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Climate Financing: Concept, Issues and Mitigation Strategies A Literary Review

Dr.B.Nagarjuna[1*] Dr.K.Rajendra Prasad[2]
1. Professor, School of Commerce & Management, MB University, Tirupati, India
2. Resource Person, Financial Education, Securities & Exchange Board of India, India
* E-mail of the corresponding author: nagarjuna1975@gmail.com

Abstract
The primary objective of the Global Climate Fund (GCF) is to aid developing-world climate initiatives, programmes, policies, and readiness. Rich nations are under attack from developing nations with similar views if they try to reverse the inevitable climate change that will affect the entire planet. To combat climate change, developed nations must significantly increase funding. Warming temperatures, according to climate change research, pose long-term economic risks; therefore, forward-looking financial markets are essential for gauging the societal implications of climate change. Death rates are projected to increase by 3%, while annual energy demand in human settlements is projected to increase by 11%, both due to global warming. Increases in rainfall due to climate change have contributed to urbanisation in parts of Sub-Saharan Africa, but not elsewhere in the developing world. Urban sprawl and other city-based patterns and structures may be significantly impacted by a rise in global temperatures. The positive benefits of climate change on national economies are well-documented. The effects of climate change and current events on funding will be analysed, and suggestions for mitigating them will be provided.
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I. INTRODUCTION

Climate financing, in this context, means the money that must be spent to pay for climate-related initiatives and investments. The wide range of possible donors, distribution strategies, and the sheer number of people who stand to benefit from climate financing all add layers of complexity.

However, questions remain about the origin, administration, and distribution of these funds. One of the tools for managing and channelling foreign funding is the recently founded Green Climate Fund (GCF). How the fund will function and what countries will be able to use it for is a topic of discussion as well as the operational norms and methodologies. The goal of the Global Climate Fund is to aid efforts to improve developing countries' infrastructure, social services, and emergency response capabilities.

The phrase "a worldwide temperature boost" refers to the gradual increase in Earth's average temperature. These shifts are generally referred to as "environmental change." Everything from more frequent flooding and longer-lasting heat waves to an increase in the frequency of severe climate events is on the rise as a result of the aforementioned warming.

Public, private, and authorised sources of climate finance appear to aid in assessing and diversifying climate change initiatives at the municipal, provincial, and national levels. Poor and defenceless people are being asked to help fund the Paris Agreement, the Convention, and the Kyoto Protocol. This recognises the wide variation among countries in their dedication to addressing environmental change and their capacity to adapt to its effects. Since massive amounts of pollution are needed to remove it, natural resources will be needed to lessen it. For major financial assets to respond to negative impacts and alleviate changing repercussions, a natural currency is essential.

At the pinnacle of COP 26 in Glasgow, several major carbon emitters, India included, committed to achieving net-zero emissions (NZE). The developing world is fighting back against carbon colonialism and demanding environmental justice. The Like-Minded Developing Countries (LMDC) are a coalition of developing nations who have banded together to condemn rich countries for trying to pass off their own undeniable responsibility for environmental change on to the rest of the globe. To implement the Sustainable Development Scenario across the country, India would need annual expenditures of $110 billion (or 100 billion Indian Rupees). This sum would cover costs associated with renewable energy generation, battery storage, electric vehicles, network expansion, and matrix modernization (SDS). This is a lot more than the annual $40 billion that is already being gambled on these markets in the United States alone.

At COP26, Indian Prime Minister Narendra Modi asked wealthy nations to contribute as much as they could toward India's environmental budget of $1 trillion over the next decade. The United States has reaffirmed its pledge to receiving $100 billion yearly from Canada, Japan, and Germany through 2025. NZE has pledged to maintain warming to 2.2 °C if discharge goals are met. The industrialised world needs to significantly increase

environmental funding. The necessary progress toward net-zero outflows is not being made since private capital is not currently flowing with that mindset.

To decarbonize the world's energy system, annual investment levels would need to quadruple to about USD 2 trillion, or 2% of GDP, according to research by Kaminker, Ch., and Stewart, F. (2012). With USD 71 trillion in assets, institutional investors might be very influential. Among the reasons institutional investors are hesitant to finance renewable energy projects is a lack of familiarity with the type of direct infrastructure investment required to do it.

The term "environment support" refers to grants awarded at the local, national, or international levels to projects that aim to mitigate the effects of environmental change and adaptation. Significant investment is needed to reduce effluents. It is believed that essential financial resources will adapt to environmental change and mitigate its negative effects. Funding assistance from developed nation parties is essential for developing nation parties to meet their UNFCCC commitments. Rich countries' parties should keep generating climate cash from a variety of sources. Efforts to raise money to fight climate change should be a step up from what has been done so far.

When it comes to environmental shifts, the speed of the ride is only becoming faster. Records have been kept since 1880, and 2001 ranks as the sixteenth warmest year of those seventeen. We see a rise of 1.78 degrees Fahrenheit in global temperatures relative to the average of the previous half-century. The warmest year on record in the Arctic was also marked by the lowest levels of sea ice over the whole of the year. Seawater is warming and becoming more acidic as carbon emissions continue to rise, along with rising sea levels, melting glaciers, and more frequent droughts and floods. Some estimates put the cost at $12 trillion over the next 25 years to maintain a global average temperature of less than 2 degrees Celsius, which is estimated to reduce the likelihood of extinction (Bloomberg New Energy Finance, January 27, 2016).

II. LITERATURE REVIEW

2.1 CLIMATE CHANGE – IMPACT ON GREEN BONDS AND EQUITY STOCKS

This section analyses and discusses how the lack of funding for climate change adaptation has an influence on stock values.

Stefano Ramelli, Elisa Ossola, and Michela Rancan argue that the first Global Climate Strike on March 15, 2019 marked a watershed moment in climate advocacy (2021). Researchers analyse the impact of this event on the cross-section of stock prices for a sizable sample of European companies. When news of the strike's success spread, the stock prices of companies with big carbon footprints dropped. Increasing public engagement with climate activism appears to be the driving force behind this result. Furthermore, following the initial Global Climate Strike, analysts lowered their long-term profit forecasts for carbon-intensive industries. The authors (Engle RF et al.) conducted a textual analysis of high-dimensional data from newspaper stories about climate change in order to generate novel hedging strategies. They proposed, for example, that climate change risk hedging may be carried out in a dynamic fashion. They provide examples of how these methods might be applied to build low-cost, sector-balanced portfolios that successfully manage climate news advancements both inside and outside of samples. Institutional investors believe that climate risks have already manifested and would have a negative financial impact on the portfolio companies they own, according to their poll.Further,according to a study by Amine Ouazad and Matthew E. Kahn (2019), evidence reveals that natural disasters like hurricanes Katrina and Sandy are occurring more often. Banks may be persuaded to sell to Fannie Mae and Freddie Mac, the two biggest buyers from the agency, in light of the potential for flooding. The data suggest that security services will significantly increase in the years after such a massive disaster.Baker M. et al. (2018) argue that mitigation of climate change and strategies of adaptation cost billions of dollars. To conduct their research, researchers looked into this market. A paradigm that incorporates non-financial assets into the price and patterns of municipal green bonds was used to examine the entire U.S. market for corporate and municipal green bonds, which leads to the understanding that green bonds are held to a lower standard of risk than regular bonds. Both the cost and the patent are critical factors to consider.

Long-term temperature increases have all been linked to slower growth, increased future volatility, and tail risk. The research on the risk-return trade-off conducted by Ravi Bansal, Marcelo Ochoa, and Dana Kiku demonstrates this (2016). Their empirical research shows that market values are negatively temperature elastic and that long-term temperature changes are connected with a positive risk premium. The researchers' theoretical framework and information from the capital markets are used to semi-parametrically compute the societal cost of carbon emissions. They come to the conclusion that the SCC has relevance given stock market expectations. According to their research, a forward-looking capital market is essential for predicting the economic impacts of climate change in the future. The findings of a 2016 study by Ronald Balvers, Ding Du, and Xiaobing Zhao show that data collected from financial markets can provide a reliable, impartial estimate of future losses due to climate change. Under the APT (Arbitrage Pricing Theory) paradigm, when temperature shocks are a systematic risk factor, the risk premium is extremely negative. Also, the majority of asset loadings are negative, with greater negative loadings of the temperature shock component found in asset portfolios belonging to more exposed industries. For

every one percentage point rise in expected temperatures, there will be a corresponding increase of 0.22 percentage points in the cost of equity capital, resulting in a 7.92 percentage point loss in the present value of wealth. Costs associated with evaluating the effects of climate change now include these outlays. This study experimentally investigates how the EU's carbon trading plan affects German stock returns, as stated by Marcel Oestreich A. and IliasTsiakas (2015). It was found early on in the scheme that companies that were given free carbon emission permits did significantly better than those that were not. This points to the presence of a sizeable and statistically significant "carbon premium," which is primarily explained by the increased cash flows arising from the free distribution of carbon emission permits. This component can also help explain some of the cross-sectional volatility in stock returns, since companies with big carbon emissions are more vulnerable to carbon risk and have higher projected returns.The classic capital asset pricing model (CAPM) formula, according to Weitzman ML, provides a beta-weighted rate of return on safe investments and intermediate returns to reflect hazardous investments across the economy (2012). Instead of two discounted rates, the author of this paper contends that two equivalent discounted characteristics ought to be applied on a small scale. They found that cutting the public investment discount and balancing the carbon costs of climate change have financial repercussions.Hong, H., and M. Kacperczyk (2009) said that fundamental underpinnings regulate bad-behavior stocks less than stocks with other comparable components. Annuity projects seem different in comparison to regular or difficult ventures that are routine adjustments and receive less attention from experts. Furthermore, sin stocks have larger projected returns than comparable companies, which is exacerbated by the discharge of mandatory monetary clients and the high number of cases generated by customary activities.

Financial analysts lowered their long-term profit projections for carbon-intensive companies after the first worldwide climate strike. The majority of institutional investors believe that their portfolio companies will experience financial consequences as a direct result of climate concerns materialising. Risk premiums are significantly negative in the APT model when temperature shocks are included as a systematic risk factor. The majority of asset loadings are negative, and the negative temperature shock loadings of asset portfolios in more sensitive industries are much greater. There are financial ramifications when the public investment discount is reduced and the carbon costs of climate change are balanced. However, a recent study found that due to their non-financial nature, green bonds are held to a lesser standard of risk than conventional bonds. On average, businesses that receive free carbon emission permits do better than those that don't. This is due to increased carbon risk exposure for businesses with high carbon emissions. The cross-sectional volatility in stock returns throughout the Paris Agreement timeframe may be partially explained by this phenomenon. Due to the release of required financial clients and the huge volume of cases produced by customary operations, sin equities have higher predicted returns than comparable corporations. Natural disasters like Hurricanes Sandy and Katrina are happening more often. In the years following such a catastrophic event, the research shows that demand for security services will increase dramatically. Using a theoretical framework and information from the financial markets, the social cost of carbon emissions may be calculated with a certain degree of precision. Investors want to know more about the economic repercussions and implications of climate change in the long run.

2.2 CLIMATE CHANGE – IMPACT ON REAL ESTATE PRICES

This section examines and analyses how real estate values are impacted by the paucity of financing for climate change adaptation.

In their article "Kakuho Furukawa, HibikiIchiue, and Noriyuki Shiraki (2020): An Examination of the Growing Body of Research on the Relationship Between the Financial System and Climate Change," Kakuho Furukawa, HibikiIchiue, and Noriyuki Shiraki examine the growing body of research on the relationship between the financial system and climate change, which is probably related to an increase in the intensity and In spite of the fact that disclosure and communication might be of assistance, assets, and notably real estate properties, are not being adequately appraised for the risks posed by climate change. Even in regions that are not immediately impacted, the quantity of credit that can be extended by affected institutions is reduced due to natural catastrophes. However, this unfavourable effect is less severe for financial institutions that have a greater amount of capital. Insurance provides some protection against the adverse effects that natural disasters like these can have on the economy, businesses, and individual households.Similarly, the purpose of Markus Baldauf, Lorenzo Garlappi, Constantine Yannelis, (2020)research is to see if disparities in climate change opinions are reflected in housing values. The authors demonstrate that values are distinct from climatic dangers in the equitable model of house selection, in which agents benefit from ownership in the same place. They use complete transaction data to link estimates of individual household prices and water inflation to beliefs about climate change. Residences in presumed submerged religious zones sell for less than houses in secular communities. According to the findings, housing prices reflect a range of perspectives on the risks of long-term climate change.Eichholtz, P., Steiner, E., and Yanger, E. (2019), also find that sophisticated commercial real estate investors respond sensibly to increased flood risk by bidding down the values of vulnerable properties. The findings show that when compared to non-exposed assets, homes exposed to flood risk appreciate at a slower rate following the storm. The price effect is

neither caused by physical damage caused by Hurricane Sandy nor is it caused by contemporaneous, unrelated market trends for beachfront property. Higher risk premiums for susceptible structures encourage it, and the spread of locally significant occupants worsens it.Giglio S. et al. (2021) are looking into private market data that may be used to determine acceptable discount rates for investments in climate change mitigation. There will be a decline in house construction over the next century, with a rate of 2.6% expected. These statistics demonstrate the use of risk as well as the threat of climate change. Due to the fact that short-term financial flow is more susceptible to climate risk than long-term cash flow, the desired long-term housing structure can be met. It is possible to utilize the model and the data to determine the proper discount rates for climate-related investments. Predictable long-term investment discount rates on climate change mitigation are substantially lower than those used to estimate these costs and determine the carbon costs of extreme carbon. A rise in discount rates has a term structure that is limited above the risk level, according to the study authors.According to Goldsmith-Pinkham et al. (2021) also municipal bond markets began pricing the growing risk of sea level rise (SLR) exposure in 2013, corresponding with increased revisions of SLR forecasts. The effect is larger for long-maturity bonds, and it is not completely related to the potential of future floods. Researchers utilize a structural model of credit risk to assess the projected economic impact and isolate the effects of underlying asset prices and uncertainty.Controlling house prices has little influence on the SLR exposure premium, showing that the effect on bond prices is driven by uncertainty about SLR's future implications rather than lower current asset values.While Gibson M., Mullins J.T., and Hill A. (2017) evaluated the effects of three flood risk indicators on residential operations in New York City from 2003 to 2016 using the hedonic-in-difference categorization approach. As a result of Hurricane Sandy and the subsequent updating of FEMA floodplain maps, the Extreme Flood Insurance Amendment Act of 2012 led to a rise in premiums. Each signal lowers sales prices by about 5% on average. Retail prices for residences that were not inundated by Sandy but have since experienced additional floods fell by 12–23% for individuals who received new knowledge from the signal, according to a theoretical model. As a result of the simplified form, they have had to make adjustments to their insurance premium and conduct research to learn that new maps inspire trust and, ultimately, improved care. Homes along the seaside tend to sell at a discount due to rising flood fears. Bakkensen, L. A., and L. Barrage (2017) use both theoretical and empirical data to answer the question of how climate risk concerns affect housing market finance. The findings show how different schools of thought might account for varying empirical results when it comes to pricing in flood risk.

Even while sharing information and raising awareness can assist, real estate properties are not being adequately assessed to account for climate change threats. The quantity of credit that affected banks can offer is impacted by natural disasters even in places that are not directly impacted. This detrimental impact, however, is mitigated for more solvent financial institutions. Businesses and households can be protected from the financial fallout of natural disasters to some extent by purchasing insurance. As a prudent response to rising flood risk, astute commercial real estate investors limit the value of vulnerable assets. Each price reduction signal often results in a 5% overall drop in sales. Financial backing for homes might be impacted by climate change worries. In other words, the effect on bond prices is driven more by uncertainty about SLR's future consequences than by lower present asset values, and housing price regulation has little to no effect on the SLR risk premium. These expenses and the carbon costs of severe carbon emissions are significantly higher than the discount rates that can be utilised to predictably spend in the long-term future to address climate change. The danger threshold limits the term structure of an increase in discount rates.

