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Introduction: What effects does climate change have on agriculture?

My topic for this research paper is how does climate change effect agriculture? I thought this would make an interesting research essay. I have always been interested in how Earth has changed over billions of years. Planet Earth today looks very different from how it looked millions and millions of years ago. Our planet has gone through many incredible if not practically unbelievable changes. According to the BBC article titled Earth was frozen snowball when animals first evolved, 715 million years ago the entire planet was covered in snow and ice. Most of life was wiped out and the average temperature was -20 degrees Celsius. Then, in more recent times during the Cambrian period 543 to 490 million years ago the majority of North America was under water.

In the last few years, my friends, family and co-workers and pretty much everyone I know has said , “Gee I don’t remember a summer that’s been this hot” or “What happened to spring, we went right into summer.” I started thinking more and more that maybe our climate is changing and maybe the greenhouse effect is real. Then, I thought if the earth is truly warming up how does this phenomenon affect out planet especially our crops and food.

The hypothesis for this research paper is: If the earth’s climate is changing then it will impact agriculture in a negative way.

What I expect to find in my research is that people are responsible for the earth's climate change. How we live and treat our planet is destroying our environment. Climate change is not caused by the earth going through another period of extreme warning in a natural way. I also expect to find that climate change adversely impacts agriculture. Due to our changing climate, farmers might have to grow different types of crops than what they are used to growing. For example, farmers who grew corn might have to change over to soybean. Crops might also be destroyed. For example, the wheat in the fields could whither and die from scorching heat.

In the real world, climate change will affect all of humanity. It will trickle downs to ways we cannot even imagine. Farms could shut, people could starve, and wars could be fought over limited amount of available produce. My understanding of how climate change affects agriculture has deepened because I learned that sustainable farming is a growing practice among farmers. Sustainable farming is important to the health and welfare of our planet. Sustainable farming means that farmers use more efficient farming equipment, they cover crops to help stop soil erosion, and they rotate crops on a regular basis.

What I learned is very important because farmers work hard to produce the food we eat. Farming must become more sustainable or another way of saying this is farming must become more environmentally and economically friendly. Earth's future depends upon this. What would happen to out planet if climate change continues and change does not happen? Farms would shut down because they would not be profitable to run. People could starve and food could be rationed. According to supply and demand, the cost of food will rise uncontrollable and the poor will be greatly affected. Trade would also be affected, and countries could begin to hoard their crops or crops could even be held for political control. The world would fall into an utter state of chaos and confusion.

I think environmentalists who do not vote need to know about my research first. They are already aware of climate change, but they need to be motivated to vote to bring current environmental issues out into the open. Politicians need to get elected in order to make climate change policies. Politicians will not push for climate issues or voters don't prioritize this issue. Environmentalists who vote have the power to demand environmental issues.

Source Entries

Citation: "preparing plants for climate change." Southwest Farm press, 28, Feb,2020, Agriculture, https://www.farmprogress

Summary: The article, preparing plants for climate change discusses how farmers are planning to grow crops under different weather conditions due to climate change.

The most information of this articles is that carbon dioxide has its benefits. Plants use carbon dioxide to help them grow. The more carbon dioxide in the atmosphere, the faster crops will grow. Raja Reddy, a professor at Mississippi State College is studying how climate change has effect on how plants will respond when there is more carbon dioxide in the air. Researchers set up a greenhouse and set up an experiment when they increased the amount of carbon dioxide in the earth's future atmosphere. The research team used realistic condition of what carbon gas levels could be in the future. The researchers used warmer weather temperatures, less water and light that would represent actual environmental stresses that could be applied to crops in the future. The researchers measured plants growth, height, leaf area, at the root systems. The result of this study demonstrated that increased plant growth with higher carbon dioxide levels does not affect how plants handle stress. Professor Reddy feels this is positive news and stated, "What breeders are doing for the future should hold up well."

Reflection: I do not agree with the results of this study made by Professor Reddy and his colleagues. My research shows that carbon dioxide is a primary greenhouse gas caused by human activity. It is harmful to the environment. According to NASA carbon dioxide concentrations are rising, causing the earth to heat up. (p. 5). https://earthobservatory.nasa.gov

Professor Reddy stated that, "What breeders are doing for the future should hold up well." I think that farmers need to do more to have their farms become more sustainable in the future. This includes using solar run tractors and using less harmful pesticides.

One thought I have about the research discussed in the article is that Prof. Reddy's study doesn't include any information on how the researchers collected their data, how they analyzed the data, and what limitations they found. I would ask the author how reliable is this study? And I would want to know if most farmers living across America believe they are well prepared to cope with the earths changing climate. And if not, how should they upgrade their farming methods to cope with changing climate.

