Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics

Bachelor Thesis

The Economic Impact of Climate change on the Main Economic Sectors of Egypt

Appendices

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Abstract

Climate change poses a serious threat globally, especially to the various economic sectors of each country. The levels of impact vary according to the geographic regions and locations of the countries. This bachelor's thesis will investigate and explore the economic impacts of climate change on the economic sectors of Egypt, particularly addressing the agriculture, water, and trade sectors, with an emphasis on agriculture and water. Through analyzing the existing data and current liturature research sources, the thesis aims to create awareness and comprehensively understand the details of the economic losses and the extend of impact of climate change-related events in Egypt. Furthermore, the adaptation, implementation, and mitigation strategies and policies are presented to evaluate the progress of the country's current economy and future implications. By accessing detailed data sources, governmental projects, and academic articles and journals, this study was able to examine specific economic values, such as GDP, food security, economic losses, production losses, trade balance, supply and demand, etc, within the given sectors, and their ability to withstand the impacts of climate change. The findings from the existing research highlight the various efforts taken by the government of Egypt, such as launching the National Climate Change Strategy 2025, the Vision 2030 project, and the updated National Determined Contributions (NDC) in 2022, including sustainable green emission projects, implementing new policies, and conducting investment cost analysis for the various project proposals, up until 2050. The summary of findings are concluded with future recommendations to overcome the adverse effects of climate change while preserving the land, agricultural and water resources, and the economy of the country. The significance and importance of international collaborations and taking action for the submitted strategies are emphasised.

Keywords: Climate change, Egypt, adaptation policies, mitigation strategies, economic impact, agriculture sector, sustainable development, trade

1. Introduction

Climate change has been an ongoing global crisis for decades. As explained by the Met Office (2023), the Earth's climate has been changing since 4.5 billion years ago. Due to the Earth's revolution around the sun, there were times of the Ice Ages prior to the Industrial Revolution. Since the 1800s, at the beginning of the Industrial Revolution, the rapid consumption of fossil fuels, coal, and gas, led to the accelerated increase in climate change. Human activity has been recognized as one of the main reasons for the rise in the Earth's temperature. Studies conducted by Gabric (2023); Lynas et al. (2021); and Hegerl et al. (2019), all provide an understanding and supporting evidence to the human causes of climate change, with a brief overview of the natural causes of climate change throughout the decades.

Analysing and understanding the impact of climate change, not only in the Arab Republic of Egypt, but globally is crucial in taking the next best measures to decrease it. Climate change has affected the global population, for example, annual rise in temperatures across regions contribute to the depletion of necessary resources, such as the production of agriculture. Additionally, it also has a negative impact on biodiversity and health of all species, according to Muluneh (2021). In the study conducted by Smith et al. (2014), the specific concerns for Egypt's economy comprises mainly of the following sectors, which are water and agriculture, the employment sector, healthcare, and tourism. This directly contributes greatly to the economic losses of the country impacted by climate change.

Egypt is located on the continent of Africa. Its borders are with Israel, the Gaza Strip, Sudan, and Libya. The Mediterranean Sea makes up around one-third of Egypt's coastline; the Red Sea contains the remainder. Egypt has a coastline of 3,500 km and a land area of over 995,000 km2. As of 2019, Egypt's population reached 100,388,000, and in 2017, 11.7% of the country's GDP came from the agriculture sector, 34.3% from industrial production like textiles, chemicals, cement, pharmaceuticals, etc. Egypt ranks 107 out of 181 countries in the Notre Dame global adaptation initiative index. The index sums up countries' weaknesses to climate change and other global changes in merging with readiness improvement. This

ranking shows that Egypt has high vulnerability levels and a low level of readiness to adapt to climate change.

Objectives and Methodology

Objectives

The primary focus of this bachelor's thesis is to assess the implications of climate change on Egypt's economy, with a particular emphasis on the sectors of trade and agriculture. The research objectives are outlined to facilitate a detailed investigation and analysis into the economic impacts of climate change within the Arab Republic of Egypt. The goal is to conduct an extensive review of existing literature and research related to the economic consequences of climate change in Egypt, specifically within the trade and agriculture sectors. This literature review aims to establish an understanding of the current state of knowledge and identifying gaps that the thesis can address.

The following objectives explore the specific impacts of climate change, such as extreme weather, temperature increases, and droughts, on Egypt's trade and agriculture sectors. The study seeks to quantify the economic losses and disruptions experienced by these sectors due to climate change-related events. Additionally, it explores the role of trade policies and international agreements in shaping Egypt's trade sector within the context of climate change. The research evaluates the effectiveness of adaptation and mitigation strategies implemented by the trade and agriculture sectors to cope with the impact of climate change. The study also examines the potential for climate-resilient agricultural practices and sustainable trade policies to enhance the long-term viability of these key economic sectors. Through this approach, this paper aims to contribute valuable insights into the broader implications of climate change on food security, trade balance, and the overall socio-economic well-being of Egypt, with a focus on farmers, traders, and related communities. Lastly, the alignment of government policies and initiatives with international climate goals is analyzed to measure the overall effectiveness of the country's response to climate change in these key economic domains.

