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Exploring Global Warming Impact on the Economy: The Nexus of Global Warming and the Economy in Perspective

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Abstract: This study explores global warming's impact on the economy, recommending solutions to reduce poverty. Its most important implications are for policy economists who present global warming's effects as impacting intergenerational equity. Grounded in production theory, the specific emphasis of this study is public-goods investment and agricultural productivity's dependency on nature. A focus on these two areas is what sets this study apart from similar research. After conducting a meta-study of the relevant qualitative information on these areas, my findings reveal that global warming's effects are always a trade-off between present and future generations' consumption of resources. Since the global population increases while resources are limited, historical inequalities are likely to persist if concerted interventions are not widely adopted. I argue that if global warming's effects are economic problems, the over-exploitation of limited resources needs to be addressed directly and that economic solutions without follow-through cannot fix the problem. Ultimately, the study recommends that reducing greenhouse gas (GHG) emissions, despite negative economic outcomes in the short term, will be beneficial over time. As a result, the present generation needs to invest wisely in environmentally sustainable technologies, rather than short-term goods, so that future generations will enjoy the economic benefits of a clean environment. Research confirms that restricting global warming will affect agricultural productivity now, but trillions of dollars will be recuperated by 2300 as a result. The sooner environmentally friendly technologies are adopted by businesses the better. Although these findings are not novel, they are timely because meta-studies such as this combat disinformation.

Keywords: *Global warming, Economy, Limited natural resources, Human consumption, Economic productivity*

1. Introduction

This study explores the impacts of global warming on the economy to recommend solutions to reduce poverty among millions of people globally who are pushed into abject poverty by the effects of global warming. These effects include natural disasters such as droughts, floods and deforestation. The study is important because policy economists usually present global-warming effects as intergenerational equity. In other words, poverty caused by environmental devastation will have lasting effects on those who experience it, while individuals (and even nation states) who exploit resources disproportionately will benefit financially in ways that will entrench their wealth for future generations. Ignoring the effects of global warming now will only result in a deepening of the unequal distribution of wealth and resources in the future. Furthermore, many studies concentrate on the causes of global warming at the expense of global-warming impacts on the economy (Nordhaus, 2019). This study addresses this shortfall in the existing research by emphasising investment in public goods and dependency on agricultural productivity to explore the nature of the problem at the heart of the relationship between global warming and the economy. My aim is similar to Zang et al (2021), in that I want to put these problems in perspective. Specifically, this study focuses on the negative impacts that arise because of anthropogenic global warming's effects on the economy. Its theoretical approach is grounded in the theory of production (Chase, 2023). Production theory deals with employing production factors such as limited natural resources (land), capital, labour, and entrepreneurs to produce goods (tangible), and services (intangible), to meet an increasing population's consumption demands (Braun, 2024). Human consumption (use of goods and services) exerts pressure on scarce natural resources, ultimately causing global-warming effects such as rising seas, droughts, floods, famine, and deforestation. These all affect the economy negatively (Zang et al., 2021).

There has been much discussion about global warming's impact on the economy emphasizing trade-offs in well-being between present and future generations (Nordhaus, 2019). Specifically, some of these discussions have been concerned with whether it is socially beneficial for the present generation to forfeit its consumption of goods to avert or mitigate global warming's effects on generations not yet born (Helm et al., 2021). Global warming's trade-offs and its devastating effects on the economy have informed world political efforts such as

the Kyoto Protocol in 2005, resulting in the establishment of new international laws. One such law created a carbon market to compel businesses to shoulder the social costs of their carbon emissions, but global warming effects continue to devastate the world economy (Stern & Stiglitz, 2021).

