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Climate colonialism: Tracing the historical responsibility of developed states in climate change

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Abstract
This research report aims to conduct a qualitative analysis on the concept of Climate colonialism. This is done with the help of a stark contrast between two states - Britain and India - with the goal of differentiating their respective climate debts and reflecting over the reasons behind the same. We analyze the economic landscape and deliberate over the various differentiating factors such as industrialisation, colonization, population, and how these phenomenons have to come to shape climate debt as we know it. It aims to delve into newer aspects to hold the developed states accountable for the carbon emissions.
The most crucial question that now arises is a basic one. Why climate change ? It is imperative to first understand the urgency and the need to address this topic. The motivating factor driving us to research and address this topic is the same as what brought Greta Thunberg to the gates of the Swedish Parliament. Where the world has been facing the growing problem of cities drowning, forests burning, and people dying with thirst, millions have been displaced and pushed to poverty. In order to deal with such harrowing instances of climate change, countries need to come up with policies and funds to meet with their climate change agendas. Developing countries, then, are faced with setbacks due to lack of funds, and historical exploitation at the hands of the Global North countries, leading to inability to adapt to the rising costs and implement policies for a better future.

Keywords: Climate, Tracing, developed states

Introduction

The unprecedented capitalist development of economies from around the world have raised dire concerns due to their contribution to the greenhouse effect. This link between economic growth and environmental degradation has been proved by multiple models such as the Environmental Kuznets Curve (EKC) which draws a link between sulfur dioxide emissions and Gross Domestic Product (GDP) per capita in 47 cities distributed over 31 countries. Considering the gravitas of these concerns, it becomes a matter of utmost concern to comprehensively account for these emissions and accurately pinpoint the accountability of states around the world.
The primary approach taken towards devising national responsibility for adverse climate change revolves around current territorial emissions. This is an evident shortcoming since factors such as difference in population are totally overlooked. This becomes a hindrance in equality-based access to atmospheric commons. A better way would be to root this analysis in terms of cumulative historical emissions as incurred by each state. This new method is based on the basic principle that the atmosphere is a common resource and all the people must have equal access to it. This is also termed as equal per capita access to atmospheric commons. Any country that exceeds its fair share of emissions would hence be in climate debt (while those within the limits of their respective fair shares would be in credit).
Fair share of a safe global carbon budget consistent with the planetary boundary has been determined at 350 ppm atmospheric CO_2 concentration. This fair share can be subtracted from the actual historical emissions that the countries have incurred in order to ascertain the extent to which countries have exceeded or undershot this limit. After mapping consumptions since 1850 and following this process, the conclusion drawn highlighted that the USA is responsible for a staggering 40% of excess global CO2 emissions while the European Union is responsible for 29%. This becomes particularly interesting as countries like India and China face regular criticism over pollution caused; however, this study proves that they are still in climate credit. This showcases how the developed countries have higher accountability for climate change as compared to developing countries.

