CS-E4450 - Explorative Information Visualization Approach

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1 Topic

I would like to aware people on the negative effects that livestock farming has on the planet, mostly in terms of water scarcity, deforestation and Green House Gas (GHG) emission. The goal is to make everybody understood the importance of dietary change in order to personally contribute to the resolution of climate change.

2 Motivation

My keen interest in climate change comes mostly from my unconditional love for traveling. Since I am a child, I travel the world with my family and have the chance to see amazing landscapes, islands and species that this amazing planet shelters. I am very grateful for that and I want to be able to offer the same experience to my children. Why tackling livestock farming among the other causes of climate change (electricity generation, transportation, manufacturing...)? Because the former can be influenced by individuals, whereas the others depends on some political changes within our governments. If people decide to change their eating habits, then the consumer demand will decrease and so will the supply.

3 Approach

I would like to create a visualization that people can relate to. I first thought about a world map showing, for example, the areas of deforestation due to livestock farming. But the vastness of these lands are difficult to visualize on that kind of map and the astonishment reaction would be lower than expected.

I think that a better approach would be to compare the savings in water consumption/GHG emission/deforestation that you could achieve if you reduce/stop eating meat, compared to the savings that you achieve when following some well-known recommendations to lower your impact (e.g. take showers instead of baths, take the bike instead of the car, use digital documents instead of printing). The goal would be to show that the effects of consuming meat on a regular basis are so negative that the little savings you do on the side to help you sleep better are completely useless. At first glance, I am thinking about barplots. This would be the most simple and efficient visualization to compare these two. Going further, I aim at integrating the space and time components into my visualizations. For example, one could visualize the number of trees cut per second equivalent to eating two beef steaks by week, or how many swimming pools does eating 1kg of meat each week represents.

4 Tools

I am thinking about https://observablehq.com to implement my visualizations. I am also thinking about integrating 3D modeling drawings, designed with SketchUp, in order to impact even more with well-known object (soccer fields, swimming pools) or locations (monuments, buildings, squares) that people are familiar with. Here is an example of what I have in mind: https://www.youtube.com/watch?v=DtqSIplGXOA.

5 Data

Most of the numbers I will use in my visualizations will be retrieved from the following scientific paper: https://science.sciencemag.org/content/360/6392/987/tab-pdf, written two researchers of Oxford. The keypoints of their paper are:

- *"Today's food supply chain creates 13.7 billion metric tons of carbon dioxide equivalents (CO2eq), 26% of anthropogenic GHG emissions."*

- *"The farm stage dominates, representing 61% of food's GHG emissions (81% including deforestation)."*
- *"Today's agricultural system is also incredibly resource intensive, covering 43% of the world's ice- and desert-free land. Of this land, 87% is for food and 13% is for biofuels and textile crops or is allocated to nonfood uses such as wool and leather."*
- *"We estimate that two-thirds of freshwater withdrawals are for irrigation, then predominating in water-scarce areas and times of the year, driving 90-95% of global scarcity-weighted water use."*
- *"Ninetieth-percentile GHG emissions of beef are 105kg of CO2eq per 100g of protein, and land use (area multiplied by years occupied) is 370m^2.year."*
- *"In particular, the impacts of animal products can markedly exceed those of vegetable substitutes. To such a degree that meat, aquaculture, eggs, and dairy use 83% of the world's farmland and contribute 56-58% of food's different emissions, despite providing only 37% of our protein and 18% of our calories."*

Other data sources include the documentary *"Cowspiracy: The Sustainability Secret"*, and the book *"Comment j'ai arrêté de manger les animaux"* from Hugo Clément.

6 Expected results

I would like to create an interactive tool showing the impacts of livestock farming on our planet (water consumption, deforestation and GHG emission). I expect that the differences between usual savings and those from reducing meat consumption will be so significant it will raise awareness about the negative effects of livestock farming on the planet, and eventually convince people to change their dietary habits.