Other information I would need to understand this article better is to understand how greenhouse gas emission work on the environment. This article states that efforts are being made to reduce gas emissions but what are they and should we reduce gas emissions like NASA believes?

I believe the author's intended audience is the farmers and ranchers. They are the community that would prepare their plants for climate change. The purpose of this articles is to inform. This article gives us detail and does not use poetry like Douglas' speech. I believe this type of genre is effective and makes sense for what the author wants to accomplish.

I think this article is credible but certain facts written needs further investigating. This article was written in Southwest Farm Press and I researched this organization. I found that it has many premier sponsors lice AGCO. I believe these sponsors might bias the article to benefit themselves. For example, AGCO designs, manufactures, and distributes agricultural equipment. I must think about why they would print an article that justifies the earth having high carbon dioxide gas levels. Maybe they cannot produce solar or wind powered farm equipment.

Quotation: "Rice is one of the most important grain crops in the world, so it is particularly important to know how rice will respond to a new climate" Explain Reddy

Citation: "*Climate Change and Agriculture."* National Sustainable Agricultural Coalition. http://bit.ly/farmerclimateletter.com Accessed Summer 2020

Summary: Farmers and Ranchers have set up a petition for people to sign to let their representatives know that they are concerned because climate change threatens agriculture in the United States. They are advocating for change and immediate action needs to take place to address earth's changing climate. Farmers and ranchers alike want to find new ways to bring the agricultural industry into the future. New farming programs need to be put into place that will make farms more resilient to extreme weather events. These innovations include developing new renewable energy systems and finding ways to improve the health of the soil and air. Also shifting technology towards sustainable farming takes significant amounts of investments, financial incentives and research.

Reflection: I agree with this petition is trying to do. This petition is bringing awareness to the fact the earth's climate is changing and these changes will adversely affect agriculture. The petition states that temperatures are rising, flooding is becoming severe and periods of droughts are

extending. There are new pest and crop diseases that threaten crop production. I also agree with the fact that farmers and ranchers need to be apart of the climate change solution. Farmers need to take steps now to reduce their reliance on fossil fuels and they must act to reduce greenhouse gas emissions. The most important point in this petition is that there must be viable solutions that invest agricultural communities.

"Our farms and ranches can also produce renewable energy in unique and important ways." To me this statement means that farmers and ranchers admit that there is a problem. They must come up with new sustainable farming methods that are environmentally and economically sound. This is one way that farmers, ranchers can help prevent climate change from destroying the agricultural industry.

One question I have about this petition is how are farmers, ranchers of color more vulnerable to climate change? The petition mention that rural farming communities lack the resources need to adapt to change but it does not discuss the reasons why this is happening. To better understand this petition, I would like more information on how farmers can find ways to improve our air and land qualities. The petition mentions only a few ways like having farmers use renewable energy like wind and solar power.

If I could say something for the farmer and ranchers who put this petition together, I would say that I will sign this petition. I would give my support to help express my concern about climate change and the impact it had on agriculture. This includes calling for solutions that invest in our agricultural industries.

This document tells me that climate change adversely affects agriculture. Climate change is caused by humans and is not cause by natural events. This petition also tells me that farmers must adapt their farming practices to deal with extreme weather changes in the future.

I feel the author's intended audience is people who are activist. Activists must let their legislative representatives know how they feel about climate change and sustainable farming. Activist need to influence the legislation of new policies that care about the climate and farming.

I believe this genre is effective. A petition makes sense in order to raise awareness on the issues surrounding climate change and agriculture. I counted nine "we" verbs and about four "we" and "our" verbs are to bring all the farmers and ranchers together as one collective unit. It is like they are united.

I believe this petition is credible. It was written by the NSCA (National Sustainable Agriculture Coalition) which is an alliance with over 116 member groups that work collectively with NSAC's Washington, D.C based staff to promote and enhance sustainable food and farm policy at the federal level

Quotation: "Our food security depends on embracing agricultural solutions to a changing climate." (p.4)

Citation: Held, Lisa*." The real Climate Impact of Organic Farming".* FoodPrint,18 Feb. 2020. Web. 17. Oct.2020. https://www.foodprint.org

Summary: The central ideal to this blog is that as the climate crisis "heats up'' there seems to be questions regarding organic farming. Some scientists believe that organic farming could be reduce greenhouse gas emissions (GHG) and others believe that organic farming is worse for the environment and helps to cause climate change.

The WRI report mentioned in this blog says that GHG emissions are directly related to how farmers farm. This includes using fertilizers to make the soil healthy, but these products also release nitrous oxide that is potential greenhouse gas. Fossil fuels are also used in pesticides and in tractor fuel.

