Gwen Wehmeyer

Soil Plant Nutrient Cycling and Environmental Quality

Dr. Raun

20 January 2016

Five Contributing Factors to Global Warming

Individuals may begin to ask themselves, in regards to this topic “What really is global warming?” Global warming is a steady increase in earth’s temperature, resulting from atmospheric gases that trap solar heat (Seven Environmental Threats 5). Scientist have conducted numerous amounts of research, trying to find and analyze the reasoning behind this all. When searching various websites and scientific articles, I was capable of finding five leading causes connected to global warming and how they can be so catastrophic to our world. This article will include the GHG (greenhouse gas) emission behind coal fired power plants that produce electricity, livestock, tillage, deforestation, and transportation.

Coal-fired power plants are the biggest source of the world’s CO2 discharges (Biello 60). According to David Biello, the United States gets 40% of its power from coal burning (Biello 61). It is stated that in just North America alone, there are more than 6,000 industrial sources of CO2 emissions (Biello 61). From the estimation of CO2 released from just kilns, we are releasing 100,000 tons or more of CO2 per year (Biello 61). Combining the fossil fuel plants around the world, we are accountable for more than 70% of CO2 pollution to our planet (Biello 61).

According to Michael Gibbs and Kathleen Hogan, “Methane is very affective in absorbing thermal radiation that radiates away from the Earth's surface. One gram of methane in the atmosphere absorbs infrared radiation about 70 times more effectively than one gram of CO2“ (Kathleen Hogan 23). Methane emissions from livestock are estimated at about 2.2 billion tonnes (metric tone) of CO2. This accounts for about 80% of agricultural CH4 (methane) and 35% of the total pollution from CH4 emissions (The Role of Livestock in Climate Change 1).

When tillage practices are performed, it decomposes the organic matter from the soil, releasing CO2 into the atmosphere. According to Dr. Mullen, Dr. Thomason, and Dr. Raun, “The continuous tillage of arable land worldwide is likely responsible for 6 to 25% of the increase in atmospheric CO2 due to decreased soil organic matter” (R. W. Mullen 17). If we as producers, are able to incorporate low-till or no-till management system, it could simultaneously increase soil productivity by increasing organic matter and also, acting as a sink (storage for carbon) for atmospheric CO2 (R. W. Mullen 17).

Deforestation is the elimination of trees around the world. The world’s CO2 emission from burning conventional fuels and deforestation was 38.0586 BT (Bacillus thuringiensis) in 2007 (Singh 44). Between China, European Union, and the United States we consumed 21% of the CO2 (Singh 44). The CO2 total from burning of fossil fuels from 2006 to 2007 went up nearly 1.483BT (Singh 44). The changes in our society and rise in human population, are some of the contributing factors behind the increase in modernization, urbanization, and deforestation. This all plays a role in the rising levels of CO2 emission.

According to the United States Environmental Protection Agency, “Almost all 95% of the world's transportation energy comes from petroleum-based fuels, largely gasoline and diesel” (Global Greenhouse Gas Emissions Data 1). In 2011, EPA created a graph, displaying the percentages of Global CO2 emissions from fossil fuel combustion and industrial processes. They concluded that transportation has a 14% addition to the CO2 contributed in the world (Global Greenhouse Gas Emissions Data 1).

**World Contributing Factors to Global Warming and Total Percentages of GHG Emission**

|  |  |  |  |
| --- | --- | --- | --- |
| Factors | GHG (Greenhouse Gas) | Percentage | Reference  |
| Electricity | CO2 (carbon dioxide) | 70% | A. |
| Livestock | CH4 (methane) | 35% | G. |
| Tillage | CO2 (carbon dioxide) | 6-25% (mean: 15.5%) | D. |
| Deforestation | CO2 (carbon dioxide) | 21% | F. |
| Transportation | CO2 (carbon dioxide) | 14% | B. |
| **TOTAL:** |  | **155.5%** |  |

As we analyze the graph above, we see the contributing factors increasing global warming such as, electricity, livestock, cultivation, deforestation. When analyzing the total, we see that it is well over 100%. Can this even be true? What about the elements of error that come into play? Tillage for example, can be anywhere from 6-25%. I went ahead and took the average of the two numbers resulting in 15.5%. If we were to use 6% that would take our total GHG emissions down by 9.5%. Let’s now look at things from a livestock perspective. Scientists claim that all livestock are producing 35% percent of methane. Is this statistic accounting for all beef, including grass fed? I do believe that when looking at deforestation, we could potentially be releasing 21% of CO2, but we have to put this into a worldwide perspective. Our world population is growing at a rapid rate. We already have over 7 billion people on this earth. We have to remove trees to create living facilities. We have to open up more farm land for the production of food to feed all of these people. When looking further into tillage, tillage has been proven to create better soil conditions and fertility for farm land. Does it create a release of CO2? Yes, but we also have producers converting to no-tillage practices to keep the percentage of their soil organic matter from decreasing. Hence forth decreasing the emission of CO2. I do believe the CO2 emission from transportation and coal burning from electrical plants, is high. We have millions of people driving, flying, and even riding trains, every single day. We have buildings that need electric. We are increasing the acknowledgment of these atmospheric problems each day. There are more and more management practices coming into play, to decrease the substantial emission of CO2. Not only with electrical plants and vehicles, but with all five sources listed above. We are converting to a more “green friendly” environment, as the year’s progress and technology increases. It’s now time to figure out what us, as educated individuals can do. How can we promote and protect our planet? It’s in our hands now.

# References

1. Biello, David. "The Carbon Capture Fallacy." *Scientific American* (2016): 58-65.

B. "Global Greenhouse Gas Emissions Data." 11 December 2012. *United States Environmental Protection Agency .* http://www3.epa.gov/climatechange/ghgemissions/global.html. 18 January 2016.

C. Kathleen Hogan, Michael Gibbs. "Methane." *EPA* (1990): 23-26.

D. R. W. Mullen, W. E. Thomason, W.R. Raun. "Estimated Increase in Atmospheric Carbon Dioxide Due to Worldwide Decrease in Soil Organic Matter ." *Communication Soil Science Plant Analysis* (1999): 1713-1719.

E. "Seven Environmental Threats ." *Scholastic Update* (1992): 6-7.

F. Singh, Hambir. "Climate Change: A Global Issue ." *Special Focus on Carbon Dioxide* (2010 ): 42-48.

G. "The Role of Livestock in Climate Change ." n.d. *Food and Agriculture Organization of the United States .* http://www.fao.org/agriculture/lead/themes0/climate/en/. 18 January 2016.