2.3 CLIMATE CHANGE - CONSEQUENCES OF GLOBAL WARMING

In this section, an examination and analysis of the impact of climate change on global warming are conducted.
In view of recent extreme weather events, Darwin Choi, Zhenyu Gao, and Wenxi Jiang (2020) argue that individuals should rethink their beliefs on climate change. Extreme heat could cause people to reevaluate their beliefs about global warming's long-term effects. They use global data to show that when temperatures are extremely high around the world, there is a corresponding increase in Google searches related to climate change. When abnormally high temperatures occur, investors who own shares of Underperformance Risk Management Services can breathe a little easier. Learn more about how people's mindsets and actions contribute to global warming thanks to this study. Strength and speed in responding to climate change, as advocated by M. Weitzman (2007) in the Stern Review, are desirable notwithstanding the risks involved. Despite the formal scepticism of the evaluation, this item reveals that the researchers are less certain than is commonly believed about the interest rate that must be used to discount climate change. The second important aspect of the evaluation is the requirement to eliminate ambiguity, especially that which could have far-reaching and difficult-to-quantify consequences. It may be seen of as a question of how much insurance to acquire in case something catastrophic actually does happen. Possible dangers to future generations' standard of living by limiting their efforts to combat climate change through their consumption.Dietz S, Gollier C, and Kessler L (2018). have all brought this to awareness as a problem. An explanation of how the weather functions in the test version. This research uses theory and integrated assessment models to argue that, up to around 100 years into the future, climate beta is positive and close to unity. Thus, the

advantages of emission reduction should be substantially disregarded. However, the expected advantages, including those that have not yet been discounted, are growing faster than the discounting effect. Uncertainty can be expressed in concrete terms using simple scales, as demonstrated by the research conducted by Barnett, M., Brock, W., and Hansen, L. P. (2020), who examine and document the consequences of global warming due to certain excavation conditions and model settings. Researchers are watching high-profile restoration efforts to gauge the potential effects of climate change on the economy at large. How can the wide-ranging uncertainties caused by climate change be accounted for when making public policy? Assembling this framework and its interconnected parts into a plurality model allows us to apply the theory and methodology of commodity pricing to answer the subject at hand. Researchers O. Deschenes and M. Greenstone (2011) used an erratic yearly temperature variable to look at how different daytime temperatures affected death rates, household energy use, and overall climate. large increases, albeit not linear, in both directions. Based on these data, climate change is expected to increase annual energy demand by 11% by the end of the century, and home mortality rates by 3%. Over the course of this century, we can expect to see these rises.These estimates cannot account for the long-term costs of climate change because climate change is predicted to worsen in the future and more individuals will be able to participate in more adaptations. Several authors, including Alison Midgley (2017), report that in 2016, USD 4.6 billion was allocated to help Southern and Eastern Mediterranean countries like Jordan, Egypt, Lebanon, Tunisia, and Morocco adapt to climate change. Foreign development banks, the European Union, and the French Development Agency all contributed significantly to the total budget. The countries in the Southeastern Mediterranean that are getting the most help adapting to climate change are Turkey, Morocco, Egypt, and Jordan. There was no mention of the Green Climate Fund on the OECD's website because it had only recently been formed (OECD). The Global Environment Facility, the Special Climate Change Fund, and the Least Developed Countries Fund all give less than one percent of their overall funding to the region. 2016's database had brief references to Israel, Libya, Palestine, and Syria.

According to Google Trends, the number of people searching for "should I be worried about global warming?" increases as temperatures rise. Severe weather conditions may force us to reevaluate the long-term effects of global warming. Extreme heat is no match for the stock risk management services of the financial markets, which can keep carbon emissions to a minimum. These projections do not include the growing severity of climate change's consequences. In 2016, $4.6 billion was allocated to the Southern and Eastern Mediterranean region to combat climate change. In spite of the review's seeming scepticism, this shows that the researchers are less certain than is popularly believed about the interest rate needed to discount climate change. For maturities up to about 100 years, the authors imply that climate beta is positive and extremely close to unity.

2.4 THE EFFECTS OF GLOBAL WARMING ON FARMING

This section explores and analyses the implications that a changing climate has on agricultural practises.
Researchers Jingyi H, Alfred E. H, and Christopher J. K have dug deep into the effects of global warming on agricultural output (2021). However, while attempting to forecast crop yields, the effects of soil on crop-climate interactions are often disregarded. Crops that are irrigated and have access to groundwater at a depth somewhere between the surface and deep aquifer are better able to withstand weather extremes. The presence of organic carbon in the soil and its texture are two factors that affect these outcomes. About half a million Colombian families rely on income from coffee farming, according to research by Federico Ceballos-Sierra and Sandy Dall'Erba (2021). By their calculations, productivity will increase by 7.6 percent annually between 2041 and 2060. Still, the forecast varies greatly by elevation: in areas higher than the average, production is expected to increase by 16%. One loses 8.1% of one's productivity for every standard deviation below the median. This means that in the future, Colombian coffee farmers will need to employ cultivation methods that are more suited to the country's unique topography and environment. The effects of climate change on rice production in Nepal are investigated by Veeshan R, Wenmei G, and Alok K.B. (2021).The research found that a rise of just 1 degree Celsius in summer temperatures was linked to a loss of 4183 kilogrammes in rice production. Although there was no conclusive link between the increase in average monsoon rainfall and the output of rice, the data show that high rainfall fluctuation has a negative influence on productivity. Magdalena Cornejo and AhumadaHildegart's study of soybean yields in Argentina, a significant producer and exporter of soybeans, is scheduled for review in 2021. Soybean yield model development is sped up when automatic model selection is used. While higher CO2 levels have a beneficial effect and could speed up photosynthesis, rising temperatures in the area have the opposite effect. Climate change's effect on agricultural output around the world was assessed by Ian Sue Wing, Enrica De Cian, and Malcolm N. Mistry. (2021) using a recent crop data collection, a flexible economic model, and a grid.The model accounts for the possibility of adaptation to climate change by differentiating between the immediate and long-term actions taken by Farmers. The writers also employ a grid format to present the data. They argue that, across the board, farmers' efforts to plan ahead have diminished the immediate fallout from their efforts. Predictions based on a pool of 21 climate models indicate that between 3% and 12% of global food supply could be lost due to climate change by the middle of the century, and that number could rise to between 11% and 25% by the end of the century if no

additional adaptation strategies are explored. This forecast is based on the premise that no more adaption measures would be implemented in the future. Musa, A.I.I., Tsubo, M., Ali-Babiker, IE.A., et al. (2021) remark that increasing temperatures are likely to have a major impact on wheat yield in Sudan during the coming decades.

There is a bad association between yields and temperature over the course of the growing season. Dongola had a highly observable tendency despite previously known tendencies. It's probable that it somewhat decreased Sudan's breadbasket's productivity. In their analysis of how temperature affects the human capital output from 2020, Garg, Jagnani, and Taraz V. find that children of school age score worse on math and reading exams when the temperature is high. Extreme temperatures during the growing season can lower agricultural yields. Crops are more impacted by hot days outside of the growing season. There is a safety net for the poor, but the establishment of a workfare program weakens the connection between temperature and health and test results. Despite the fact that high temperatures have short-term negative effects on output, Burke M. and Emerick K. (2016) revealed that long-term farming practises in the United States appear to have reduced by less than half. The lack of counter-investment in the face of future climate change is suggested by the limited experience gained from recent practise. Recent temperature and precipitation data are used to analyse the effects of climate change on agriculture in the United States. Using these measurements, updated estimates of the impact's likely magnitude can be calculated. Additionally, climate change was blamed by Noah S. Diffenbaugh, Frances V. Davenport, and Marshall Burke (2021). Because of the government's generous assistance, the agriculture industry in the United States has a unique opportunity to rectify this discrepancy. Scientists may be able to prove the significant impact of global warming by comparing temperatures across different regions. Around half of the population, they say, was affected by the observed warming that occurred between 1991 and 2017. Furthermore, an evaluation of a large collection of climate models from around the world may reveal the highest degree of confidence that human-induced climate change has increased the loss of plant insurance in the United States. These forecasts for various companies are really helpful.

When trying to predict the agricultural yields, soil's influence on crop-climate interactions are typically ignored. The losses in the United States' agricultural sector have been exacerbated by climate change. Human-caused climate change has increased the loss of plant insurance in the United States, as determined by a meta-analysis of hundreds of climate models from around the world. Rising temperatures are predicted to have a major effect on Sudan's wheat production. If people are already living in poverty and there are no safety nets in place to help them, then the effects of climate change on their ability to work and earn a living will be devastating. Produce losses due to high temperatures during the growing season are a real possibility. The United States appears to have lost less than half of its long-term agricultural skills, with high temperatures having essentially no immediate detrimental effects on yield. Inadequate counter-investment in the face of future climate change is implied by recent limited practise. In the model, both immediate and future responses to climate change on the part of farmers are modelled. Midway through this century, climate change might reduce global food production by 3-12%.

2.5 THE EFFECTS OF CLIMATE CHANGE ON EDUCATION

Within the scope of this section, an investigation and analysis of the effects of climate change on education are carried out.

Christoph Deuster's (2021) study explores the ties that may exist between climatic shifts, labour market development, and internal migration in Africa. For this reason, work has begun on a two-tier national economic model that expands access to higher education and wider travel opportunities. This intricate model suggests that climate change may be a driving factor in the current trend of rural residents seeking shelter in cities. Simply put, greater profits and easier access to higher education are enticing more people to put their money into the sector in urban regions. Because of this, these extreme projections are supported by both national panel data and statistical research that dissects the groups at the provincial level. An examination of resistance reveals a connection between the dissemination of information about the precariousness of internal migration justice and the impact of climate change. According to the results of this research, rising literacy rates in Africa may be an unexpected consequence of climate change. The statistics suggest that increased internal mobility may be the root cause of this phenomenon.The effects of removing migration constraints on high school enrollment decisions made by rural Chinese middle school graduates were studied by A. de Brauw and J. Giles in 2017. An exogenous shift in the time frame during which national identity cards are issued to counties allows rural migrants to register as temporary residents in metropolitan regions. The objective of this variation is to identify price differences associated with migration. After assessing the pros and cons of their detection method, the researchers concluded that migration opportunity had a strong negative correlation with high school attendance. An absence of educational opportunities in rural China cannot account for this correlation. This realisation came after the writers weighed the merits and drawbacks of their approach extensively. Groppo and Kraehnert's (2017) research contributes to what is previously known about the long-term and medium-term effects of extreme weather on schools. Because of the catastrophic livestock losses caused by the extremely cold weather during the past two winters, Mongolia is the focus of this study.It is less likely that those who are in school at the time of the shock will be able to complete their required

coursework. The fallout is the responsibility of those who grew up in households where animals were herded, while those who did not have no bearing on the situation. Migratory trends from rural to urban areas as a result of climatic change in sub-Saharan Africa were compared to those in other developing countries by Barrios, Bertinelli, and Strobl (2006). Researchers used a global panel data set into this framework to estimate urban travel choices. Climate change, as seen by increasing rainfall, has helped the spread of cities in the developing world, according to an economic study conducted in Sub-Saharan Africa. Since gaining independence, the country has flourished thanks to the lifting of restrictions on the migration of indigenous Africans across the border.

Africa's educational system may be negatively impacted by climate change. A two-tiered national economic strategy that expands educational opportunities and vacation options is now being developed. The statistics suggest that a greater degree of internal mobility may be at the root of this impact. But in rural China, there is a large negative correlation between migration opportunities and high school enrolment. The authors only discovered this finding after carefully weighing the advantages and drawbacks of their approach. The distribution of national identity cards can be exogenously changed so that rural migrant can register as temporary residents in metropolitan regions. People's probability of finishing their education requirements is decreased if they are subjected to a harsh winter while they are enrolled in school. The researchers' focus is on people who were raised in herding conditions rather than people who live in homes where animals are not herded. An economic study in Sub-Saharan Africa shows that climate change, as evidenced by increased rainfall, has aided in the expansion of cities in the developing world. The removal of regulations that impeded the migration of indigenous Africans over the border has resulted in the nation's growth since its independence.

2.6 CLIMATE CHANGE - IMPACT ON NATIONAL & INTERNATIONAL MIGRATION

This section looks into and analyses how climate change is affecting both domestic and international migration.Recent research shows that global warming is having a major effect on urbanisation. Castells-Quintana, Krause, and McDermott (2020) found a correlation between growing urbanization and deteriorating weather. This is evident across the city because both cities and towns are still expanding. Climate change may have an influence on the size, population density, and general design of a city.Dallmann, I., and Millock, K. (2017) also investigated the effect of climate change on domestic migration by combining climatic data with migration data from India and the 2001 census. Estimated statistics show that migration to India is initially increased by the frequency of droughts. The effects of immigration are especially noticeable in agricultural areas, where provinces affected by the drought are seeing a sharp rise in their immigrant populations.The environmental elements that Beine, M., and Parsons, C., explored in this study may have an impact on international migration (2015). Natural catastrophes are an example of a short-term occurrence, whereas climate change and its inherent unpredictability are an example of a long-term trend. In their overall sample, there is no evidence of a long-term effect of climate change on international migration.

A city's size, population density, and overall design may be impacted by climate change. There is a link between increasing urbanization and bad weather. The city as a whole may see this because both towns and cities are continually growing. Researchers analyse the potential impacts of climate change on domestic migration by combining meteorological data with migration statistics from India and the 2001 census. Estimates show that droughts increase the number of people migrating to India from the areas hit hardest by the phenomenon. The effects of immigration are most noticeable in areas of the country that rely heavily on agriculture. There is less evidence that climate change will have a lasting effect on human migration patterns. Natural catastrophes are an example of a one-time event, but climate change is indicative of a longer-term tendency.

