BAT 404 - Analytics Techniques and Tools

Final Project Proposal Topic:   
A Data Exploration of Carbon Emission to Improve the Implementation of NDC in the Philippines

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**Introduction**

Climate change is happening right now, and it is considered as the biggest environmental problem that today’s generation has ever faced. The National Aeronautics and Space Administration (NASA) explains how climate change has thoroughly changed the Earth for the past centuries. Global warming is unmistakably the product of human activities since the mid-twentieth century, and it is occurring at an unprecedented rate spanning millennia.It is undeniable that human activities contributed to warming the atmosphere, ocean, and land and that widespread and rapid changes in the atmosphere, ocean, cryosphere, and biosphere have occurred. Since the late 90s, the average surface temperature of the planet has risen about 2 degrees Fahrenheit (1C°), causing increased carbon dioxide emissions into the atmosphere and other human activities. During the last 40 years, the majority of the temperature rise has occurred with the last seven years being the warmest. The hottest years on record are 2016 and 2020.

Though carbon dioxide absorbs less heat per molecule compared to other greenhouse gasses, it is the most abundant and stays longer in the atmosphere. It stays 300 to 100 years in the atmosphere, and each year, we emit carbon dioxide in the atmosphere more than what the natural process could remove.  Increasing atmospheric gas causes an energy imbalance that contributes to the rise of the Earth’s temperature. Carbon emissions have a direct impact on humans, with increased smog and air pollution causing greater respiratory problems or diseases. Not to mention the fact that if carbon emissions wipe out particular animal species, disrupt crop production, and devastate lands, people will suffer the consequences.

Philippines, despite being one of those countries who contributes less on carbon emission, implements a mitigation plan as response to climate change. Recently,  President Rodrigo R. Duterte has approved the Philippines’ first Nationally Determined Contribution (NDC) which aims to reduce greenhouse gas (GHG) emissions by 75% by 2030, the Finance department stated. Though the country's ability to achieve the target of NDC still depends on the cooperation of public and private sectors.

This project is conducted to provide a data analysis that could help to improve the mitigation plan in response to climate change that can be implemented in the Philippines and helps to achieve the NDC.

**Problem Statement**

While the goal of the NDC seems to be too ambitious, it can’t be done by the government alone. A huge effort from public or private enterprises is needed as well as the local government and most specially each citizen of the country. It takes all individuals to make the changes possible. The primary issue that this project addressed is the low level of participation and involvement of  the local communities and local governments, due to lack of available and sufficient information on the implementation process and measures aimed at achieving it. Monitoring progress becomes much more difficult due to the absence of information. If there is a lack of civil society participation, it can hinder transparency and accountability efforts by government and related monitoring mechanisms at all levels.

**Significance of the proposed project**

This research will specifically benefit the following:  
 *Government* - This research will help them to improve their implementation of mitigation plans for climate change, and make the local communities and individuals participate in the program and achieve the goal.

*Citizens* - This research provides information to the Filipino citizens about the current situation of the globe and the country itself concerning greenhouse gas emission that results in climate change. For them to be aware and well informed on how they could contribute and cooperate to the government to achieve the goal.

*Future Researchers* – The findings of this study may be utilized to help the future researchers in their future studies in relation to climate change and come up with an ideal mitigation plan for climate change that they may propose to their local community.

**Methods**

Local communities cooperation is a crucial aspect of the implementation of NDC. Data exploration will be conducted by the researcher to visualize the data and easily identify the insight of other countries' response to climate change and dig deeper into their mitigation plan to achieve the neutral greenhouse gas emission in their country. Excluded in the datasets that the researchers have, was the details of the mitigation plan of each country. In order to acquire more knowledge about how they manage to have a positive response in carbon emission, the researchers collected articles that provide adequate information about their mitigation strategies. Those countries who have achieved the net-zero emission that was shown in the dataset will be listed along with their strategies. Their plan will be evaluated and the existing mitigation strategies that the Philippine Government have implemented across the country will be compared in order to determine how to improve it.

