

International Sakharov Environmental University

Human Ecology and Anthropogenic Pressure

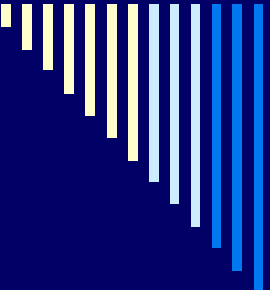
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What is...Human ecology?

- Human ecology is the subdiscipline of ecology with focus on humans. More broadly, it is an interdisciplinary and transdisciplinary study of the relationship between humans and their natural, social, and built environments.
 - Human ecology adds the complex human dimension of cultural inheritance that is mediated by the socio-culturally adapted human brain.
 - The term 'human ecology' first appeared in a sociological study in 1921 and at times has been equated with geography. The scientific philosophy of human ecology has a diffuse history with advancements in geography, sociology, psychology, anthropology, zoology, and natural ecology
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- Understanding the human impact on environment is a crucial understanding that people need to have. Yet, for many people, this is a topic that does not interest them and even is not likely to grab their attention. The problems from the human impact on the environment continue to grow, though. Over time, it becomes increasingly important for people to take the time to carefully consider what they can do to lessen this impact. When and if nothing is done to make those improvements, the results will be catastrophic for virtually anyone involved. Yet, there is help and hope for rewards out there.

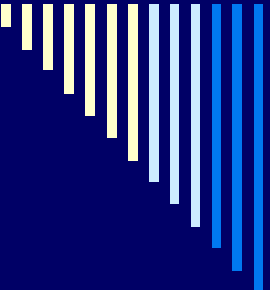




What is the human impact on environment?

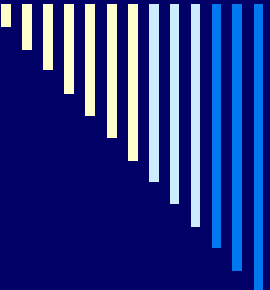
- To understand this, consider how people use the world around them for everyday life.
- • We use the world as a resource for food to keep us alive and well.
- • We use the world as a way to produce energy so that tasks can be accomplished.
- • The world is used as a source of medications that help to keep people healthy and heal many ailments.
- • The world is used for a source of enjoyment, recreation and simple fun
- • The world is used as a natural resource for the production of products including industrial products and supplies.



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- In every way, the human impact on environment happens every day. The world has also changed because of these needs and impacts.
 - For example, human pressure, as scientists call it, is greater than ever which means more potential problems in the long term. This includes more intensive agriculture that has taken the place of traditional farming methods. This has strained the western rural landscape so badly it threatens it.
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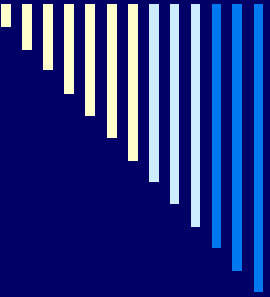
- Look closer to find other examples of the human impact on the environment. Tourism, on a massive scale has taken a toll on the planet as well. The natural landscapes have changed considerably, especially coastal areas, mountains and larger lakes. This not only affects the look of these areas but also their ability to sustain wildlife.





What other ways does the human affect on the environment happen?

- There is a decreased diversity of species since so many habitats have been destroyed
 - There is a reduction in the genetic resources for many species, which in turn makes it more difficult for these animals to evolve and continue to prosper
 - Energy resources have been drained in many areas
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- The human impact on the environment is significant and in some situations, it cannot be reversed. For this reason, it becomes important and even essential for people to make changes now so tomorrow becomes much easier to live with.



Human impact on the natural environment

- Natural environment is of crucial importance for social and economic life. We use the living world as
- a resource for food supply
- an energy source
- a source for recreation
- a major source of medicines
- natural resources for industrial products
- In this respect the diversity of nature not only offers man a vast power of choice for his current needs and desires. It also enhances the role of nature as a source of solutions for the future needs and challenges of mankind.

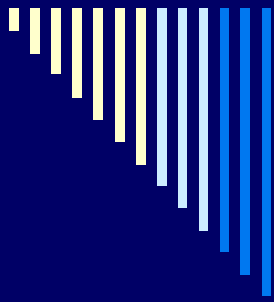


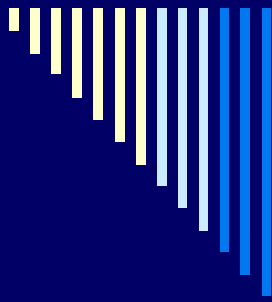


State of ecosystems, habitats and species

- In the past, human interaction with nature, although often having a disruptive effect on nature, often also enriched the quality and variety of the living world and its habitats - e.g. through the creation of artificial landscapes and soil cultivation by local farmers.
- Today, however, human pressure on natural environments is greater than before in terms of magnitude and efficiency in disrupting nature and natural landscapes, most notably:
 - intensive agriculture replacing traditional farming; this combined with the subsidies of industrial farming has had an enormous effect on western rural landscapes and continues to be a threat.
 - mass tourism affecting mountains and coasts.
 - the policies pursued in the industry, transport and energy sectors having a direct and damaging impact on the coasts, major rivers (dam construction and associated canal building) and mountain landscapes (main road networks).
 - the strong focus of forestry management on economic targets primarily causes the decline in biodiversity, soil erosion and other related effects.

- The clearest manifestations of the degradation of the natural environment are:
- Reduction and fragmentation of habitats and landscapes
- The expansion of humans activities into the natural environment, manifested by urbanisation, recreation, industrialisation, and agriculture, results in increasing uniformity in landscapes and consequential reduction, disappearance, fragmentation or isolation of habitats and landscapes.
- It is evident that the increasing exploitation of land for human use greatly reduces the area of each wildlife habitat as well as the total area surface throughout rope. The consequences are:
 - A decreased species diversity, due to reduced habitable surface area which corresponds to a reduced "species carrying capacity".
 - The reduction of the size of habitats also reduces the genetic diversity of the species living there. Smaller habitats can only accommodate smaller populations, this results in an impoverished gene pool.
 - The reduction of genetic resources of a species diminishes its flexibility and evolutionary adaptability to changing situations. This has significant negative impacts on its survival.





