International Journal of Research Studies in Education
2025 Volume 14 Number 2, 133-141

Opportunities and challenges of climate change affecting Vietnamese export

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Received: 30 December 2024 **Revised**: 27 January 2025 **Accepted**: 15 February 2025
Available Online: 20 February 2025 **DOI**: 10.5861/ijrse.2025.25814

ISSN: 2243-7703
Online ISSN: 2243-7711

OPEN ACCESS

Abstract

Climate change is an urgent issue that directly impacts all aspects of social life, including Vietnam's export activities. This paper analyzes the challenges that climate change poses to Vietnam's export industry. On the other hand, research will also be conducted to consider whether climate change, in addition to its negative impacts, brings about any development opportunities for the export industry. By analyzing these intertwined factors, this paper sheds light on the complex ways in which climate change will reshape Vietnam's trade dynamics and proposes potential adaptation strategies for the state and businesses to ensure a long-term trade recovery and sustainable export development.

Keywords: climate change, sustainable development, Vietnamese export

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1. Introduction

Climate change is occurring at an accelerating and intense rate, emerging as one of the most pressing worldwide challenges. Nations globally prioritize international integration and collaboration in addressing and adjusting to climate change. Vietnam is regarded as one of the most susceptible nations to climate change because of its geographic position and socio-economic features. According to the Ministry of Natural Resources and Environment, between 2011 and 2020, extreme weather events led to significant economic losses amounting to approximately 10 billion USD (Bao Chau, 2022). Experts say that climate change directly affects all aspects of life, economy and society in Vietnam and causes a lot of damage to the country. Therefore, preventing the negative impacts of climate change as well as implementing response solutions is becoming the most urgent task of Vietnam in the current period.

Currently, climate change is having a serious direct impact on economic sectors, especially import and export, which plays an important role in the national economy. That impact affects import and export activities in many ways such as disrupting production, transportation, logistics, affecting the supply chain of import and export goods. In addition, it increases production, transportation, and goods insurance costs, reduces competitiveness, and also increases trade risks, such as commodity price fluctuations, exchange rate risks, and contract risks. However, besides the negative impacts, climate change will also bring many opportunities to the Vietnamese economic sector such as promoting demand for environmentally friendly products, opening up opportunities for Vietnam to export organic agricultural products, recycled products, etc., or promoting climate change-resistant infrastructure. Therefore, the research on the topic will help assess and grasp the level of impact of climate change on export activities, thereby proposing solutions to help businesses and management agencies have appropriate strategies to contribute to improving the ability to adapt to climate change to ensure sustainable development. Not only that, this topic is also interdisciplinary, combining economics, environment and society, in line with current research trends.

2. Literature review

2.1 Climate change, causes and impacts

There are many different definitions of climate change in the world. Here are some typical views such as:

- According to the definition of the Intergovernmental Panel on Climate Change in its fourth report in 2007, climate change is a change in the state of the climate system, identifiable by changes in the mean value and the variability of its properties, maintained for a sufficiently long period, typically decades or longer. In other words, if we consider the equilibrium state of the climate system as the average weather conditions and its variability over decades or longer, then climate change is a change from one equilibrium state to another equilibrium state of the climate system (Solomon et al., 2007).

- According to the United Nations Framework Convention on Climate Change, climate change is a change in climate which is attributable directly or indirectly to human activity resulting in changes in the composition of the global atmosphere.

In short, climate change refers to long-term shifts and alterations in temperature, precipitation, and other atmospheric patterns on Earth. While the planet has experienced natural climate variability over geological timescales, modern climate change is primarily driven by human activities, especially the burning of fossil fuels, deforestation, and agricultural practices that increase the concentration of greenhouse gases (GHGs) in the

atmosphere.

Causes of Climate Change:

• Greenhouse Gas Emissions:

Carbon dioxide (CO2): The main greenhouse gas emitted from the combustion of fossil fuels (coal, oil, and natural gas) for energy and transport.

Methane (CH4): Emitted by livestock, landfills, rice paddies, and during the extraction of fossil fuels.

Nitrous oxide (N2O): Released from agricultural activities, including the use of fertilizers.

CFCs and other industrial gases: These potent greenhouse gases were once used in refrigerants and aerosols.

• Deforestation: Cutting down trees reduces the Earth's ability to absorb CO2, thus exacerbating climate change.