2.7CLIMATE CHANGE - IMPACT ON ECONOMIC LIFE & DEVELOPMENT

In this part, the consequences of climate change on economic life and development are investigated and analysed In this study, Dell, Jones, and Olken analyse how changes in national average temperatures throughout history have affected global economic performance (2012). There are three major conclusions drawn by the writers. Rising temperatures have a dual impact, the first of which is detrimental to the economics of developing nations. Second, increased temperatures may limit production rather than growth rates. Third, when the average temperature increases, economic, political, and agricultural output will increase as well. Although the link between climate change and GDP growth has been debated for some time, this study suggests that developing countries may be hit particularly hard. Effects of climate change on economic activity, trade, human migration, growth, and wellbeing were investigated by Desmet K. and Rossi-Hansberg E. (2015) using the model. It is projected that 10,158 businesses from 34 different nations are open to the benefits of climate change using the method provided by Sautner Z. et al. (2020). The technique uses machine learning algorithms based on the passage of time to keep track of instances of randomness, physical strain, and the effects of global warming.Compared to carbon sequestration or proportions, these measurements are more accurate at capturing changes in solid level, and they also show phase variations and time series in a way that is suitable given the objectives. Measures of exposure take into account past behavior's economic elements, which are assumed to be strongly associated with exposure

to climate change. High ratings and a company's susceptibility to regulatory shocks are now shown to be negatively correlated in recent years. In the course of the last century, researchers in the United States have looked at the correlation between high temperatures and death rates to determine how likely it is that these two factors will become more in line in the years to come (Barreca A., Clay K., Deschenes O., Greenstone M., and Shapiro JS, 2016). First, there was a 75% reduction in the impact that was caused by the number of days and the average temperature that was higher than 807 degrees Fahrenheit. There were mostly declines after 1960. Second, the fact that air pollution is so prevalent in residential areas is principally responsible for the overall decline in the death rate associated with a hot day. Third, the ongoing Dubin and McFadden model projects that US consumer income will have increased by between $85 and 185 billion in 2012 since the invention of the air-conditioned airliner. In 2016, Heal, G., and Park, J. examined current economic studies on extreme temperatures. Data from small and large research discussing the effects of short-term heat stress on health, staffing, and productivity are increasing, despite the fact that there aren't many studies at the moment on potential adaptations. Taking into account ethical attitudes and institutional constraints, as well as providing clearly defined measurements of heat-related losses, the local economy is suggested by the authors as a possible aid in establishing the entire cost of heat usage. Researchers Hauer ME, Evans JM, and Mishra DR agree that rising sea levels are the most obvious consequence of climate change on human society (2016). The experts argue that not enough studies have accounted for the fact that the world's population would continue to expand into the foreseeable future. Here, they employ population estimates to investigate the threat of sea level rise (SLR) in all U.S. coastal regions. Worldwide, 4.21 million people will be at risk of flooding in 2100 due to an SLR of 0.9 metres, compared to 13.1 million due to an SLR of 1.8 metres. These results suggest that a public uprising similar to that which occurred during the Great Depression may occur in the United States. There has been a substantial rise in the price of conducting business with vigorous economic expansion and the widespread adoption of innovative new technology.Overall, per capita salary and other financial and sector quality measures are strongly correlated with the environmental zone, disease types, and proximity to the seashore, according to Sachs, Jeffrey D. (2003). This note finds that per capita payments are directly impacted by intestinal illness (malaria) transmission, which is strongly influenced by environmental variables, after accounting for the type of organization. Brock WA and Hansen LP. (2018) examine the economic problems of climate change using data from decision-making theory under uncertainty. They adopted a three-part approach to uncertainty: risk, ambiguity, and miss specification. The researchers were looking at a recent climate science study that highlights climate change uncertainties that are crucial for economic analysis and compliance with the use of models to give policy direction. The components of uncertainty and their consequences for decision theory aid in the organization of this data and the identification of modeling and evidence issues. According to Gollier C and Weitzman ML (2010), the long-term discount rate decreases until it reaches the lowest price that can be afforded. It is known as the "Weitzman-Gollier dilemma" because two seemingly equal and equally rational approaches to dealing with unknown future discount rates give radically different results. It's important to keep the active discount rate at its lowest possible value if future discount rates are unpredictable but have a long-term impact. This crucial metric, which looks further into the future than a standard discount for a constant cost, can be greatly impacted by a cost-benefit analysis (CBA) of climate change implications. Weitzman ML. (2009) investigates the impact of structural economic uncertainty on high-impact but low-risk disasters. Post-distribution forecasts that are based on stable structural elements have a large "tail fat increase," even when they are revised based on Bayesian interpretations. The impact of fat tails is particularly felt in contexts like climate change, where catastrophic outcomes are possible because insufficient background knowledge was available to set adequate limits on the potential for harm. According to this study, the economic costs of uncertainty resulting from a fat-tailed structure could easily outweigh the effects of discount mitigation in policy analyses of climate change. As the average temperature of the Earth rises, climate scientists Hong, Li, and Xu predict that droughts will become more frequent (2019). The extent to which these risks are reflected in food prices is a topic of research.Based on data from publicly traded food companies, the Palmer Drought Severity Index rates countries by their vulnerability to drought. Slower food industry growth is anticipated for nations with lower trend grades. Food stock returns across the country are also expected to fall. The underreaction of food stock prices to the challenges posed by climate change provides further evidence for the predictability of this return. Heal G. and Millner A. (2014) state that everyone is aware the climate is changing, but nobody knows how quickly. Nobody knows for sure what kind of social and economic effects these changes will have, or how effective existing mitigation initiatives will be. This study aims to provide light on all of the factors contributing to climate change uncertainty. In view of the public's possible lack of familiarity with the topic, researchers investigate the potential economic effects of a complex policy framework for addressing climate change. For climate change policy and infrastructure investments to be effective, Moritz argues that future outcomes must be taken into account. Multiple studies, including A. Dell, M., Jones, B. F., and Olken, B. A. (2014), have employed panel techniques to examine the impact of weather on economies. The effects on agriculture, industry, employment, GDP growth, energy consumption, war, and health are also analysed in this study. This research presents novel reading techniques, data sets, and findings. According to the article's author, Gollier, C. (2002), the purpose is to determine the appropriate level of public discount for

public investment projects so that they can finally recoup their costs and benefits. The experts agree that consumer spending is expanding in a random fashion. As a first step, they examine the decisions made by the representative agent throughout a repeated job about the discount rate for a given time horizon. Then, they take into account the time frame to determine how it will influence the future service model. They show that the uncertainty of future growth influences the effective discount rate everywhere, and that under a variety of preferences (including high degrees of discretion, moderate risk aversion, and complete avoidance of risk), the discount rate should be lowered in the near future.

Economic and societal effects of climate change, as well as the scope of effective responses, are unknown. Scientists look into every facet of climate change to stress the significance of each variable. Scientists look into the connections between weather and economic growth and societal outcomes. The authors have used panel techniques from an expanding choir to account for the impact of weather on economic outcomes. The economic aspects of past behaviour are taken into consideration in calculating levels of vulnerability to climate change. Droughts are more likely to occur as global temperatures continue to climb. In order to examine the financial effects of climate change, this study draws on information from the field of decision-making theory in the presence of uncertainty. According to a recent study, local economies may help evaluate the typical cost of energy consumption by factoring in factors like institutional frameworks and ethical perspectives. The rise in sea levels is the most visible effect of climate change on modern society. Hotter weather may reduce factory output. When temperatures rise, so will industrial and agricultural output. Long-term discount rates decrease until they are as low as possible. It's important to keep the current discount rate as low as possible if future discount rates are unpredictable and have a long-term impact. According to a recent study, it's possible that the time and effort spent analysing plans to combat climate change will end up being counterbalanced by their negative effects. Stable structural factors considerably boost the "tail fat" for post-distribution projections. There is a major effect of fat tails on problems like global warming. Researchers show that growth is unpredictable and affects the effective discount rate globally; hence, the discount rate should be lowered quickly under a variety of preferences, including high degrees of discretion, moderate risk reduction, and complete risk aversion.

2.8CLIMATE CHANGE – IMPACT ON PEOPLE'S LIFE AND SATISFACTION

This section explores and examines how climate change affects people's quality of life and satisfaction.

Kalfin S, Sudradjat S, and Mustafa M (2022) are of the opinion that the chance of suffering financial loss as a result of natural disasters has grown over time. This study investigates the evolution of insurance as a substitute for long-term economic recovery following natural disasters. Based on the data from such 266 publications, it is clear that the number of scientific papers produced each year increased from 2000 to 2021. Increased frequency and severity of natural catastrophes are directly attributable to climate change, as is the likelihood of suffering considerable financial loss. In the last five years, there has been a heightened focus on three of the six different categories of catastrophic risk insurance: agriculture insurance, flood insurance, and property insurance. With access to recovery money, communities can quickly rebound from disasters and weather tough times. According to Diakakis, M., M. Skordoulis, and E. Savvidou (2021), global warming is one of the gravest threats humanity faces today. People's perceptions of the risks associated with climate change should be factored into any efforts to lessen or adapt to the phenomenon. The data in this study comes from a questionnaire survey conducted in Greece, a high-risk region in the Eastern Mediterranean. The results show that one's personal catastrophe experience correlates positively with their perception of the threat posed by climate change and the root causes of recent disasters. According to Omolola E.A., et al. (2021), people of colour in Harris County, Texas viewed Hurricane Harvey and Winter Storm Uri from the vantage point of increased risk of natural disasters brought on by global warming. Spatial analyses show that the illness load, social vulnerability, and community-level risk indicators are all much higher during pandemics and catastrophic catastrophes. Minority groups who had been through disasters before were better prepared for the next one, suggesting that their communities were more resilient overall.According to Tam T. Le et al. (2021), this research looks at how households in Vietnam's Quang Binh Province see their risk of natural disasters in light of their past catastrophe experience and their financial preparations. Due to the fast urbanisation and growth of the country, the province is one of the places most affected by climate change and natural disasters. According to research published in 2013, by Slettebak R T, both urbanisation and population expansion are likely to push more people into vulnerable locations, while climate change is forecast to raise the likelihood of natural disasters. Unrest and politically driven violence in the wake of the disasters are likely to cause less harm to India than the disasters themselves. Despite the diversity of its regions, focusing on a single country improves our ability to account for temporal variation.The research conducted by Wamsler, C. (2010) looks at the development of disaster risk management concepts from the 1960s, as impacted by actual experience with the rise in disaster frequency and urbanisation. Climate change is shown to be a key factor in the development of a pro-poor agenda for adaptation in urban areas, which may be used to address existing challenges in the area of urban risk reduction. We give a comprehensive framework for mitigating climate change and natural disaster risks, and we highlight some of the options available for doing so. Climate change-related

calamities have far-reaching consequences for human communities, as Tschumi, Elisabeth, and Jakob Zscheischler (2019) demonstrate. Climate warming is expected to exacerbate existing weather extremes and cause new ones. Droughts, floods, heat waves, and cold waves are major yearly fluctuations in temperature and precipitation across the entire country. Extreme weather events are more common in industrialised countries than in underdeveloped ones. According to Diana Reckien et al. (2017), climate change, which may have an effect on large and diverse metropolitan populations, is commonly recognised as the greatest threat to our communities in the next decades.Various populations are shown to be more susceptible to heatwaves, floods, landslides, and even climate change adaptation and mitigation strategies. Many people point to gender and social class as sources of sensitivity. Bhatt, R. K. Mall, and T. Banerjee (2015) argue that the increasing emphasis on disaster risk reduction and climate change adaptation in global governance is promising for the development of more cutting-edge local disaster management systems. People's actions have a significant effect on the environment and hasten climate change, which is a well-known fact. Climate change has devastating consequences, but the situation may become even more dire if predicted shifts in weather extremes materialise. Although the precise level of stress is still debatable, everyone believes that expected climate change would worsen the associated vulnerabilities. According to the CAN Report (2013), low-carbon growth paths and societal transformation are essential for developing nations to adapt to climate change.At the UN climate conference in Copenhagen at the end of 2009, developed countries promised to increase their financial contributions to $100 billion US year by 2020. Even if the private sector may play a role in climate adaptation, it may not be the best choice for the most vulnerable and marginalised communities. Further investigation and a bottom-up approach, mapping unique needs to tailored methods and equipment, are essential. A standardised method for monitoring and recording private money, including adaptation funds, is required. The key topics of this special issue are climate change, natural disasters, and development, as stated by Goldhill, S. and Georgie, F. (2021). The research presented here aims to facilitate climate-resilient decision-making and promote sustainable development by maximising the positive effects of climate change responses and minimising the negative effects across the full spectrum of geographies and sectors that are potentially affected by climate change.It is widely acknowledged that climatic catastrophes pose a threat to human life on a worldwide scale (Rahman, M.S., et al., 2022), but not much is known about how these disasters would effect the urban and rural populations of Indonesia. The cross-sectional data came from a sample of 7110 Indonesians who had experienced natural disasters, including 3297 people in rural areas and 3813 people in urban areas. The results show that natural disasters have a profoundly depressing effect on people's happiness levels but have little to no effect on the joy experienced by the Indonesian people. The World Bank reports that corruption in climate finance hinders efforts to reduce emissions and improve infrastructure (Nest, Mullard, &Wathne, 2020). Despite being home to some of the world's worst corruption, the top receivers of climate money receive 41.9% of all climate-related aid for international development. Corruption risks have not been well mapped, and anti-corruption technologies are still being developed, tested, and assessed.

Long-term economic recovery in the wake of natural disasters has been aided by the development of insurance as an alternative. In the past five years, three of the six different kinds of insurance against natural disasters have become increasingly popular. The risk of catastrophes and the potential for loss are both amplified by climate change. Extreme weather events have a major negative effect on happiness but have little to no effect on Indonesians' ability to have fun. The public's perspective on climate change is important to consider when working to mitigate its effects and adapt to its impacts. Due to the fast urbanisation and growth of the country, the province is one of the places most affected by climate change and natural disasters. Funding corruption has a negative impact on pollution reduction and infrastructure repair initiatives. Almost half of the money spent on foreign development projects relating to climate change goes to only eight organisations. Due to a lack of study, anti-corruption tools continue to be developed, tested, and given low ratings. People's actions have a significant effect on the environment and hasten climate change, which is a well-known fact. Climate change has devastating consequences, but the situation may become even more dire if predicted shifts in weather extremes materialise. More people will be living in dangerous areas as a result of urbanisation and population growth. Natural disasters are likely to become more common as a result of climate change. It's true that natural disasters can cause a lot of destruction on their own, but when they spark armed conflict, the carnage is amplified many times over.

2.9 CLIMATE CHANGE – RISK ASSESSMENT & AVOIDANCE

The implications of climate change for risk assessment and mitigation are the topic of this section's research and examination.Because catastrophic risk is dependent on time, it is difficult to analyse, understand, and respond to it, according to Ismail-Zadeh A (2021). Natural hazards (NH), climatic change (CC), vulnerability (V), exposure (E), and choice-making are all taken into account here (DM). Catastrophes are sparked by NHs, but CC is expected to increase their frequency, and both V and E are significant contributors to disasters. Knowledge of V&E, relevant options for disaster preventive measures, and scientific data from NH&CC are essential for any competent DM working in the field of disaster risk reduction. According to Wahyuni, E. S., Hartini, S. R., and Dina N., the BPS (Badan Pusat Statistik, or Statistics Indonesia) and the National Disaster Management Authority should establish