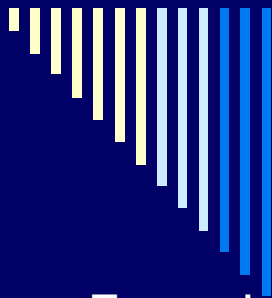
- The conditions under which the reduction of habitats often occur prevent living organisms making use of their normal ways to flee their threatened habitat. Those escape routes include migration to other habitats, adaption to the changing environment, or genetic interchange with populations in nearby habitats. Of particular concern is:
 - The abrupt nature of human intervention; human projects are planned and implemented on a much shorter time scale than natural processes;
 - Furthermore human intervention, such as the construction of buildings, motorways or railways results in the fragmentation of habitats, which strongly limits the possibility for contact or migration among them;
 - In extreme cases even the smallest, narrowest connections between habitats are broken off. Such isolation is catastrophic for life in the habitat fragments.



- Loss of Species of Fauna and Flora

- Although relatively few species of Europe's fauna and flora have actually become totally extinct during this century, the continent's biodiversity is affected by decreasing species numbers and the loss of habitats in many regions. Approximately 30 % of the vertebrates and 20 % of the higher plants are classified as "threatened". Threats are directly linked to the loss of habitats due to destruction, modification and fragmentation of ecosystems as well as from overuse of pesticides and herbicides, intensive farming methods, hunting and general human disturbance. The overall deterioration of Europe's air and water quality add to the detrimental influence.





Agriculture



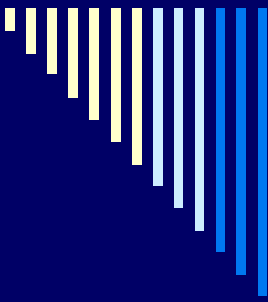
- Europe's natural environment is inextricably linked with agriculture and forestry. Since agriculture traditionally depends on sound environmental conditions, farmers have a special interest in the maintenance of natural resources and for centuries maintained a mosaic of landscapes which protected and enriched the natural environment.
- As a result of needs for food production since the 1940s, policies have encouraged increased production through a variety of mechanisms, including price support, other subsidies and support for research and development. The success achieved in agricultural production has however entailed increased impact on the environment.
- Modern agriculture is responsible for the loss of much wildlife and their habitats in Europe, through reduction and fragmentation of habitats and wildlife populations. The drainage of wetlands, the destruction of hedgerows and the intensive use of fertilizers and pesticides can all pose a threat to wildlife. Highly specialised monoculture are causing significant loss in species abundance and diversity. On the other hand increased production per hectare in intensive areas, raising of livestock volume, and lower prices for agricultural products also caused marginalization of agricultural land, changing the diversity of European landscapes into the direction of two main types: Intensive Agriculture and Abandoned land.



Energy



- Abandonment can be positive for nature, but this is not necessarily so. Land abandonment increases the risk of fire in the Mediterranean Region, causes a decline of small-scale landscape diversity and can also cause decrease in species diversity.
- All energy types have potential impacts on the natural environment to varying degrees at all stages of use, from extraction through processing to end use. Generating energy from any source involves making the choices between impacts and how far those impacts can be tolerated at the local and global scale. This is especially of importance for nuclear power, where there are significant risks of radioactive pollution such as at Chernobyl.
- Shell Oil Company and IUCN have jointly drafted environmental regulations for oil-exploitation in Arctic areas of Siberia. Other oil companies are aware of this and use these environmental regulations voluntarily for developing oil fields.
- Into the future the sustainability of the natural environment will be improved as trends away from damaging energy uses and extractive methods reduce and whilst real cost market forces and the polluter pays principle take effect.



Fisheries

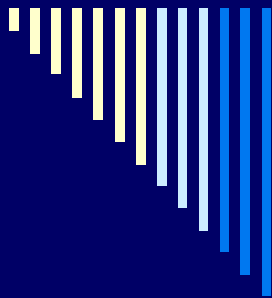


- The principle of the fisheries sector is towards sustainable catches of wild aquatic fauna. The principle environmental impact associated with fisheries activities is the unsustainable harvesting of fish stocks and shellfish and has consequences for the ecological balance of the aquatic environment. The sector is in a state of "crisis", with over capacity of the fleet, overexploitation of stocks, debt, and marketing problems.
- Growing aquaculture industry may increase water pollution in western Europe, and is appearing to be a rising trend in the Mediterranean and Central/East Europe.
- Fishing activities have an impact on cetaceans and there is concern that large numbers of dolphins, and even the globally endangered Monk seal, are being killed.

Forestry



- Compared to other landuses, forest management has the longest tradition in following sustainable principles due to which over 30% of Europe is still covered with trees. Without such an organised approach, forests are likely to have already disappeared from Europe's lowlands. However, as an economic sector, forestry has also impacted severely on the naturalness of Europe's forests: soils have been drained, pesticides and fertilizers applied, and exotic species planted. In many areas monocultures have replaced the original diverse forest composition. Monocultures are extremely sensitive to insect infestations, fires or wind, and so can lead to financial losses as well as biological decline. The inadequate afforestation practices characterize new trends in impacting on the sustainability of the natural environment.



Industry



- Almost all forms of industry have an impact on the natural environment and its sustainability. The impact varies at different stages in the life cycle of a product, depending upon the raw materials used through to the final end use of the product for waste residue, re-use or recycling. Industrial accidents and war damage to industrial plants can also endanger the natural environment.