Moreover, an ever-increasing population creates demand for consumables, which leads to the production of goods and services to meet demand. Production activities combine factors of production such as natural resources, capital, labour, and entrepreneurs to produce goods and services. Through this cycle, natural resources that are limited in supply become overexploited to meet the increasing population's consumption needs. Limited natural resources, overexploitation lead to global-warming effects such as drought, deforestation, and famine (Helbling & Meierrieks, 2022). Global warming is defined as the long-term heating of the Earth's surface, which has occurred since the pre-industrial era because of human activities, especially the burning of fossil fuels, which causes the emission of carbon dioxide, with negative consequences for the economy (Stern & Stiglitz, 2021). Ortiz-Bobea et al's (2021) research refers to global warming as *anthropogenic climate change*.

The economy is defined as the ability of humans (industry) to assemble facilities for the production of goods and to sell services for meeting human-consumption demands. Because of increasing demand for economic growth and development, limited natural resources are overexploited, hence global-warming effects (Brown & Saunders, 2020). Economic growth is defined as an increase in the production of goods, while economic development is defined as an increase in people's living standard, namely in areas such as education, health, and infrastructure development (Chase, 2023). Global warming's effects cause negative ramifications, namely rising seas, decreasing agricultural productivity, and declining agricultural productivity (farm crops and livestock) (Helbling & Meierrieks, 2022). Global warming's effects cause glaciers to melt, and sea levels to rise. This results in urban and coastal areas losing residential land area, in addition to the damage to infrastructure that counts as economic losses (Braun, 2024). Furthermore, droughts and floods disproportionately affect those who are highly dependent on agricultural productivity for their survival, especially in rural settlements.

Droughts cause livestock and farm crops to die because of the scarcity of water during these periods. When floods occur, there is an abundance of water for crops and livestock, but in excess, it causes them to die (Helbling & Meierrieks, 2022). Ipso facto, agricultural production is lowered by global warming. Rural settlements' dependence on agricultural productivity leads to the loss of outputs and wages, which in turn affects the gross domestic product (GDP) and gross national product (GNP) of nations (Orimoloye et al., 2022). Governments lose tax revenues or incomes, which deepens poverty and further exacerbates inequality in the development of infrastructure in urban and rural areas. Hence, rural-urban migration is triggered. These are some of the impacts of global warming on the economy. It also deepens generational wealth inequalities. This study problematizes both inequalities to explore the solutions set out by the existing literature. It aims to contribute socially by advocating for curbing global warming on the economy. A net benefit of adopting these solutions would be to alleviate the consequences of poverty suffered by millions of people around the world due to climate change. The paper includes a literature review establishing the existing findings on production and agriculture regarding climate change. I then include my theoretical framework based on production theory. The study's methodology is based on a Literature Review, which can otherwise be called a meta-study, and I explain how this was done under that subheading. The paper ends with findings, a conclusion, and recommendations. The next section presents the literature review of the study.

2. Literature Review

The discourse of the nexus between global warming and the economy

The United Nations (UN) published statistics in 2024 showing that the world population is 8.2 billion people. The same document projects that as of 2050, the world population will increase from 8.2 to 9.7 million people. The UN Environmental Programme (2024) confirms: 'We have only one Earth. Today, the 8 billion people on it are using more of its resources than it can provide. Every new person is a new consumer, adding to that demand. Some of us take far more than others and there are many steps those of us who do must take to make our consumption sustainable. Fewer new consumers everywhere is one of them. The global organization continues ''Increasing resource use is the main driver of the triple planetary crisis of climate change, biodiversity loss, and pollution'' (*United Nations Environment Programme, 2024)*. The UN's statements imply

that the ever-increasing world-population exerts pressure on limited natural resources provided by nature (Wang et al., 2024). Since natural resources are limited, while the world population continues to increase, there is a demand for more goods and services to be produced that cannot be met indefinitely. To respond to consumption demands, production capacity needs to increase, which leads to overexploitation of limited natural resources. Global warming's effects cause, for example, droughts, deforestation, among others, as well as affecting infrastructure, and agricultural productivity outputs. Economic contraction results, which creates challenges such as unemployment, loss of income, and inflation (Wang et al., 2024). Global warming hits rural settlement dwellers the hardest and causes economic losses for the people living in these areas (Wang et al., 2024). Devastated places of human habitation, especially settlements that depend on agricultural productivity, result in low yields from crops and livestock, wage losses, and underemployment, which triggers migration from rural to urban areas as those affected look for a better life elsewhere (Samson, 2023; Helbling & Meierrieks, 2022). Such a process is termed rural-urban migration. Environmental immigrants' arrival creates carrying-capacity problems over the entire ecosystem and in the existing economy within and between nation states. Conflicts among natives and environmental migrants arise as a result. Carrying capacity is defined as the number of people a particular environment or economic system can support.