Another study discusses in this blog found that organic farming would reduce emissions are compared to traditional farming methods when it came to crop production. But the catch is that organic farming produces less of a harvest, so more land is used for crop production. Using more land means an increase in gas emissions.

The Rodale Institute shows that the crop yields or how much organic crops being produced are lower in the first few years. Over time, there is no difference in the number of crops produced between traditional farming vs. organic farming. Also, organic farming builds up the organic matter in the soil that helps farmers produce healthy crops. The blog concludes by saying that there needs to be more studies on organic farming, and it is benefits has not been fully researched.

Reflection: I agree with the text where it says that farmers are also part of the problem. The way that most farmers farm today contributes to climate change. Farmers use techniques that pump carbon dioxide nitrous oxide and methane into the atmosphere. In order for me to make up my mind as to whether or not organic farming contributes to climate change or that it is better way to farm, I would need to read more articles on the topic. This way I can be informed individual and make up my own mind. The problem is that even scientists are undecided as to what the benefits of organic farming are.

One question I have about what the text is saying is, what exactly is organic farming? “That reputation is mainly attributed to the fact that organic food is produced without the use of chemical fertilizers and pesticides (despite the fact that it’s much more than that for dedicated organic farmers), which can damage ecosystems and be harmful to human health at certain levels”. I learned that organic farming means that farmers do not use pesticides. I want to know what the line does “that it’s the much more than that for organic farmers” mean. I do know that when I go to the store organic fruits and vegetables are more expensive. I am also interested in asking the author what farmers most think about organic farming. Would it be easy for our farmers to change the way they farm and move towards organic agriculture?

To better understand this article, I am interested in knowing what a food print is because this article is written in a food print blog. I looked this up online and found that the purpose of a food print is to make sure that food is produced in a fair and clean way. A food print is an educational organization that brings awareness to how food gets from the farm to you table.

If I could say something to this author, I would ask her how can I as consumer lower my food print? Is it worth the money buying organic groceries to help the environment even though organic means higher consumer cost? This document tells me that climate change affects the agriculture industry. Farmers are aware that harmful chemicals (The byproduct of farming) are being emitted into the atmosphere. These chemicals are responsible for global warming which in turn cause various crops to be ruined.

I like the author’s writing style. Her writing was easy to understand. I did not have to reread the article so many times like I did when I read Wollstonecraft’s letter. The author did not write this passage about God, did not put herself down, and did not include poetry. She gives us

facts and details. This genre is effective, and it make sense for what the author wanted to accomplish.

I believe the author's intended audience is the consumer. I learned that we have the power to make changes in our lives by doing our share to end climate change. We could make it a point to only buy organic foods. Then farmers would get the message that they need to change how they farm to protect the earth and help end climate change.

I do not know anything about the author of this blog except she is a reporter, writer, and editor. She is not a professor or a scientist. Maybe she cannot study the effects of organic farming on our environment, but I believe she is writing this article because she cares 100% about our planet

Quotation: "The practices invented in organic are not the only ones that are going to be necessary to deal with full spectrum of climate impact when it comes to agriculture, but they are central" (no page number)

Conclusion:

What I found in my research is that climate change is real, and it has major impact on the agricultural industry. My research has shown that climate change has an adverse impact on farms and that farmers need to modify the way they farm in other to help the environment.

Our climate is changing. The average temperature of earth is rising continuously, the amount of rainfall is decreasing per year, and we are going through longer periods of droughts.

I also found that greenhouse gas emissions are one of the largest contributors to climate change. According to EPA, carbon dioxide, methane, and nitrous oxide make up the vast

majority of greenhouse gas emissions. These gases are release into the atmosphere when fossil fuels like oil and coal are uses. We use oil and coal to heat our houses and make our car and buses run. People are creating this situation. It is not a natural event.

I also found in my research that climate change is affecting agriculture. Farmers are noticing that as our climate is changing more crops are being destroyed by heat and farmers are unable to plant the same kind of crops on their land as they use to. This is because most healthy crops grow in a narrow range of temperatures. Also, earth' soil is being washed away from increased flooding and the soil is losing important nutrients and mineral necessary for the growth of plants. Crop yields are smaller and crop diseases and pests are rising because of humidity levels are rising.

What surprised me the most is that farmers are adding to the climate change problem. I had no idea that farming adds to the greenhouse gas problem. For example, tractors use fossil fuels to run. On one hand fertilizers and pesticide can help encourage crops to grow healthy but, it also led to pollution that can ruin the environment and add to climate change.