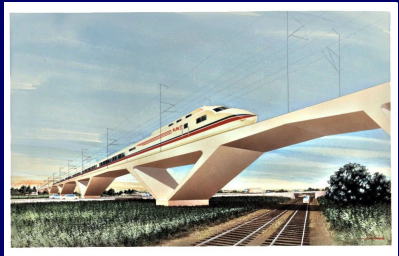
Tourism and Recreation

- Tourism and recreation impact in various ways on the natural environment. On the one hand, natural areas form the very basis of many touristic attractions by highlighting scenic value or exceptional encounters with fauna and flora. However, some forms of tourism can be extremely detrimental to ecologically sensitive areas, resulting in habitat degeneration or destruction, in the disturbance or hunting even rare or threatened species. The pressure from short holiday seasons and specific, sometimes small, locations of touristic interest result in conflicting land-uses, such as in the Alpine regions, at Mediterranean beaches and along many banks of inland waters.



Transport and Infrastructure

- Transport is perhaps the major contributor to pollution in the world today, particularly global environmental issues such as the greenhouse effect. The key impacts of transportation include fragmentation of habitats and species and genetic populations, disruption of migration and traffic mortalities to wildlife. Since the 1970s transport has become a major consumer of non-renewable resources, 80% of oil consumption coming from road transport.





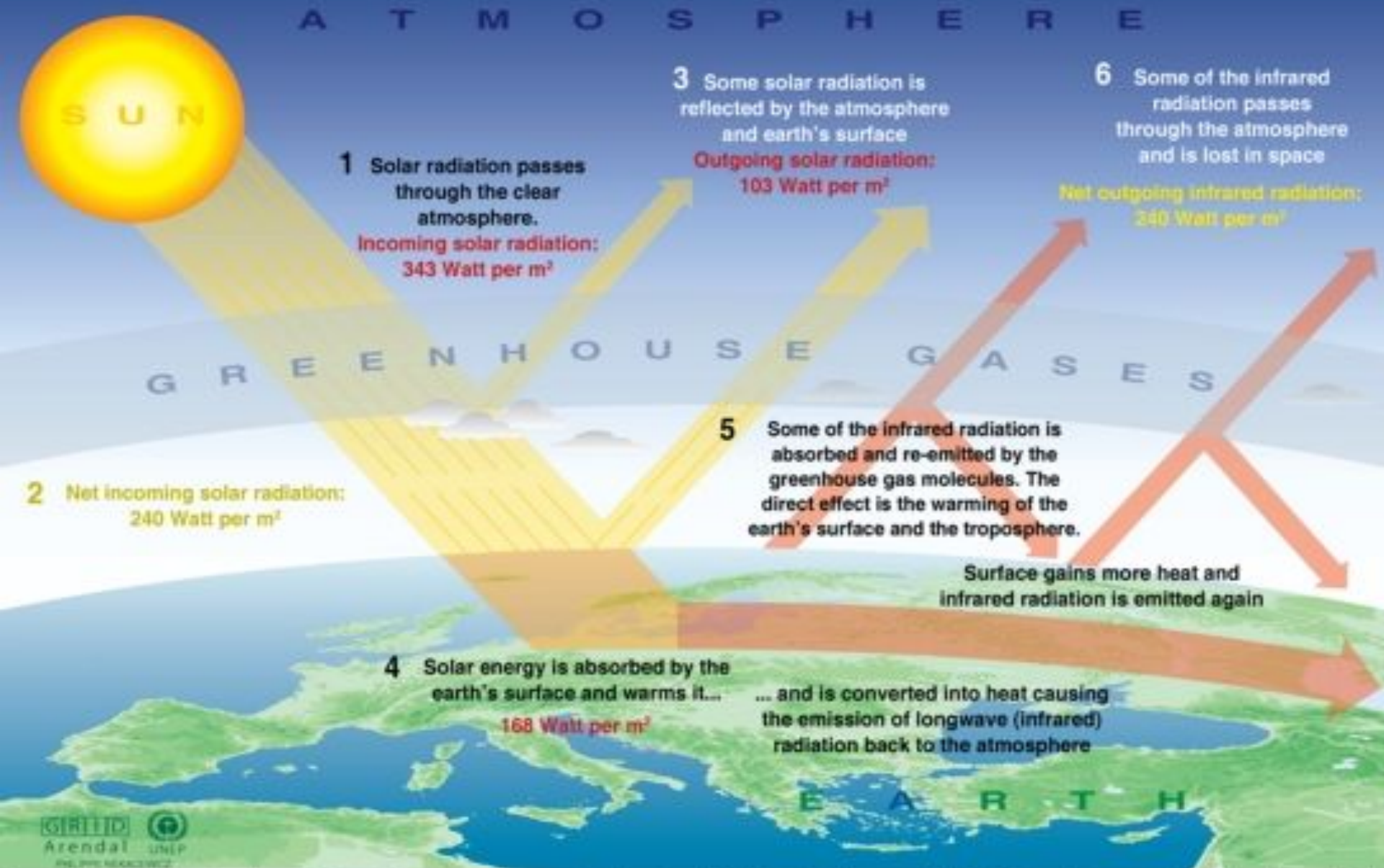
What is the Greenhouse Effect?

- Life on earth depends on energy from the sun. About 30 percent of the sunlight that beams toward Earth is deflected by the outer atmosphere and scattered back into space. The rest reaches the planet's surface and is reflected upward again as a type of slow-moving energy called infrared radiation.
 - The heat caused by infrared radiation is absorbed by "greenhouse gases" such as water vapor, carbon dioxide, ozone and methane, which slows its escape from the atmosphere.
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- Although greenhouse gases make up only about 1 percent of the Earth's atmosphere, they regulate our climate by trapping heat and holding it in a kind of warm-air blanket that surrounds the planet.
- This phenomenon is what scientists call the "greenhouse effect." Without it, scientists estimate that the average temperature on Earth would be colder by approximately 30 degrees Celsius (54 degrees Fahrenheit), far too cold to sustain our current ecosystem.