Global warming's effects on economic productivity

In an attempt for humankind to improve living standards and satisfy increasing human-consumption demands, more energy or fuel is burned, especially fossil fuels, which are needed to produce goods and services. This results in more GHG emissions in the atmosphere. The increase in GHGs causes global-warming effects like droughts, floods, and deforestation among others (Helbling & Meierrieks, 2022). These effects have impacts on rising temperatures, the economy, and unpredictable weather patterns. Climate change's impacts have devastating consequences for labour productivity and development across the globe. This leads to a loss of economic activity and lowers global productivity due to high temperatures (Zang et al., 2021). Climate impacts occur as a result of altered biological, chemical, and ecological processes, resulting in reduced overall productivity globally (Elrys et al., 2022). Environmental effects such as heat waves lead to decreased labour productivity because it is impossible to be productive when one is physically overheating. Even temperatures hot enough to cause discomfort without dramatic negative health consequences lower productivity. Poor nations without safe buildings, or working environments fitted with air conditioning units and other infrastructure necessary for human health, safety and comfort, are harder hit compared to developed nations with more of these sorts of amenities.

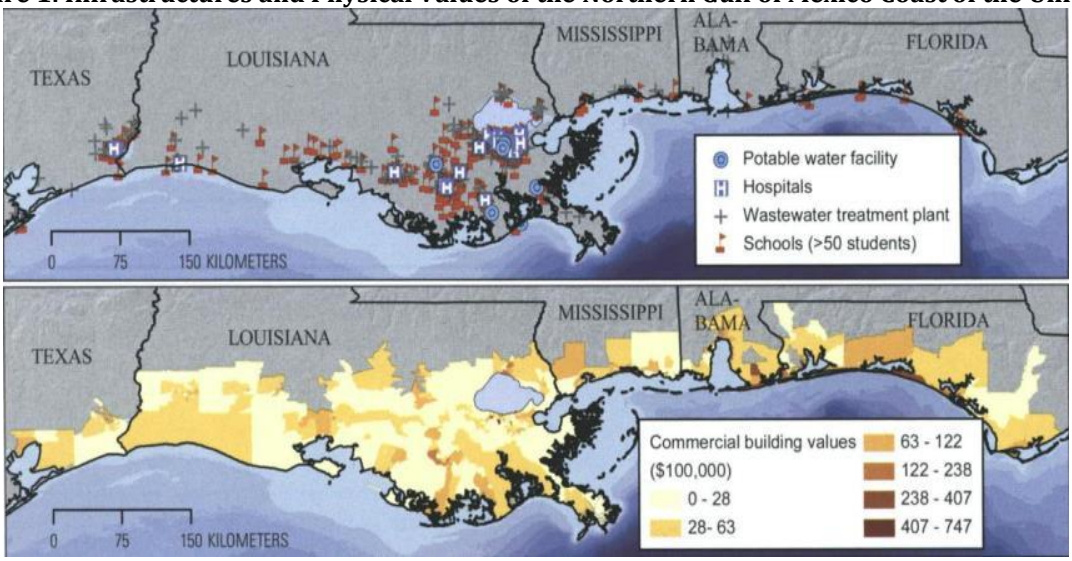
Economically, poor nations also bear the brunt of global warming's effects (Zang et al., 2021) due to their heavy dependency on agricultural productivity, which is usually stymied by natural disasters such as storms, floods, and droughts. These natural disasters not only destroy crops and buildings, but also roads, bridges, and other transportation infrastructure. Worsening climate change affects livestock and farm produce (Elrys et al., 2022). This is because usable land is degraded, and therefore, the yield per acre decreases. Such patterns affect the length of growing seasons, and when they decrease production yields are lowered (Zang et al., 2021). Global warming's effects lead to market failure and inefficient allocation of world resources due to the collapse of most economies.

