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**Are developed and developing countries equally responsible for reducing greenhouse gas emissions?**

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## Literature review-

### Section 1-

#### What is climate change?

The UN has defined climate change as “long-term shifts in temperatures and weather patterns. These shifts may be natural, such as through variations in the solar cycle. ”

Although the UN has stated that shifts in temperatures and weather patterns can be through natural causes, the article goes on to explain that the main driver of climate has, in fact, been human activity since the early 1800s. <sup>1</sup>

Primarily, the leading cause of human driven climate change is the burning of fossil fuels. These fuels, when burned, release copious amounts of greenhouse gasses (GHGs) which form a sort of blanket around the earth and absorb solar energy, keeping heat close to the earth’s surface rather than letting it escape into space. This has led to the creation of the term ‘global warming’ which is the gradual rise in surface temperatures. Climate change is a consequence of global warming. The Intergovernmental Panel on Climate Change (IPCC) has stated that the Earth’s average temperature has already increased around 1.2°C (compared to the pre-industrial era)<sup>2</sup>

Human activities like deforestation, rapid urbanisation, overgrazing, most methods of transportation, oil drilling and mass wastage and pollution are also leading causes of global warming.

The threats climate change poses to the entire world are undeniable. Climate change can lead to extreme weather events, such as heatwaves, storms, droughts, and heavy precipitation. These can be severe and unpredictable which can lead to massive crop failures, food shortages and water scarcity. The number of weather-related disasters

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<sup>1</sup> “What Is Climate Change?” *United Nations*, <https://www.un.org/en/climatechange/what-is-climate-change>. Accessed 9th October 2022.

<sup>2</sup> “Intergovernmental Panel on Climate Change.” *IPCC*, [archive.ipcc.ch/ipccreports/tar/vol4/index.php?idp=75](http://archive.ipcc.ch/ipccreports/tar/vol4/index.php?idp=75).

have increased more than fivefold since the 1970s with the clear cause being climate change.<sup>3</sup>

Climate change lead to global temperatures rising and the earth's ice caps and glaciers melting. This causes a rise in sea levels which directly puts all coastal communities and ecosystems at risk of flooding, storm surges and coastal erosion. Furthermore, climate change can also have a huge impact on wildlife as sudden changes in weather patterns can disrupt migration patterns and lead to species extinction. Climate change can also cause the extinction of certain habitats that require constant rainfall or certain temperatures. To add to that, even humans are at risk as increased temperatures can aggravate air pollution and aid the spread of air-borne diseases.<sup>4</sup>

Climate change is a serious global issue which affects the environment, well-being, biodiversity and even world economies.

### **The history of climate change-**

The entire concept of global warming and the harmful effects of greenhouse gasses was discovered in 1896, when Svante Arrhenius linked the rise in CO<sub>2</sub> and greenhouse gas emission to an atmospheric greenhouse effect. However, these findings were largely ignored at the time due to the lack of scientific knowledge regarding the topic. It wasn't till much later where we actually realised how serious this issue was.<sup>5</sup> In 1958, Charles Keeling measured the CO<sub>2</sub> concentration in the atmosphere at Mauna Lua observatory in Hawaii, finding out that it was, in fact, steadily increasing. These findings caused the first real concern in the scientific community regarding harmful gas emissions. However it wasn't till further research in the 1980's that we found out that the Earth's atmosphere is trapping more heat that it ideally should be. This discovery led to the birth of the term 'the greenhouse effect'.

After this, global concern and awareness increased rapidly, as thousands of magazine and newspaper articles were published on this topic. Subsequently, the first international agreement to address climate change was signed in 1992, called 'United Nations Framework Convention on Climate change'. This was followed by several similar conferences like the Kyoto Protocol and Paris agreement. <sup>6</sup> Many conferences regarding

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<sup>3</sup> World Meteorological Organization (WMO). "Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes (1970-2019)." 2021, [public.wmo.int/en/resources/library/atlas-mortality-and-economic-losses-weather-climate-and-water-extremes-1970-2019](https://public.wmo.int/en/resources/library/atlas-mortality-and-economic-losses-weather-climate-and-water-extremes-1970-2019).

<sup>4</sup> Steffen, Will, et al. "Global Change and the Earth System: A Planet Under Pressure." Springer, 2005

<sup>5</sup> Nunez, Christina. "Greenhouse Gases, Facts and Information." *Carbon Dioxide Levels Are at a Record High. Here's What You Need to Know.*, National Geographic, 9 May 2022,

<sup>6</sup> History.com Editors. "Climate Change History." History.com, A&E Television Networks, 6 Oct. 2017, [www.history.com/topics/natural-disasters-and-environment/history-of-climate-change](https://www.history.com/topics/natural-disasters-and-environment/history-of-climate-change). Accessed 8th November 2022.

climate change have taken place and countless regulations have been imposed. However, year after year, the problem worsens.