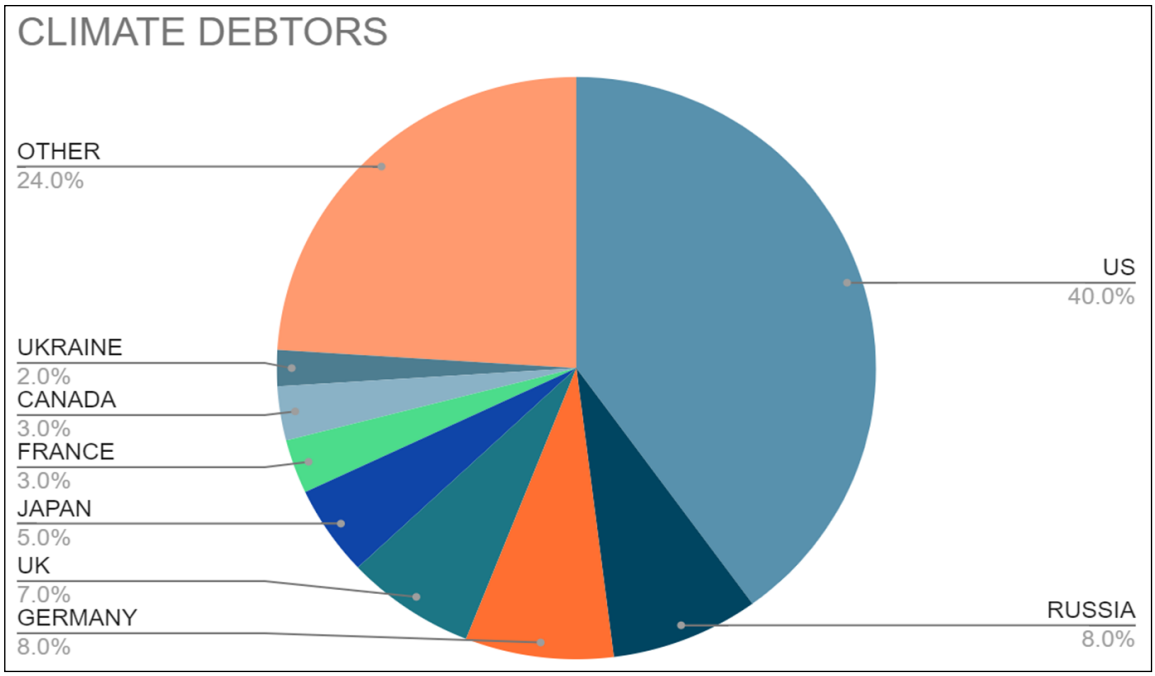


Fig 1

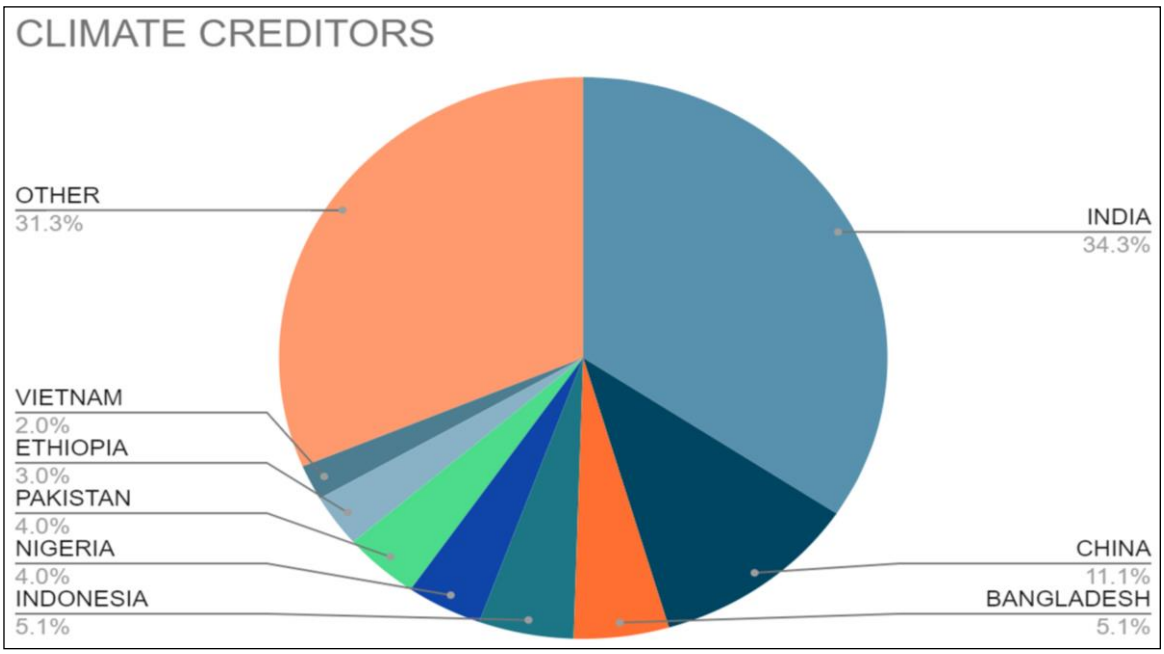


Fig 2

India-UK Comparison

For a comprehensive analysis of this study, we'll approach it by drawing a stark comparison between India and the UK. In the year 2019, the UK witnessed CO2 emissions amounting to 550 million tonnes as opposed to India's figures of 2201.865 MT. This might not come as a shock to most readers as we regularly see Indian cities making it to the list of top most polluted cities in the world. What's interesting to note is that in contrast to this statistic, the study being discussed interestingly concludes that India is in climate credit of 34% while UK is in climate debt of 7%. Hence, let's reflect on this conclusion by discussing some factors that must be taken into consideration while devising national responsibility for adverse climate change.

