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Impacts from human activity on land and in the water can influence ecosystems profoundly. Climate change, ocean acidification, permafrost melting, habitat loss, eutrophication, stormwater runoff, air pollution, contaminants, and invasive species are among many problems facing ecosystems.

Humans and the environment

Cutting down trees and littering have a negative effect on animals and plants. Protecting endangered species and cleaning lakes and seas has a positive effect on the environment. At home you can help the planet by recycling waste and growing plants or vegetables.

Business and human activities can be direct threats to ecosystems. They can cause destruction, degradation, and the impairment of biodiversity and other natural resources. Ecosystem threats includes; (1) climate change, (2) pollution, (3) habitat destruction, (4) over exploitation, and (5) introduction of invasive species. Business and human activities can stress the ecosystem they operate in reducing its overall health and at some point the accumulation of all negative impact from human activities are population, affluence, and technology.

## Climate Change

Climate change is one of the greatest threats to sustainability. It is a controversial and contested topic. As highlighted in the previous section, the earth’s climate does fluctuate over time due to a variety of factors. However, there is a significant body of scientific research that indicates that global temperatures are rising and that rising global temperatures are directly linked to human activities involving the emissions of greenhouse gases (GHG).“IPCC Fourth Assessment Report, Working Group III, Mitigation of Climate Change,” IPCC, GHG traps heat in the atmosphere allowing the planet to be a habitable place. The primary GHG of interest is carbon dioxide (CO2), which is a vital gas in our earth system and is released from various sources, including the combustion of fossil fuels. Over the last two centuries, rapid industrialization and the corresponding increased burning of fossil fuels and deforestation of large tracts of land globally has caused the concentrations of greenhouse gases to increase significantly in our atmosphere. Current atmospheric carbon dioxide levels exceed the natural range observed over at least the last 800,000 years and are rapidly rising.

## Pollution

Pollution is the contamination, harm, or disruption of the natural environment through the emissions of harmful substances. Pollution is most typically associated with anthropogenic sources but can also occur from natural activity, such as volcanic eruptions. Pollution can impact air, water, and land. Pollutants include domestic, industrial, and agricultural waste. It comes in many different forms and can be chemical substances or noise, heat, or light.

Pollution can be either point source or non-point source. Point source is a specific and easily identifiable source of pollution, such as a factory or power plant. Non-point sources consist of many small, distributed sources of a pollutant that are difficult to individually identify and on their own may not be that harmful but in aggregate are significant sources of pollution. A classic example of non-point source would be soap detergents, fertilizers, and other commonly used chemicals and products from many residences and businesses that then contaminate watersheds with high levels of nitrogen. Non-point sources tend to be more complex to regulate for pollution emissions.

Pollution is not just toxic substances; it can be pollutants that are actually part of a healthful ecosystem in the proper quantities, such as nitrogen or carbon dioxide, but that in excessive quantities alter the normal functioning of an ecosystem resulting in harm to the ecosystem. Pollution can range from highly dangerous radioactive materials to airborne dust (a substance that is typically benign) resulting from land erosion.

Air pollution, the contamination of the atmosphere by airborne pollutants, is most often related to combustion of fuel from either stationary or mobile sources. Stationary sources include the smoke stacks of factories, power plants, and furnaces or boilers. Mobile sources refer to motor vehicles, aircraft, and other forms of fossil-fuel-based transportation. Paints, chemicals, and aerosol sprays also can pollute the air. Natural sources of air pollution include dust, methane from livestock, volcanic activity, wildfires, and even vegetation.

## Overexploitation

Overexploitation is a major threat to ecosystems and therefore sustainability. It is the consumption of a natural resource at a rate greater than that natural resource can maintain itself. Overhunting of species is one of the clearest examples of overexploitation, but there are other forms. Land degradations are human-induced changes that impair the capacity of the land to sustain life. Deforestation and overgrazing exploit the land and result in the exceeding of sustainable yield.

## Habitat Destruction

Habitat destruction brought on by the activity of humans threatens resident species and ecosystems. Two examples of habitat destruction are deforestation and desertification. Deforestation occurs when a forest or stand of trees is removed, converting the land to a non-forest use. This changes the ecosystem drastically and results in a dramatic loss of biodiversity. Deforestation can be the result of timber harvesting or of clearing land for agricultural, commercial, or residential use. The loss of biodiversity and trees alters the ecosystem and can result in aridity and erosion. It also results in climate change and extinction, and it can lead to desertification if on a significant enough scale. The social impacts can include displacement of indigenous peoples.

Desertification is the degradation of land quality and features low biodiversity, dry conditions, and poor soil quality. Deserts are formed through both natural processes and human activity. However, desertification is occurring at a greater rate than past geological time scales due to human activity.

## Invasive Species

Invasive species are brought on by transporting species either intentionally or accidentally from other areas of the world. This can be devastating to existing species as invasive species are introduced on a timescale much more quickly than typically would happen with evolution over longer time periods. This can include outcompeting native species in the ecosystem, leading to the decline or extinction of local species, and overpopulation as these invasive species may not have any predators in this new ecosystem. They also can be a major economic cost.