Climate change leads to losses in agricultural productivity, income and employment. This forces environmental victims affected by global warming's effects to adopt migration as a coping mechanism (Vorvornator, 2024a; Korsi & Vorvornator, 2021). The more vulnerable an economy is, the more it is affected by global warming's effects. Shivanna's (2022) research predicts that by the year 2050, more than 200 million people worldwide will be affected by climate change. Other scholars anticipate higher figures over and above that of Shivanna's (Roberts Kingman et al., 2022). In addition, an economist at Hong Kong and Shanghai Banking Corporation (HSBC) bank published data in 2007 demonstrating that Venezuela could lose up to 35% of its GDP by the year 2050 because of climate change (Lachaud et al., 2022). The variability in predictions can be explained by the uncertainties and vulnerabilities of the economy due to climatic conditions. Therefore, it can be said that global warming's effects cripple economic growth and development and affect labour productivity globally. Even the accuracy of economic modelling is made more difficult because of the unprecedented effects of climate change. At the very least, it can be said unequivocally that climate change will impact the global economy in a profoundly negative way if nothing is done to curb its effects.

Global warming's impacts on coastal regions

Coastal regions are the geographical areas or places that are close to coastlines. For cost-effectiveness, a great deal of fossil-fuel infrastructure, such as oil refineries and harbours, is established near the coast (Andrews et al., 2021). Global warming's effects (such as rising seas) force a larger than otherwise number of glaciers to melt as temperatures rise. Rising seas affect many coastal regions because their shorelines begin to recede, and their low-lying areas become inundated by rising waters (Elrys et al., 2022). Coastal flooding as a result of rising sea levels destroys residential and commercial buildings, and other valuable infrastructure such as schools and hospitals. Significant economic and structural losses caused by this process hurt economic development globally (Habibullah et al., 2022). Below is Figure 1.1, depicting the Gulf of Mexico coast of the USA, which is more vulnerable to rising seas because of societal and physical factors.

Figure 1: Infrastructures and Physical Values of the Northern Gulf of Mexico Coast of the United States



Source: (Barker, 2024)

Highly populated, urbanized areas near coastlines are more vulnerable to the effects of climate change. Many coastal cities are susceptible to infrastructure damage from rising seas and are destined for future losses. Occurrences of these losses would trigger urban-rural migration. This means urban dwellers migrate to non-urban, less susceptible areas when natural disasters occur. A case in point is the USA as a nation. The USA has a coastal area of about 1.7 million square kilometres, starting from Miami to southern California, which is prone to devastation from rising sea levels (Lin et al., 2024). Many coastlines of the USA are threatened by global warming's effects, including rising sea levels. Examples of coastal areas that are likely to experience rising sea levels due to glacier melt are California, New Jersey and Florida. The American states' coastlines are highly vulnerable to the effects of global warming (Lin et al., 2024). Many countries face the same problem, which damages properties and lives, resulting in economic losses. Increasingly, storms affect structures located on coastlines as a result of glaciers melting due to climate change (Lin et al., 2024). Cities display substantial economic losses because of low-lying coastal properties. The consequences of rising seas are the loss of property and lives, both of which ultimately impact the economy (Lin et al., 2024).