A further examination of the UN website gave me a better look at these conferences, and I noticed very similar language being used by the UN to describe each and every one of these conferences. Every year the UN holds a climate conference known as the COP, with the last COP27, that took place at the end of 2022. I further looked at some of these conferences through the UN website, and all of them were described as being 'a huge step towards international collaboration and working towards a joint global commitment to solve climate change'. However, climate change has been worsening every single year, with the last decade being the worst of it all, so what exactly have these conferences achieved?

Upon researching through sources that weren't influenced by the UN, I discovered that the UN clearly had a bias when describing their conferences as they couldn't call them outright failures. However, this wasn't an issue for independent news sources, I found tons of articles which criticised the UN for their inability to take any sort of definite action. The 2 articles I found most useful and reliable were from the Conversation <sup>7</sup>and the Guardian.<sup>8</sup> Both these articles had a very similar idea, and they were very useful in narrowing down why these climate conferences are failing. I had to account for possible biases in both of these sources, but the articles seemed fairly logical and based on scientific and historical data. The Guardian being a UK source could have a potential bias for its country which is why validating the idea with the Conversation was useful. Both of these sources have been known to exaggerate or use dramatic language in order to get clicks. Which is why I also consulting a science-based study by multiple authors<sup>9</sup>. The study by Rogeli, Joeri et. Al was peer reviewed and published in The Nature volume which makes it a reliable and credible source. Through all of these sources, I found a lot of points, the Guardian said that the UN had become too large for any of these conferences to work, that it was simply impossible for 193 countries to agree on something that involves so much power and money. While the Conversation said that the UN was completely under control of the richer nations, and it couldn't compel them to take any action. The main reason as outlined by all three of the sources I consulted was non-binding agreements. The UN has no real power to force any country to take action through these conferences.

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<sup>7</sup> Marc Hudson Researcher. "Don't Bet on the UN to Fix Climate Change – It's Failed for 30 Years." *The Conversation*, 8 Dec. 2022, [theconversation.com/dont-bet-on-the-un-to-fix-climate-change-its-failed-for-30-years-123308](https://theconversation.com/dont-bet-on-the-un-to-fix-climate-change-its-failed-for-30-years-123308).

<sup>8</sup> "Un Climate Talks Failing to Address Urgency of Crisis, Says Top Scientist." *The Guardian*, Guardian News and Media, 8 Dec. 2019, [www.theguardian.com/environment/2019/dec/08/un-climate-talks-are-failing-to-see-urgency-of-crisis-says-scientist](https://www.theguardian.com/environment/2019/dec/08/un-climate-talks-are-failing-to-see-urgency-of-crisis-says-scientist).

<sup>9</sup> Rogeli, Joeri, et al. "Paris Agreement Climate Proposals Need a Boost to Keep Warming Well Below 2°C." *Nature*, vol. 534, no. 7609, 2016, pp. 631–639, doi:10.1038/nature18307.

All of the conferences have had little to no impact because countries have no incentive to follow the resolutions. The climate conferences represent 20 years of debate and discussion in the international community about who is responsible for reducing climate change emissions, thus understanding them were crucial to my report. This is why for the next section, I decided to use UN websites as well as independent news sources cited above to give a fair analysis of them.

### **Past climate conferences-**

Since the 1990s, many climate conferences have taken place under the United Nations Framework convention on climate change (UNFCCC). These conferences are known as the Conference of the Parties (COP).

To start with in the first international conference, the COP, a distinct line was drawn between developed countries and developing countries. The UNFCC (United Nations Framework Convention on Climate Change) was charted. This identified developed countries as the ones responsible for global emissions and thus responsible for reducing them.

In 1997, the UN adopted the Kyoto protocol, which was imposed only on richer countries, asking them to cut carbon emissions by 5% from 1990 to 2012. However, global emissions went up by 60% from 1990 to 2013, proving the conference to be a catastrophic failure. This was hugely because developing countries like China and India would rely massively on fossil fuels to run their economies and also because the United States backed out due to paranoia in their congress about developing countries overtaking them in economic growth, which is when the US declared that they would not sign anything which didn't compel all countries, regardless of their developmental stage, to take action. The Kyoto protocol was the first milestone in addressing climate change as it was the first signed agreement between the international community which addressed climate change as a legitimate problem. However, the Kyoto protocol is now considered to be hugely insufficient in terms of its impact on addressing climate change.

In 2009, the COP15 introduced the Copenhagen accord. This conference led to the conclusion that the rise in global temperatures from pre-industrial levels should be below 2°C but did not set any legally binding limits or targets relating to emissions. The accord faced tons of criticism for its exclusion of many developing countries and lack of legally binding commitments.