• Land Use Changes: Agriculture, urbanization, and industrialization alter the natural balance of ecosystems, contributing to more CO2 in the atmosphere.

Global climate change results from two categories of factors: objective factors and subjective factors. Research conducted by scientists indicates that human influence on the natural environment is the primary driver of climate change. Energy, goods, and food production activities have created a huge amount of emissions. In addition, deforestation for construction or transportation also contributes to increasing CO2 emissions into the environment. These emissions contribute to the greenhouse effect and climate change. In addition to the causes of human activities, objective factors causing climate change are changes in nature itself, including changes in solar activity and the Earth's orbit. The Earth, the movement of continents, El Nino, La Nina phenomena, ... also have a significant impact on this situation.

Increasing temperatures over time alter weather patterns and disturb the natural equilibrium of the environment. This can present numerous dangers to humans and other forms of life on Earth. Increasing temperatures lead to more heat-related illnesses and complicate outdoor labor. As the climate heats up, wildfires are more likely to ignite and spread at a faster rate. As temperatures increase, additional water evaporates, intensifying extreme rainfall and flooding, which results in more severe storms. Higher ocean temperatures also influence the occurrence and intensity of tropical storms. Climate change intensifies water scarcity in numerous regions and raises the likelihood of agricultural and environmental droughts, impacting crops and rendering ecosystems more susceptible (Del Castillo, 2023). As Earth’s temperatures increase, sea levels slowly rise. Increasing temperatures lead to the melting of glaciers, sea ice, and continental ice on Earth, resulting in a higher volume of water entering the seas and oceans. The financial harm caused by climate change also rises with increasing global temperatures. Significant storms lead to crop losses and inflict billions in damages; moreover, managing the outbreak of diseases following each storm and flood demands substantial financial resources as well. The harsher the climate, the greater the economic shortfall.

3. Results and Discussion

3.1 Current climate change situation in Vietnam

According to the latest research on climate change by the National Bureau of Economic Research (NBER), the world could suffer six times more damage than imagined if global temperatures rise. A 1°C increase in global temperature leads to a 12% decline in world GDP (Adrien Bilal, Diego R. Känzig, 2024). The damage globally, and especially in tropical countries, makes people think of Vietnam. With 3,260 km of coastline running through major cities and manufacturing areas, Vietnam is at high risk of being affected by rising sea levels. According to

a 2020 World Bank report, the impact of climate change on the economy and social welfare in Vietnam has been significant - equivalent to about 3.2% of gross domestic product (GDP) - in 2020 - and is expected to increase rapidly even with further climate change mitigation efforts in the future worldwide. Vietnam ranks 13th among the countries most at risk from climate change. As per the United Nations Development Program's yearly evaluation of nations severely impacted by extreme weather conditions from 1997 to 2016, Vietnam was ranked 5th in the global climate risk index in 2018 and 8th in the long-term climate risk index (CRI) (Hoang Hoai Linh, Mai Van Khiem, 2024). As per a recent study, Vietnam was placed 127th out of 182 nations in accordance with the Notre Dame Global Climate Change Adaptation Initiative (ND-GAIN) and 13th among 180 countries based on the Germanwatch Global Climate Risk Index for the years 2000-2019 (World Bank, 2022).

As stated in the Vietnam Country Climate and Development Report (World Bank, 2022), Vietnam ranks among the East Asian economies with the highest GHG emission intensity (calculated as emissions per unit of output), on par with Indonesia, yet significantly exceeding China or the Philippines. Over a third of Vietnam's greenhouse gas emissions consist of non-CO2 gases, particularly methane, along with nitrogen dioxide (a gas that significantly influences short-term global warming and air pollution); however, CO2 emissions from energy consumption are rising at a much quicker pace.

As of now, Vietnam has prepared and released 6 national greenhouse gas inventories in the years 1994, 2000, 2010, 2013, 2014, 2016, 2018, and 2020 using aggregated data from national and sectoral sources. Thus, in the timeframe from 1994 to 2020, Vietnam's overall greenhouse gas emissions rose swiftly from 103.8 million tons of CO2 equivalent to roughly 413.5 million tons of CO2 equivalent. Over the last 30 years, swift economic growth, urbanization, and industrialization have depended on a complete energy supply that relies heavily on coal, resulting in substantial greenhouse gas emissions, averaging more than 11 million tons of CO2 equivalent annually.