Notably, infrastructure located on coastlines is costly. States that experience rising sea levels such that infrastructure is destroyed will feel negative impacts on their economic development. Moreover, coastal infrastructure cannot be easily replaced due to the high costs involved, meaning that affected areas will experience losses in a significant and ongoing way. Not only are the cities located near the coast more susceptible to rising sea levels, but increasingly high temperatures also trigger storms and hurricanes. A rise in these natural phenomena would affect millions of people. In addition, high temperatures may cause storms to be worse than they otherwise would be. This brings to mind Hurricane Sandy, which devastated New York City in the year 2012 (Medwinter, 2021). Hurricane Sandy destroyed many lives and properties. It flooded buildings, which cost the NYC government billions of dollars, affecting the economy negatively. Another effect

of climate change is heavy rain, which can lead to flooding. Many coastal areas of the world over are vulnerable during hurricane season due to severe flooding (Medwinter, 2021). These adverse effects of global warming have negative consequences for the economy, hindering its growth and development.

Global warming's impacts on agricultural productivity

Agriculture is defined as activities that involve producing plants or animals that are used for human consumption (Harris, 2021). These activities produce foods (cereals and meat), fibres (cotton), fuels (products derived from agriculture), raw materials (rubbers), livestock (poultry), and products from forests (forestry). Agricultural products' survival is mostly dependent on the weather (Harris, 2021). This means favourable weather patterns result in higher yields, which are necessary to satisfy human-consumption demand. Conversely, unfavourable weather produces fewer products, which impacts the economy negatively due to food-price increases (inflation) (Agu et al., 2023). Moreover, continuously increasing temperatures because of global warming cause glaciers to melt. Glaciers' receding affects the flow of rivers negatively in the long run (Zang et al., 2021). Changes in river speed, height and direction threaten millions of people's livelihoods globally because rivers are critical sources for irrigation for farmers. Furthermore, rivers' water quality and levels decrease as glaciers continue to melt. This leads to reduced rainfall, causing water scarcity in areas that already have too little water to begin with (Zulfiqar et al., 2018). Areas in which water is already scarce include: Sub-Saharan Africa (SSA); almost all of the Middle East, and many parts of South Asia. Already, these areas experience the problem of scarcity of water per capita, and it is predicted that further decreases in the amount of rainfall and melting of glaciers will impact these places negatively for the next 100 years. Unless mitigation, aversion, and prevention measures are adopted to ameliorate the situation. Decreases in rainfall result in deforestation and the decline of water bodies, especially rivers. The knock-on effect is a reduction of arable land (Zulfiqar et al., 2018). Millions of people who depend on rivers for irrigation will have their livelihood affected because of the effects of climate change. Their harvests will decrease, which will affect their countries' GDPs down the line. In some cases, farmers convert their farmland into forests to manage their losses. This then affects agricultural productivity, because forests replace farmland. The result is that the price of goods and services goes up, pushing many people into poverty. For those unable to earn an income, life becomes more difficult and precarious because the prices of goods that meet their basic needs continue to increase (as well as the prices of goods merely desired) (Zulfiqar et al., 2018).

Natural resources such as soil and air, like water bodies, are not spared from the effects of global warming (Harris, 2021). Degradation of air and soil quality also impacts agricultural production negatively, which in turn hurts the economy (Agu et al., 2023). Global warming's effects lead to soil erosion and the degradation of soil nutrients. Decreasing agricultural productivity affects per-capita income. This triggers unemployment, underemployment, and an increase in high dependency on a single breadwinner in families. In some instances, migration is chosen as a coping mechanism for the betterment of the lives of affected families (Vorvornator, 2024b). Global warming's effects, historically and in the present, will continue to devastate millions of people, especially those who depend on agricultural productivity as their livelihood strategy (Agu et al., 2023). As stated earlier, the regions hardest hit will include SSA, where agriculture is crucial as a way of life. Therefore, global warming can be viewed with the same urgency as a pandemic, in that it needs to be tackled immediately. Its impacts affect millions of people globally, leading them into abject poverty. The next section presents the theoretical framework through which this study was conducted.