definitions for disasters, including those caused by climate change (2020). More often than fleeing a natural disaster are people fleeing because of a lack of economic opportunity. The population growth rate needs to be reduced, the consumption of natural resources needs to be altered, and the Earth's carrying capacity needs to be increased. Quantitative catastrophe risk assessment can be improved using a county-level, all-hazards risk assessment, say Guo, Guizhen et al. (2021). It can be used as a scientific basis for the creation of strategies to reduce the likelihood of catastrophic events. Based on theories and methods of natural disaster risk assessment, this study integrates disaster statistics, meteorological data, geographic information, and other multivariate data to quantify the hazards of various disasters in Cangnan County, Zhejiang Province, with a focus on climate-related hazards.According to Hugues Chenet, Josh Ryan-Collins, and Frank van Lerven, it is becoming evident that central banks and regulators must address climate-related financial risks (CRFR) in order to maintain financial stability (2021). Much of the focus of the developing policy framework to address CRFR is on market-based strategies. The authors argue that their method won't be particularly effective since the CRFR's massive uncertainty makes it hard to engage in "effective" price discovery. Instead, advocates of a "precautionary" fiscal policy argue that bolder actions from the financial sector are needed to better control these long-term risks. According to research by Dellmuth, Lisa M., et al., the frequency of extreme weather occurrences will increase as a result of global warming (2021). Nations rely significantly on the United Nations and other multilateral institutions to provide efficient disaster help. In order to examine what factors affect United Nations disaster relief, the authors use a dataset of almost 2,000 climate-related disasters that occurred between 2006 and 2017. They create a unified measure of global hazard severity that can be applied to a wide range of climate-related events with similar accuracy. Financial market and climate change research is analysed by Stefano G, Bryan T. K, and Johannes S (2020). They begin by discussing the many approaches that might be taken to include climate risk into microfinance models. Next, we take a look at the research that has been done to determine how different asset classes, such stocks, bonds, and real estate, have priced climate risks.Furthermore, they discuss how these assets might be used by investors as a hedge against climate risk in portfolio construction. As a parting recommendation, they propose a few exciting avenues for future study in the field of climate financing. The potential risks of disaster in economics models of climate change are explored by Mittnik, Stefan, Willi Semmler, and Alexander Haider (2020), who also highlight the importance of intervention. The relationship between carbon dioxide emissions and the frequency of climate-related disasters is investigated using a panel data technique. A multi-stage dynamic model including the distressing phase caused by catastrophe shocks can be used to examine mitigation and adaptation measures, as well as recovery approaches. According to SiamakJavadi and Abdullah-Al Masum (2021), robust empirical data demonstrates that firms located in regions more susceptible to climate change pay much larger spreads on bank loans. To alleviate concerns about relying on a company's headquarters to determine climate risk exposure, researchers take advantage of the economic connection between a firm and its customers and discover that the exposure of a firm's customers to climate risk also negatively affects that firm's cost of borrowing. According to their findings, low-credit-rated businesses taking out long-term loans is what causes the cross-sectional effect. Overall, their findings suggest that financial institutions are beginning to view climate change as a material risk concern. It has been found by Jetten Jolanda et al. (2021) that climate-related disasters are more common and severe than in prior decades.Disasters can sometimes provide the impetus for social change, although this is by no means always the case. In order to understand whether disasters lead to social transformation or maintenance of the status quo, researchers propose a model (Social Identity Model of Post-Disaster Action; SIMPDA). It has been reported by Bellquist L. et al. (2021) that between 1989 and 2020, 71 officially sanctioned fisheries catastrophes happened in every federal fisheries management region and coastal state in the United States (eleven more are pending). There is not enough structure in place for evaluating the efficacy and equity of disaster relief to be provided. As the frequency of such catastrophic occurrences rises due to climate change, the federal system for declaring disasters and mitigating their effects must be revised. How, in the current post-pandemic environment of rising corporate and governmental debt, can one initiate a wave of low-carbon investments that are consistent with the Paris Agreement's well-below 2° C objectives? this is the question asked by Jean-Charles Hourcade, Dipak Dasgupta, and F. Ghersi (2021). It has been argued by researchers that the initial risks prevent the world's surplus savings from growing quickly enough to aid in climate change adaptation and "green" economic recovery strategies. The authors next demonstrate why public assurances are the superior mechanism for risk sharing, so resolving the aforementioned issue. According to the research of meteorologist Mark E. Keim (2011), the frequency and intensity of extreme weather events may rise as the planet warms. Historically, these occurrences have been linked to catastrophic public health crises.The effects of climate change can be reduced by taking steps to reduce the causes of climate change. In order to adjust to climate change, it has been suggested to take a catastrophe risk reduction strategy that is both broad and deep. It's common knowledge that these situations lead to public health crises, but it is possible to lessen their impact. Externalities, including as greenhouse gas emissions, are to blame for the largest market failure in human history, according to Nicholas Stern (2008). The fundamental issue poses a worldwide threat. The study's author warns that failing to take this step could lead to disastrous policy decisions. With this talk, the author hopes to lay out the approach he sees as most promising for examining the

climate change issue in light of the particular challenges we are currently facing. Albert Czerny and Simon Cadez (2018). To a large extent, the problem and its solution can be traced back to the same set of organisations: those responsible for a high volume of anthropogenic greenhouse gas (GHG) emissions and those that are GHG-intensive. These companies are doing studies to better understand climate change and its causes, as well as the effects it may have on their operations. If the world continues with business as usual in its response to climate change, greenhouse gas concentrations in the atmosphere will rise to catastrophic levels in the next decades, as predicted by Jeffrey D. Sachs (2007). As long as the benefits to society balance the costs of mitigation, it should be done. By balancing the extra costs of effective greenhouse gas stabilisation against the incremental benefits of slowed climate change, the optimal rate and intensity of emission reduction can be determined.Thanh D. Huynh, Thu Ha Nguyen, and Cameron Truong predict that in 2020, businesses who operate in areas prone to significant drought will see an increase of 92 basis points in their equity expenses. This information confirms the widespread belief that large financial institutions have a predisposition toward investing locally and illustrates that diversification is not enough to prevent a total economic loss due to the drought. The impact of the drought on predicted profits is mitigated for businesses with diversified cash flows and/or investments, geographically dispersed corporate operations, and sizable cash reserves. According to the definition provided by Samer Fawzy et al. (2020), climate change is the alteration of weather patterns due mostly to greenhouse gas emissions from natural systems and human activities. Many of the world's 315 natural disasters in 2018 were precipitated by unseasonable weather. Infrastructure, food, water, health, ecosystems, and human habitats are all particularly vulnerable to the effects of climate change. In order to reach the targets set by the Paris Agreement, it is evident that traditional mitigation methods alone will not be enough.When it comes to protecting children from danger, Seddighi H, Yousefzadeh S, Monica Lopez L, and Homeira S (2020) argue that minimising their exposure and vulnerability to climate-related disasters is essential. Children can play a key role in mitigating climate change risks to their families and communities by teaching others about the issue. In the long run, taking part in initiatives to slow global warming could mean safer conditions for children. Confronting climate change and lowering emissions of greenhouse gases (GHG) is, as many argue, one of society's top priorities. Archaeological evidence from 33 societies over 22 catastrophic climate-related disasters tested two disaster resilience theories (Peregrine, P. N., 2018). Literature on disaster response shows that societies with higher levels of citizen participation in decision-making, better community cooperation, and more effective governance institutions fare better. However, the author points out that recent psychology research has shown that communities where social standards are strictly enforced tend to be less robust. Mocuta D N, Stelica C, Adrian T R, and Ana Maria H (2018) claim that the allocation of material and human resources for disaster prevention and mitigation has been significantly altered as a result of climate change. Finding novel approaches to risk assessment that would tempt all parties included in disaster risk management programmes to contribute to disaster prevention (public authorities, NGOs, communities, business sector).Warren (2010) argues that facility managers should anticipate occurrences and prepare for them. Increased frequency of natural disasters may occur as a result of climate change, as is discussed in this research. The study's findings indicate that the burden of conducting risk assessments and making contingency plans falls squarely on the shoulders of facility managers. Natural disasters brought on by climate change could cause significant harm to the commercial sector. There is a need for more research into the effects of natural disasters on the resilience of buildings and property. According to O'Brien, Geoff, Phil O'Keefe, Joanne Rose, and Ben Wisner (2006), efforts to reduce vulnerability to climate change risks would be hampered by a development-focused approach that fails to recognise the need of bolstering governance and resilience. The harm caused by climate change can be mitigated by lowering people's susceptibility to it. This requires a shift in viewpoint on the threat posed by climate change, in addition to changes in institutional connections and structures.

The quantitative risk assessment of catastrophes can be improved by conducting risk assessments at the county level for a wide variety of natural hazards. The research focused on climate-related risks in Cangnan County, Zhejiang Province. The role of central banks and regulators in addressing financial risks associated to climate change is gaining prominence. Because of climate change, multilateral organisations like the United Nations will be under more pressure to effectively respond to natural disasters. Natural hazards, climate change, vulnerability, exposure, and decision-making all contribute to the intricate web that is 21st-century disaster risk. They conclude that the vulnerability of a firm's customers to climate risk has a negative effect on the cost of borrowing. The frequency and intensity of climate-related disasters have increased during the past few decades. It's not always the case, but natural disasters can serve as a catalyst for social transformation. A model is proposed by the researchers to explain whether or not disasters cause societies to change or to keep things the same. As the frequency of such catastrophic occurrences rises due to climate change, the federal system for declaring disasters and mitigating their effects must be revised. Between 1989 and 2020, there were 71 federally recognised fishery catastrophes. Finally, they offer a few interesting topics for future study in the field of climate finance.

Many of 2018's 315 natural disasters can be traced back to the weather. The effects of climate change are most likely to be felt in areas relating to infrastructure, food, water, health, ecosystems, and human habitats. Protecting children from harm requires drastic reductions in their exposure to and vulnerability to climate-related

calamities. Children can play a key role in mitigating climate change risks to their families and communities by teaching others about the issue.The health of children may be safer if more people take part in projects to slow climate change. How we distribute material and human resources for catastrophe prevention and mitigation has been profoundly affected by climate change. Historically, these occurrences have been linked to catastrophic public health crises. The effects of climate change can be lessened by taking steps to reduce the causes of climate change. The increasing likelihood of natural disasters due to climate change is stressed. Natural disasters brought on by climate change could cause significant harm to the commercial sector. There is a need for more research into the effects of natural catastrophes on property and building resilience. According to the study's author, ignoring climate change would lead to disastrously flawed policy decisions. The purpose of this presentation is to outline the author's preferred methodology for investigating the climate change issue. By balancing the extra costs of effective greenhouse gas stabilisation against the incremental benefits of slowed climate change, the optimal rate and intensity of emission reduction can be determined. When it comes to climate change, if the world keeps doing what it's always done, deadly levels of greenhouse gases will be released into the atmosphere in the coming decades. If we want to lessen the impact climate change could have on our lives, we need to minimise our exposure to risk. Changes in perspective on the threat posed by climate change are necessary, but so are adjustments to the interconnected and structural nature of institutions.

2.10 CLIMATE CHANGE – NEED OF POLICY AND FINANCING

In this section, we will evaluate the repercussions of climate change on the need for policies and financing to mitigate the effects of climate change.

William Nordhaus (2018) argues that climate change is one of the most pressing global environmental challenges facing countries today. In order to slow the effects of global warming, governments have taken only small measures thus far. The updated dynamic integrated model of climate and the economy (DICE) model is used in studies to predict new trends and the effects of possible climate policy. In other words, it indicates that governments won't be able to meet the 2°C objectives of the international accords even if radical reforms are undertaken soon. The authors Jing W. U. et al. (2016) argue that the concept of climate finance is crucial to current debates about halting global warming. In this work, we propose a mechanism for climate financing in which wealthy nations donate money to developing nations with the express condition that the latter utilise that money only to cut their carbon emissions. The results highlight the potential contribution of continuing climate finance to the fight against global warming. There may be a short-term hit to GDP in wealthy countries if they begin investing in climate change, but the long-term advantages will more than make up for it. China, the United States, and the European Union are the top three emitters of greenhouse gases, with India coming in at number four. Their study's overarching goal is to describe the possibilities, hurdles, and possibilities that Indian cities confront in their fight against climate change.In this essay, We will first discuss the role of the co-benefits idea at the urban level and the difficulty of multi-level academic climate governance (Jan Beermann et al. 2016). Institutional frameworks in India for climate finance have generally embraced national policy solutions, as stated by Vyoma Jha (2014). According to preliminary research, the Indian climate finance landscape is complex and dispersed, featuring a wide variety of institutions, actors, and channels for climate funding. The purpose of this research is to determine how institutions and stakeholders in India's fight against climate change may work together more effectively. It considers lessons learned from India's previous use of multilateral climate funding. According to Mohammad Rasel Kabir et al. (2021), as climate change is now a global issue, no single country can effectively handle climate governance on its own. Engagement from civil society is crucial for ensuring accountability and transparency in climate spending. This research suggests that civil society organisations in Bangladesh are becoming entangled in the fraudulent supply chain of the climate finance business. According to Koyel Kumar Mandal (2019), climate finance, or funding for efforts related to climate change, has received a lot of attention in international climate change negotiations.This chapter focuses on the evolution of climate funding as a concept in India. It analyses the main elements that affect the flow of such funds and looks at India's present efforts to raise money for adaptation and mitigation from various sources. Financial policy and climate change are two areas where the economic literature is fast growing, and Benjamin Dennis (2022) reviews this trend. A number of significant institutional distortions prevent such pricing from being accurate, and researchers find that it remains difficult to estimate the statistical characteristics of a changing climate. However, there is growing evidence that financial markets are factoring in climate-related risks. Finally, scientists have suggested that regions could serve as a particularly valuable analytical unit for calculating the monetary impacts of climate change. Because of the many threats that are expected to grow as a result of climate change, Bangladesh is one of the most susceptible countries, as stated by Sammonds P, Shamsudduha M, and Bayes A (2021). Losses from natural disasters, both abrupt and slow, have decreased significantly since the 1970s. These advancements in development and disaster risk reduction are now in jeopardy as a result of the climate problem. Relocation due to natural disasters is a serious extra issue. According to Tek Jung M, LudkBláha, Batu U, and Michal B (2019), Nepal is one of the nations most at risk from climate change. The decline in social and economic development, the complexity and unpredictability of the natural

environment, the absence of institutional capacity, and the shocking state of underdevelopment in the world's infrastructure have all contributed to an increase in population and ecosystem vulnerability. Researchers analyse the existing financial situation, argue about hypothetical future possibilities, and recommend policy alterations in order to provide long-term adaptation and mitigation solutions.Climate finance policy is given an empirical review by Rishikesh Ram Bhandary, Kelly Sims Gallagher, and Fang Zhang (2021). Nine different climate finance policies—including disclosure policies, national development banks, feed-in tariffs, weather-indexed insurance, target lending, green bond policies, loan guarantee programmes, and national climate funds—are analysed in terms of their efficacy based on a review of the literature and case studies. Both positive and negative outcomes in specific countries are analysed. We define criteria for assessing climate finance policies, including the elements affecting their efficacy in practise, knowledge gaps that must be bridged, and policy implications. According to Zhang Wen and Pan Xun (2016), the 21st Conference of Parties, which took place in Paris at the end of 2015, marked the beginning of a new paradigm in the international community's response to combatting climate change. This research classifies the mitigation objectives of all Parties and provides a comprehensive examination of the resources needed, the costs of mitigation, and the priority investment sectors for developing countries. The World Bank reports that climate finance has advanced significantly in recent years (2020). Climate-focused financial planning entities like the Green Climate Fund and Climate Investment Funds were established for this purpose. Despite this improvement, the climate financing mechanism might be made more effective. A more creative and catalytic approach is needed to close the gap between resource availability and demand. It classifies eight major categories of climate change levers and provides basic suggestions for innovative climate funding.Sarah Bracking and Benjamin Leffel (2021) find that new decentralised, polycentric frameworks make it easier for sub- and non-state actors directly adopting climate change governance to acquire climate money. The growth of market-oriented and debt-based mixed finance for climate change is an expression of a neoliberal logic that gives power to market actors. A return to publicly authored finance and governance is strongly supported by grants, say researchers who agree with others. According to Muhammad Sheriffdeen et al. (2020), efforts to curb climate change have been a staple of international discourse for decades. Institutions at the national level are responsible for raising, managing, and doling out climate financing. This viewpoint is gaining adherents. This research provides an indicator-based method for evaluating the effectiveness of the Indonesian Climate Change Trust Fund as a case study. According to Akihisa Mori, Syed M. Rahman, and Md. Nasir Uddin, a change in cash allocation may put pressure on the Adaptation Fund to make efficient use of the readiness programme (2019). Gaining access to this money is more likely for low-income nations than for the world's poorest nations. In light of the results, the ease with which a country can use the AF and the amount of money it receives in return is likely to depend on the degree to which it is vulnerable. When investigating how to reach the 2009 objective of mobilising US $100 billion in climate finance to developing nations by 2020, Timmons Roberts J. et al. (2021) found that it was not specified what sorts of funding may count toward the target. It is impossible to verify whether or not wealthy countries have met their duties because of vagueness and questionable assertions. As the year 2020 draws closer, however, a new commitment can be made to fix these problems. Tim Cholibois (2020) learns how Madagascar's New Energy Policy's planned transition to renewable energy sources would be funded by climate money. Results were generated through discussions with experts in energy financing and focus groups in recently electrified rural areas. It is concluded that up to 19 million Malagasy may be left out of future electrification programmes if only financially viable energy projects are funded moving forward. According to Bhawna Srivastava and Reddy P. B., several world leaders have recognised India as a frontrunner due to its efforts to tackle COVID-19 and climate change (2021). Climate change threatens India's economic growth, food and water security, health, gender equality, and poverty alleviation initiatives. Finding ways to increase climate finance to deal with the effects of climate change is a major problem in many developing countries. The link between the right to development and climate change is explored by Saad Alfarargi, the United Nations Special Rapporteur on the right to development for the year 2021. He thinks there needs to be a just transition from the carbon-based economy to one based on sustainable growth, the protection of human rights, and the principle that nobody is left behind. Promoting diverse, green economies with climate-resilient, sustainable development will not only aid developing nations' right to development and adaptation but also improve global fairness. Within the context of the Paris Climate Agreement of 2015, Gabrielle Kissinger et al. (2019) investigate the potential for climate money to assist impoverished nations' efforts to transform unsustainable land use patterns. According to the authors' analysis of the NDCs, only 14 out of 40 countries provide detailed cost estimates for proposed forest-related climate change actions.While there has been considerable discussion of domestic issues, few have addressed the need for changes in fiscal policy to address the root causes of land use change. They also talk about Brazil and Indonesia, bringing up the challenges of conducting business in those countries. Financial vulnerabilities and the potential for sovereign defaults are discussed in Mallucci E.'s (2020) research. Using data from seven hurricane-prone Caribbean countries, the author modifies a standard sovereign default model to incorporate catastrophe risk. It highlights how 'disaster clauses,' which provide debt-servicing relief, allow governments to borrow more money and preserve their access to financial markets despite heightened catastrophic risk due to disaster risk and climate change. Overborrowing and

