ERF Policy Brief

Stolen Dreams or Collateral Damage: Climate and Economic Growth in Time of COVID-19

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In a nutshell

- *Climate change is a pressing challenge to humanity, its awareness is continuously rising, and especially amongst young generations.*
- *Global warming is constraining the entire world, and the Middle East and North Africa (MENA) region is no exception.*
- *Rising temperatures and sea levels, extreme weather fluctuations, and food and water insecurity are a few symptoms of the ongoing problem.*
- *While higher temperature levels adversely impact GDP growth in the MENA region, in- creased economic activities contribute significantly to higher temperature levels.*
- *Higher precipitation levels could contribute to higher growth rates in the MENA region, while higher growth rates may lead to lower precipitation levels.*
- *Bidirectional causality between climate change and economic growth in the MENA region is affected by exogenous shocks like COVID-19.*
- *Emergency action is indispensable to limit catastrophic climate disruptions.*
- *Public discussion about financing adaptive measures should be held.*
- *Future generations may well be better off inheriting a preserved climate and financial debt rather than preserved public finances and permanent damage to the environment.*

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This policy brief assesses the dynamics of climate change and economic growth in the MENA region, by focusing on two weather variables: average temperature, and precipitation as well as some macroeconomic indicators collected from the International Financial Statistics (IFS), World Bank Development Indicators (WDI) databases, and the Global Economy database. To account for the strictness of COVID-19 lockdowns and their impacts on economic activities, the Oxford COVID-19 Government Response Tracker (OxCGRT) stringency index that records policies that primarily restrict people's behavior is used.

Climate change in MENA

Climate change is a pressing challenge to humanity, but its awareness is continuously rising, especially amongst young generations. In a sharp rebuke to the United Nations' leaders, Greta Thunberg, a Swedish teenager activist, said: "You have stolen my dreams and my childhood with your empty words"[1]. She urged world leaders for more bold and collective actions to tackle the climate crisis. Rising temperatures and sea levels rise, extreme weather fluctuations, and food and water insecurity are a few symptoms of the ongoing problem. Scientists across the globe confirm Greta's fears: The threat of climate change to humankind is real. Forty years following the first world climate conference in Geneva 1979, more than 11000 scientists from 153 countries urged policymakers to address climate change before it is too late as no corner of the globe is immune from its devastating consequences.

The MENA region is becoming one of the most heavily affected regions by extreme weather pat- terns. Figure 1 depicts the MENA region temperature anomalies. The deviations of temperature from their historical norms over the past 38 years (1980-2017) show that there is an increasing trend which means climate change is already emerging over the MENA region. The temperature anomalies range from -1.71C to 1.38C. The positive values start from year 1998 and continue to rise. This time series plot shows that the MENA region has witnessed, with the world, the warmest temperature in 2016. Recent research suggests that, by 2070, the region could suffer heatwaves beyond the limit of human survival, which may pose a deadly threat to millions, especially to Hajj pilgrims during summer. These heatwaves can have adverse impacts on many spheres, including water stress, and food security and public health issues. However, climate change remains to be a secondary issue on policymakers' agendas in many MENA countries.

Global warming in the MENA region is bound to influence water supplies, sea levels, biodiversity, public health, food security, land use and urban development, and tourism. Each of these threats exhibits unprecedented challenges to macroeconomic policy such as economic growth performance and governance issues which calls for significant initiatives to minimize their adverse and dangerous effects. It will cause hot temperatures to expand over more land for extended periods, rendering some regions uninhabitable and limiting cultivated agricultural areas. Cities will feel an excessive heat effect on the mainland, and most of the capital cities in the MENA region could confront four months of scorching heat every year. Increasing temperatures will place incredible pressure on crops and already scarce water resources, potentially increasing migration and conflict risk.