- The energy sector is the quickest expanding sector within national greenhouse gas inventories. Total greenhouse gas emissions from the energy sector rose from 25.6 million tonnes of CO2 equivalent in 1994 to 286.5 million tonnes of CO2 equivalent in 2020, representing approximately 69% of the nation’s emissions.

- In 2020, the agricultural industry released 85.8 million tonnes of CO2, placing it second in greenhouse gas emissions and representing 20.7% of the nation’s overall emissions. Rice cultivation contributed approximately 48% of those emissions, with livestock at 15.3%, synthetic fertilizer application at 12.9%, and manure management at 9.5%. It is important to highlight that over 70% of the greenhouse gas emissions from the agricultural sector consist of methane and nitrous oxide, rather than carbon dioxide (CO2). Methane and nitrous oxide have significantly shorter atmospheric lifespans compared to CO2, yet they are markedly more damaging to the environment. Consequently, decreasing the emissions of these gases will lead to a quicker and more significant effect on mitigating global warming in the near term. (World Bank, 2022).

- In the industrial process sector, greenhouse gas emissions rose from 3.8 million tonnes of CO2 equivalent in 1994 to 52.7 million tonnes of CO2 equivalent by 2020.

- In the waste sector, greenhouse gas emissions surged swiftly from 2.6 million tonnes of CO2 equivalent in 1994 to 31 million tonnes of CO2 equivalent by 2020.

- In the LULUCF (Land Use, Land Use Change and Forestry) sector, an estimated 42.5 million tonnes of CO2 were absorbed. (Ministry of Natural Resources and Environment, 2023).

Climate change is progressively affecting Vietnam's economy, and the expenses are beginning to hinder growth. Preliminary evaluations in the recent Country Environment Analysis indicate that Vietnam suffered a loss of US$10 billion, equivalent to 3.2% of its GDP, in 2020 as a result of climate change effects (World Bank, 2022). In the absence of suitable adaptation and mitigation strategies, climate change is projected to impose costs on Vietnam ranging from 12% to 14.5% of its GDP each year by 2050, potentially driving as many as 1 million

individuals into extreme poverty by 2030 (World Bank, 2022).

3.2 Challenges of climate change to export activities

The reality is that as climate change worsens, we will experience more frequent extreme weather events, including hurricanes, tsunamis, wildfires and floods. These will inevitably increase the risks to international trade and investment. Changes in environmental and weather conditions can disrupt production and increase the costs of transportation, insurance and supply, affecting the profits and investment decisions of international businesses. The devastation caused by hurricanes and floods has destroyed road infrastructure and productive assets, and such devastation will inevitably lead to a spike in labor, energy and logistics costs – at a time when inflation is already rising. Costs are rampant. And the combination of these factors has choked the flow of money that lubricates global trade. For instance, maritime shipping, responsible for approximately 80% of worldwide trade volume and over 70% of trade value, might face disruptions due to climate change. Specifically, increased intensity and frequency of storms, intense rainfall, and rising sea levels may result in more regular port shutdowns, impacting shipping efficiency, necessitating alternative routes or safety precautions, and raising the expenses associated with operating ships and ports (World Bank, 2022).

Increasing extreme weather and climate events not only cause damage to resources and socio-economic development, but also affect the country's sustainable development goals. The Ministry of Natural Resources and Environment estimates that the overall damage caused by extreme climate events, when calculated for the years 2011-2020, reaches VND 229,958 billion (approximately 10 billion USD). Each year, direct damage averages around 2.4 billion USD, which is approximately 0.8% of GDP. If assessed based on the overall expenses of environmental decline, the harm inflicted by climate change is projected to be around 10 billion USD in 2020, which corresponds to 3.2% of GDP. According to the World Bank's estimate, each year in Vietnam, 930,000 people are affected and lose 2.6 billion USD (Anh Vu, 2024). Even by 2050, climate change could cause Vietnam to lose up to 12-14.5% of GDP (Anh Nhi, 2024).

