Causes of Global Warming

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Global warming is a significant problem for many countries across the world. It is a threat to the life of people on earth. However, it is a concept that is associated with many controversies in the debate about global climate change. Experts across the world have put much effort to unfold the uncertainties associated with global warming. Existing evidence shows that global warming might be a serious problem if it is not addressed. Therefore, there is a need to understand the factors that lead to global warming, including greenhouse gases, fracking, human activities, and natural processes.

When greenhouse gases accumulate in the atmosphere, they trap heat that radiates from the earth's surface towards space. The gases act as the greenhouse's glass walls that prevent heat from leaving but allow light to pass through. The glass walls allow the incoming ultraviolet radiation to pass through, which is then absorbed by plants. However, weaker infrared radiation does not pass through the glass walls. This radiation is trapped inside, leading to high temperatures within the greenhouse. Greenhouse gases work in a similar manner. These gases allow sunlight to pass through them but prevent heat from leaving the earth's surface. The tradeoff between the outgoing and incoming radiation that leads to the earth's heating is the greenhouse effect. The gases responsible for the greenhouse effect are chlorofluorocarbons, nitrous oxide, methane, carbon dioxide, and water vapor (Tomizuka, 2015). They absorb infrared radiation and prevent it from leaving the earth's surface, leading to an increase in the atmospheric temperatures. According to Tomizuka (2015), if the volume of these gases is not controlled for a long period, it will lead to devastating effects on the climate.

The earth's atmosphere is a thin layer of gases. It has changed dramatically over the decades due to the greenhouse effect leading to global warming. Although the atmosphere traps the amount of heat necessary to prevent the earth from reaching the freezing point, excessive accumulation of heat is harmful.

Human activities contribute to the production of greenhouse gases. Activities such as burning fossil fuels like oil and coal increase the concentration of carbon dioxide in the atmosphere (Gülen, 2013). Gülen (2013) argued that when oil or coal burn, they combine with oxygen and carbon, leading to carbon dioxide. Besides, when farmers clear their land through burning, carbon dioxide is released into the atmosphere (Amini, 2019). Farming activities also lead to the production of methane, which is also produced from fracking. The use of commercial fertilizers on farms leads to the production of nitrous oxide and methane. Digestive systems of livestock are also a source of methane. The other source of these gases that is related to agricultural practices is landfilling. When biomass from landfills is burned, greenhouse gases are released.

Deforestation that results from the clearance of land for farming also contributes to global warming. Trees are important because they capture carbon dioxide from the atmosphere (Gleiser, 2016). Trees are also cleared to create room for infrastructure development, extraction of palm oil, timber processing, and paper production. When they are cut in large numbers without replacement, the amount of carbon dioxide in the atmosphere increases because it is not trapped. Besides, when the trees and other vegetation are burnt, the stored carbon dioxide is pumped back into the atmosphere.

Fracking is another process that contributes to global warming. It is the process where oil wells are drilled vertically and then horizontally, which results in the formation of a shale (Pearce, 2013). A mixture of sand, chemicals, and pressurized water is then injected into the drilled well to create and prop open pathways for the gas to flow. The process leads to the release of methane gas, which finds its way into the atmosphere. Fracking releases a chemical signature of methane that is found in the atmosphere. A large volume of methane is released from gas operations in Canada and the United States of America. Most of the methane is released from fracking for shale gas. The release of methane is significant because the effects on global warming are more than that of all the other greenhouse gases combined. Although methane does not last long in the atmosphere, it gradually converts into carbon dioxide, lasting for many years. Methane that is released from fracking for shale gas has more carbon-12 than carbon-13. Thus, it is lighter than methane released from the burning of coal and natural. Because of its lightness, it contributes significantly to the increase in the volume of methane in the atmosphere. Natural activities worsen the effects of this gas on climate.

Natural activities such as solar variations, the orbital changes of the earth, ocean currents, and volcanic eruptions also contribute to global warming. Volcanic eruptions pump out large volumes of ash and dust. Ash and the cloud of dust block sunlight from reaching the earth's surface as particles are heavy, which makes them fall on earth within three months after the eruption. As a result, they cause short-term cooling on the climate. The eruptions also lead to the production of sulfur dioxide. Sulfur dioxide combines with dust and water vapor to form sulfate aerosols. The sulfate aerosols formed reflects light from the sun away from the surface of the earth. Unlike ash, aerosols remain in the atmosphere for at least a year. Therefore, while volcanic greenhouse gases cause warming, the aerosols mitigate this warming, though only in the short-run.

For instance, in 1991, Mount Pinatubo erupted. As a result, the atmospheric temperatures reduced by about 0.50 C. Fine particles, ash, carbon dioxide, and lava were released in the eruption. However, the volume of carbon dioxide released was not large enough to cause warming. In this regard, volcanic eruptions are significant to global warming when combined with other factors, but they are not a major concern on their own.

The other natural event that contributes to global warming is ocean currents. The currents can move water either vertically or horizontally. The circulation system of the ocean is powered by water density differences, solar energy, the Coriolis Effect (the rotation of the earth), tides, and wind (Dogar, Sato, & Liu, 2020). The global ocean circulation system contributes to the distribution of heat energy and gases, thus regulating the climate. The orbital changes of the earth are responsible for the seasons.

Industrial activities are also responsible for global warming. During the industrial revolution, petroleum, coal, and other fossil fuels became important sources of energy needed to run industries (Wrachien, 2017). The energy was also needed for use in diesel-or-gasoline-powered airplanes, trains, trucks, and cars. In producing energy from fossil fuels, CFCs, methane, carbon dioxide, and other gases are produced. These gases are responsible for the greenhouse effect, which has led to global warming.

In conclusion, factors that lead to global warming are greenhouse gases, fracking, human activities, and natural processes. Greenhouse gases cause the greenhouse effect. Human activities contribute to greenhouse gas production through activities such as the burning of fossil fuels like oil and coal. The use of commercial fertilizers on farms leads to the production of nitrous oxide and methane. Deforestation, fracking, and natural activities such as solar variations, the orbital changes of the earth, ocean currents, and volcanic eruptions contribute to global warming. Other factors are ocean currents and industrial activities.

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