Generally, sufficient awareness of the significance of weather integration in the MENA countries' long-term planning may reduce the risks of wasteful distribution of the expenditure and minimize the risk of duplication and the additional burden. It can also improve coordination across ministries, improve communication and raise public awareness of climate change with other stakeholders. There is no final win-win scenario in many cases, but it is essential to take a closer look at the trade-off between some areas of growth and climate change.

Climate change-economic growth dynamics in MENA

Climate scientists believe that economic activities that accumulate greenhouse gas (GHG) emissions are to blame for the climate crisis and are responsible for changing temperatures, among other calamitous impacts. Satellite images during COVID-19 lockdowns showed how global emissions dropped remarkably as a result of receded economic activity.[2] On the other hand, others argue that economic growth and distributive measures are essential in combating extreme poverty. According to this view, the success in lifting millions of people out of poverty would not have been possible without sustained periods of economic growth in the global south, and thus climate change is merely collateral damage towards a more significant cause. Yet, there is growing evidence of the ad- verse economic impacts of climate change on growth, productivity, among other possible outcomes.

[1] https://www.reuters.com/article/us-climate-change-un/you-have-stolen-my-dreams-an-angry-thunberg-tellsu-n-climate-summit-idUSKBN1W81HO

[2] https://www.weforum.org/agenda/2020/03/emissions-impact-coro-navirus-lockdowns-satellites/