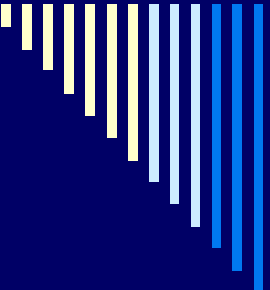
The Greenhouse effect





How Do Humans Contribute to the Greenhouse Effect?

- While the greenhouse effect is an essential environmental prerequisite for life on Earth, there really can be too much of a good thing.
 - The problems begin when human activities distort and accelerate the natural process by creating more greenhouse gases in the atmosphere than are necessary to warm the planet to an ideal temperature.
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- Burning natural gas, coal and oil -including gasoline for automobile engines-raises the level of carbon dioxide in the atmosphere.
 - Some farming practices and land-use changes increase the levels of methane and nitrous oxide.
 - Many factories produce long-lasting industrial gases that do not occur naturally, yet contribute significantly to the enhanced greenhouse effect and "global warming" that is currently under way.
 - Deforestation also contributes to global warming. Trees use carbon dioxide and give off oxygen in its place, which helps to create the optimal balance of gases in the atmosphere. As more forests are logged for timber or cut down to make way for farming, however, there are fewer trees to perform this critical function.
 - Population growth is another factor in global warming, because as more people use fossil fuels for heat, transportation and manufacturing the level of greenhouse gases continues to increase. As more farming occurs to feed millions of new people, more greenhouse gases enter the atmosphere.
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Acid rain

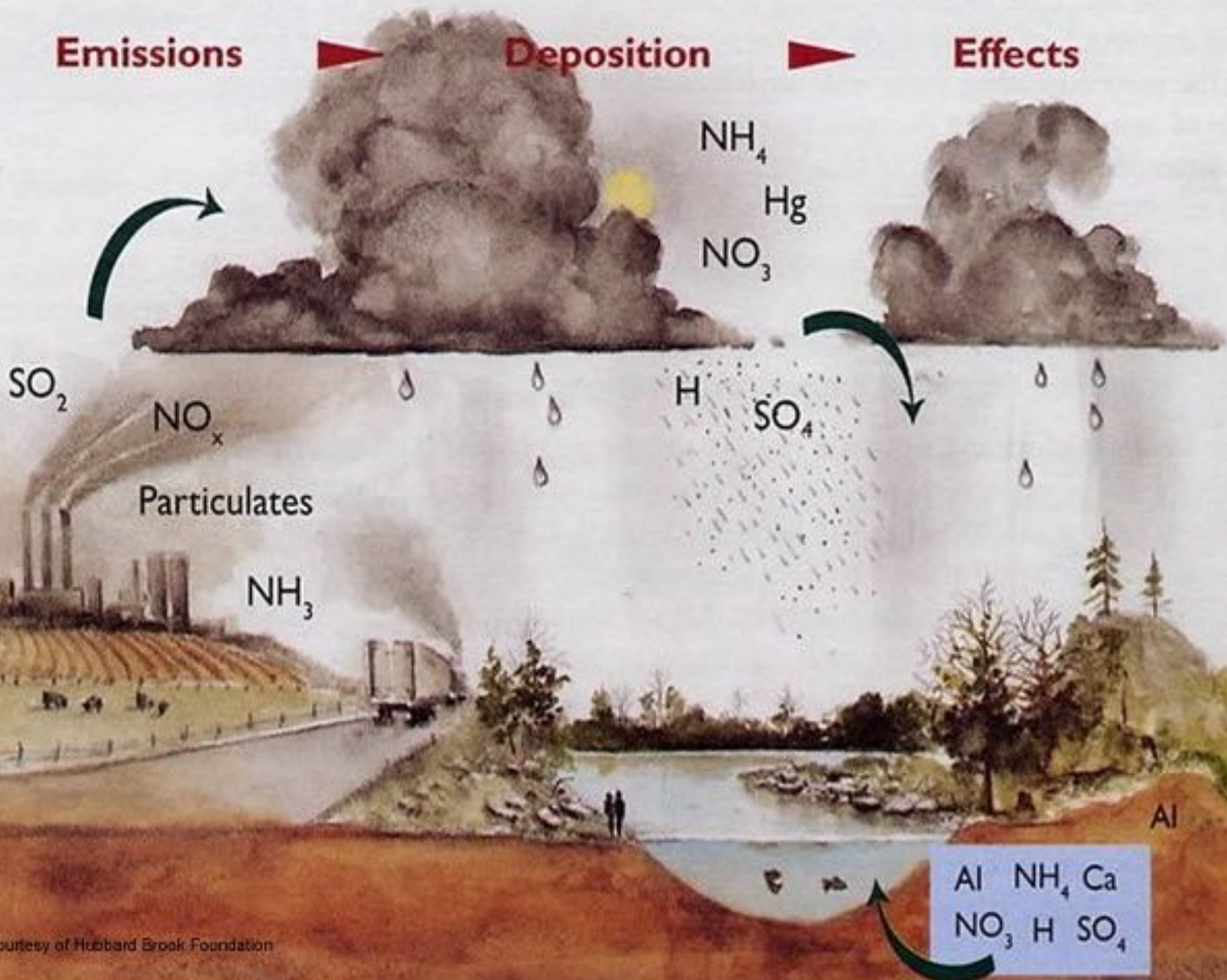


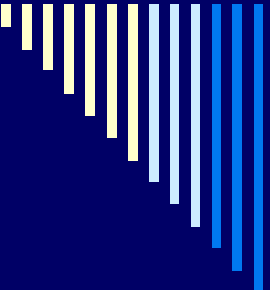
- Acid rain describes any form of precipitation with high levels of nitric and sulfuric acids. It can also occur in the form of snow, fog, and tiny bits of dry material that settle to Earth.
 - Rotting vegetation and erupting volcanoes release some chemicals that can cause acid rain, but most acid rain falls because of human activities. The biggest culprit is the burning of fossil fuels by coal-burning power plants, factories, and automobiles.
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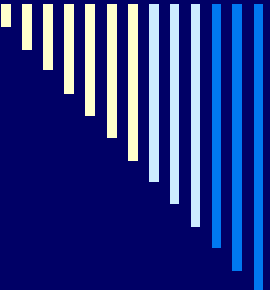
Emissions