Ranking highly in terms of vulnerability to the impacts of climate change, Vietnam has been selected by the United Nations as a case study country on climate change and human development. Climate change impacts Vietnam’s trade, with a clear focus on areas of activity such as agricultural exports, domestic trade, trade in services (warehousing, wharfage) or commercial infrastructure that will be most severely affected, as follows:

• Agricultural disruption: Currently, the agricultural sector serves as Vietnam's primary export domain, yet it is largely focused in low-lying regions and coastal plains that are susceptible to climate change effects. Increasing temperatures may decrease the growth period of crops in the North, and significant water shortages can greatly lower yearly production. Furthermore, the Mekong Delta is the area with the greatest agricultural yield in the nation, accounting for 50% of rice output and 95% of rice export revenue, 65% of aquaculture yield and 60% of fish export output, 70% of fruit yield and one-third of Vietnam's agricultural GDP. Nevertheless, the Mekong Delta is encountering escalating challenges due to rising sea levels and saltwater infiltration. In the absence of adaptation strategies, roughly 45% of the Mekong Delta region will experience saltwater flooding, resulting in approximately 17 billion USD in losses by 2030 (World Bank, 2022). Projected agricultural losses in Vietnam because of climate change are expected to be between 5.6–6.2% by 2030 and 7.6–10.6% by 2050, varying by climate scenario, with the effects of climate change significantly reducing productivity gains in agriculture. The aquaculture industry faces an annual risk of flooding affecting 1.1 million tonnes of output, resulting in nearly $1 billion in export revenues. Diminished crop yields may also result in increased food prices, significantly affecting low-income earners (World Bank, 2022).

• Damage to infrastructure and disruptions in supply chains: Climate change will strain various kinds of infrastructure in Vietnam, affecting supply chains for imports and exports alike. Hazard scenarios indicate that road accidents caused by flooding will rise by at least 40% by the year 2030. Likewise, Ho Chi Minh City's largest seaport is expected to be five times more prone to regular flooding in the future (World Bank 2022). This

may result in holdups, higher shipping expenses, and diminished competitiveness in global markets.

• Rising sea levels and coastal erosion: Vietnam features an extensive coastline, with numerous key seaports and commercial hubs situated in coastal regions. Moreover, coastal regions and river delta basins in Vietnam that are low-lying are particularly susceptible to the rise in sea levels. A common example is the Mekong Delta, where ongoing sand mining operations worsen the effects of increasing sea levels on the erosion of coastlines and riverbanks. A 2022 World Bank report indicates that the Mekong Delta is especially at risk from climate change. If sea levels increase by 75–100 cm from the 1980–1999 baseline, almost half of the delta will be flooded. A one-meter increase in sea level would submerge 79% of the overall area of Ca Mau province and 76% of Kien Giang province. In the absence of adaptation measures, approximately 45% of the Mekong Delta will face saltwater intrusion, resulting in losses estimated at US$17 billion by 2030. Increasing sea levels and coastal erosion due to climate change can harm port facilities, interfere with shipping lanes, and raise the risk of saltwater encroachment on agricultural areas, impacting both import and export operations.

• Insurance expenses and financial risks: The rising occurrence and intensity of extreme weather events linked to climate change could raise insurance expenses for companies engaged in import and export operations. This extra financial strain may affect profit margins and investment choices, particularly for small and medium-sized businesses with restricted means to handle risks.

• Risks in long-term planning and investment: Climate change introduces uncertainty and risks into long-term planning and investment decisions for import and export activities. Infrastructure projects, supply chain investments and market expansion strategies must take into account climate-related risks such as rising sea levels, changing weather patterns and regulatory changes to ensure resilience and sustainability over time.

• Impact on prices: Climate change can disrupt supply chains by affecting production and delaying the transportation and distribution of goods. This leads to higher costs, making partner countries reluctant to import, reducing profits for businesses supplying goods.

In addition to the impacts of climate change, Vietnam's trade will be affected by other impacts due to having to accept environmental commitments in trade activities, both domestically and internationally. This is reflected in the fact that businesses will face many difficulties when exporting goods to other countries due to higher requirements on the level of environmental compliance for exported products

3.3 Opportunities

In addition to the threats that climate change poses to Vietnam’s imports and exports, climate change also presents many opportunities for imports and exports. Here are some potential opportunities:

