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CONSEQUENCES OF INCREASING GREENHOUSE GAS EMISSIONS: CASE STUDY ON THE IMPACT OF THE FOOD INDUSTRY

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Abstract:*The global carbon footprint has increased to frightening heights due to rising greenhouse gas emissions, mainly from the energy and industrial sectors, which include the food industry. This case study examines how the industry's carbon emissions have changed over time, highlighting the sector's major environmental impact and the pressing need to implement decarbonization plans. The particularity of the study lies in the analysis of the crucial role that emissions from the food industry play in global emissions. An overview of the global industrial carbon footprint was created through an analysis of carbon emissions data from multiple sources, with a particular focus on the food industry. Since the Industrial Revolution, carbon dioxide emissions have increased dramatically worldwide, reaching a record high of 36.3 billion tons in 2019. With around 23% of global emissions coming from industry, the energy sector is the largest emitter. The main cause of emissions is the use of fossil fuels in heavy industries such as steelmaking, cement, and chemicals; the two largest emitters are China and the United States.*

Achieving the goals outlined in the Paris Agreement and halting climate change requires reducing carbon emissions from the food industry. The adoption of low-carbon technologies, increased energy efficiency and a shift to cleaner energy sources are essential remedies. The industrial sector needs to decarbonize faster, and this can only be achieved through international cooperation and strong government regulations.

Introduction

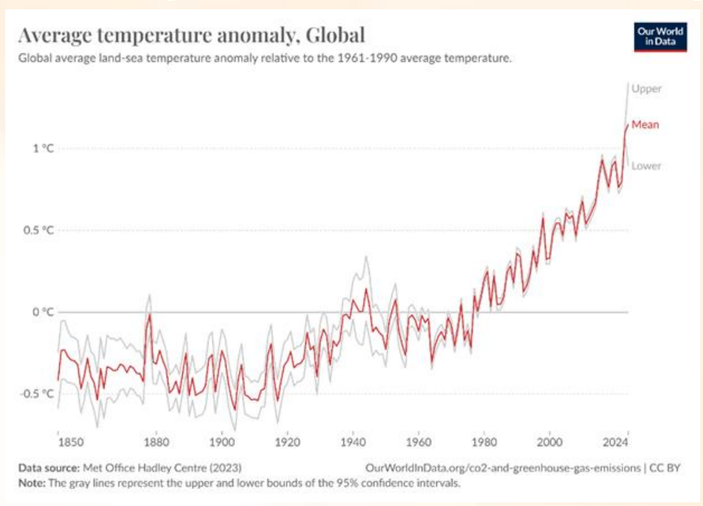
Climate change is one of the most pressing issues facing our planet today. The main cause of climate change is the emission of greenhouse gases (GHGs) into the atmosphere from various anthropogenic sources, such as fossil fuel burning, deforestation and industrial agriculture (SCHULZ, 2022). GHGs act as an invisible blanket around the Earth, trapping solar heat and causing global temperatures to rise. This temperature increase has serious consequences, including increased extreme weather events, rising sea levels, melting glaciers and changes in biodiversity (ARIAS ET AL., 2021)

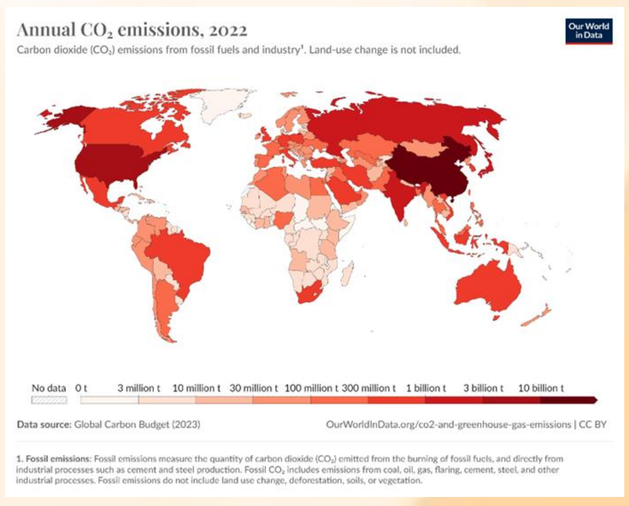
The need to promptly address climate change, mainly stemming from greenhouse gas emissions from human activities, including agriculture, is crucial. To this end, key international agreements have been concluded, such as the Paris Agreement and the UNFCCC, which were created to set targets and a framework for reducing emissions.