Theoretical Framework

Production theory

This study is grounded in Chase's (2023) *Theory of Production*. Production is defined as the creation of goods and services by humans to satisfy their basic needs and wants. For production to happen, factors of production such as natural resources (land), capital (equipment and machines), labour (skilled and unskilled) and entrepreneurs are brought together to produce goods and services. The combination of production factors results in goods (which are tangible), and services (which are intangible) to satisfy humankind (Maja & Ayano, 2021). The market mechanism known as supply and demand determines the quantity and type of products and services that need to be made available. This means producers who assemble factories and businesses for production purposes respond to consumers' needs by managing the amount of goods and services that they produce (Chase, 2023). Therefore, if more consumer goods are required, more will be supplied. To meet high

demands, the overexploitation of scarce natural resources occurs. By contrast, if demand is low, fewer natural resources are needed (Chase, 2023).

The increasing world population exerts enormous pressure on limited natural resources. As a result, there is overexploitation of limited natural resources to satisfy the increasing consumption demand of people (Maja & Ayano, 2021). This leads to the overexploitation of scarce natural resources through the burning of fossil fuels in an attempt to meet the increasing population of consumers' demands. As a result, more and more GHG-emitting industries are being established. Given the scientific evidence presented in the 4th report from the Intergovernmental Panel on Climate Change (IPCC) about global warming's effects, it is clear that GHGs hurt the world economy (Allan et al., 2023). An attempt to satisfy consumers' rising demands can only lead to an increase in production. This, in turn, leads to increased GHG emissions into the atmosphere, which then leads to rising temperatures (Zang et al., 2021). As a result, a higher frequency of disasters and natural catastrophes is inevitable unless action is taken timeously. These disasters include droughts, famines, floods, deforestation, heat waves, high mortality rates, related cardiovascular ailments, the spread of infectious diseases, and significant biodiversity loss (Orimoloye et al., 2022). Negative consequences of this magnitude have economic costs, some of which include the loss of infrastructure, lower agricultural productivity, and reduced production capacity, all of which impact the world economy adversely (Orimoloye et al., 2022).

By relating production theory to global warming's impact on the economy, it becomes evident that, since the world population continues to increase while natural resources are limited in supply, overexploitation of scarce natural resources has and will continue to lead to global warming. These effects (for example, droughts and floods) in turn impact the economy negatively (resulting in financial losses) causing greater poverty and suffering among the world's most vulnerable people. It is not only the most vulnerable who are affected. Even the wealthy living in coastal properties will feel the impacts of global warming. A useful concept for conceptualising the causal links between the two is the global-warming-economy nexus.

3. Methodology

This study began with a literature review (LR) exploring the effects of global warming on the economy. Taherdoost (2021 p. 11) states that LR is 'the process of accessing published secondary data'. The definition explains two distinct things. The first is that an LR adopts only data from secondary sources, not primary sources. Information from secondary sources was used in this exploration, and these sources included articles, books, journals, and organizational and non-organizational reports (Maxwell, 2021). The second implication of Taherdoost's definition is that LR is desktop research, and is not conducted in the field (Taherdoost, 221). Another way to define such a study is a 'meta study', because it reviews, organizes and arranges the information coherently presented in existing studies.

Several search engines, namely JSTOR, Google Scholar, Research Gate, Web of Science, EBSCOhost and Scopus were consulted for this study. Economics websites and journals, including, inter alia, the International Journal on Global Warming (IJGW) and the International Journal of Environment and Climate Change were consulted. In addition, search terms such as: 'global warming', 'economy', 'scarce natural resources', 'climatic changes', 'human consumption patterns', and 'human impacts on economy', were employed.

The study acquired 1435 ideal publications; 1425 of these were derived from an electronic search, and ten were found through forward and backward searches. Eligibility assessment was conducted and a total of 99 articles were selected, through the following eligibility criteria: a) publication concentrates on either or both global warming's effects or the economy; b) publication focuses on global warming's effects and the economy; c) publication date in 2015 or later; d) publication in English (Creswell, 2021). Ten years was chosen as a way to limit the scope of this study because it explores the phenomena related to unprecedented global-warming effects since the Great Recession of 2007–2009 (Feng et al., 2023). For instance, prolonged drought led to food insecurity in Mexico, Guatemala, Ecuador, Honduras, and Nicaragua after that time. Scholars' models have predicted that between 5.8 and 10.6 people will be internally displaced by 2050 in Latin America and the Caribbean (Feng et al., 2023). In addition, world conflicts since that time have resulted in rising numbers of refugees, including those from Afghanistan and Syria, the Arab Spring migration to Europe, and the current Ukrainian refugees.