a consequent decline in welfare are two potential outcomes if debt ceilings aren't implemented. The world must act quickly on climate policies if it is to invest in reaching the temperature and adaptation targets of the Paris Agreement, as argued by Ananthakrishnan P, Elena L, Alan X F, and William O (2022). It is imperative that policy initiatives be matched by adequate funding in order to help close the world's massive funding gap. The article delves into alternative ways for leveraging domestic and international private-sector capital in climate financing, in addition to climate-related legislation.The International Monetary Fund's prospective involvement is also briefly considered. Governments, according to Carolyn Fischer's (2016) research, are seeking low-carbon solutions that simultaneously provide domestic job growth, which is why the green industrial policy is gaining traction. Within this context, I analyse domestic and international motivations for subsidising exporting nations' production and deployment. Constraints on upstream subsidies lessen global welfare when externalities are large relative to political distortions. Alternatives to climate funding don't exist. if political distortions are large and the price of carbon is not artificially low by governments. The research of Zewdu Eshetu et al. (2014) indicates that it would be extremely challenging to finance Ethiopia's response to climate change. The national Climate Resilient Green Economy policy has asked for USD 7.5 billion per year to tackle climate change. With national budgetary resources for climate change-related activities estimated to be in the range of USD 440 million per year and foreign sources adding a few tens of millions of USD per year, it appears that there is a large financing gap. For this reason, much more effort is required to generate additional resources both locally and internationally if the approach is to be executed. But as Hari Prasad Sharma (2014) demonstrates, Nepal is actively working to mitigate the risks and capitalise on the benefits of climate change. From 2009-2012, international donors provided a total of US$236.62 million to support adaptation-friendly projects, while in 2013-14, the government allocated 10.3% of its budget to climate change. By establishing a climate change fund to pool and redistribute resources and strengthen local expertise, the government may choose to invest up to 80% of the money earmarked for climate-sensitive projects in local initiatives. There has been a growing interest in increasing private investment over the past decade to tackle long-standing socioeconomic and environmental concerns, as reported by Robyn Clark, James Reed, and Terry Sunderland (2018). Private sources reportedly amount to billions of cash, ready to be put to use. Experts agree that greater collaboration is needed to increase funding for landscape-scale initiatives with a long-term and sustainable outlook.According to the research by Lianbiao Cui and Yuran Huang (2018), the Green Climate Fund (GCF) faces the difficulty of insufficient funding. Several strategies for encouraging developed countries to contribute more publicly to the GCF are analysed in this report. The current international monetary system has taught us a lot. If the United States were to withdraw its climate funding, other donors, particularly the European Union, would have to shoulder a larger share of the financial burden. According to research by Sangjung Ha, Thomas Hale, and Peter Ogden (2016), the "South-South Climate Finance" (SSCF) initiative can help to raise significant new funds for the climate crisis. Parties to the UNFCCC should keep an eye on the SSCF and provide support in order to ensure that it works well with the more traditional climate money that flows from developed to developing nations. Countries can seek the aid of multilateral development banks in order to raise more money for climate change initiatives through this method. the role of development banks in raising additional funds for climate change. Research on this topic was given a fresh lease on life in 2010 thanks to the Cancun Accords, which pledged $100 billion in international climate money annually by 2020 (Luis M. Abadie, IbonGalarraga, and Dirk Rübbelke, 2012). The current structure of international climate funding does not reflect the Accords' need that adaptation be given the same priority as mitigation. The study authors pinpoint a number of unique causes of the mitigation bias and suggest avenues for policymakers to begin working from to boost financing for adaptation and eliminate the bias. Increased money is needed for adaptation, according to SmitaNakhooda, Alice Caravani, and Neil Bird (2011), who are cited in the policy brief. Problems arise when trying to determine which locations and people are most at risk from climate change and then allocating funds accordingly. This executive summary explores the approaches institutions are taking to build future scaled-up climate funding.At the end, it highlights some key areas that the government could focus on to improve the efficiency and fairness of climate funding in the region. Public and/or private support for investment flow through the Clean Development Mechanism under the Kyoto Protocol could be viewed as a form of financial support for mitigation, as stated by Jan Corfee-Morlot, Bruno Guay, and Kate M. Larsen (2009). For the goal of mitigation, it is projected that developing countries received between $8 and $53 billion USD in 2007. Public and private flows are shown, but adaptation funding is not included. Offering a monitoring system that incorporates public and private funding in areas directly relevant to mitigation as well as areas unrelated to mitigation is a significant consideration. It is possible that the UNFCCC may collaborate with other groups to generate and use more standardised data from alternative sources. HE Due to climate change, the energy sector needs to be revamped, as Jian-Kun (2015) demonstrates. Increasing the use of renewable energy sources is a fundamental objective of the country's energy policy. By 2030, China plans to increase its reliance on non-fossil fuels for energy production by roughly 20%. Coal use drops from its current 70 percent to below 50 percent. Twenty percent less carbon dioxide is being released from energy production and use than in 2005. Mark Purdon (2013) argues that neoclassical realist models of climate change politics cast doubt on the idea that cooperation on climate change is exclusively motivated by common norms and interests originating

at the international level. Most climate funding comes from existing ODA programmes, making it more vulnerable to the systemic dynamics emphasised by neoclassical realism. Carbon markets, even if imperfect, are sometimes wrongly contrasted with a perfect system of climate funding that imposes few political constraints on cross-border transfers of resources to combat climate change.According to ISHII and Yumio (2009), infrastructure has played a crucial role in sustaining human society ever since its inception. The creation of disaster protection infrastructure has contributed to Japan's rapid economic expansion, yet their crucial importance is often overlooked. Politicians haven't come to terms with the potential catastrophe brought on by climate change, and as a result, disaster prevention money has been cut. According to research by Haroon ur Rashid Khan et al., the worldwide financial markets have collapsed because of the ongoing pandemic catastrophe, which is more severe and widespread than any previous global financial disaster (2022). The latest COVID-19 pandemic wave has negatively impacted world health and GDP. Climate financing and carbon pricing are viewed as effective strategies for a sustainable policy that may aid in reducing severe environmental repercussions by supporting green activities and imposing taxes on persons who emit carbon emissions.

Investing in achieving the temperature and adaptation goals of the Paris Agreement requires swift implementation of climate policy. With such a widening monetary imbalance on a global scale, policies should be matched with commensurate cash flows. The newest COVID-19 pandemic wave has had detrimental effects on national economies and international trade. It is widely believed that by encouraging green activities and taxing individuals who emit carbon emissions, climate finance and carbon pricing might be beneficial measures for sustainable policies that can help prevent major environmental damage. Scientists still struggle with accurately estimating the statistical features of a changing climate. There is a growing incorporation of climate-related risks into the market. The study authors suggest that regions make for a particularly valuable analytical unit when trying to quantify the monetary effects of climate change. As a result of the many dangers that climate change is predicted to amplify, Bangladesh is among the most at risk nations.

These gains in economic development and catastrophe preparedness are now endangered by climatic problems. India received this honour in recognition of its efforts to combat climate change and the global spread of the influenza virus COVID-19. Some of the effects of climate change on India's fight against poverty reduction efforts include. How to enhance climate spending to tackle the threats is a critical issue in many developing countries. A goal of the 2009 Paris Agreement was to secure $100 billion in climate funding for developing nations by 2020. Due to ambiguity and questionable assertions, it is hard to tell if wealthy states have met their responsibilities. The evolution of climate finance into market-oriented and debt-based hybrid forms is emblematic of a neoliberal logic that hands power over to market participants. Managing climate governance on a national level has become increasingly challenging. The effects of natural disasters on financial vulnerability and the collapse of states are investigated. The government's ability to issue debt is hampered by the threat of natural disasters; furthermore, climate change restricts the government's access to financial markets. In order to build agencies focused on climate finance planning, the Green Climate Fund and Climate Investment Funds were set up. In order to address climate change, the Indonesian government has established national climate finance institutions that are responsible for collecting, managing, and dispersing funds for this purpose.In this study, the Indonesian Climate Change Trust Fund is used as a case study to assess effectiveness. Indian researchers examine India's current initiatives to raise money for adaptation and mitigation from various sources. Only 14 of the 40 countries with nationally determined contributions surveyed by the authors provided specific cost estimates for expected forest-related climate change actions. The country's vulnerability to global warming is mainly attributed to poor socio-economic development, challenging and unpredictable geographical environment and lack of institutional capacity.There is a growing demand for increased private investment in solving long-term socio-economic and environmental problems. Billions of dollars of private capital are reportedly available for investment. There are proposals to strengthen the involvement of developed countries in public financing of the GCF. The European Union would bear a disproportionately greater burden as a result of the United States' decision to stop paying for climate finance.The effects of climate change are one of the most urgent environmental challenges facing governments today. To date, governments' efforts to curb climate change have been relatively weak. Initial climate investment may have a modest negative impact on GDP in wealthy countries, but the long-term benefits will more than compensate. For the climate crisis, the "South-South Climate Finance" effort may be a key factor in securing substantial additional investment. As a result, national governments might seek assistance from international development banks in order to raise more funds for climate change mitigation and adaptation. With annual national budgetary resources for climate change operations estimated at US$440 million, there appears to be a large financing vacuum. Nepal will work to adapt to the changes brought on by climate change. The climate change budget in 2013–14 was 10.3% of the government's total budget, with another US$236.62 million coming from outside contributors. The majority of the funds for climate-related projects do not need to leave the country. Climate finance in India is complex and dispersed due to the wide variety of organisations, people, and channels involved.The study's objective is to determine how various Indian institutions and stakeholders may work together to advance climate change finance and policy. Climate change cooperation based purely on international norms

and interests has been called into question by neoclassical realist models of climate change politics. Carbon markets, despite their flaws, are frequently mistaken for a flawless climate finance scheme. The current structure of international climate finance does not account for the necessity of giving adaptation the same weight as mitigation. In spite of the Cancun Agreements' pledge of $100 billion in yearly global climate money, just a small portion of that sum has been allocated to adaptation thus far. Companies' plans to improve future climate financing are discussed. The report continues by outlining areas that need government attention in order to improve the effective and fair distribution of climate money in the region. The potential calamity of climate change has been ignored by policymakers, and spending on disaster avoidance has fallen over the past few decades.

2.11 RESEARCH GAPS

Climate change is not a term that has been exhaustively and generally defined. This list of causes of global warming is incomplete. The root causes of global warming are complex, and there is no comprehensive list of them. The occurrence of climate change could be cyclical, unpredictable, or both. The positive or negative outlook that people have on climate change. What experts think about climate change is not studied. It's important to know whether or not climate change is good for the world and humanity. International communities are worried about the effects of climate change. Extreme weather and climate change are real dangers to human life. Extreme heat is one of the most dangerous weather conditions. Due to the increased strength and rainfall caused by warmer oceans, hurricanes are becoming increasingly lethal. Wildfires pose a variety of health risks, and dry weather makes them worse. The same can be said about whether or not the affected countries are cooperating effectively to stop climate change. Whether or not there is a disparity between the nations that back and carry an average value of supporting action (of supportive action) that is equal to or greater than the global average and the countries that back and carry an average value that is less than the global average. Either all poor countries should get the same amount of international help, or the developed world should do more. Methods used by governments to determine if adaptation to new environmental conditions is possible via the use of technology alone or if behavioural adjustments are also necessary.The flow and trend of global climate finance, as well as its sources, namely public and private sources in each region, at the domestic and international levels, and at the global level, need to be researched. Additionally, it's critical to research the specific sources, such as debt, equity, and bonds, that may be employed to raise funds for the battle against climate change and comprehend what is required to minimize its negative repercussions on human existence.

2.12 CONCLUSION

There is a need to understand whether climate change benefits or harms the world and human existence. People's perceptions of climate change as an opportunity or a threat are not researched. The flow and trend of global climate finance, as well as its sources, need to be researched. It's critical to research the sources, such as debt, equity, and bonds, employed to raise funds for the battle against climate change.

III. RESEARCH QUESTIONS

The research questions mentioned below are proposed to investigate the idea of climate financing based on the above-mentioned review of literature:

1) What exactly is climate change?
2) How does this happen?
3) Is it not a part of the natural cycle?
4) Why could climate change be a problem and not an opportunity?
5) What do the scientists say about climate change?
6) How does climate change affect the planet Earth and human life?
7) Is there anything that must be done in order to lessen the detrimental effects of climate change on human life?

IV. RESEARCH OBJECTIVES

The following is a list of the goals that the suggested research paper aims to accomplish:

1) To know the perceptions of the people from different regions about climate change.
2) To learn about the attitudes of residents in various parts of the world toward climate change and its consequences.
3) to find out what people all throughout the world are worried about in terms of climate change.
4) To understand how people in different nations describe the timing of climate change implications on two levels: current (now) and future (in the coming years).
5) The level of concern about climate change will be measured on a scale from highly concerned to slightly or moderately concerned (SW).
6) To learn how different countries are concerned about and responding to climate change.

7) To find out the extent to which inhabitants of different countries support or oppose the policy measures of their respective governments to limit emissions of greenhouse gases.
8) In order to assess whether developed nations or less developed nations should invest more in programmes to mitigate climate change.
9) To determine whether or if a modification of one's way of life is required, as well as the perspectives of various nations about the development of technology that could mitigate the adverse effects of climate change.
10) In order to investigate regional, national, and international flows of money for climate change, including trends, sources (both public and private), and vehicles, this study aims to: (equity, bonds, etc.).

V. METHODOLOGY

This research paper followed the methodology as follows:

5.1 Data type

In this study secondary data was used for analysis. The literature review draws from a wide range of domestic and international journal papers. Quantitative data from the Spring 2015 Global Attitude Survey (www.pewresearch.org) was used for further analysis and hypothesis testing. Barbara Buchner et al. (2021) provided the information used to conduct the analysis of regional, public and private source, instrument type, and domestic and international finance flows and distribution to test the research's aims and hypotheses. Each table includes a footnote detailing its source, lending legitimacy to the presented information.