The next conference that made headlines was the Paris agreement which was reached at the COP21 in 2015. This agreement set a goal of limiting rise in global temperatures to 2°C, with efforts to limit it to 1.5°C. However, what differentiated this conference from the Kyoto Protocol and Copenhagen accord was that it also compelled developing countries to take action. Each country was required to create Nationally Determined Contributions (NDCs) to reduce greenhouse gas emissions. However, a study by Rogeli, Joeri, et al<sup>8</sup> shows that the combined NDCs made in the Paris agreement are largely insufficient and the potential rise in temperatures by 2100 is estimated to be 2.6–3.1°.

While the past conferences have made real progress in spreading awareness about the issue in many developed and developing countries, enough has not been done by governments around the world to combat the problem.

In a nutshell, these conferences haven't achieved anything substantial because developing countries think that they have a right to pollute and use up the majority share of the carbon budget as they have multiple developmental goals like no poverty or increase in education to achieve along with sustainability. On the other hand, developed countries argue that equal action must be taken, as developing countries are the ones producing the most emissions and developed countries have no obligation to help them. The irony in the debate being, developed countries are 'developed' because they have enjoyed a carbon-intensive industrialisation without having a single concern about global warming or climate change due to the lack of knowledge.

## **Abstract:**

Climate change has been making headlines for the past decade and is undoubtedly one of the greatest crisis' we are facing today. The global community has been unaware of the disastrous effects of climate change until recently, and not much has been done. However, now that we have an in-depth understanding of it, who is responsible for reducing and reversing the effects of the copious amounts of greenhouse gasses present in the environment. This was the question I wanted to answer, I looked at historic emissions to see who was responsible for the majority of greenhouse gasses present in the environment today and then analysed various political and social factors before presenting my findings about what can be done. I used a rich variety of sources that included, books, articles, websites, scientific studies and journals, and UN speeches. I found out that although developed countries have a greater responsibility due to their economic and political position along with their historic emissions, Developing countries need to set a precedent for the coming generation that climate change is a serious threat. Thus, a collaborate mitigative effort is required for effectively tackling this issue.

## **Introduction:**

"Only when the last tree has died, and the last river been poisoned, and the last fish been caught will we realize we cannot eat money." Climate change is the most serious threat facing the globe today. More than twenty-five thousand species are at risk of going extinct due to the harmful effects of global warming, wildfires, higher ocean levels, melting glaciers, pollution, and a lot more, and the human race may just be next. For the last many years, the importance of economic and industrial growth vs the harmful effects this growth causes has been a controversial topic of debate. However, with the abundance of scientific research, there is now no more denying that if nothing is done about climate change, it may be the end of the entire human race. The research question answered in this essay is: Are developed and developing countries equally responsible for reducing greenhouse gas emissions? Previous research has been conducted in associating emissions to current nations. However, this dissertation aims to broaden the scope of that research and include an in-depth analysis of political, social and economic factors to present what countries can do about climate change. The reason I chose this topic comes from the urgency required in addressing it. We are the first generation that is fully aware of the consequences of climate change and the last generation that will have the ability to fix it.

Key technical terms for my research include greenhouse gas emissions, climate change, developed and developing countries. Climate change refers to long-term changes in Earth's weather patterns, primarily due to human activities that release GHGs into the atmosphere. GHGs are gasses that trap heat in the atmosphere and are harmful if present in abundance. Developed countries are the ones with high industrialisation, development and quality of life. Where else, developing countries are lower in these indicators. Recently, the media has shown the debate surrounding this topic however the lack of conclusions often leads to nothing being done about climate change.

Developed countries are those with high levels of industrialization, income, and human development, while developing countries have lower levels of these indicators. The essay has a literature review which talks about the fundamental topics around climate change, its consequences the past climate conferences and their impact. The dissertation then dives into a discussion which addresses the debate and talks about who is responsible considering past emissions, political and economic factors. It then talks about what can be done through an evaluation of the current situation in both these countries and the aforementioned factors.

## **Discussion-**

### **The debate: Assigning responsibility for historic Climate Change emissions.**

The UN has said that “Everyone must take climate action, but people and countries creating more of the problem have a greater responsibility to act first.”<sup>10</sup> However, which countries are most responsible for producing the most climate change emissions? The issue of climate change and the widespread emissions of greenhouse gasses has its roots in the industrial revolution. The increased use of coal and oil for industrial production led to huge economic development for developed countries, primarily most of Europe and North America. Developing countries on the other hand only started their industrial revolution in the mid 20<sup>th</sup> century or even later, due to the available technology, large emerging economic powerhouses like India and China are industrialising at a rapid rate, leading to large amounts of greenhouse gas emissions.

Determining responsibility for past emissions is difficult as there is little data available. Most estimates come from analysis of fossils and predictions. There is abundance of data for current emissions which is why developing countries often get blamed but historically, developed countries were the ones that emitted the most GHGs. There are many models that assign responsibility for past emissions but the following 3 are most widely recognized.

#### **Cumulative Emissions Model:**

This model recognises that past emissions continue to have an impact on the climate as greenhouse gasses have a long atmospheric lifetime. In specific, carbon. As such, this model attributes countries that have contributed the most to global emissions over time.

