

Is industrial agriculture one of the leading causes of climate change?

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Introduction

What is the true cost of industrial agriculture? As we have progressed as a society with our population increasing significantly, globalized production of food needs to meet demands. Current data demonstrates the immense connection between water depletion, deforestation, and emitted greenhouse gases to the livestock sector. "Animal agriculture is responsible for 18% of greenhouse gas emissions, more than the combined exhaust from all transportation. (FAO, 2012)" Despite the reduced economic costs, the environment suffers. This system of convenience is lacking the consideration of the world's future ecosystem safety and public health. This paper brings together existing research regarding the world's meat consumption habits, animal agriculture, and greenhouse gas emissions. A study from the Global Environmental Alert Service (GEAS), suggests that a, "reduced meat production would ease both pressures on the remaining natural environment and on atmospheric emissions of CO₂, CH₄, and N₂O." (2012) If education is implemented, conveying the facts about how eating a hamburger is damaging to the environment, we could introduce a new reform, so that we remain sustainable as earth's inhabitants. Furthermore, the following analysis of how the livestock sector's resource use and emission contribution relates to the current state of the environment is done purposefully with intentions to progress towards more sustainable practices.

Materials & Methods

In order to analyze animal agriculture's direct impact on the environment, it is essential to take a research based experimental approach, utilizing the current published research. The global meat supply and per capita consumption rates are rising. As our global population has increased from about 5 billion in the year 1987 to 7 billion in 2011, it is evident that a demand for food production has also increased (UNEP, 2012). By considering these numbers, one can realize the potential animal agriculture possesses, in terms of effecting the environment. Additionally, researchers utilize Life Cycle Assessment in order to generate comprehensive and reliable data regarding environmental information of agricultural products and practices. Complex systemic analysis on the inputs and outputs of industrial agriculture, is a seemingly popular method, providing researchers with reliable information on the environmental impacts. In order to receive broad and expansive data, it is fundamental to view the role of animal agriculture on climate change under an umbrella that accounts for all aspects of the produced emissions. This includes deforestation, land use change, feed production, enteric fermentation, and releases of stored manure (GEAS, 2012). Specifically, the approach developed for this study, builds on findings and results of the Life Cycle Assessment methodology.

Results & Discussion

Our topic is dense and complex, giving it the the potential to encompass lots of different experiments, thus we included data that represented how human population growth has impacted meat production. This is a great representation on how intense agricultural practices and population growth have impacted our planet, and a large contributor to climate change. These trends are similar to many other practices. For example, our cultures intense farming, and how we are feeding our food substances, that make them grow faster and larger. Yes, it is efficient and makes it possible to provide for more humans, but it is altering our planet and changing the quality of our food. Overall, we believe that the experiments conducted/studies done on this topic worked well, and showed undeniable proof of what we predicted.

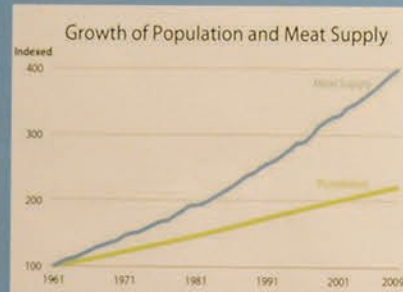


Figure 1: Growth of population and meat supply, indexed 1961=100 (FAO 2012a, UN 2012)

This graph presents the correlation of meat supply with the steady increase of global population from 1961-2009.



Figure 2: Meat supply around the world (kg/capita/year) (FAO 2012a)

This figure shows global distribution and concentration of meat supply (kg) and highlights the countries with the largest meat supply.



Figure 3: Meat supply (kg/capita/day and tonnes) for selected countries/regions (FAO 2012a)

Represents meat supply per region around the globe by ton's and per grams per day of total meat usage for the year 2009.