5.2 Data classification and tabulation

The data collected were classified and tabulated in accordance with the research objectives and hypotheses to facilitate data analysis.

5.3 Statistical tools used

The statistical tools that are used for the analysis of the data are;

- Increase or decrease percentages
- Trend percentages
- Ranking
- ANOVA Two-factor without replication
- Test of correlation
- T-test: paired two samples for means
- T-test: two samples assuming unequal variances

5.4 Research hypotheses

Statements of null hypotheses:

i) There is no significant correlation between nations that believe climate change effects are most visible now and those that believe climate change effects will be noticeable in the near future.
ii) There is no substantial association between nations that are greatly concerned about climate change and nations that are only marginally concerned about the issue of climate change.
iii) Countries that are concerned about climate change don't appear to have a strong connection to countries that participate in climate change mitigation initiatives.
iv) It's not clear if countries that support climate change mitigation efforts with support levels equal to or higher than the global median value differ significantly from those that support efforts with support levels lower than the global median.
v) There is no significant correlation between the nations that opt for "developing countries (DC) should invest the same amount as developed countries" and the nations that opt for "rich countries (RC) should increase their spending" for the climate change mitigation purposes.
vi) There is no statistically significant difference between the mean votes for "rich countries (RC) should increase their spending" and the mean votes for "developing countries (DC) should invest the same amount as developed countries" when it comes to climate change mitigation efforts.
vii) Those that choose "technology to solve the concerns of climate change" and countries that implement "lifestyle change" measures to mitigate climate change have no discernible relationship.
viii) There is no significant correlation between domestic and international climate finance flows among the regions.
ix) The average climate funding flows are not significantly different from previous years(2019/2020):
    - between public and private sources
    - among the different regions.

VI. FINDINGS

Human activities have contributed to the acceleration of climate change since the 1800s. By burning fossil fuels, hot gases are released. When these thermal gases blanket the Earth, they trap the sun's heat and raise global temperatures. Carbon dioxide and methane are two greenhouse gases that contribute to the acceleration of climate change. Since the late 1800s, the average worldwide surface temperature has increased by around 1.1 degrees Celsius. From 2011 to 2020, the ten years with the warmest average annual temperature on record will have passed. The effects of climate change include, but are not limited to, droughts, water shortages, increasing sea levels, floods, melting glaciers, and powerful storms. Our health, ability to raise food, shelter, safety, and economic stability are all at risk from climate change. It is anticipated that the number of "environmental outcasts" will continue to rise in the future. While it's true that everyone needs to do their part for the environment, those in positions of power have a particularly large incentive to do so. The world's average temperature will rise by 1.5 degrees Celsius during the next two decades. The report, as IPCC Chair Hoesung Lee explains, looks at the consequences of inaction on climate change. Intense food and water shortages have been made worse by climate change, affecting a massive population. Plants and animals can no longer withstand the effects of extreme weather. Forcible environmental change is necessary to avoid the additional death toll, biodiversity loss, and infrastructure disruption. A healthy climate is resilient to environmental changes and provides basic health services like food and clean water. Keeping and storing carbon naturally has benefits for society. There needs to be collaboration between governments, businesses, and ordinary people to reduce risks and boost value (Climate Action, 2022).
Spring 2015Global Attitude Survey(www.pewresearch.org) results were published in the year 2015 the data from this survey is considered for further analysis from this paper's research objectives and presented as follows:

6.1 Global concern about climate change– Regions

The perceptions of the people from different regions are presented in Table 1.

Table 1. Global concern about climate change – Region (Percent)

S. No	Regional medians	Climate Change is a severe issue (percent)	People are suffering from climate change (percent)	The effects of climate change will be detrimental to people's health. (percent)
1	China	18	49	15
2	Asia/Pacific	45	48	37
3	Europe	54	60	27
4	US	45	41	30
5	Latin America	74	77	63
6	Middle East	38	26	27
7	Africa	61	52	61
8	**Global Median**	**54**	**51**	**40**

Source: Spring 2015Global Attitude Survey; www.pewresearch.org

Surveyed individuals' beliefs about whether or not they are suffering as a result of climate change, as well as general opinion on whether or not it is a significant issue. It has been revealed that the majority of Latin American citizens are concerned about climate change at all three levels, with Africa and Europe trailing behind. The Asia Pacific, the Middle East, the United States, and China are all falling short of the global median value (54 percent). This suggests that the majority of regions and their citizens are not concerned about climate change in general and in particular.

6.2 REGIONAL EFFECTS OF GLOBAL WARMING

The climate change impact has been perceived by the citizens of different regions across the world can be observed in Table 2.

Table 2. Impacts of global climate change - Region (Percent)					
S. No	Regional Medians	Dry spell& Water Scarcity	Extreme Weather (Floods & Storms)	long periods Abnormal hot weather	Rising Sea Levels
1	Africa	59	18	16	3
2	Asia Pacific	41	34	13	6
3	Middle East	38	24	19	5
4	Latin America	59	21	12	5
5	Europe	35	27	8	15
6	US	50	16	11	17
7	**Global Median**	**44**	**25**	**14**	**6**
	Source: Spring 2015Global Attitude Survey; www.pewresearch.org				

The majority of Latin Americans (59%) believe that drought and water scarcity are directly attributable to climate change. This percentage decreases for the rest of the world, which includes Africa, the United States, Asia Pacific, the Middle East, and Europe. Climate change will lead to extreme weather, such as catastrophic floods and storms, according to people of Asia Pacific (34%), Europe (27%), the Middle East, and other countries. Only about 20% of people worldwide are convinced that climate change will lead to warmer-than-average temperatures and greater sea levels.

In a word, the majority of people across the globe attribute drought and water scarcity to climate change, and they expect these to be followed by floods and storms, protracted periods of abnormal weather, and eventually rising sea levels.

6.3 Concern about climate change – Nations

Table 3 presents, in descending order with ranks, residents' assessments of their concern about climate change in terms of median values in percent.

According to the survey, 86 percent of Brazilians are concerned about climate change and are very concerned about significant problems caused by climate change, followed by 79 percent in Burkina Faso, 77 percent in Chile, and 76 percent in India, and so on. The global median proportion is 54%. Climate change affects more than 54% (Global Median) of people in 20 nations (out of 40). In the remaining 20 nations, less than 54 percent (Global Median) of the population is concerned about climate change. Climate change concerns just roughly 18% of China's population. This implies that more than half of the population of the world is not aware of the problems of climate change.

Table 3. Concern about Climate Change – Nations		
Country	**The current state of the planet's climate presents a major obstacle -Response (%)**	**Rank(1 for the highest percent)**
Brazil	86	1
Burkina Faso	79	2
Chile	77	3
India	76	4.5
Uganda	76	4.5
Peru	75	6
Philippines	72	7.5
Venezuela	72	7.5
Vietnam	69	9
Ghana	68	10
Lebanon	67	11
Mexico	66	12
Kenya	62	13
Nigeria	61	14
Argentina	59	15
Senegal	58	16
Tanzania	57	17
Spain	53	21
Italy	55	19.5
Germany	55	19.5
France	56	18
Canada	51	22

Table 3. Concern about Climate Change – Nations		
Country	**The current state of the planet's climate presents a major obstacle -Response (%)**	**Rank(1 for the highest percent)**
South Korea	48	23
US	45	25
Japan	45	25
South Africa	45	25
Jordan	44	27.5
Malaysia	44	27.5
Australia	43	29
UK	41	30.5
Indonesia	41	30.5
Ethiopia	40	32
Palestine. Ter	38	33
Turkey	37	34
Russia	33	35
Ukraine	29	36.5
Pakistan	29	36.5
Israel	24	38
Poland	19	39
China	18	40
Global Median	54	-
Source: Spring 2015 Global Attitudes survey		

6.4 Effects of Climate Change – Nations

The majority of Latin Americans (59%) believe that drought and water scarcity are directly attributable to climate change. This percentage decreases for the rest of the world, which includes Africa, the United States, Asia Pacific, the Middle East, and Europe. Climate change will lead to extreme weather, such as catastrophic floods and storms, according to people of Asia Pacific (34%), Europe (27%), the Middle East, and other countries. Only about 20% of people worldwide are convinced that climate change will lead to warmer-than-average temperatures and greater sea levels.

In a word, the majority of people across the globe attribute drought and water scarcity to climate change, and they expect these to be followed by floods and storms, protracted periods of abnormal weather, and eventually rising sea levels.

Table 4.Climate Change Effects– Nations			
Country	Climate Change Effect (percent)		
	Now	In the next few years	Total
Brazil	90	9	99
Burkina Faso	76	21	97
Chile	68	28	96
Peru	79	16	95
Venezuela	76	19	95
Argentina	78	17	95
Uganda	74	20	94
Mexico	68	26	94
South Korea	50	43	93
Philippines	60	30	90
Italy	65	25	90
Ghana	56	33	89
Kenya	54	34	88
Spain	61	27	88
France	59	28	87
India	71	15	86
Vietnam	61	25	86
Tanzania	51	35	86
Japan	71	15	86
Germany	66	18	84

Table 4.Climate Change Effects– Nations			
Country	Climate Change Effect (percent)		
	Now	In the next few years	Total
Lebanon	40	42	82
Canada	56	25	81
Malaysia	36	45	81
China	49	31	80
Senegal	41	37	78
Ukraine	50	28	78
Nigeria	52	23	75
Jordan	26	47	73
Palestine.Ter	23	50	73
Russia	42	31	73
UK	48	23	71
Israel	36	35	71
Australia	46	24	70
US	41	28	69
Turkey	24	44	68
Ethiopia	33	34	67
Poland	28	38	66
South Africa	31	32	63
Indonesia	20	43	63
Pakistan	16	28	44
Global Median	**51**	**28**	**79**
Source: Spring 2015 Global Attitudes survey			

However, nations that regard climate change as a present concern are inversely and strongly related at a 5 percent level of significanceto those that see it as a future one. In other words, more residents in nations presently experiencing the consequences of climate change will perceive it as an issue in the coming years (see Table 5). This means that while more individuals believe climate change is a current issue, relatively fewer believe it will be a problem in the near future, and vice versa.

Table 5. A Correlation Analysis of Now and Future Years		
Impact of Climate Change	Now	In the next few years
Now	1	-
In the next few years	-0.81306*	1
*The p-value is< 0.00001, *significant at p < 0.05*		
Source: The author computed the data in table 4		

6.5 How much concerned about climate change – Nations (Percent)

Table 6 shows the level of worry regarding climate change in terms of being very concerned and somewhat (SW) concerned.

The countries are listed in order of their overall percentages. Climate change concerns 97 percent of Ugandans, followed by 96 percent in the Philippines, 95 percent in Burkina Faso, and so on. The countries are divided into two categories: those that are above the world median (72 percent) and those that are below the global median. According to the data, there are 26 countries that are above the worldwide median and 16 countries that are below the global median.

Furthermore, nations that are highly concerned about climate change and nations that are slightly concerned are strongly, inversely, and significantly associated at a 5 percent level of significance(see Table 7). This means that just 40% (the worldwide median) of the world's population is highly concerned about climate change, while 32% are moderately concerned. Furthermore, 72 percent (global median) are just concerned about climate change, suggesting that 28 percent are unconcerned, implying that more than a quarter of the worldwide population is unconcerned about climate change and related issues.

Table 6. How Much Concerned about Climate Change– Nations (Percent)			
Country	Very Concerned	SW Concerned	Total
Uganda	88	9	97
Philippines	75	21	96
Burkina Faso	77	18	95
Ghana	77	18	95
Brazil	78	16	94
Peru	68	26	94
Venezuela	69	23	92
Mexico	56	36	92
India	69	23	92
Chile	56	35	91
Vietnam	60	30	90
Argentina	58	31	89
South Korea	32	57	89
Kenya	61	28	89
Tanzania	56	31	87
Malaysia	40	45	85
Nigeria	63	22	85
Japan	34	48	82
Ethiopia	60	22	82
Italy	37	44	81
France	35	44	79
Senegal	54	22	76
Turkey	30	45	75
Lebanon	44	30	74
Indonesia	42	32	74
China	15	58	73
Spain	36	35	71
Palestine.Ter	27	44	71
Russia	26	42	68
South Africa	39	29	68
Jordan	24	42	66
Poland	15	51	66
Canada	27	37	64
Ukraine	22	41	63
Germany	18	42	60
Pakistan	28	32	60
US	30	29	59
Israel	15	43	58
Australia	18	35	53
UK	19	27	46
Global Median	**40**	**32**	**72**
Source: Spring 2015 Global Attitudes survey			

Table 7. Test of Correlation between *Very concerned* and *somewhat* concerned about climate change (N=40)		
Degree of concern	Very Concern	Somewhat concern
Very Concern	1	
Somewhat concern	-0.80238*	1
The p-value is <0.00001, * significant at p < 0.05		
Source: The author computed the data in table 6		

6.6 Concern about and doing action to combat climate change

Concern for and supportive action on climate change was taken from the 'Spring 2015 Global Attitudes Survey'

for a selected 18 nations, and the difference between supporting action and climate concern was computed in percentages and sorted in the order shown in Table 8.

Table 8. Concern for and supportive action on climate change (%)

Country	Climate Concern (CC)	Supportive Action (SA)	Difference D=SA-CC
China	18	71	53
Poland	19	63	44
South Korea	48	89	41
Japan	45	83	38
UK	41	78	37
Australia	43	80	37
Italy	55	89	34
Canada	51	84	33
Russia	33	65	32
Germany	55	87	32
France	56	86	30
US	45	69	24
Indonesia	41	63	22
Turkey	37	56	19
Mexico	66	78	12
South Africa	45	56	11
Brazil	86	88	2
India	76	70	-6
Global Median	54	78	24

Source: Spring 2015 Global Attitudes survey
Note: Difference between SA and CC computed by the author

China has the largest disparity between supported action and climate concern (53 percent), followed by Poland (44 percent), South Korea (41%), and so on. There are 12 nations (in grey-green) whose supporting action exceeds climate concern and exceeds the world median (54%). This means that climate change mitigation efforts are being pursued actively. Five countries (in pink) whose supporting action exceeds climate concern but fall short of the global median value of 54%. This means that mitigation efforts are less vigorous and severe than the global average. India is the only country whose supporting action for climate change mitigation is lower than climate concern, and so the difference is negative, meaning that the country is not serious about addressing climate change.

The Karl Pearson coefficient of correlation of 0.49114 appears to be insignificant, but when the correlation test is done, it is discovered that the correlation is significant and positive at a 5 percent level of significance, meaning that climate concern and supporting activities go in the same direction and are important (see table 9

Table 9. Test of Correlation between Climate concern and Supportive action- climate change (N=18)

	Climate concern	Supportive action
Climate concern	1	
Supportive action	0.49114*	1
The P-Value is 0.03849. *significant at p < .05		
Source: The author computed the data in table 8		

6.7 Support and oppose Governments limiting greenhouse gas emissions

Table 10 shows, based on results from the Spring 2015 Global Attitudes survey, the percentage of citizens in a number of nations who support and who oppose government efforts to limit emissions of greenhouse gases.
Most people around the world (around 78%) approve of government initiatives to cut down on carbon dioxide and other greenhouse gases. Two groups of countries emerge: those with a median value above or equal to the global median (78%) in favour of restricting greenhouse gas emissions, and those with a median value below or equal to the global median (60%). The table shows that the median values of 22 countries are at or above the global median value of 78%, while the median values of 18 countries are below the global median value. This means that in order to make climate change manageable, all countries will need to adopt a policy of restricting emissions of greenhouse gases.