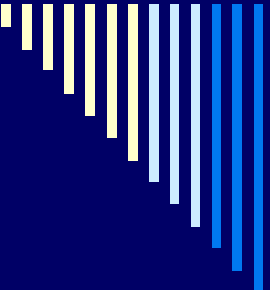
Deposition

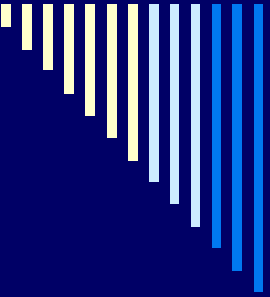
Effects

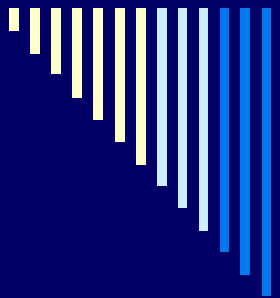


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- When humans burn fossil fuels, sulfur dioxide (SO_2) and nitrogen oxides (NO_x) are released into the atmosphere. These chemical gases react with water, oxygen, and other substances to form mild solutions of sulfuric and nitric acid. Winds may spread these acidic solutions across the atmosphere and over hundreds of miles. When acid rain reaches Earth, it flows across the surface in runoff water, enters water systems, and sinks into the soil.

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- Acid rain has many ecological effects, but none is greater than its impact on lakes, streams, wetlands, and other aquatic environments. Acid rain makes waters acidic and causes them to absorb the aluminum that makes its way from soil into lakes and streams. This combination makes waters toxic to crayfish, clams, fish, and other aquatic animals.
 - Some species can tolerate acidic waters better than others. However, in an interconnected ecosystem, what impacts some species eventually impacts many more throughout the food chain—including non-aquatic species such as birds.
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- Acid rain also damages forests, especially those at higher elevations. It robs the soil of essential nutrients and releases aluminum in the soil, which makes it hard for trees to take up water. Trees' leaves and needles are also harmed by acids.
 - The effects of acid rain, combined with other environmental stressors, leave trees and plants less able to withstand cold temperatures, insects, and disease. The pollutants may also inhibit trees' ability to reproduce. Some soils are better able to neutralize acids than others. In areas where the soil's "buffering capacity" is low, the harmful effects of acid rain are much greater.
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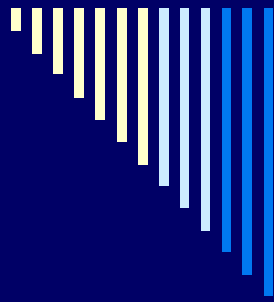
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- The only way to fight acid rain is by curbing the release of the pollutants that cause it. This means burning fewer fossil fuels. Many governments have tried to curb emissions by cleaning up industry smokestacks and promoting alternative fuel sources. These efforts have met with mixed results. But even if acid rain could be stopped today, it would still take many years for its harmful effects to disappear.
 - Individuals can also help prevent acid rain by conserving energy. The less electricity people use in their homes, the fewer chemicals power plants will emit. Vehicles are also major fossil fuel users, so drivers can reduce emissions by using public transportation, carpooling, biking, or simply walking wherever possible.
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Deforestation



- Deforestation is the removal of a forest or stand of trees where the land is thereafter converted to a nonforest use. Examples of deforestation include conversion of forestland to farms, ranches, or urban use.
- The term deforestation is often misused to describe any activity where all trees in an area are removed. However in temperate mesic climates, the removal of all trees in an area—in conformance with sustainable forestry practices—is correctly described as regeneration harvest. In temperate mesic climates, natural regeneration of forest stands often will not occur in the absence of disturbance, whether natural or anthropogenic. Furthermore, biodiversity after regeneration harvest often mimics that found after natural disturbance, including biodiversity loss after naturally occurring rainforest destruction



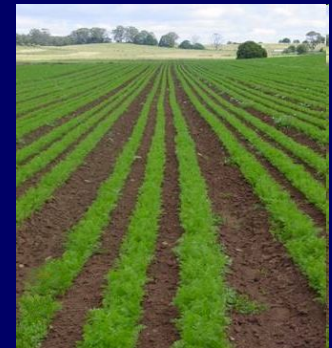
- Deforestation occurs for many reasons: trees or derived charcoal are used as, or sold, for fuel or as timber, while cleared land is used as pasture for livestock, plantations of commodities, and settlements. The removal of trees without sufficient reforestation has resulted in damage to habitat, biodiversity loss and aridity. It has adverse impacts on biosequestration of atmospheric carbon dioxide. Deforested regions typically incur significant adverse soil erosion and frequently degrade into wasteland.

- Disregard or ignorance of intrinsic value, lack of ascribed value, lax forest management and deficient environmental laws are some of the factors that allow deforestation to occur on a large scale. In many countries, deforestation, both naturally occurring and human induced, is an ongoing issue. Deforestation causes extinction, changes to climatic conditions, desertification, and displacement of populations as observed by current conditions and in the past through the fossil record.



