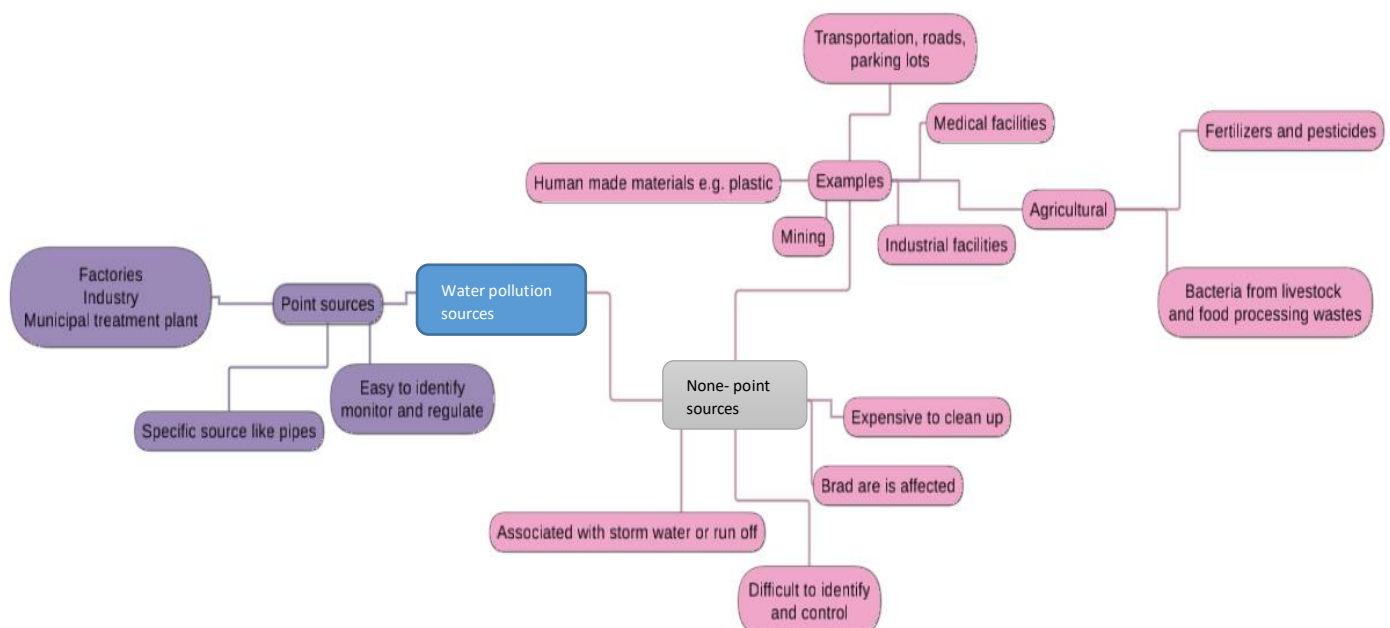
Drinking polluted water

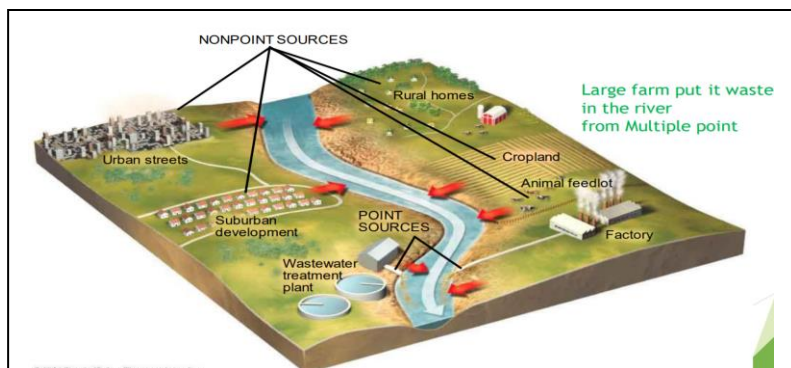
Bathing or showering in polluted water

Swimming in polluted water

Breathing the vapors of a polluted water while sitting next to a polluted water source

Consuming polluted food from animals fed with polluted water of food affected by polluted water OR vegetables irrigated with polluted water or grown in an area with polluted groundwater





Controlling Water Pollution:

- ❖ **Mass social awareness** should be inculcated regarding the nature and effects of water pollution, and remedial measures.
- ❖ **Strict laws** should be enforced, and persons, industry or farm violating the provision of pollution control should be penalized.