• Renewable energy exports: As countries strive to reduce carbon emissions and shift to renewable energy sources, demand for renewable energy technologies is increasing. In 2020, Vietnam ranked as the third largest exporter of environmental goods—items that aid in climate and environmental objectives (with Vietnam’s products focusing primarily on renewable energy)—in the Southeast Asian area, achieving an export revenue of US$6.5 billion. From 2000 to 2020, Vietnam's exports of environmental goods increased by an average annual rate of 48%. Exports of solar cells and heliostats experienced notably high annual growth rates of 81.6% and 71.2% respectively from 2010 to 2020, indicating a shift in the makeup of Vietnam's export portfolio. This economic shift, along with the rise of new industries, could generate new, more sustainable employment opportunities in a sector that will persist in expanding as the world swiftly moves towards more environmentally friendly trade, production, and consumption. The solar photovoltaic industry is a specialized field, frequently integrated within intricate value chains. Consequently, having access to resources is vital for maintaining growth in the future. Vietnam is already a significant participant in solar equipment but could still carve out a niche in wind and electrical equipment technologies. Nonetheless, regulations implemented by trade partners (importers) may influence this trade. Consequently, Vietnam must expand the variety of its markets. Chances are also present

in emerging markets, like the African Continental Free Trade Area (World Bank, 2022).

• Climate-resilient agricultural products: Climate change impacts agriculture, but it also creates opportunities for Vietnam to develop and export climate-resilient agricultural crops and technologies. For example, drought-resistant seeds, innovative irrigation systems, and sustainable farming methods could become valuable exports as other regions face similar climate challenges.

• Water management solutions: With changing rainfall patterns and increasing water scarcity, the global demand for water management solutions is increasing. Vietnam can export expertise, technology and services related to water conservation, wastewater treatment and flood control.

• Adaptation technologies and services: Countries around the world are investing in adaptation measures to cope with the impacts of climate change. Vietnam, with its experience in dealing with floods, storms and rising sea levels, can export adaptation technologies and services such as coastal protection infrastructure, early warning systems and disaster preparedness training.

• Ecotourism: Vietnam's diverse natural landscape, including coastlines, mountains and forests, makes it an attractive destination for ecotourism. As awareness of climate change grows, demand for sustainable and environmentally friendly travel experiences is growing. Vietnam can export ecotourism services such as nature tours, sustainable accommodation and conservation initiatives.

• Climate-resilient infrastructure: With the increasing frequency and intensity of extreme weather events, the need for climate-resilient infrastructure such as resilient buildings, roads and urban planning solutions is increasing. Vietnam can export its expertise and technology in designing and implementing climate-resilient infrastructure projects. Overall, while climate change poses significant challenges for Vietnam, it also presents the country with opportunities to develop and export solutions to address climate-related issues both domestically and internationally. However, seizing these opportunities will require strategic planning, investment in research and development, and collaboration with international partners.

4. Recommendations

4.1 Government

Proactively responding to climate change will help Vietnam minimize the negative impacts of climate change, improve competitiveness, and promote sustainable socio-economic development.

• Perfecting policies and laws on climate change: Issuing specific laws and regulations on climate change response in the import-export sector. Creating a legal framework to encourage businesses to apply climate change adaptation measures.

• Improving climate change adaptation capacity: Increasing investment in infrastructure such as building dyke systems, sluices, canals to prevent floods, droughts, and saline intrusion, upgrading transportation and logistics systems to ensure the circulation of goods; Applying science and technology to agricultural and industrial production to improve productivity, adaptability to climate change, and develop green industries with low greenhouse gas emissions; Raise public awareness by strengthening propaganda and education on climate change and adaptation measures for people and businesses, encouraging the use of energy saving and efficiency.

• Diversify import and export markets: Expand export markets by strengthening trade promotion, seeking new markets for Vietnamese exports, reducing dependence on some traditional markets. In addition, develop import markets by increasing the import of raw materials and supplies for domestic production and consumption; diversify raw material supply sources to minimize risks caused by climate change.

• Encourage the development of green production: Support businesses in applying green production

standards: Provide financial, technical and technological support for businesses in applying green production standards and minimizing environmental impacts. Encourage the production of environmentally friendly, recyclable and reusable products; develop renewable energy products.

• Strengthen international cooperation: Actively participate in international treaties on climate change, share experiences and learn climate change response measures from other countries. Strengthen cooperation with international organizations on climate change to mobilize financial, technical and technological resources for climate change response activities. In addition, the state also needs to have specific support policies for import-export enterprises to respond to climate change such as: Providing tax incentives and loan interest rates for enterprises investing in climate change response measures; Providing consulting and training services on climate change for enterprises; Supporting enterprises to apply advanced technology to minimize environmental impacts.