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<sup>10</sup> “What Is Climate Change?” *United Nations*, <https://www.un.org/en/climatechange/what-is-climate-change>. Accessed 9th October 2022.



Developed countries have had huge economic development during the industrial era which has continued into the present. Whereelse, developed countries are now producing the most emissions however have a relatively greener past. <sup>11</sup>This model gives the most responsibility to developed countries, as per this model, between 1850 and 2011, the United States was responsible for 27% of all total global CO<sub>2</sub> emissions and the European Union for 25% of them. The next on the list was Japan, with only 4%.<sup>12</sup> The cumulative model is important as historical emissions have had a huge role in shaping today's climate landscape, but in the 21<sup>st</sup> century the nature of emissions has changed greatly and developing countries are contributing the most to climate change. This model is most commonly referred to a climate conferences.

### **The per capita emissions model-**

The per capita emissions assign responsibility based on greenhouse gas emission per person in a country. This is based on the reasoning that that countries that have a greater population are privy to a greater share of the global carbon budget. The GDP per capita in developed countries is much higher because of the high levels of consumption and resource use present in them, mostly because the population has greater wealth than a population of a developing country. For example, India's per capita emission rate is only 1.7 metric tons while the United States, while producing lesser cumulative emissions currently, has a per capita CO<sub>2</sub> emissions rate of 16.5 metric tons.<sup>13</sup> However, this model does not take into account past emissions and only focuses on current emissions per capita.

### **The carbon intensity model-**

The carbon intensity model attributes responsibility for climate change by measuring the amount of greenhouse gas emissions a country produces, per unit of economic output. This is most commonly measured in CO<sub>2</sub> emissions per GDP. This is a unique model which is able to tell us about the relationship between economic development and emissions, disclosing how efficient a country's economy is with respect to its carbon footprint and emissions. This model can identify countries that are relatively less efficient economically for a high carbon footprint, these countries can then be pushed to adopt more sustainable development practices and to adopt more low-carbon technologies. This technology gives great emphasis to the role of technology to combat climate change. The countries that are the least carbon intense are in the best spot to transition to sustainability whereelse the countries that have carbon-heavy industries like China and India are in a less comfortable spot. As developing countries tend to be reliant on coal and often the largest manufacturers of coal and gas product, they are the most carbon intense. China's carbon intensity was 0.64kg per USD compared to 0.33 of the United States.<sup>11</sup>

A fundamental problem with all of these models is that it measures climate emissions on a territorial basis, in the sense that the country that occupies the land in which the

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<sup>11</sup> Bodansky, Daniel. "The United Nations Framework Convention on Climate Change: A Commentary." *Yale Journal of International Law*, vol. 18, 1993, pp. 451-558.

<sup>12</sup> World Resources Institute. "Cumulative CO<sub>2</sub> Emissions (1850-2011)." *Climate Analysis Indicators Tool*, 2014. <https://www.wri.org/resources/data-visualizations/cumulative-co2-emissions-1850-2011>

<sup>13</sup> World Bank. "CO<sub>2</sub> emissions (kg per 2010 US\$ of GDP)." *World Development Indicators*, 2021. <https://data.worldbank.org/indicator/EN.ATM.CO2E.KD.GD>

emission took place historically is given responsibility for those emissions. This can be inaccurate as land occupation has changed many times over history, however, the larger problem with this is that developed countries specifically the US, outsource production of their goods to developing countries like China very often. This makes the US artificially greener when in reality, the US is responsible for the emissions on Chinese land as US products caused those emissions.

Even though developing countries are now starting to take over developed countries in terms of total annual emissions, historically, it was actually quite the opposite. Since CO<sub>2</sub> and other greenhouse gasses remain in the atmosphere for up to 1000 years, scientists have looked at fossils and other records to find that developed countries are actually responsible for the majority share of greenhouse gasses present in the atmosphere today, and as such should be responsible for reducing these emissions. However, developing countries also share some portion of the responsibility as they are the most carbon intense. A logical plan of action would be for developed countries to help developing countries transition their carbon-based industries to renewable energy, however there are many factors to consider.

### **Economic aspects and arguments- Arguments for equal responsibility-**

#### **Rapid economic growth-**

In the recent past, developing countries have had huge and rapid economic growth to fuel industrialisation and urbanisation. The largest developing countries have the highest GDP growth rate per year, but this comes at a cost of increased greenhouse gas emissions. Developed countries on the other hand have been investing in greener energy. The argument being that as developing countries are currently the ones benefitting the most from emissions and if their economic growth continues at its current pace, they will soon overtake developed countries in terms of cumulative and per capita emissions.<sup>14</sup> As developing countries are the ones projected to be equally bad as developed countries in terms of emissions, they also need to take responsibility for reducing their emissions before the situation worsens.