To confirm that there is a significant difference t-test is performed assuming unequal variances between the two groups;

i) Those nations (X_1) thatsupport and bearthe median value equal to or greater than the global median

value of 78, and

ii) Those nations (X_2) that support and bear a median value less than the global median value of 78.

t-test results are shown in Table 11. At the 5% level of significance, the difference in means between the two groups is statistically significant. Countries that produce less greenhouse gases than the global average should be supported and encouraged to reduce their own emissions. This is essential if we're going to keep the effects of climate change on Earth to a minimum.

Table 10. Support and oppose Governments limiting greenhouse gas emissions (percent)

S. No	Country	Support	Oppose
1	Uganda	91	5
2	Spain	91	6
3	Tanzania	90	7
4	South Korea	89	8
5	Italy	89	7
6	Brazil	88	9
7	Chile	88	8
8	Burkina Faso	87	10
9	Germany	87	12
10	France	86	14
11	Venezuela	85	10
12	Canada	84	10
13	Japan	83	10
14	Philippines	82	13
15	Ghana	82	12
16	Argentina	80	11
17	Vietnam	80	11
18	Israel	80	6
19	Australia	80	15
20	Mexico	78	18
21	Lebanon	78	17
22	UK	78	15
23	Peru	77	14
24	Ukraine	77	9
25	Nigeria	77	9
26	Kenya	76	19
27	Senegal	76	13
28	Ethiopia	76	6
29	Jordan	73	16
30	China	71	16
31	India	70	13
32	Malaysia	70	12
33	US	69	24
34	Russia	65	17
35	Palestine.Ter	64	18
36	Poland	63	20
37	Indonesia	63	11
38	Turkey	56	26
39	South Africa	56	18
40	Pakistan	48	15
	Global Median	78	12

Source: Spring 2015 Global Attitudes survey

Table 11. t-Test: Two-Sample If Variances Are Not Equal		
Particulars	Nations that support with equal to or greater than the Global median value of 78 (X_1)	Nations that support but with less than the Global median valueof78 (X_2)
Mean	84.36363636	68.16666667
Variance	19.86147186	72.97058824
Observations	22	18
Hypothesized Mean Difference	0	H_0: Mean of X_1 = Mean of X_2
df	24	
t Stat	7.27506307	H_1: Mean of $X_1 \neq$ Mean of X_2
P(T<=t) one-tail	8.12477E-08	
t Critical one-tail	1.71088208	$\alpha = 0.05$, $(1-\alpha) = 0.95$
P(T<=t) two-tail	1.62495E-07	t Stat (= 7.275) > 1.711 (one-tailed or 2.06 (two-tail), hence **H_0 is rejected implying significant difference**.
t Critical two-tail	2.063898562	
Source: The author computed based on the data in table 10		

6.8 Whether advanced or developing countries pay more on climate change costs

The data on who should spend more on climate change mitigation initiatives are derived from the cited study, Spring 2015 Global Attitudes Survey. The options were: a) advanced economies should spend more (X_1), or b) emerging economies should spend the same as advanced economies (X_2). The inhabitants of the various countries (N=40) replied, and the median value in percent is shown in Table 12.

The difference between the second choice (Advanced economies should spend more) and the first option (Developing economies should spend as much as advanced economies) was calculated (on the assumptions that advanced nations will be emitting more pollution because of more degree of industrialization and advanced nations are financially sound and can afford), and nations were arranged from the greatest positive difference value to zero and negative difference value. Ten countries in pink (25%) believe that developing economies should spend as much as developed economies, and as a result, the percentage of respondents in those countries who chose the first option was higher than the second-choice replies. However, residents in 29 (72.5%) countries (in grey-green) believe that advanced nations should spend more. However, there is a country named "Chile" (highlighted in yellow) whose citizens chose both alternatives equally. On the whole, it is implied that advanced nations should keep more funds to finance climate change. In the terms of the global median, it is understood that more have voted for the second option indicating that advanced economies should spend more on climate change mitigation activities.

Table 12. Advanced or developing countries pay more on climate change costs				
S. No	Country	Developing countries (DC) should invest the same amount as developed countries (X_2) (percent)	Rich countries (RC) should increase their spending (X_1) (percent)	Difference (RC-DC)
1	Philippines	23	73	50
2	Palestine.Ter	21	62	41
3	Ukraine	25	64	39
4	Jordan	29	66	37
5	Tanzania	27	64	37
6	Ghana	28	64	36
7	Poland	26	61	35
8	Lebanon	32	63	31
9	Russia	29	58	29
10	Turkey	26	54	28
11	Israel	31	58	27
12	Burkina Faso	31	55	24
13	Senegal	31	55	24
14	China	33	56	23
15	Germany	38	59	21
16	Peru	36	53	17
17	Spain	41	56	15
18	Nigeria	35	50	15

Table 12. Advanced or developing countries pay more on climate change costs

S. No	Country	Developing countries (DC) should invest the same amount as developed countries (X_2) (percent)	Rich countries (RC) should increase their spending (X_1) (percent)	Difference (RC-DC)
19	Italy	41	55	14
20	Argentina	40	54	14
21	India	30	44	14
22	South Korea	43	56	13
23	Venezuela	40	53	13
24	France	46	54	8
25	Australia	42	50	8
26	Canada	42	49	7
27	UK	43	49	6
28	South Africa	38	43	5
29	Uganda	45	46	1
30	Chile	48	48	0
31	Indonesia	38	37	-1
32	Pakistan	29	28	-1
33	Vietnam	42	40	-2
34	Ethiopia	40	36	-4
35	Mexico	50	43	-7
36	Kenya	50	43	-7
37	US	50	40	-10
38	Malaysia	52	39	-13
39	Brazil	59	37	-22
40	Japan	58	34	-24
	Global Median	**38**	**54**	

Source: Spring 2015 Global Attitudes Survey
Note: The difference is computed by the author

After computing the Karl Pearson coefficient of correlation, a test of correlation is done at a 5% level of significance to see if there is any sort of correlation between the alternatives picked by the nations, and the results are reported in Table 13.

Table 13. Correlation between the two options (N=40)

Karl Pearson Coefficient of correlation	Developing countries should do just as much	Rich countries should do more
International aid should be equally distributed among the world's developing nations.	1	-
Rich nations should do more.	-0.652*	1

The P-Value is < .00001. *Significantat p < .05.
Source: The author computed the data in table 12

The correlation between the options is proven to be negative and substantial, meaning that people who chose the option (Developing countries should do as much as advanced economies) had less propensity toward the other option (Advanced economies should spend more), and vice versa. Further, the t-Test -paired with two samples for means is also used to see if the mean of each choice is significantly different at a 5% level of significance, asshown in Table 14.

Table 14. t-Test: Paired Two Samples for Means		
	Rich countries should do more (X_1)	**Developing countries should do just as much (X_2)**
Mean	51.225	37.7
Variance	102.6916667	90.42051282
Observations	40	40
Pearson Correlation	-0.652275061	H_0: Mean of X_1 = Mean of X_2 H_1: Mean of $X_1 \neq$ Mean of X_2 $\alpha = 0.05$, $(1-\alpha) = 0.95$ t Stat (= 4.791) > 1.685 (one-tailed or 2.419 (two-tail), hence **H_0 is rejected implying significant difference**.
Hypothesized Mean Difference	0	
df	39	
t Stat	4.790651491	
P(T<=t) one-tail	1.20956E-05	
t Critical one-tail	1.684875122	
P(T<=t) two-tail	2.41913E-05	
t Critical two-tail	2.02269092	
Source: The author computed based on the data in table 12		

Both options have a considerable difference in the average value.The mean of the first option (advanced nations should spend more on climate change mitigation strategies) is 51.225 greater than that of the second option (developing nations should spend as much as the developed nations) mean (37.7) value. Therefore, the majority of countries and citizens believe that developed or wealthy countries should devote greater resources to climate change mitigation initiatives.

6.9 Climate Change Reduction Requires Changes in Technology or Lifestyle

People from different countries were polled on whether or not they believed technological advancements may assist lessen the impact of climate change or if they believed that behavioural changes were more urgent. It is noted that the data originates from the 2015 spring Global Attitudes Survey. Difference between "lifestyle modifications essential" and "technology can solve" (X2-X1), estimated using data, with global median value shown in Table 15. The data is also sorted from highest to lowest according to the difference value, and the countries are classified into two groups: those with a value at or above the worldwide median (45%), and those with a value at or below the global median (5%). (45 percent). With the exception of Jordan, almost every country acknowledges that adjusting one's way of life is essential to combating the effects of climate change. It is also found that out of the 40 countries studied, 22 (or 55%) have a value equal to or higher than the global median value of 45%, indicating that the majority of countries place a high value on encouraging behavioural change among their citizens as a means of mitigating the effects of climate change.

Table 15. Climate Change Reduction Requires Changes in Technology or Lifestyle

S. No	Nations	Technology (X_1) can solve (%)	Lifestyle changes (X_2) are required (%)	Difference (X_2-X_1)
1	Brazil	10	89	79
2	Argentina	12	83	71
3	Peru	13	83	70
4	South Korea	14	83	69
5	Chile	13	82	69
6	France	16	83	67
7	Venezuela	15	81	66
8	Mexico	17	80	63
9	Vietnam	16	77	61
10	Spain	18	77	59
11	Uganda	17	76	59
12	Philippines	20	77	57
13	Germany	19	75	56
14	Canada	17	73	56
15	Kenya	29	84	55
16	Ethiopia	20	69	49
17	Italy	23	70	47
18	Senegal	18	65	47
19	Ghana	21	67	46
20	Tanzania	24	69	45
21	UK	22	67	45

Table 15. Climate Change Reduction Requires Changes in Technology or Lifestyle				
S. No	Nations	Technology (X_1) can solve (%)	Lifestyle changes (X_2) are required (%)	Difference (X_2-X_1)
22	Burkina Faso	19	64	45
23	India	24	67	43
24	US	23	66	43
25	Australia	25	64	39
26	Nigeria	25	59	34
27	Indonesia	21	54	33
28	China	30	58	28
29	Malaysia	26	52	26
30	Pakistan	20	41	21
31	Turkey	32	51	19
32	Ukraine	30	49	19
33	Lebanon	34	52	18
34	South Africa	26	44	18
35	Japan	36	53	17
36	Poland	33	49	16
37	Israel	32	48	16
38	Palestine.Ter	35	47	12
39	Russia	36	39	3
40	Jordan	46	40	-6
	Global Median	**22**	**67**	**45**
Source: Spring 2015 Global Attitudes Survey *The difference is computed by the author*				

Karl Pearson's coefficient of correlation is computed to check the direction of the options, and he performed the test of the hypothesis at a confidence level of 5% to discover the correlation, as shown in Table 16. The association is determined to be negative and substantial. This indicates that a considerable percentage of nationals have chosen the option of "lifestyle adjustments."

Table 16. Test of Correlation between the two options (N=40)		
	Technology (X_1) can solve (%)	Lifestyle changes (X_2) are required (%)
Technology can solve (%)	1	-
Lifestyle changes are required (%)	-0.8069*	1
The P-Value is < .00001. significant* at p < .05 *Source: The author computed the data in table 15*		

6.10 Climate Finance Flows

Table 17 shows biennial averages and predicted trend percentages for global climate finance flows from the given source over ten-year intervals (from 2011 to 2020), with the first biennial average as the base year. In 2011–12, there were $364 billion in global climate finance flows. In 2019–20, there will be $632 billion, which is a 73.63 percent increase from 2011–12.

Table 17. The global climate financing flows, between 2011 and 2020		
YEAR	FLOWS (USD Billion)	Trend Percentage
2011-12	364	100
2013-14	365	100.27
2015-16	463	127.20
2017-18	574	157.69
2019-20	632	173.63
Source: Barbara Buchner, et al (2021)		

6.11 Public sources of global finance flows

The public sources of global finance were extracted from the referred source for 2017-18 and 2019-20. The increase or decrease in percentage is calculated by taking (the 2017-18) period as the base and presented in Table 18.

Table 18. Public sources of climate finance (USD billion)

Sources	2017-18	2019-20	Increase or decrease %
National DFIs	134	120	-10.45
Multilateral DFIs	57	65	14.04
State-owned FIs	24	45	87.50
Governments	32	38	18.75
Bilateral DFIs	22	35	59.09
SOEs	25	13	-48.00
Others	6	5	-16.67
Total	**300**	**321**	**7.00**

Source: Barbara Buchner, et al (2021)

National Development Funding Institutions (DFIs), Multilateral DFIs, State-owned Financial Institutions (FIs), Governments, Bilateral DFIs, State-owned Enterprises (SOEs), and others are among the public sources of global climate finance. The contribution of national DFIs is the biggest, however it fell by 10.45% from 2017-18 to 2019-20. State-owned financial institutions' participation increased by 87.5 percent from 24 to 45 billion dollars, followed by bilateral DFIs (59.09 percent), governments (18.75 percent), and multilateral DFIs (14.04 percent). The contribution of SOE has decreased by 48 percent, while that of others has decreased by 16.67 percent. Overall, the entire climate financing fund rose by 7% from 300 billion dollars in 2017-18 to 321 billion dollars in 2019-20.

6.12Private sources of global finance flows

For 2017-18 and 2019-20, the private sources of global financing were retrieved from the cited source. Table 19 shows the percentage increase or decline determined using the (2017-18) period as the baseline.

Table 19. Private Sources of climate finance (USD billion)

Sources	2017-18	2019-20	Increase or decrease %
Corporations	156	124	-20.51
Commercial FIs	48	122	154.17
Households and Individuals	53	55	3.77
Others	17	9	-47.06
Total	**274**	**310**	**13.14**

Source: Barbara Buchner, et al (2021)

At the global level, private sources of climate finance include corporations, commercial financial institutions (FIs), households and individuals, and others. Commercial financial institutions have raised their contribution by 154.17 percent, from 48 billion dollars in 2017-18 to 122 billion dollars in 2019-20, followed by households and individuals (3.77 percent). Corporations' contributions decreased by 20.51 percent from 156 billion USD in 2017-18 to 124 billion USD in 2019-20, followed by others (47.06 percent). The total private fund has increased by 13.14 percent.

6.13 Domestic and international climate finance flows broken down per region

Table 20 shows the climate finance flows in terms of domestic and foreign flows by region for the period 2019–20 as an annual average.

Table 20. Climate change financing from both domestic and international sources (USD billion, 2019/2020 yearly average)

Region	Domestic	International	Total
East Asia & Pacific	270	22	292
Western Europe	74	31	105
US and Canada	76	7	83
Latin America and Caribbean	16	19	35
Central Asia and Eastern Europe	17	15	32
South Asia	11	19	26
Sub-Saharan Africa	2	18	20
Middle East North Africa	6	10	16
Transregional	0	10	10
Other Oceana	6	3	9

Source: Barbara Buchner, et al (2021)

There are 10 different areas, as shown in the table. There is a massive chasm between domestic and international flows, with East Asia and the Pacific having the highest domestic participation and the second highest international participation. When it comes to both domestic and international migration, Western Europe is among the top three. Both the United States and Canada are ranked second in terms of domestic flows.

The correlation test is carried out on Karl Pearson's coefficient of correlation estimated between domestic and foreign flows, and the results as shown in Table 21.

Table 21. Test of Correlation between domestic and international flows (N=10 Regions)

	Domestic	International
Domestic	1	-
International	0.37405*	1
The P-Value is 0.287.**Not significant*** at $p < 0.05$		
Source: The author computed based on the data in Table 20		

The relationship between domestic and foreign climate finance flows is found to be insignificant. This means there is no relationship between domestic and international climate finance flows in the regions. To put it another way, independent policy measures are needed in each region to improve both local and international climate finance inflows.