Food Pollution:

Contamination is the state of being impure or unfit for use (the human use) due to the introduction of unwholesome or undesirable

Problems associated with:

- 1) Food quantity: excessive or insufficient
- 2) Food quality: sometimes certain contaminants decrease the quality of our food

Contamination implies the addition is not intended or planned. The substance added may or may not cause health problems.



Bacterial cross-contamination: the transfer of harmful/pathogenic bacteria from one item/food/surface/person to food

Direct cross-contamination	Indirect cross-contamination	foodborne Infections (invasive Infections)
occurs in food when there is direct contact between the source of the bacteria and food.	This occurs when harmful bacteria are transferred from the source to the food via a vehicle.	Microbes release digestive enzymes that begin to damage body tissue and cause illness.
- Raw meat stored above or in contact with cooked meat - Raw chicken stored above or in contact with coleslaw - Food handler sneezing/coughing onto food	- Using the same knife/chopping board to slice raw meat and then cooked meat without washing it and disinfecting it between tasks - Touching food after blowing your nose, without first washing your hands	- cannot occur if the microbes are killed (heat/ washing) - may be caused by bacteria and viruses. - Symptoms (Fever, diarrhea, vomiting, abdominal pain)

Chemical Contamination

enter foodstuffs during	Chemical Hazards	Chemical Hazards
• Growth: e.g. veterinary drugs (antibiotics and hormones) fertilizers pesticides environmental contaminants e.g. lead • Processing e.g. oils lubricants from machines cleaning chemicals • Transport e.g. as a result of spillage or leaks • Sale e.g. cleaning chemicals	• ACUTE and temporary → smaller more isolated outbreaks, usually accidental misuse toxins • CHRONIC/ Long term → majority(except toxins), long term exposure, Carcinogens • Risk ASSESSMENT → less straight forward compared to biological contamination	** most are repeated from entering • Food Additives (e.g. Vitamins, Colors, Flavors) • Pesticide Residues • Veterinary Medicines (e.g. Hormones And Antibiotics) • . Environmental Residues (Lead: Leaded Gasoline, Solder For Tin Canned Food) • Cleaning Agents • Allergens

Physical determinants:

- Foreign objects
- Including:
 - Nuts, bolts, wire, metal
 - Cardboard, plastic, string
 - Rodent droppings, hairs
 - Cigarette butts, glass, flaking paint
 - Earrings, fingernails

Global Environmental Problems:

1) Global Warming:

Human practices emit greenhouse gases → raise to specific height in the atmosphere → accumulate → more gases get trapped → raising planet temperature → results in:

- I. melting of polar ice caps
- II. rise in sea levels
- III. unnatural patterns of rain such as flash floods, excessive snow or desertification in other areas
- IV. the earth's temperature has increased by 0.8 degrees Celsius over the past century

2) Overpopulation:

- increasing population → less sustainability of natural resources → intensive agriculture using pesticides and insecticides → damaging the environment
- Population explosion in less developed and developing countries is straining the already scarce resources.

3) Natural Resource Depletion:

Fossil fuel over consumption → decrease in installing the infrastructure and maintaining these sources → shift to renewable sources of energy like solar, wind, biogas and geothermal energy

4) Waste disposal



5) Climate change:

Results in:

Melting of polar ice

Change in seasons

Occurrence of new diseases

Frequent occurrence of floods and

Change in overall weather scenario.

6) Shrinkage of biodiversity:

Eco- system balance is in danger because of human activities which destroy many species
e.g. Coral reef in many oceans → which supports the marine life

7) Deforestation:

- It means Clearing of green cover and make that land available for residential, industrial or commercial purpose.
- At present forests cover 30% of the land but every year tree cover is lost
- Because of growing population demand for more food, shelter and cloth.

8) Ozone Layer Depletion:

Ozone layer: invisible layer of protection around the planet that protects us from the sun's harmful UV rays.

Chloro-fluoro carbons in the ozone layer → depletion of ozone layer → causing a hole in it (the biggest is above the Antarctic)

The CFC's are banned in many industries and consumer products.

9) Urban Sprawl

- Refers to migration of population from high density urban areas to low density rural areas which results in spreading of city over more and more rural land.
- displaces natural environment consisting of flora and fauna (plants and animals)
- results in:
 - i. land degradation
 - ii. increased traffic
 - iii. environmental issues
 - iv. health issues

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