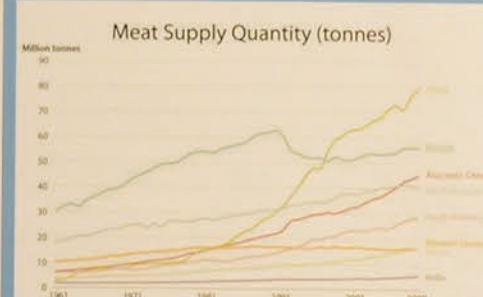


Figure 4: Trends in meat supply for selected countries/regions between 1961 and 2009 (FAO 2012a)

Graph which breaks down per region the increase of meat supply ranging from the years 1961 to 2009. Certain regions around the world have more significant amounts meat supply increase over time such as China for this figure.

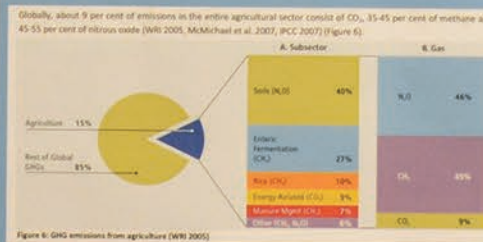


Figure 5: GHG emissions from agriculture (WRI 2005)

This figure portrays the world greenhouse gas emissions. Agriculture is responsible for 15% of the total emitted greenhouse gases in 2005. Figure 5 does an in depth analyze as to which sectors of agricultural practices are responsible for which type of emission and how much they produce.

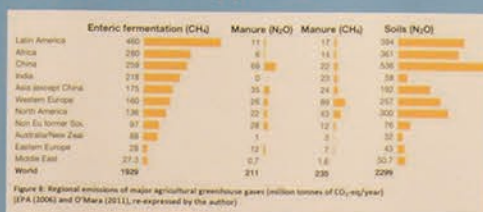


Figure 6: Regional emissions of major agricultural greenhouse gases (million tonnes of CO₂ eq/year) (EPA 2006) and O'Mara (2011), re-expressed by the author

Represents four major climate changing agricultural emitted gases emitted in tons for the year 2006.

Conclusions

At present, greenhouse gas emissions deriving from animal agriculture, specifically livestock is exponential. The results proved that raising livestock to meet our consumption habits results in approximately 10-25 percent of total greenhouse gas emissions (Steinfeld, 20016). Regarding the systemic structures that raise and produce livestock, an array of mitigation techniques should be continuously implemented in order to lessen the overall emissions. There is no quick fix to this problem, but one general fix is to reduce one's personal meat consumption. The American culture has grown accustomed to eating meat with every meal, but if everyone cut back, it would allow us to farm less cows. Having less focus on cattle based agriculture would allow for a global cutback on the use of fresh water, cattle require vast amount of water to hydrate and considerable amounts of water to grow feed for the cows. Preserving of more arable lands for future generations would also be accomplished by a global cutback of cows. Ecosystems such as the Amazon rainforest in some areas are being completely cleared in terms of vegetation in order to make room for cows to graze. The cultivation of less cows would result in less greenhouse gas emissions. One result that was interesting was that CO₂ only counts for a small portion of emissions in animal agriculture. Although there are an array of greenhouse gases responsible for climate change such as CO₂ it has recently been found to be not nearly as harmful as methane which is released from manure of cattle. The two largest contributors of greenhouse gas emissions is methane and nitrous oxide, which both of which are the two largest gases that cattle emit into the atmosphere. Overall, agriculture can account for 15 percent of all greenhouse gases, with only 6 percent of those gases coming from cattle. These significant findings deem it necessary to rethink components of our agricultural processes.

Literature Cited

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 Steinfeld, H., Gerber, P., Wassenaar, T., Castel, V., Rosales, M. and de Haan, C. (2006). Livestock's long shadow: Environmental issues and options. Food and Agriculture Organization of the United Nations (FAO), Rome, Italy.
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Acknowledgements

Written by: Uriaha Bauer, Rachel Slark, Moreya Gardner
 Thanks to all group members for contributing and taking time to do thorough research.

For Further Information

Please check out this website for further information:
<http://www.fao.org/docrep/007/j0902e/j0902e03.htm>