#### **Energy consumption and demand-**

With booming economic growth, comes increased energy demand and consumption. China accounted for 28% of global energy consumption in 2019. Energy production requires the burning of fossil fuels and therefore contributes to global warming. While the developed countries are working towards innovation in the field of renewable energy, this won't be effective unless the developing countries look to do the same as they have the highest need for energy and energy products.

#### **Global supply chains-**

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<sup>14</sup> Friedlingstein, Pierre, et al. "Global Carbon Budget 2020." *Earth System Science Data*, vol. 12, no. 4, 2020, pp. 3269–3340, doi:10.5194/essd-12-3269-2020.

Developing countries largely benefit economically from global supply chains. Many developing countries have their economies based around manufacturing and export-based industries. As the term suggests, these chains are 'global' in the sense that developed countries also contribute to these emissions by demanding goods from developing countries like China. The argument for equal responsibility is that if both countries are to collaborate on changing the global supply chain, only then, will any results be visible as developing countries need help from developed countries to adopt sustainable practices to help reduce emissions from the production processes but developing countries also need to take the initiative and attempt to do so.

#### Market for renewable energy-

Investing in clean energy is seen as a burden in the economic community as in the past, countries have largely benefitted and grown their economies thanks to large amounts of emissions. However, as we have progressed, it has been proven that the future is in renewable energy. Renewable energy has a high upfront cost but saves money in the long run. As the climate crisis worsens, all countries will have to shift towards sustainability thus investing early in the renewable energy market can have great benefits. Job creating, innovation and development of sustainable practices in the population being some of them.

#### **Arguments for why developed countries should take more responsibility- Historic economic development-**

As previously discussed, developed countries have contributed the most to historic emissions during their industrial revolution, as they enjoyed economic growth without any concern for emissions. In the book 'Why are we waiting' by Nicholas Stern, the argument is excellently made that developing countries have a right to be allowed to finish their economic growth without the concern for emissions. This is partly in the interest of fairness but even if one argues that the current landscape of climate change is such that matters like fairness are no longer important, allowing developing countries to economically develop first can be beneficial for many other reasons.

If developed countries take current responsibility for reducing the effects of climate change, developing countries would be able to focus their resources on economic development which could lead to the situation worsening at first but gradually getting better and better over time as developing countries transition to developed countries.

1. According to the international energy agency, highly developed countries are more likely to invest in clean energy as they can afford to. Developing countries often have other issues like unemployment, poverty and hunger which require immediate attention and government funds tend to go there. Thus, the argument being that rather than comprising on growth and indecorously trying to go green, it will be more beneficial to rush economic growth which would solve the problems listed above and after which, focus all resources on sustainability and clean energy.
2. Increased development can lead to lesser populations, a clear correlation has been proven between education and birth rate, the more educated a family gets, the

lower the birth rate. Which is why developed countries have declining populations, as development increases, the birth rate will go down which will reduce demand for energy products thus reducing emissions.

3. Advancements in development will lead to advancements in technology. The more educated the population gets, the better the ideas and innovations gets, and this leads to technological advancement. Improvements in things like water treatment systems, efficient waste management systems and renewable energy can have a huge impact on reducing climate change.
4. Increased public awareness can also have a huge impact as if enough individuals choose eco-friendly products and services, it can give firms a reason to switch to renewable practices.
5. Stronger regulations are also a great advantage. Developing countries on average have more difficulty holding firms to a high environmental standard, recently 2 firms in India escaped a 100 million USD penalty, given to them due to their high emissions. Having a more secure and developed economy and help the governments have more control over firms.

### **Technological advancements and financial capability.**

Developed countries have access to superior technology and financial resources. These resources can be utilized to accelerate the transition to sustainability and a low carbon economy. In the UN climate summit in 2014, the secretary-general of the UN, Ban Ki-moon, emphasized the importance of sharing of technology and financial support between developed and developing countries. <sup>15</sup>Developed countries taking the lead on the response to climate change will allow for the development of technology which can be used by developing countries and make it a lot easier for them. As per the per capita emissions model, developed countries have a much rate of emissions per person. This is most directly a result of the higher quality of life which leads to higher demand for energy. As such, developing countries should also have a right to prioritise the well-being of their citizens.<sup>16</sup>

### **Section 5- Political and social aspects-**

#### **Arguments for equal responsibility-**

Developing countries not taking any responsibility sets a dangerous precedent for the generation to come. Developing countries have large, booming youth populations that

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Ban Ki-moon. "Address by United Nations Secretary-General Ban Ki-moon." United Nations Framework Convention on Climate Change (UNFCCC) COP21 Opening Ceremony, 30 November 2015, Paris, France. United Nations, <https://unfccc.int/news/cop-21-opening-statement-by-un-secretary-general-ban-ki-moon>. Accessed 17 April 2023.