Templier and Paré (2015) identify six steps in exploring LR namely: a) identifying primary research objectives and questions; b) exploring the relevant articles; c) making inclusions; d) exploring the quality of articles and their content; e) extracting data, and f) analysing data. All articles considered irrelevant were excluded. After an eligibility check, the researcher proceeded to the data extraction and analysis stage. Data extraction deals with coding significant articles related to this study. The researcher adopted 'framework analysis', which deals with methodological processes and procedures. The researcher, then analysed and extracted the relevant literature. The guiding process and procedure, which facilitate both analysing and extracting relevant data, is described by Armstrong (2021) as 'sifting, charting and sorting materials according to key themes and issues'. In specific terms, familiarization is done to have actual knowledge about the articles' importance. Thereafter, the researcher identified the thematic framework centring on theories and ideas that emerged from reading on global warming's effects on the economy. Indexing is done through sifting the data related to particular themes; charting the information is done to sort out important headings and sub-headings during the thematic framework stage (Creswell, 2021). These were the processes that the researcher followed. Mapping and interpretation, which entail assembling, gathering and analysing all criteria features of the dataset, and a synthesis of information were performed.

Several articles selected for the study used a range of qualitative and quantitative methodologies. Meta-analysis for the quantitative data was ignored because this research method was different. This means that this research did not share common methods or the same variables with a quantitative methodology. Textual information was mapped, coded, and presented accordingly by employing a framework-analysis approach. The theories, concepts, and LR used here present a broad picture, one that forms baseline information, and assists in the understanding of the previous literature on global warming's effect on the economy (Maxwell, 2021). The LR on global warming's effects on the economy has helped to avoid the duplication of existing works by other researchers. However, there are limitations to this method. For example, since not all academic search engines were employed, there could be some previous literature that was left out. The next section presents findings of this study.

4. Findings

Global warming-economy nexus findings

The study's findings reveal that the present generation should reduce consumption to mitigate global warming's effects to benefit unborn generations (Nordhaus, 2019). Global warming's effects and the economy are interdependent, and this relationship implies that the more economic production there is, the more global warming effects there will be. Conversely, the fewer the products, the lower the global-warming effects (Chase, 2023). An increasing global population triggers demand for goods and services, which results in the overexploitation of limited natural resources. As a result, global-warming effects such as droughts, floods, and rising seas (Wang et al., 2024; Maja & Ayano, 2021; Helbling, & Meierrieks, 2022) starve and suffocate (through excess water) agricultural productivity (Wang et al., 2024).

Global warming's effects lead to disastrous consequences for labour markets and infrastructure development globally. High temperatures result from changes in biological, chemical, and ecological processes, (Zang et al., 2021; Elrys et al., 2022). Global warming's effects impact developing nations more than developed ones, especially settlements that are heavily dependent on agricultural products, such as farm crops and livestock (Zang et al., 2021). Natural disasters such as rising seas not only destroy agricultural productivity but also infrastructure such as oil refineries and harbours that are located near coastlines for cost efficiency (Habibullah et al., 2022).