Intensive farming

- Intensive farming is an agricultural system that aims to produce maximum yield from available land. This farming is applicable to the yield of the livestock also. You could say food is produced in large quantities with the help of chemical fertilizers and pesticides. The products such as eggs, meat and many agricultural products available in many supermarkets are produced using modern intensive farming. Intensive farming is practiced widely by many of the developed economies of the world. Sustainable intensive farming, intensive aquaculture, intensive live stock farming and managed intensive grazing fall under intensive farming. Here we look at both the advantages and the disadvantages of intensive farming.





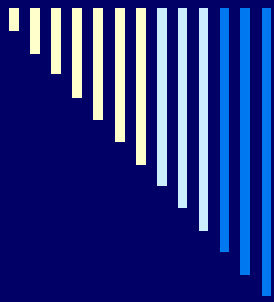
Advantages of Intensive Farming

- ❑ One of the major advantages of intensive farming is that its yield is high.
 - ❑ With the introduction of intensive farming, the farm produce such as vegetables, fruits and poultry products have become less expensive. This means that poor people can afford a balanced and nutritious diet.
 - ❑ Many organic food is affordable only to the rich and the elite strata of the society. Apart from that, large farming spaces are required to cultivate organic crops using natural manure. However, with the introduction of intensive farming, the space requirement for farming is less.
 - ❑ Another advantage of intensive farming is that large productivity of food is possible with less amount of land. This would help to meet the ever-growing demand for food supplies.
 - ❑ Compared to the disadvantages, the advantages of intensive farming are less.
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Disadvantages of Intensive Farming

- Remember, intensive farming involves the usage of various kinds of chemical fertilizers, pesticides and insecticides. Apart from this, intensive farming is also associated with farms that keep livestock above their holding capacity and this could lead to pollution and various diseases.
 - Reports and studies reveal intensive farming affects and alters the environment in multiple ways. Forests are destroyed to create large open fields and this could lead to soil erosion. Intensive farming affects the natural habitats in the forests. Use of chemical fertilizers contaminates water bodies such as lakes and rivers near the farming land.
 - The pesticides sprayed on crops not only destroy pests and contaminate the crops but also kill good insects. Eventually, these chemicals are passed on to the human beings.
 - The fruits and vegetables bought from farms that promote intensive farming are covered with invisible pesticide. These are not easily washed off. The residue of the pesticide affect the health of human beings.
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- The statistics show, an increase in the number of cancer patients. Researchers opine, consumption of inorganic vegetables, fruits, poultry and meat could probably be one of the reasons.
- There are many hybrid varieties of livestock and poultry today. The livestock and poultry are injected with hormones and other chemicals to increase the yield. There is a tug of war between the animal rights activist and farmers of intensive farming. However, the debate is still on going without much success.
- There are both pros and cons in promoting intensive farming. Intensive farming involves genetic selection and breeding of both plants and animals. Artificial growth hormones and inorganic plant nutrients are mixed with the fertilizers and livestock feed. This results in the highest yield of all time. On one side, the health of human beings is largely affected by intensive farming, while on the other side, it is argued that the poor and needy cannot simply afford organic food.



Chemical Pollution

- Chemical pollution occurs when chemicals resulting from human activities enter the environment, contaminating air, water or soil. Acid rain, greenhouse gases and ozone are all examples of chemical pollution.





Chemicals That Cause Water Pollution



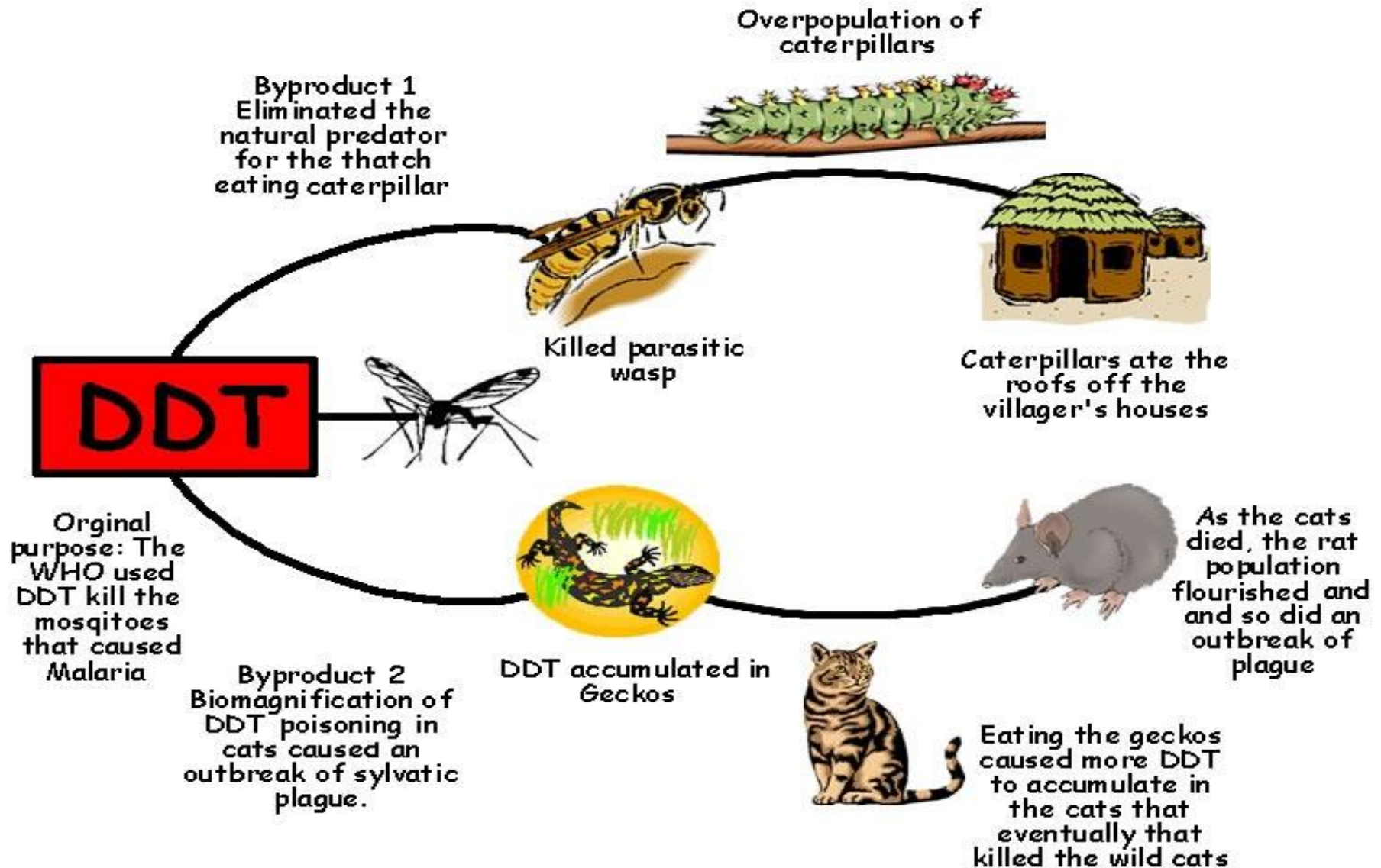
- Pesticides and fertilizers that contain nitrates and phosphates are a source of chemicals that cause water pollution. These chemicals seep into the groundwater and mix with runoff moving to lakes and rivers.