<sup>16</sup> The Economist. "The disproportionate impact of climate change on developing countries." The Economist, 2018. <https://www.economist.com/open-future/2018/10/29/the-disproportionate-impact-of-climate-change-on-developing-countries>

will learn by example. If they see that no action is being taken for climate change it may lead them to believe that climate change is not as severe a threat as it actually is. Equal responsibility will create and nurture a global culture for sustainability, where everyone will be empowered to take decisions in their life to reduce the impact of climate change.<sup>17</sup> Furthermore, both developing and developed countries have an obligation to take action under the Paris agreement. The Paris agreement doesn't hold any legal power over countries, however, it was discussed and agreed upon and the countries in question have a political responsibility to uphold it.

### **Arguments for Developed countries taking more responsibility-**

Developed countries have a responsibility to promote a more sustainable lifestyle for its citizens as it has more emissions per capita. Developed countries also have a moral obligation to support vulnerable populations in developing countries who have very little resources to combat the problem<sup>18</sup>, especially since developed countries have had a share in creating that problem. Developed countries also have more influence and power, this should position them as leaders to tackle the climate crisis.

### **The current situation and what action can be taken?**

Firms in developing countries like India and China that produce energy products like coal are being heavily subsidised (given a sum money for each unit of output produced by the government).

This is done by the governments to help increase production by incentivising firms. If they are given money from the government for each unit of output, they have higher profitability, thus allowing them to produce these goods for cheaper and therefore, sell them for cheaper, allowing other firms and households to fuel their growth at a lower price, leading to economic development for the country. However, this has huge spill over effects for the environment. Firstly, production of energy goods requires large amounts of fossil fuels to be burnt, releasing greenhouse gasses and worsening climate change. It also has the effect of deterring energy firms to switch to renewable sources of energy as they have higher profitability from producing coal. Another effect of this may be that subsidies on imported coal leads to countries unintentionally increasing production of coal in other countries. For example, along with an annual 11 billion USD in subsidies to energy firms, India spends around 2 billion USD on imported coal from China, this encourages Indian firms to demand more coal from China as they are getting it for a cheaper price, the increased demand for Chinese coal then leads to Chinese firms

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<sup>17</sup> Leiserowitz, Anthony, et al. "Politics & Global Warming, November 2021." Yale Program on Climate Change Communication, 2021, [climatecommunication.yale.edu/publications/politics-global-warming-november-2021/](https://climatecommunication.yale.edu/publications/politics-global-warming-november-2021/).

<sup>18</sup> Gardiner, Stephen M. A Perfect Moral Storm: The Ethical Tragedy of Climate Change. Oxford University Press, 2011.

increasing production for coal, which essentially means India is paying a huge sum of money to increase coal production in China.

That said, asking developing countries to reduce greenhouse gasses would mean cutting subsidies for energy products coming from fossil fuels and increasing those coming from renewable energy.

An effort was made to get India to reduce coal subsidies in the 2021 conference at Glasgow, the COP26, however this was strongly argued against by India. "In such a situation, how can anyone expect that developing countries can make promises about phasing out coal and fossil fuel subsidies when developing countries have still to deal with their development agendas and poverty eradication?" said Bhupendra Yadav, India's environmental minister.

As Renewable energy is more expensive and harder to use, 'forcing' India to reduce coal subsidies either through international action like sanctions would mean that India would have to slow down their economic growth a significant amount and sacrifice on a higher quality of life for its citizens. In retrospect, when developed countries like those in the EU (including Britain) were industrialising, their entire continent was 100% powered by coal with Britain being the lead exports of coal produced goods.

### **So how can the issue be tackled?**

Both developed and developing countries need to work together and create a plan of action, developed countries should take the lead, considering their greater economic power and political influence.

### **Transition to Renewable energy-**

One of the greatest ways to tackle climate change is transitioning to renewable energy, as the production of energy and energy products are the leading cost of the climate crisis. However, renewable energy has a very high upfront cost which makes it impractical for developing countries to switch to it. Developed countries need to transition to renewable energy first and help developing countries transition through funding and technology. Developing countries can have the chance to leapfrog the carbon-intensive and wasteful industrial revolution that developed countries took and directly transition to renewable energy to fuel their industrialisation.<sup>19</sup> This will also create economic opportunities as renewable energy is a rising market which can create tons of jobs. Since renewable energy, is by definition, unlimited, it can also save money in the long run. As energy coming from fossil fuels will become more expensive as time passes because fossil fuels are limited, and their limits are close to being exhausted.