1. Industrialisation

Since human beings began to evolve, the innate human desire to enhance their level of living has been a persistent phenomenon. Humans have engaged in activities that utilize natural resources for a better yet unsustainable life since the dawn of humanity. Excessive use of natural resources such as coal has resulted in an increase in global temperature, resulting in climate change.

With the passage of time, humanity began to evolve and seek for less expensive means of sustaining their existence. The industrial revolution was one of the primary instances where humans began to use machines to alleviate labor in order to revolutionize the economy, connect distant places, increase metropolitan areas, and bring technology to the forefront. It was characterized by large-scale expansion with increasing mechanization and new industries being set up rapidly. This inevitably put more strain on the respective states' resources which were soon being exploited. Oceans were being scoured for fuel, land being mined for coal and forests being cut down to meet the increasing land requirements.

This becomes an important point to take into account due to the difference in industrialisation periods. Industrialisation prevailed at different times in different states. For instance, Britain witnessed it almost a century before India which meant that it had already scaled up its industries multifold before India could even dream of doing the same. According to E. A. Wrigley and Kenneth Pomeranz, Great Britain shifted from a self-sustaining to a mineral resource-depleting inorganic economy in the mid-eighteenth century [1].

The coal industry was a significant contributor to Britain's economic growth and, as a result, a key actor during the industrial revolution. Coal was produced and utilized as a fuel for steam engines. Later, as the railway networks expanded, coal use increased rapidly. Coal was a significant actor in each industry, like salt, soap, alum, gunpowder, refining sugar, brewery, etc. The use of coal was not limited to the industries but expanded into the domestic sphere as well, for cooking and heating purposes. An estimation of the growth of coal production by John Nef, an economic historian, has shown that the coal industry has produced 210 thousand tons of coal annually during 1551-1560 and 2.9 million tons during 1681-1690, thus representing a growth rate of 10.15% per annum on an average for a period of 130 years. Between 1852 and 1862, the British coal usage averaged 65 million tons per year. During the decade 1903-1912, this figure increased to 181 million tons. The peak year for coal production in the United Kingdom was 1913, when 287 million tonnes were produced, with 10.86 tons as per capita emissions. The coal business grew exponentially as a result of the increased demand produced by technological improvements.

Britain wanted to expand its newly found technology to the rest of the world, and thus landed on Indian soil. The coal industry in Britain was well-established before it came to India. However, Indian coal fields were not equipped with the technology to commercialize the commodity. This idea was brought to India by the Britishers in 1774, when coal mining was commercialized in the Raniganj Coalfield along the Western bank of river Damodar. Although India faced multiple challenges in the initial years with the quality of coal available here and the ones available in Britain, the latter being more superior, the production gathered pace in the 1850s. The production of coal India rose to an annual average of 1 million tonne (mt) and India could produce 6.12 mts. per year by 1900 and 18 mts per year by 1920. The numbers clearly showcase how the Indian coal industry was at a mere nascent stage even by the late 1800's while in Britain, it was booming by then. We know that production quantity is proportional to the resultant total emissions and hence, the steep difference in development stages between the two states was accompanied by similar steep differences in resultant emissions. In short, India was incurring only a small proportion of the emissions of the UK, simply because it was still much less developed.

The facts stated above simply direct us to a conclusion that industrialisation prevailed at different times in different nations. The industrial revolution was introduced and observed in Britain long before it reached India.This comes down to the fact that the industries in Britain have scaled up way faster than India could even dream of doing and that too well in advance, further proving our argument that the pollution caused by Britain is more than that of India's, and is unaccounted for.

2. Colonization

The nature of colonialism is concentrated on the colonists' exploitation of the colonized country. It is an ideology that enriches the lives of the Europeans at the cost of the colonized people. In this case, the Indians. For centuries, the Indians have been a subject of political oppression, economic exploitation, murder, and genocide. There is no question that a colonizer will choose policies that are detrimental to the colony on purpose. Britain colonized India with the specific goal of conquering the country's lucrative industries and foreseeing a bright future. In the 17th century, the East India Company set foot on Indian territory for the aim of trading. Soon, the market appeared to be ripe, resulting in the establishment of the company's monopoly.