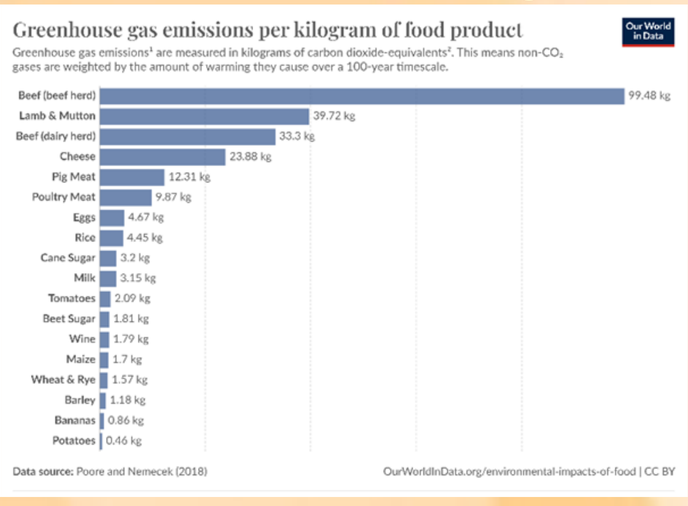
United Nations Framework Convention on Climate Change

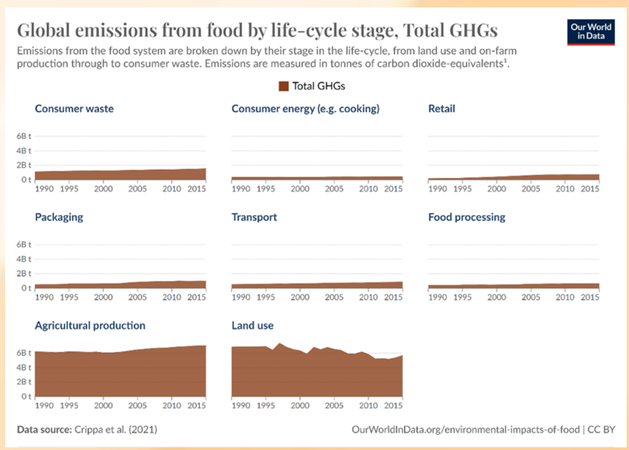
Material and method / Results and discussions

This case study examined the evolving impact of the food industry on global carbon emissions. The research aimed to highlight the significant contribution of industry to the environment and highlight the need for decarbonization strategies. Global carbon footprint data was obtained from academic databases such as Web of Science, Scopus or Elsevier, but also sources such as Global Carbon Budget, Intergovernmental Panel On Climate Change or Paris Agreement on climate change were used. Information on greenhouse gas emissions per kilogram of food product was obtained from an LCA study published by POORE &; NEMECEK (2018), and data on global food emissions by life cycle stage were taken from a scientific article by CRIPPA ET AL. (2021).Descriptive statistics were used to analyze data collected on global carbon footprint and food-related emissions. The figures were created to illustrate trends and variations in emissions across different food sectors and categories.









Conclusions

This study presented a comprehensive analysis of climate change, greenhouse gas (GHG) emissions and its impact on the environment. The data and figures presented underline the urgent need to take concrete measures to reduce GHG emissions and mitigate the effects of global warming.

Human activities, especially the burning of fossil fuels and deforestation, are the main contributors to rising global temperatures. The Paris Agreement provides a global framework for climate action, setting ambitious GHG emission reduction targets. CO_2 emissions vary significantly between countries, and developed countries bear greater responsibility for reducing their historical and current emissions. Food choices can influence GHG emissions, low consumption of red meat and adoption of a diet based on grains, vegetables and dairy can help reduce climate impact. Food waste and agricultural production are the stages in the food life cycle that contribute most to GHG emissions. Reducing food waste, improving sustainable agricultural practices, and implementing sustainable solutions throughout the food chain are key to reducing emissions from this sector. To successfully combat climate change, collective action is needed from governments, industry, communities, and individuals. Effective strategies to reduce GHG emissions need to be developed and implemented in all sectors, including energy, transport, agriculture, and waste management. Continued investment is also needed in research and development of clean technologies and sustainable practices that can help reduce our carbon footprint.