### **Energy efficient technology-**

Other than renewable energy, countries can also implement other energy efficient methods. While emissions are the leading cause of climate change, many other things have long-lasting negative impacts on the environment. Developing countries are

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<sup>19</sup> Climate Technology Centre and Network (CTCN). "About the CTCN." Climate Technology Centre & Network, 2021. <https://www.ctc-n.org/about-ctcn>

experiencing a population boom and to accommodate their rising population, they burn down forests. This can be disastrous as trees take in CO<sub>2</sub> and produce oxygen and when cut down, they release that stored up CO<sub>2</sub> into the environment. Improved urban planning can help improve this and remove the need to cut down trees. Further relaxed immigration laws in developed countries can also help developing countries control their population. Other than this, there are also many ways to make sectors like transportation and residential building more efficient through technical assistance and financial aid. If developing countries prioritise energy efficiency, they can make significant cuts in costs and emissions. This can allow them to reduce subsidies on energy products and work towards a sustainable future.<sup>20</sup>

### **Climate adaptation-**

While we can work towards reducing climate change in the future, many harmful effects of the greenhouse gasses are already taking place. These mostly affect vulnerable populations in developing countries as they have limited access to quality healthcare. Large campaigns for disaster relief education along with donations of first aid-kits and emergency essentials can be greatly beneficial for developing countries however they will need developed countries to provide the funds for these. One way to do this is to enhance the nationally determined contributions, NDCs, which are funds from developed countries given to developing countries, these are moderated by the UN which prevents corruption<sup>21</sup>. Large education campaigns can also cover the importance of efficient agricultural practices. All developing countries have large agricultural markets with many of the poorer part of the population engaging in farming activities on a day-to-day basis. Many of these farmers lack knowledge of efficient farming practices which can increase their yield and also protect the climate from the use of unnecessary and harmful fertilisers.

### **Conclusion-**

In conclusion, this essay explored how responsibility for reducing the effects of greenhouse gasses and climate should be divided between developed and developing countries. The economic, political and social factors were discussed at length and various arguments were presented for equal responsibility and greater responsibility for developed countries.

After evaluating all the different arguments, it can be reasonable argued that developed countries need to take greater responsibility. This is because of a combination of factors including their historic emissions, higher level of per capita emissions and superior economic capabilities. However, it is also essential to recognize the importance of setting a precedent for the next generation through collaborative action towards mitigating

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<sup>20</sup> Mission Innovation. "About Mission Innovation." Mission Innovation, 2021. <http://mission-innovation.net/about-mi/>

<sup>21</sup> UNFCCC. "The Paris Agreement." United Nations Framework Convention on Climate Change, 2021. <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

climate change. While developed countries need to take the lead, a collaborative method is also required.

There are several extensions to this research that can help further our understanding of this area. I would like this to pursue these in my higher studies to build on my project.

1. Understanding the effect of technology transfer-

Further research can help understand how effective technology transfer and capacity building initiatives through collaborative efforts between developed and developing countries can help mitigate the effects of climate change. This could work towards understanding the most effective way of doing this through identifying the best practices and proposing new and innovative strategies for promoting efficiency.

2. Climate policies

Evaluating the success of past climate policies in promoting sustainable development and reducing emissions of GHGs can be effective. This can provide information about the most effective policies which can be applied in developing and developed countries and help reduce climate change through informing the decision makers in both types of countries

3. Non-government role-players

Large firms and businesses play a large role in contributing to climate change, understanding how these firms can reduce their emissions and how this will defer in developing and developed countries will be essential to drafting a plan for sustainability in the future. This research can look at collaborative efforts between governments of developed and developing countries and large firms as well.

By further developing our research in the fields mentioned above, we can gain a comprehensive understanding of the problem and create a plan involving collaborative efforts and efficient and innovate strategies to reduce the effects of climate change.

## **Evaluation-**

The main aim of this dissertation was analysing the responsibility distribution between developed and developing nations for reducing the effects of climate change. I believe that this aim was successfully met as I was able to draw conclusions through in-depth analysis as presented in my discussion and literature review. I wanted to work on my critical thinking skills as mentioned in my project proposal and I think I was given a great opportunity to do that. I analysed a variety of sources and was able to come up with many perspectives to weigh and evaluate. This gave me the chance to develop my analysis skills as well.

## **Strengths and weaknesses:**

### **Strengths-**

Secondary Research skills used-

I was able to use a wide range of diverse sources, which included books, articles, websites, journals and even UN speeches. These gave me the chance to gain a comprehensive understanding of the topic and reflect that in my analysis. A good amount of quantitative data also made the dissertation more well-rounded as it



involved more than perspectives. For my research I had to go over a lot of media articles and new clippings on who is responsible, One thing I observed was that it was very important to show awareness and understand how media itself interprets the same events in different ways due to biases and different styles of thinking. On any event or topic I found a lot of articles criticising it and a lot of articles giving the benefits of it as media companies often give a controversial opinion to get more views. I had to be aware and mindful about these biases while reading through information and carefully choose and analyse the sources and find ways to incorporate how many ever perspectives I can in order to fairly give both the perspectives.

#### Range of perspectives-

I was able to come at this from a wide range of perspectives and include various arguments for and against equal responsibility. I was able to do this for political, economic and social factors which led to an interesting debate. I also think I successfully identified different solutions which would be beneficial to parties representing all of these perspectives.