**Expected output**

2020 ranks as the second-hottest year on record for the planet, knocking 2019 down to third hottest, according to an analysis by NOAA scientists. [NASA](https://www.nasa.gov/news/releases/latest/index.html) scientists, who conducted a separate but similar analysis, have determined that 2020 ties 2016 as the warmest year on record, sharing the first-place spot (NOAA, 2021). This research is conducted to provide an efficient exploratory of data to be utilized in order to improve the implementation of NDC in the country. Effective cooperation to meet the goals established requires good and efficient climate change governance. To minimize duplication of effort between the government and civil society, the governance system must also include a transparent distribution of tasks.

**Reliability of the Source**

*Our World in Data*

This data portal produced by the Oxford Martin Programme on Global Development at the University of Oxford is made available as a public good. Data analyses and visualization is used to explore a wide range of topics that are important to understanding trends in global living conditions, including health, food and nutrition, income growth and distribution, violence, human rights, war, education, the environment, and more. The portal disaggregates data in each of these topics to illustrate trends, offers contextual background, and provides discussion about the quality of data and sources. This portal illustrates the interconnections among global health issues and the roles they play in altering living conditions over time. Users interested in public health may be particularly interested in the [“meta-entry” on global health](https://ourworldindata.org/health-meta), which provides a high-level introduction to key issues with links to specific analyses on related topics such as life expectancy, maternal and child mortality, disease burden, health systems and financing, and more. The founder of Our World in Data is Max Roser, an economist at the University of Oxford. He provides suggestions to educators who want to use [data visualization in presentations](https://ourworldindata.org/about/how-to-use-our-world-in-data).

Our World in Data is free, open-source and provided as a public good. It has millions of users every month, and is cited in research and media across the world every day. This allows millions of people to understand the large problems the world is facing, and how we can solve them.

*NASA Goddard Institute for Space Studies (GISS)*

The NASA Goddard Institute for Space Studies (GISS) is a laboratory at the National Aeronautics and Space Administration's Goddard Space Flight Center's Earth Sciences Division (ESD) (GSFC). The ESD is part of the GSFC's Sciences and Exploration Directorate. One of GISS's main goals is to forecast atmospheric and climatic changes in the twenty-first century. The study combines the use of global models of atmospheric, land surface, and oceanic processes with the analysis of large global datasets. Past climate change on Earth and in other planetary atmospheres may be used to evaluate our overall understanding of the atmosphere and its history.

Program areas at GISS may be roughly divided into the categories of climate forcings; climate model development; Earth observations; atmospheric radiation; atmospheric chemistry; climate impacts; planetary atmospheres, exoplanets, and astrobiology; paleoclimate; and other disciplines.Because of the links, the majority of GISS employees work in multiple of these fields.Space observations provide critical data for monitoring global change and developing a better knowledge of the Earth system. Goddard Space Flight Site plays a key role in global change studies as NASA's primary Earth observation center. GISS's global change research is coordinated with that of the GSFC Earth Sciences Division's other offices and laboratories.

**Evaluation of the X variables inside the Data sets:**

*CO2 and Greenhouse Gas Emissions*

|  |  |
| --- | --- |
| **X Variables** | **Description** |
| Entity / Country | This are the countries or regions that contributes CO2 |
| Code | The countries code |
| Year | The year CO2 emitted |
| Annual CO2 Emission | Indicates how much CO2 emission of the country |
| Annual CO2 Consumption | Indicates how much CO2 consumption-based of the country |
| GDP PPP | Shows the Gross Domestic Product Based on Purchasing Power Parity of each country |

*GISS Surface Temperature Analysis (GISTEMP v4)*

|  |  |
| --- | --- |
| **X Variable** | **Description** |
| Year | Indicated the annual global temperature anomalies |
| January | Indicates the monthly temperature anomalies |
| February |
| March |
| April |
| May |
| June |
| July |
| August |
| September |
| October |
| November |
| December |
| July  December | Indicates the seasonal temperature anomalies |
| December - November |
| December, January, February |
| March, April, May |
| June, July,August |
| September, October, November |

**References Datasets:**

Ritchie, H. and Roser, M. (2020, August).  *CO2 and Greenhouse Gas Emissions.*  Retrieved

April 2022, from Our World in Data: <https://ourworldindata.org/co2-and-other-greenhouse-gas-emissions>

Schmidt, G. (2020, March). *GISS Surface Temperature Analysis (GISTEMP v4).* Retrieved April

2022,  from National Aeronautics and Space Administration - Goddard Institute for Space Studies:<https://data.giss.nasa.gov/gistemp/>