The Britishers established their bases in specific cities in order to have better access to new lands, resources and laborers. New areas were seen with a different lens of expanding the colonizers' business, by exploiting not just the people but also the land. Mangroves, rainforests, wetlands, and forests were cleared to establish industries, which would further damage the environment in multiple ways.

From the 17th century till the mid 20th century, India was a colony of Great Britain, where most of its natural resources were exploited. The Indian Forest Act of 1927, in operation till 1980, was extremely exploitative in nature. The 1927 Act was an extension of the 1878 Act, both constituted during British rule. It was set up to establish state monopoly and acquisition, disregarding the rights and responsibilities of the adivasis and other forest dwellers whose livelihood depended on the forests. It was an Act that was made by the Britishers, and for the Britishers.

A later establishment by the Britishers that harmed the climate through displacement and migration while demolishing their habitat, was the development of railways. The rail industry was introduced by the East India company by launching steam locomotives in 1853. Despite the fact that railways were built with the intention of connecting distant towns, there was still an element of desire when the British built the railway system. The

railway industry was built at a time when coal production in India was not as advanced as it was in Britain. However, wood was used as fuel and as tracks also. This meant cutting of trees on a large scale. High levels of deforestation to develop the industry led to situations of drought and flood. This, in turn, affected the system of irrigation and food production, thus heightening social unrest. As the coal business grew, so did the railway sector, thanks to advancements in technology and time. The latter necessitated the use of a lot of coal. This degraded living circumstances even further by causing a lot of pollutants.

These instances establish the fact that the Britishers made the first move in establishing and exploiting the resources of the state they were colonizing. Although these inventions brought a massive development in the society, it also destroyed the natural, unsustainable resources of the places. The example of railways further proves that the developments hardly benefitted the locals but were established for the convenience of the colonizers. Indians were discriminated against using the railways, except the ones who were loyal to the Britishers. Apart from that, this showcases instances of avarice and exploitation, which is beyond repair.

Since these developments were initiated by and for the colonizers, would it be fair to hold the colonized countries, like India, responsible for the emissions incurred in this process ? In normal practice, these emissions are included in the country's tally of historical emissions. This leads us to another question of how to ascertain what fraction of total emissions can be linked to the colonizer. This aspect needs more mechanization to be able to accurately pinpoint the true accountability of each country.

3. Population

First thing to note is the vast differences in population of different states. It would be unfair to compare India with the UK because the former has a much higher population density. The amount of resources utilized in India are divided into a large population and hence, the amount of resources used per person would then be much lower than that of other countries. To be precise, the estimated total population in India amounted to approximately 1.38 billion people in 2020 as compared to a meager 67.61 millions in the UK. The same is reflected through the statistics of population density which reflect that India has a population density of 464 per Km2, while the United Kingdom has a population density of 281 per Km2, as of 2020. Once you equate the resources used by the population of both the states, you'll soon realize that per capita consumption is much higher in the latter's case. This is evident from the data provided by the World Resources Institute, India has per capita emissions of about 2.47 Tco2e (tonnes of carbon dioxide equivalent), as compared to the global average of 6.45 tco2 per capita.

4. Outsourcing Emissions

Another fair argument states that countries such as the UK and USA outsource their emissions to carbon intensive countries like China. Due to the rapid climate change trends, the world is moving towards stricter environmental norms with the objective of minimizing toxic greenhouse emissions. Various developed countries such as the US are trying to escape these norms by outsourcing their production units and factories to other under-regulated developing states for the sake of their own capitalist development. This is termed as carbon leakage. Following the current methodology of calculating territorial emissions, total emissions accruing out of these outsourced production units gets linked to the host country while the former escapes accountability allowing the former country to preserve its own environment at the cost of other foreign countries. This is another reason as to why many researchers wish to base accountability not just on production but even on consumption. This can be done by tracking the countries which reap the ultimate benefit.