Global-warming effects such as glacier melt threaten coastal settlement dwellers globally, and they threaten lives and damage properties, resulting in substantial economic losses. It forces people to migrate from urban to non-urban or less susceptible areas, which is known as urban-rural migration (Lin et al., 2024). Global warming's negative impacts on air quality, soil nutrients and land degradation all affect the environment in which production occurs. This leads to the loss of economically viable land. Moreover, global warming's effects cause economic contraction, which results in unemployment, a negative balance of payment (import prices are greater than export prices), and recession (decline in economic activities for two consecutive times) (Agu et al., 2023). It leads to high food prices due to lower productivity, which pushes millions of people into abject poverty

(Agu et al., 2023). This affects economic outputs and the GDP of nations (Agu et al., 2023). In consequence, affected settlement dwellers are forced to choose migration as a coping mechanism to avoid environmental challenges (Vorvornator, 2024a). These environmental migrants move to places that they deem to be good destinations to thrive. An obvious knock-on effect is that carrying-capacity problems occur. In some instances, carrying-capacity problems lead to conflicts between natives and environmental migrants, which leads to the loss of lives, damage to property and economic losses (Addae & Quan-Baffour, 2022). I argue that if global-warming effects are real economic problems, then economic measures alone without direct implications for environmental and climate management will not improve the situation. Economic incentives for reducing GHGs must have a direct causal link with preventing further increases in global temperatures. Without monitoring and regulation, these measures won't have the tangible benefits necessary to realise change. In other words, the laws implemented thus far are not working. More needs to be done. If urgent measures are not taken now, the situation will continue to deteriorate. Because the increasing global population has a growing need for consumable goods and services, producers are spurred to overexploit limited natural resources to meet demand and their profit motives. In principle, curbing global warming will require the present generation to lower consumption so that future generations will benefit from a cooler planet by reducing conventional investment.

Overall, this study concludes that the increasing world population will cause consumption demands to rise, hence more goods and services will need to be produced, which will lead to the overexploitation of limited natural resources. This sparks a cycle, causing and worsening global-warming effects such as droughts, floods, rising sea levels and deforestation, which have negative consequences on agriculture and infrastructure. When fewer products are sold by farms, and infrastructure is damaged and destroyed, there are cascading negative results for the global economy.

5. Conclusion and Recommendations

This study explored global warming's impact on the economy. It was revealed that there is interdependency between global warming's effects and the economy. The more economic production needed to satisfy human-consumption demands, the more global-warming effects, and the fewer economic products and services, the fewer global-warming effects. Global warming's effects, such as rising seas, destroy economic infrastructure strategically located on coastlines for economic efficiency, namely oil refineries and harbours. Furthermore, they affect soil quality and nutrients, air quality and cause the loss of arable lands, which affects economies that depend on agricultural production the most. Developing nations in SSA, almost all of the Middle East, and many parts of South Asia, face more of global warming's impacts than developed nations. This study therefore recommends that, even though GHG-emission reduction will cause outputs to plummet or affect GDP negatively in the short run, it is the only way to benefit in the long run. Overcoming global warming's effects means that there should be what economists call 'Pareto improvement'. This implies that the current generation needs to buy and spend less and live more sustainably so that future generations enjoy higher productivity and more widespread employment, with lower GHG emissions. Research confirms that restricting global warming from 2.0°C to 1.5°C will affect agricultural productivity and GDP outputs negatively now, but trillions of dollars will be yielded by 2300. There is no doubt that there are costs and benefits of curbing rising temperatures, and economic projections are uncertain due to some factors that are beyond the scope of this study. Nevertheless, the simple fact remains: the benefits of acting now outweigh the costs in the long run. How immediate financial losses will be recouped will depend on how individuals and businesses adapt to climate change and global warming now. Businesses need to be innovative, explore the possibilities and adopt technology that will allow them to operate in an environmentally sustainable manner. Although the initial implementation and installation costs may be high, over time, working in environments more conducive to productivity will allow them to produce goods at lower prices, leading to a reduction in selling prices. When there is a reduction in the price of goods, demand will increase globally. The question of what technology must be invested in by businesses cannot be answered by this study. In the short run, innovation and technology may not spread throughout different countries at the same pace. However, with proper global cooperation and legislation in place, coupled with education, oversight and necessary penalties for free riders, businesses globally will adjust to adopt new technology to produce goods and services that will have less impact on the environment.

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