#### Synthesises and simplicity-

I think I was able to synthesize a vast variety of sources and reduce the complexity, this was something that I was struggling with at the start, however, I think I did a good job at the end. I was having particular difficulty with the historic emissions part of it due to the high number of models and sources available. I had to pick the best ones and present their information in the simplest way possible for my audience.

#### **Weaknesses-**

##### 1. Primary research-

Involving primary research would have made the dissertation a lot more well-rounded. Interviews from climate or economic experts would have given an additional perspective which would connect the dissertation to the real world as well.

##### 2. Time management-

I was constantly lacking behind and had to hurry my work. I think if I was able to manage my time differently and create better deadlines for myself, I could have handed in a better project. There were a few more things I wanted to cover like the cultural factors but I didn't have time to do justice to them.

#### Things to do differently-

1. Engage with more stakeholders: If given the opportunity to redo this project, I would try to engage with a greater range of people and cooperations who are involved in the problem and as such, responsible for reducing it, these can involve climate change experts, policymakers, and representatives from both developed and developing countries, and even non-government role players as mentioned in the conclusions. This would give me more interesting perspectives to analyse and create a better discussion.

2. Conduct primary research: Interviews, surveys and case studies are paramount to a good dissertation and I should have included at least one of them. Primary research connects secondary research to the real world and makes the dissertation more well-rounded
3. Explore additional factors: To further enhance the quality of my written work I should have analysed other factors that play an important role in climate change. Such as historical and cultural factors.
4. Time management: Creating better deadlines to myself and being organised enough to be able to stick to them. Being regular with the activity log as well.

From this experience I have learned the importance of managing my time. I have also learned the importance of planning and organisation when undertaking a research project. I hope to take away the skills I have learnt, in particular, research and critical thinking. I need to work towards a few things as mentioned above but I have also learnt the importance of refining my plan and continually changing initial assumptions. This project has changed my perspective as I was led to believe only developed countries should take action but I now clearly understand the importance of a collaborative effort between nations.

### Evaluation of sources-

Source Reference	Evaluation
United nations framework on climate change(UNFCCC website)	I used the UNFCCC website for my past conferences part of the literature review. The website is continually updated almost everyday. Information I used was published annually at the end of each climate conference. As the UN is the organizer of these climate conference, they have firsthand access to all information regarding them. Making them a relevant source. The UN is a well-reputed international peacekeeping organization which means all information is credible and reliable. The purpose of the website is to disclose the conclusion reached in all past UN conferences however as UN hosts the conferences themselves they have a bias. Most independent news sources called the UN conferences outright failures however the UN describes them as 'large steps towards global collaboration'. The website provides useful factual information about these conferences and the resolutions reached but is not reliable enough in analyzing the impact of these conferences.
The economist, "The disproportionate impact of climate	"The disproportionate impact of climate change on developing countries," published in The Economist in 2018, is a highly credible and relevant source that talks about the levels of impact

<p>change on developing countries"</p>	<p>of climate change on developing and developed countries. The Economist is a highly credible sources, cited many times in other articles. The article talks about the need for international cooperation The article has information that is up to date even though it was published in 2018. The Economist is known for its liberal stance but this particular article presented a well-balanced view. It was useful for the essay as it spoke about the impact of climate change in developing countries as compared to developed countries.</p>
<p>"Global Change and the Earth System: A Planet Under Pressure." Book by Will steffen</p>	<p>"Global Change and the Earth System: A Planet Under Pressure" by Will Steffen, published in 2005, is a credible and relevant source that mainly discusses the impact of human activity on climate change. The author is a renowned climat change expert which speaks to its credibility. The book provides a simple but thorough understanding of the consequences and causes of climate change. It offers a well-rounded perspective. The book was published in 2005, which means that the information is slightly outdated.</p>
<p>"The contribution of emissions from high-income households to global warming." Environmental Research Letters, vol. 15, no. 9, 2020, p. 094012.</p>	<p>This study by Lamb et al., is a highly credible sources as it was published in the peer-reviewed journal Environmental Research Letters in 2020,. It talks about the disproportionate emissions coming from high income households and the link between wealth and carbon emissions. All authors are certified professors and experts in climate research. A great benefit of the study is that it is a recent publication which means all information is up to date and relevant today. As this is a scientific study, the authors present a well-rounded and objective view, this was useful as developed countries have more high income households and a higher emissions per capita.</p>
<p>Bank-Ki moons 2014 address at the Climate summit.</p>	<p>Ban-ki-moon was the secretary general of the UN at the time of his address, and his 2014 speech at the climate summit talks about the urgent need for global action regarding the climate crisis. He also strongly encourages countries to make commitments. The downside is that the speech is in 2014 so more recent actions should also be considered. Coming from the secretary general of the UN, the speech is highly credible and relevant. As Ban-ki-moon is the secretary general of the UN and bound by their political status, possible political influence over his speech by the UN must also be considered. The address is valuable for our dissertation as it talks about the importance of tackling climate change with a united global front.</p>

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