Linking this back to the ongoing India-Britain comparison, the following table showcases the Emissions Embodied in Bilateral Trade (EEBT) between the two countries. The table clearly highlights that the emissions incurred in India for the purpose of export to Britain is much larger than emissions incurred by Britain for export to India. Hence, it's evident that the UK is outsourcing its emissions to India to better reach its emissions mitigation targets.

Table 1

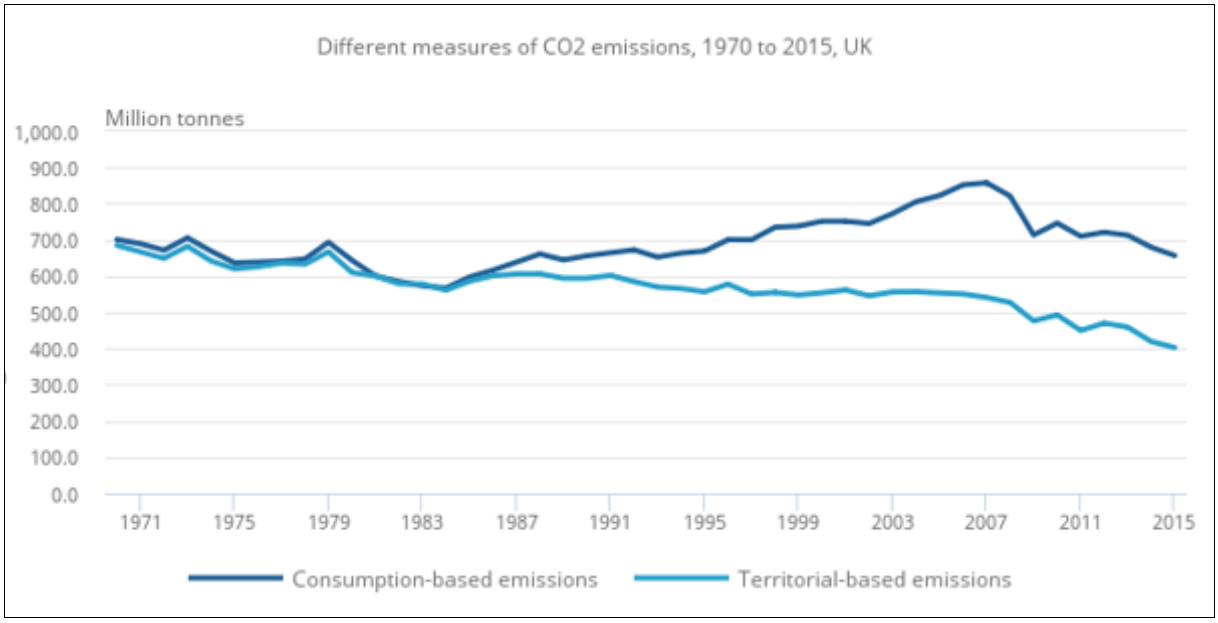
Emissions	Quantity (2015)
Emissions Embodied in Indian Export to UK	8.314 Million Tonnes
Emissions Embodied in Indian Import from UK	0.686 Million Tonnes

India's method of manufacturing is emissions intensive due to its high use of coal-related sources as an energy source as compared to the UK which has devised non-traditional methods incurring less pollution. Hence, India gives rise to a greater amount of emissions for the same amount of production as compared to the UK. This holds true for unilateral trade between various developed and developing countries which leads to the conclusion that 'Carbon leakage' in turn, results in greater net emissions.

Trading responsibility

A relatively newer and unique approach also links accountability not just to countries that directly emit CO2 but also to countries that purchase and consume the goods associated with those CO2 emissions. Currently, national emissions inventories conducted under the UN Framework Convention on Climate Change (UNFCCC) only

consider emissions that occur within the borders of each country. This means that currently the responsibility remains with the exporting state.
This is important because rapid globalization has resulted in service-based economies creating indirect emissions through outsourcing of manufacturing processes. Hence, CO2 emissions embodied in international trade must be ascertained to gauge the states' true accountability.