Methodology

This study will use a comprehensive research approach, focusing on the analysis and comparison of existing data and information sources. This will provide an in-depth understanding of the economic impact of climate change on Egypt's key economic sectors, specifically trade and agriculture. To achieve the objectives of this study, the research process will be conducted through a collection of scientific articles, periodicals, and journals in English and Arabic. The collection of data will be found through various databases such as World Data, Science Direct, Google Scholar, Web of Science, Elsevier, WHO, etc. The thesis will rely mainly on previously collected data and information from primary and secondary sources from the region.

Data related to trade and agriculture, such as GDP contributions, trade balances, agricultural yields, and sector-specific economic indicators from official government reports and reliable international databases will be examined and critically analyzed. Specific case studies within Egypt's trade and agriculture sectors to gain a deeper understanding of localized impacts, adaptation strategies, and challenges will also be analyzed.

Results and Discussion

Egypt has realized that strong policies and plans are urgently needed to address the serious concerns that climate change poses. Projects like the National Climate Change Strategy 2025 and updated National Determined the contribution that Egypt is showing to become a regional leader in Climate Change mitigation and adaptation. With financial support totalling 196 Billion USD for mitigation and 50 Billion USD for adaptation emphasize international recognition of Egypt's vulnerability the importance of addressing climate change. Egypt also aligns with the goals of the Paris Agreement by highlighting sustainable and converting to low carbon economy.

Additionally, The Vision 2030 strategy for sustainable development targets to reduce greenhouse gas emissions by 10% by 2030. Its primary focus areas are sea-level rise mitigation, drought prevention, and water resource preservation. The protection of infrastructure and livelihoods from climate-related disasters relies strongly on investments made in adaptation projects, especially in coastal areas and water resources. Potential offers for Egypt's renewable energy to mitigate the economic impacts of climate change while supporting sustainable development. The agricultural sector prioritizes includes modernizing irrigation techniques and improving crop resilience to climate change, investments aim to improve the food security and mitigation from the negative impacts on the crop production. Cross governmental collaboration and engagement with the private sector are needed for effective climate policy implementation presenting Egypt's comprehensive strategy for mitigating and adapting to climate change as it progresses toward a sustainable future.

SWOT ANALYSIS

STRENGTHS	WEAKNESSES
• Launched comprehensive National Climate Change Strategy (NCCS, 2022). • Launched updated National Determined Contributions (NDC, 2022). • Assistance from global resources • Vision 2023 Sustainable Development Strategy (SDS, 2014). • An emphasis and commitment on moving toward a sustainable and low-carbon economy. • Extensive investment plans in green and renewable energy resources. • Commitment to implementing the proposed strategies and policies, in addition to upholding the Paris Agreement.	• Higher imports over exports leading to economic losses, deficit in food security, and inability to implement adaptation policies and future plans. • Lack of awareness and knowledge among the general population and farmers particularly of the extensive negative impacts of climate change. • Relying on external funding sources for adaptation and mitigation initiatives. • High investments costs for the proposed adaptation and mitigation projects. • Inefficient and limited usage of majority of Egypt's land.
OPPORTUNITIES	**THREATS**
• Gaining knowledge from the experiences of surrounding countries. • Increasing collaboration and support on a global level. • Ideal conditions for renewable and sustainable energy projects. • Potential increases in the country's economy through low carbon emissions and green transition strategies.	• The intensity of the adverse impacts of climate change on the major economic sectors such as, agriculture and water. • The disruption of agricultural productions such as reduction in crops • Unemployment in the agriculture sector, such as farming, fishing etc.

Conclusion

Egypt is facing a crucial moment in its struggle against the impacts of climate change. It is clear from thorough investigation and analysis conducted in the research that the nation confronts serious threats in several areas such as trade, agriculture, and water resources. Egypt has taken an active approach by enforcing policies like the National Climate Change Strategy 2050 and updated National Determined Contributions, as well as by aligning with international agreements like the Paris Agreement COP21.

Egypt seeks to reduce greenhouse gas emissions, slow the increase in sea level, avoid droughts, and protect its water resources. The 'Vision 2030' policy for sustainable development makes these objectives very clear. Financial commitments support from domestic and international sources are helping to strengthen these efforts, highlighting how the global community recognizes Egypt's vulnerability and its urgency to address climate change.

Furthermore, Egypt's commitment to update farming methods, investing in renewable energy projects, and switching to a low-carbon economy shows how committed it is to achieve sustainable growth. Effective policy implementation and building success in climate resilience need collaboration across governmental sectors and private sector.

As a conclusion, Egypt is making strong progress toward a sustainable future and has a well-thought-out plan in place for mitigating and adapting to climate change. By giving priority to adaptation measures, investing in strong infrastructure, and fostering innovation, Egypt is well-positioned to emerge as a leader in the area for mitigation and adaptation. In the battle against climate change, this will serve as a model for other nations to follow

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