6.14 Destination of climate finance: region and sources

Table 22 displays, by location and funding source, the climate finance inflow for 2019–20. East Asia and the Pacific region receive the lion's share of public and private climate finance flows. Similarly, private source finance flow is significantly more numerous than public source finance flow, with the exception of the United States and Canada.

Table 22. Climate change funding's final destination, broken down into public and private sources (in billions of dollars, on an annual basis for 2019–2020)

Region	Public	Private	Total
East Asia and the Pacific	180	112	292
Western Europe	43	62	105
US and Canada	4	79	83
Latin America and the Caribbean	18	17	35
Eastern Europe and Central Asia	20	13	33
South Asia	19	11	30
Sub-Saharan Africa	17	2	19
The Middle East and North Africa	9	7	16
Transregional	11	0	11
Other Oceania	1	8	9
Total	322	311	633
Source: Barbara Buchner, et al (2021)			

In addition, an ANOVA two-way test is being used to see if there is a significant difference in mean climate financing flows by region and source, with the findings shown in Table 23.

It is shown, at the 5% level of significance, that there is a sizable difference in regional mean climate-related financial flows (rows). That means participation in efforts to lessen the effects of climate change varies greatly across geographic areas. Public and private actors appear to be equally involved in the distribution of climate change financing, as there is no obvious difference in mean climate financial flows between public and private sources.

Table 23. Anova: A Two-Factor Analysis Without the Need for Replication				
SUMMARY– Regions - Rows	*Count*	*Sum*	*Average*	*Variance*
East Asia and the Pacific	2	292	146	2312
Western Europe	2	105	52.5	180.5
US & Canada	2	83	41.5	2812.5
Latin America & the Caribbean	2	35	17.5	0.5
Eastern Europe & Central Asia	2	33	16.5	24.5
South Asia	2	30	15	32
Sub-Saharan Africa	2	19	9.5	112.5
The Middle East & North Africa	2	16	8	2
Transregional	2	11	5.5	60.5
Other Oceania	2	9	4.5	24.5
SUMMARY– Sources – Columns				
Public	10	322	32.2	2830.4
Private	10	311	31.1	1516.989

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	33571.05	9	3730.12	6.04*	0.0066	3.18
Columns	6.05	1	6.05	0.0098**	0.92	5.12
Error	5555.45	9	617.27	*** Significant**		
Total	39132.55	19		**** Not Significant**		
Source: the author computed for the table 22.						

6.15 Climate finance by an instrument – in USD Bn and trend percentages

Table 24 shows climate funding flows by type of instrument in USD billions for the years 2015-16, 2017-18, and 2019-20, with trend percentages calculated using 2015-16 as the base period.

Table 24. Climate finance by an instrument in USD Bn &Trend Percentage			
	2015-16	2017-18	2019-20
Equity – USD Bn	140	167	206
Equity - Trend Percentage	100	119.29	147.14
Debt - USD Bn	306	379	384
Debt - Trend Percentage	100	123.86	125.49
Grant - USD Bn	17	28	42
Grant - Trend Percentage	100	164.71	247.06
Total - USD Bn	463	574	632
Total - Trend Percentage	100	123.97	136.50
Source: Barbara Buchner, et al (2021)			

Equity, debt, and grants are the most common methods for raising funding for climate finance. Each instrument's growth is shown by trend percentages. Grants increased by 147% from 17 billion dollars in 2015-16 to 28 billion dollars in 2017-18 and 42 billion dollars in 2019-20, with equity increasing by 47% and debt increasing by 25% for a total increase of 36.5 percent. Grants and equity are increasing at a faster rate than the overall growth rate. If policymakers are serious about raising money for climate change, they should focus on funding and equity issues.

VII. SUGGESTIONS

In addition to improving our quality of life and protecting our natural resources, many strategies for combating climate change have the potential to bring about financial gains. Between 2020 and 2030, it is expected that fossil fuel output would decrease by about 6% annually. Individuals, homes, businesses, ways of life, and ways of life, as well as infrastructure and the environment, can all benefit from adaptation to the elements. It considers both the current state of affairs and any anticipated future developments. The potential for a high rate of return deserves consideration. The Climate Technological Center and Network, part of the UNFCCC's Technology Mechanism, has been connecting developing nations with cutting-edge technology since 2013. Real progress in climate technology requires the international expertise that countries may provide utilising their strengths. By working more closely with the Green Climate Fund, the UNFCCC Technology Mechanism can better serve the world's poor and most vulnerable people by unlocking investment strategies and strengthening capacity at all levels, from

the community to the nation. The terms "climate engineering" and "climate technology" encompass more than most people think they do.

In recent years, climate technology has become widely distributed at an unprecedented rate. Certain renewable energy technologies are now competing with natural gas generating options, and technology tests and road maps developed by The Climate Technology Center and Network (CTCN) and its partners help ensure that appropriate technological choices are made by governments and that favorable conditions exist to support domestic and international investment. to increase their deployment. The distribution of climate technology to adapt to the conditions is very important.

The World Resource Institute (WRI) recommends the following to mitigate climate change:

7.1 Coastal wetlands should be protected

Coastal ecosystems such as mangroves, wetlands, and grasslands serve as natural water filters and marine habitats. It is possible that more than two years of world emissions might be wasted by clearing mangrove forests, hence worsening the consequences of climate change. Efforts to restore coastal wetlands should engage local communities that depend on these natural systems for their existence and livelihoods.

7.2 Spread the word about the benefits of sustainable agriculture

Existing methods of land management unquestionably require examination. Woody pastures, for instance, can accumulate five to ten times as much carbon as non-timber pastures of the same area. Farmers can diversify their income streams by growing a wide range of crops and raising cattle in these areas, with the added benefit of reduced exposure to climate-related sickness. According to Renee Cho (2017), by studying the ice cores where Greenland and Antarctica have made inroads, scientists can reconstruct the planet's historical pattern of regular environmental shifts. Scientists can see that the CO2 atoms formed by plants and organisms are lighter than those emitted by non-renewable energy sources when they consume it, says Peter de Menocal, a professor at Columbia University and the director of the university's Center for Climate and Life.Many researchers present an environmental change model that records the relationship between a dangerous atmospheric deviation and monetary development and incorporates risks of harm caused by an increase in global temperature to better understand the financial impact of long-term minor deviations from current resource costs and expected returns. A temperature shock that is supported causes a low-recurrence component of the float to retreat. To reflect the gamble premia and the social cost of carbon, researchers provide smart answers.

7.3 Reliable power supply

Growth and development in the human population have the dual effect of increasing energy efficiency. In the event of a calamity, the electrical distribution system ensures that parts of the community are not left without green or clean electricity.

7.4 Indigenous peoples' rights to land

There are over 2.5 billion individuals who are dependent on local and indigenous groups for their basic needs such as food, clothes, and shelter. In addition, research conducted in Bolivia, Brazil, and Colombia reveals that deforestation is twice as likely to occur in regions where indigenous peoples have legal rights to their respective lands. Aside from that, these groups make up less than one quarter of the total population of the world.

7.5 Improved public transportation

Road transportation now accounts for 72 percent of global transportation demand, and this figure is expected to rise until new low-cost and inexpensive modes of transportation become available. Hurricanes and extremely high temperatures caused by climate change make transportation infrastructure easier. Extreme weather will have an equal impact on low-income persons and other vulnerable urban populations with restricted mobility. Both problems can be solved with the employment of heavy loads and low carbon. If public transportation in urban areas expanded by 40%, we could avoid releasing an additional 6.6 litres of CO2 into the atmosphere in the year 2050. Large-scale transportation can be kept functioning by reconfiguring and rebuilding it to survive natural disasters, rising sea levels, and extreme heat.

7.6 Need for insurance cover

The insurance industry has started making progress in the right direction, but much more can and should be done because climate change simply means that many of the technical insurance capabilities will need to develop. The insurance industry has started making progress in the right direction. It is necessary to find a solution to the problem that conventional models and, more generally, historical loss experience will not accurately anticipate the future. Changes in obligations will need the development of new strategies for managing portfolios. In addition to this, there will be an increased presence of nonlinear effects. Issler P, et al. (2019) studied wildfires that occurred in the

state of California from the years 2000 to 2018 by utilising vast integrated data on fires, mortgages, property attributes, and the weather. In the aftermath of a fire, the number of residences at risk of losing their mortgages or being foreclosed on increases significantly. As the fire gets larger, these negative impacts begin to diminish, which they assume is due to the coordination externalities given by enormous flames. This concern has been raised in light of recent fire-related losses as well as ambiguity in regulatory requirements by insurance firms. Central banks and insurance regulators can use the methodology presented in this article to evaluate various bank and insurance firm models. In a way, it's like a bank stress test.

7.7 Gross domestic product can be significantly impacted by total natural investment

To combat climate change, less than one percent of global GDP has to be allocated. State of Finance for Nature estimates that $8.1 trillion should be invested over the next 30 years to effectively address climate change, biodiversity loss, and other environmental problems. By laying the groundwork for future economic decision-making, it compels governments, financial institutions, and corporations to close the investment gap.Barro RJ. (2013) made the observation that extremely low discount rates play a significant part in a robust environmental protection study.There is some evidence to show that natural investment can account for a significant portion of GDP in the event of a rare macroeconomic crisis. It is only through equal investment in natural and man-made disasters that we can break down major barriers that still remain.

7.8 Education on climate change

Questions of what teachers should teach and how students might engage in learning to prepare for the hazards and human and environmental repercussions of climate change are addressed by Robert B. S., Jennifer N., and Hilary L. W. (2017). Australia's educational institutions have a wealth of resources to teach students about preparing for and adapting to climate change. In order to accomplish this, educators must model research and teamwork in the classroom. In addition, Barro, R. J., & Lee, J. W. (2013) conducted research from 1950 to 2010 and included 146 countries in their revised panel data collection on educational achievement. By using the ten-year gap in parental education as an instrumental variable of the current level of education, we were able to boost the average rate of return by 5% to 12% after controlling for simultaneous demographics and outcome. In line with the conditional volatility return rates typically seen in spreadsheets.

7.9 CSR initiatives and climate financing

A study by Putu Indah Rahmawati, Terry DeLacy, and Min Jiang (2016) found that making tourism places climate-proof will be difficult in the future. This case study of Bali will demonstrate how tourism businesses may help host communities adapt to the effects of climate change by implementing mitigation and adaptation strategies as part of Public Commitment initiatives. Communities that prioritise environmental, economic, and social sustainability in their response to climate change will benefit from the tourism industry's corporate social responsibility initiatives (CSR).Bansal, R. et al. (2016) give complete risk assessments and returns on investment-based enterprises utilising robust data-level estimates of the business community's responsibility.In the case of reading the event, they find that the reduction in corporate social responsibility rates leads to a significant reduction in the unusual return that disappears after the second year. The alpha difference between high and low stocks is most visible during good economic times and is strongly related to both NIPA[1] luxury consumption and sales growth for the right retailers[2].

7.10 Considering co-benefits of climate policies

One important example is a decrease in the amount of pollution in the air around the local area, which occurs because the majority of the instruments that might be used to reduce greenhouse gas emissions (GHG) would simultaneously decrease the negative impact that pollution can have on human health. Analysis conducted by the OECD suggests, however, that this effect, by itself, is not powerful enough to make GHG abatement "pay for itself." This is due to the fact that targeted policies to cut local air pollution by a given amount can generally do so at a lower cost than the GHG abatement that is required to achieve the same reduction.

7.11 Transferring technologies with ease

In fact, the transfer of technology is expected to be a component of the worldwide solution to the problem of climate change, and various programmes have been developed to encourage the rapid spread of climate-friendly technologies.

[1]National Income and Product Accounts
[2]The Bureau of Economic Analysis (BEA) provides a collection of financial records that provide information on the value and creation of results produced in the United States during a given period, as well as the types and uses of the pay generated by that production.

7.12 Need for more mitigation funds, through the Clean Development Mechanism

Many of the low-cost options for decreasing carbon emissions can be found in poor countries; unfortunately, many of these countries lack the capacity or the funds to put these ideas into action without external support. Part of the Kyoto Protocol, the Clean Development Mechanism (CDM) is meant to pave the way for private funding of mitigation efforts in developing countries. Expanding the CDM could be made more cost-effective by exploring the prospect of shifting from a project-based strategy to one that is more sectoral or programmatic.

VIII. LIMITATIONS OF THE WORK

The limitations of the research are listed as follows:

a) In the research, mostly secondary data were used. Although there are valuable lessons to be learned from this work, it misses out on those that could have been drawn from primary data on public awareness because the people's active participation is crucial for the implementation of climate change policy and financing.
b) The significance level is set at 5% for each of the hypotheses tested in this research.

IX. SCOPE FOR FUTURE RESEARCH

The following subjects are suggested for future research:

a) 'Climate Financing: Its Need in the Indian Sub-continent – to know the degree of the consciousness of the Indian public to make vital mindfulness crusades at the school level to stop environmental change exercises.

b) A comparative research project with the working title "Cultural Perspectives on Climate Finance among the BRICS Nations–A Comparative Study" might be a good idea to undertake in order to acquire a more in-depth comprehension of India's position in relation to those of Brazil, Russia, China, and South Africa.

c) 'Climate Financing Practices in Advanced and Emerging Nations-An Analytical Study

Best Practices on Climate Change Mitigation: Lessons from Advanced Nations' can be suggested for developing nations to learn about the best practices of advanced nations regarding climate financing to reduce the negative effects of climate change.

X. SOCIAL RELEVANCE OF THE RESEARCH

India's financial sector has to be educated on the merits of green financing in light of the country's ongoing efforts to improve its infrastructure and its citizens' understanding of climate danger. many different training, capacity-building, webinar, conference, seminar, and other event programmes. After completing the RBI's training programmes, anyone from the private sector, including corporations, nonprofits, and schools, to government workers at the federal and state levels, is eligible to participate. and green money to fix the problems caused by global warming.

XI. CONCLUSION

The majority of people are just not aware of the deeper connotations that are associated with climate engineering and the term "climate technology." The yearly production of fossil fuels is projected to experience a decline of approximately 6% between the years 2020 and 2030. There are several forms of renewable energy that are progressively competing with other options for the generation of natural gas. It is essential that climate technology be implemented by a large number of people. A non-timber pasture of equivalent size may only contain a small portion of the carbon dioxide emissions that are produced by a woody pasture of the same size. Farmers have the potential to increase their income while simultaneously lowering the likelihood of disease outbreaks if they grow a diverse range of crops and keep livestock in these locations. A model of environmental change has been presented by a number of academics, and it seeks to explain the connection between a potentially hazardous atmospheric deviation and economic expansion. There is still a long way to go in the fight against climate change, which is why the creation of a diverse array of technical insurance capacities will be required. Less than one percent of the global gross domestic product might be spent on climate change mitigation strategies and yet be effective. To address issues related to climate change, biodiversity, and other environmental concerns will require an investment of $8.1 trillion over the next 30 years. What lessons should be taught by teachers, and how can students learn to best prepare themselves for an uncertain future brought on by the dangers and effects of climate change on both humans and the natural world.

XII. BIBLIOGRAPHY

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End Notes:

[1] COP stands for Conference of the Parties and COP 26 is the most recent annual United Nations conference on climate change. The summit was attended by nations that signed the United Nations Framework Convention on Climate Change (UNFCCC), which entered into force in 1994.

[1]National Income and Product Accounts.

[1]The Bureau of Economic Analysis (BEA) provides a collection of financial records that provide information on the value and creation of results produced in the United States during a given period, as well as the types and uses of the pay generated by that production

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