Source: Eora, 2018, World Resource Institute, 2017 and Department for Business, Energe and Industrial Strategy, 2019b

Fig 3: Decouping of GDP per head from CO2 emissions seems to have happened at the expense of outsourcing manufacturing

The figure shows how the UK's consumption-based emissions were only slightly higher between 1971-1986 since it had a prominent manufacturing sector at the time which met the majority of the domestic needs. This changed as the state gradually shifted from a manufacturing-based to a service-based economy. The figure hence showcases decoupling of the GDP due to outsourcing of production to other developing countries. Decoupling is when the growth rate of an environmental pressure (CO2 for instance) is less than the economic driving force (GDP for instance). We've already established the importance of population and size of a state as a factor while drawing a comparison. Furthering the same concept, the UK has one of the highest per head net imports of carbon dioxide emissions. Despite the US being the highest importer of CO2 emissions, the UK has more emissions per head as compared to the US.
Taking CO2 imports and exports into account would increase US emissions by 6% while Chinese emissions would be lowered by 13%. Switzerland is an instance of an extreme case where the emissions would be 209% higher if C02 imports were taken into account. India's consumption-based CO2 emissions amounted to 2.41 billion tonnes as compared to the production based CO2 emissions of 2.63 billion tonnes while the figure stands at 520.70 million tonnes and 369.01 million tonnes for the UK respectively.
Consumption Based Accounting (CBA) is a relatively new and emerging method which isn't largely regarded as 'official statistics' yet due to variability in results. However, the results of the multi-regional input-output table (MRIO) models differ by less than 10% for major economies which is considered acceptable.

Brazil - an anomaly
Countries with vast swathes of forest lands have been exploited and been subjected to deforestation on a massive scale. There is a need to prevent these forests from being cut down and responsible actors to take accountability. Verified Carbon Standard (VCS) is a new initiative in this field which aims to fulfill these above mentioned goals. They implement projects through which they hire local members and distribute duties, such as, patrolling the forest, building fire lines to prevent wildfires, etc. They also issue carbon credits - one for every ton of CO2 that would have otherwise been released.
The carbon credits are sold to the governments or individuals, and are channeled to affected communities to provide them with a livelihood, wildlife protection, offer new jobs, education, and other things that transform their dependency from the forest to the local economy. One of the registered initiatives under the VCS is Reducing Emissions from Deforestation and Forest Degradation (REDD+). The plus sign signifies conservation of forest carbon stocks, sustainable management of forests, and enhancement of forest carbon stocks. The supporters of REDD + argue that Brazil's voluntary carbon credit market has financially benefited the small-

scale farmers, indigenous and traditional people, and has also helped in conserving the forest, thereby protecting the climate.

The Article 6 of the Paris Agreement claims to strengthen the global response to the threat of climate change and help countries tackle the effects of such changes. This article is imperative in order to aid the developing states to receive financial aid from the developed states to foster sustainable development and mitigate carbon emissions. By acting as a carbon sink by the virtue of its expansive Amazon rainforest, Brazil has balanced the environmental scale for many years. This raises a simple but pertinent question - Should Brazil be allowed greater emissions as it is also the largest source of oxygen generation at the moment ? Brazil argues that the only way to save the jungle is through carbon credits and by financing sustainable economic activities so that people can make a living from fish farming, cacao production and other activities that don't require the razing of trees. Thereby, Brazil has demanded compensation from the developed states for the preservation of flora and fauna in the Brazilian territory. It has demanded monetary compensation in exchange for retention of forest count.

Conclusion

Through the literature review and data research conducted, we can conclude that accounting for territorial emissions alone is an incomplete method of assessing a states' emissions. The factors discussed in the research paper play a crucial role in determining the true accountability of a state. This is constructively explained using the India-UK case study where the former acts as a developing country representative while the latter is a developed country representative.

The statistics reveal that rich countries, such as the United Kingdom in this example, have a historical responsibility to developing countries, such as India. The former has wrongfully abused the latter's riches. Unfortunately, this practice did not end with the end of British colonial rule. As our research has revealed, newer approaches such as carbon import-export have perpetuated climate colonialism, making developing countries responsible for the emissions. These countries have borne the brunt of the atrocities imposed against them. Due to financial, social, and political challenges, such countries fail to reach the goals established by developed countries. These problems can be addressed by developed-country reparations to developing countries, which can take the shape of public apologies, social justice programmes, affirmative action, education cultural projects, commemoration events, and so on.

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