4.2 Enterprise

To adapt to climate change, avoid challenges and take advantage of sustainable development opportunities, businesses need to take the following measures:

• Assess risks and opportunities: Businesses need to identify potential risks and opportunities brought by climate change to their import and export activities. For example, risks from supply chain disruptions, changes in market demand and opportunities from developing renewable energy markets. In addition, impact assessment includes measuring carbon emissions caused by business operations. Identify and evaluate energy consumption such as energy use in production, system operation, daily operations and potential impacts on the environment, including impacts on biodiversity, water, air, etc.

• Adapt to the impacts of climate change: Diversify the supply chain by seeking suppliers in areas less affected by climate change, increase inventory; Build storm and flood-resistant infrastructure to increase resilience to extreme weather events; Purchase risk insurance; Invest in research and development of environmentally friendly products and services.

• Increase investment in technology: Apply advanced technology to improve operational efficiency and minimize environmental impact. For example, using renewable energy systems, applying energy-saving technology and using green logistics solutions. Innovation, creativity and digital transformation will help businesses accelerate the process of building sustainable pillars. Pioneering businesses that transform and operate according to the motto of production and business with responsibility to the community, society and environment are proving to be highly adaptable, resilient and sustainable, resilient to negative changes from the outside as well as flexible and effectively grasping the opportunities that the economy brings.

• Strengthening environmental and resource protection: Businesses can take measures to reduce carbon emissions and environmental impacts by using energy efficiently, minimizing waste, and moving towards a green economic model that not only helps minimize the impacts of climate change but also brings many other benefits to businesses such as reducing operating costs, creating new business opportunities, enhancing the reputation of the business brand in the community and market

• Raising employee awareness: Organizing training programs to raise awareness of staff about climate change and its impacts on import and export activities. Raising awareness will help businesses respond more effectively.

• Cooperating with stakeholders: Joining associations and business networks on climate change. Cooperating with non-governmental organizations and governments to share information, experiences and resources. Participating in international cooperation programs to access funding for climate change prevention projects.

5. References

Adrien Bilal and Diego R. Känzig. (2024). The macroeconomic impact of climate change: global vs. local temperature. NBER Working Paper No. 32450. Retrieved December 20, 2024, from https://www.preventionweb.net/media/96410

Anh Nhi. (2024). Vietnam could lose 14.5% of GDP due to climate change by 2050. Retrieved December 20, 2024, from https://vneconomy.vn/viet-nam-co-the-mat-14-5-gdp-vi-bien-doi-khi-hau-vao-nam-2050.htm

Anh Vu. (2024). The terrible cost of climate change. Retrieved December 20, 2024, from https://tiasang.com.vn/dien-dan/cai-gia-khung-khiep-cua-bien-doi-khi-hau/

Bao Chau. (2022). Climate change "blows away" billions of dollars. Retrieved December 20, 2024, from https://monre.gov.vn/Pages/bien-doi-khi-hau-thoi-bay-hang-ty-usd.aspx

Del Castillo, F. A. (2023). Climate crisis and public health: Global or local inaction. *Journal of Preventive Medicine and Public Health, 56*(2), 203–204. https://doi.org/10.3961/jpmph.23.114

Hoang Hoai Linh, Mai Van Khiem. (2024). Forecasting and early warning of hydrometeorology to proactively prevent and respond to natural disasters and climate change. Retrieved December 20, 2024, from https://tapchimoitruong.vn/chuyen-muc-3/du-bao-canh-bao-som-khi-tuong-thuy-van-de-chu-dong-phong-ngua-ung-pho-thien-tai-va-bien-doi-khi-hau-29948

Ministry of Natural Resources and Environment. (2023). Identify areas for greenhouse gas inventories. Retrieved December 20, 2024, from https://monre.gov.vn/Pages/xac-dinh-cac-linh-vuc-phai-kiem-ke-khi-nha-kinh.aspx

Solomon, S. et al. (2007). Climate change 2007: The physical science basis: contribution of working group I to the fourth assessment report of the intergovernmental panel on climate change. Cambridge University Press. Retrieved December 20, 2024 from https://www.ipcc.ch/site/assets/uploads/2018/05/ar4_wg1_full_report-1.pdf

World Bank. (2022). Vietnam Country Climate and Development Report. Retrieved December 20, 2024, from https://openknowledge.worldbank.org/entities/publication/29e72556-d255-5c50-a086-245c1ccc4704