- Industrial emissions can also cause water pollution. An example is mercury in waste water from paper manufacturers. Instead of remaining inert as expected, the mercury reacted to bacteria in the water and changed to methyl mercury. Now, mercury levels in fish such as swordfish can pose dangers to people who eat it.

Effect of DDT Use in Borneo

In the early 1950's the people in Borneo, suffered from Malaria the World Health Organization had a solution, kill the mosquitoes with DDT. This is what happened.

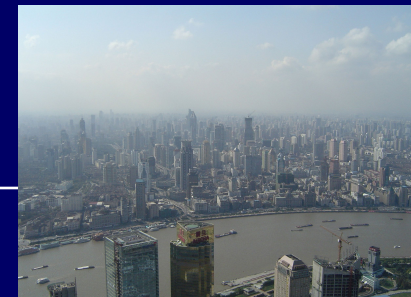




Chemicals that Cause Air Pollution



- ❑ A major source of chemical pollution in the air is fossil fuels burned by utilities, industries and motor vehicles.
- ❑ Sulfur dioxide is produced when coal is burned. It is an ingredient of acid rain and can cause lung damage to people who breathe large amounts of it.
- ❑ Nitrogen oxides are a byproduct of motor vehicles such as cars, trucks and airplanes. These oxides are also an ingredient of acid rain and can cause lung damage to people over time.
- ❑ Other chemicals that cause air pollution include ozone, carbon monoxide and lead.



Chemical Pollution in Soil

- Chemical pollution in soil can be caused by overuse of fertilizers, pesticides and herbicides. Construction and demolition sites are also sources of soil pollution, as are mines, landfills and foundries.





Preventing Pollution

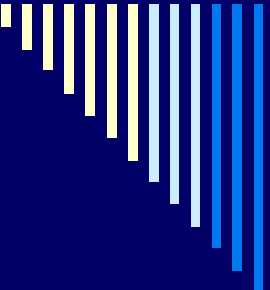
- Individuals can help prevent chemical pollution by making simple changes in their habits and activities. Some ways you can prevent chemical pollution include buying only the chemicals you need, buying the least harmful or least hazardous products, mixing and applying pesticides at the proper concentration and using alternative fuels.
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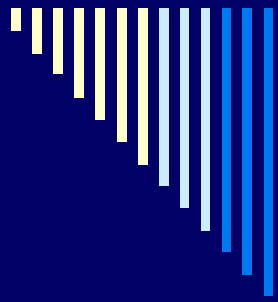


Biological Weapons



- Biological weapons are toxic materials produced from pathogenic organisms (usually microbes) or artificially manufactured toxic substances that are used to intentionally interfere with the biological processes of a host. These substances work to kill or incapacitate the host. Biological weapons may be used to target living organisms such as humans, animals or vegetation. They may also be used to contaminate nonliving substances such as air, water and soil.
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- There are a variety of microorganisms that can be used as biological weapons. Agents are commonly chosen because they are highly toxic, easily obtainable and inexpensive to produce, easily transferable from person to person, can be dispersed in aerosol form, or have no known vaccine. While it is possible to develop biological weapons from microbes, typically bacteria, finding a means of distributing the substances is difficult.



- One possible way is through aerosols. This can be ineffective as the materials often get clogged when spraying. Biological agents distributed by air may also be destroyed by UV light or rain may wash them away. Another method of distribution may be to attach the toxins to a bomb so that they may be released upon explosion. The problem with this is that the microbes will most likely be destroyed by the explosion as well.

Bioterrorism



- Bioterrorism is terrorism involving the intentional release or dissemination of biological agents. These agents are (bacteria, viruses, or toxins), and may be in a naturally occurring or a human-modified form.





Biological organisms that may potentially be used as biological weapons

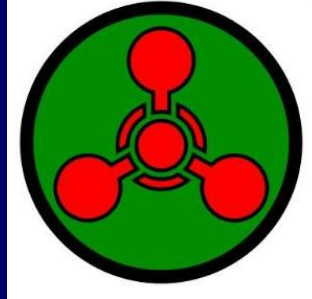
Microbe	Natural Environment	Target Host	Mode of Contraction	Diseases/Symptoms
Anthrax Bacillus anthracis	Soil	Humans, Domestic Animals	Open Wounds, Inhalation	Pulmonary Anthrax Septicemia, Flu-like symptoms
Clostridium perfringens	Intestines of humans and other animals, Soil	Humans, Domestic Animals	Open Wounds	Gas gangrene, Severe Abdominal Cramps, Diarrhea
Clostridium botulinum	Soil	Humans	Contaminated Food or Water	Inhalation
RICIN Protein Toxin	Extracted from Castor Bean Plants	Humans	Contaminated Food or Water, Inhalation, Injection	Severe Abdominal Pain, Watery and Bloody Diarrhea, Vomiting, Weakness, Fever, Cough, and Pulmonary Edema
Smallpox	Eradicated from Nature, Now Obtained from Laboratory Stockpiles	Humans	Direct Contact with Bodily Fluids or Contaminated Objects, Inhalation	Persistent Fever, Vomiting, Rash on Tongue and in Mouth, Rash and Bumps on Skin

- A chemical attack can affect the contaminated area for several minutes or several days (depending on factors like the concentration of the agent, whether the attack is indoors or outdoors and the weather).
- Although relatively cheap to produce, chemical weapons are still more expensive and complicated to use than biological weapons.
- There are four basic categories of chemical weapons agents, each of which has its own way of attacking the human body





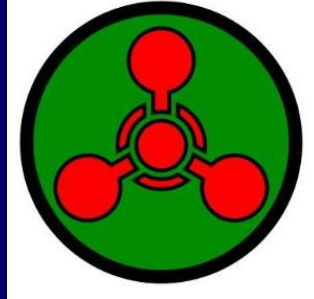
Vesicant Chemical Weapons Agents



- Also known as 'blistering agents' or 'mustard agents', vesicants (delivered in either gas or liquid form) produce burns and blisters on the skin, eyes, throat and even internal organs. If they pass into the blood stream vesicants act as poisons. If they reach the respiratory system, they can cause death by asphyxiation.
 - The most well-known vesicant substance is mustard gas. Mustard gas attacks the whole body and is a carcinogenic (it induces cancer). In the event of exposure, the effects of mustard gas may take up to 24 hours before they start to become apparent. Mortality rates from mustard gas are relatively low. Those who die usually do so between about two days and about two weeks after exposure.
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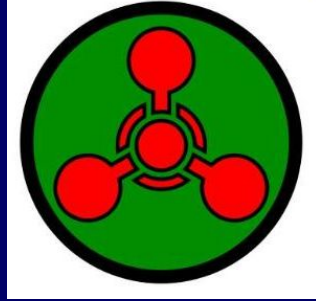
Choking Chemical Weapons Agents



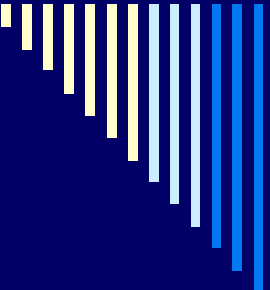
- Choking agents are relatively simple substances, most of which are either common industrial chemicals (like chlorine, and phosgene) or their derivatives.
 - Choking agents are delivered in gas form and are more volatile than vesicants (which means they will disperse in the air more quickly).
 - They act exclusively by inhalation, targeting the nose, lungs and throat, provoking an immediate smothering effect followed by oedema (excess fluid) of the lung possibly resulting in death by asphyxiation.
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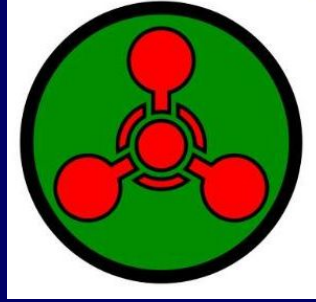
Blood Chemical Weapons Agents



- Blood agents like cyanhydric acid and hydrogen cyanide, are cyanide-based poisons that enter the blood stream disrupting cellular functions in the respiratory system producing suffocation as the victim 'drowns' in his/her own blood supply.
 - Hydrogen cyanide (in gas or liquid form) is poisonous to inhale and can also be absorbed by the skin.
 - Early symptoms of cyanide poisoning include restlessness, headache, palpitations and difficulties breathing, followed by vomiting, convulsions, respiratory failure and unconsciousness.
 - Cyanhydric acid was used by the Nazis in the gas chambers. And although no documented evidence exists, Iraq is believed to have used hydrogen cyanide against the Kurds in the 1980s.
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- Hydrogen cyanide is volatile which means that it disperses quickly so it's difficult to build up a high concentration outdoors. However, in a confined space, it quickly reaches lethal levels of concentration. In this scenario, there may not be time to display early symptoms with victims just suddenly falling dead.
 - Like choking agents, these are common industrial chemicals that are relatively easy to find and produce.
 - There is no antidote for cyanide poisoning.
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Nerve Chemical Weapons Agents



- Nerve agents (neurotoxins) like sarin, tabun (developed by Nazi Germany during the 1930s), soman or VX produce their deadly effect by blocking an enzyme that is necessary for the central nervous system to function. This leads to a disruption of muscle function followed by a seizure and, eventually, death.
- Nerve agents (in either gas or liquid form) enter the body through inhalation, through skin absorption or through being consumed (for example, in a contaminated water supply). Generally the symptoms are produced faster when inhaled (2 to 3 minutes) than when they are absorbed or consumed (20 to 30 minutes).
- A thimble-sized portion of one of these nerve toxins can kill a person in minutes. A few particles can produce death in 24 hours.
- Nerve agents pose a real threat as a chemical weapon because they're relatively easy and cheap to manufacture (they're made from ingredients used in the manufacture of insecticides, fertilizers and certain coloring agents).



Thanks you for
your attention!