Figure 1: Temperature Anomalies - MENA Region

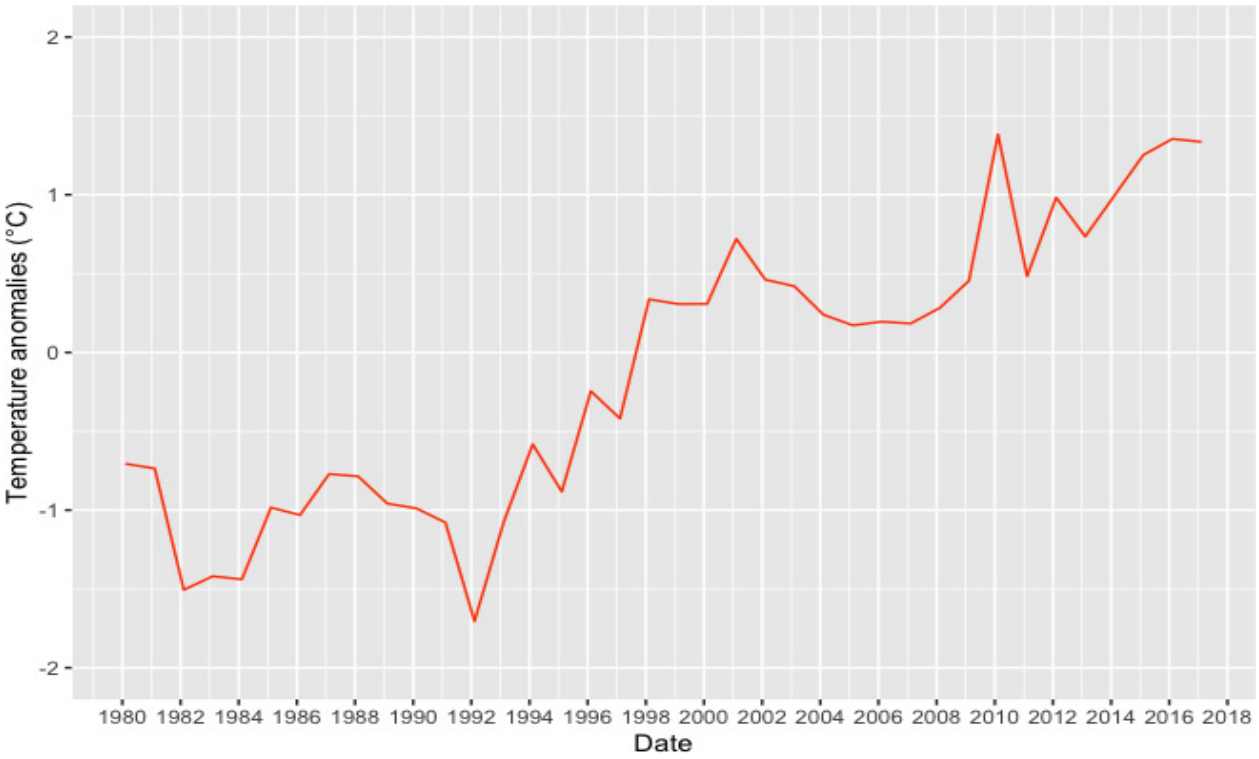
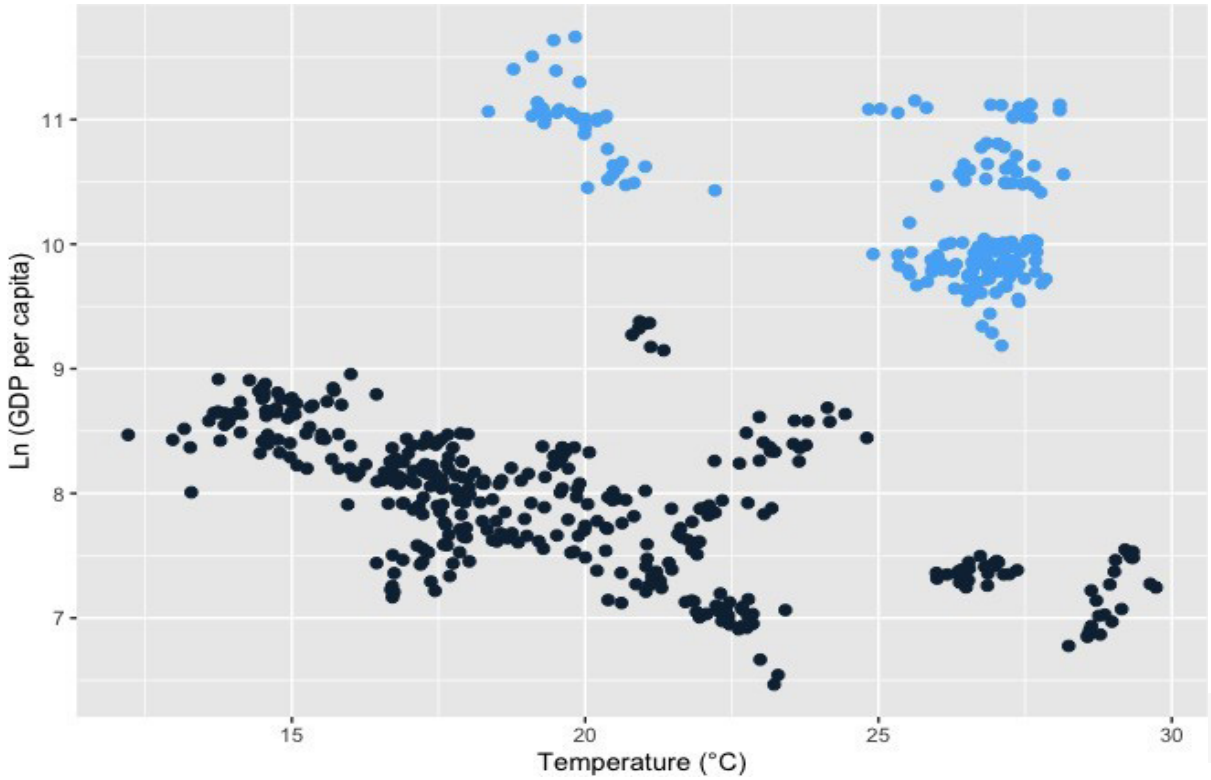


Figure 2: Temperature versus GDP per capita (1980-2017)



Note: Blue points represent GCC countries and black ones represents Non-GCC countries

Thus, while growth is necessary, economic activity can induce environmental damage that has high economic costs and can slow-down economic growth over the long run.

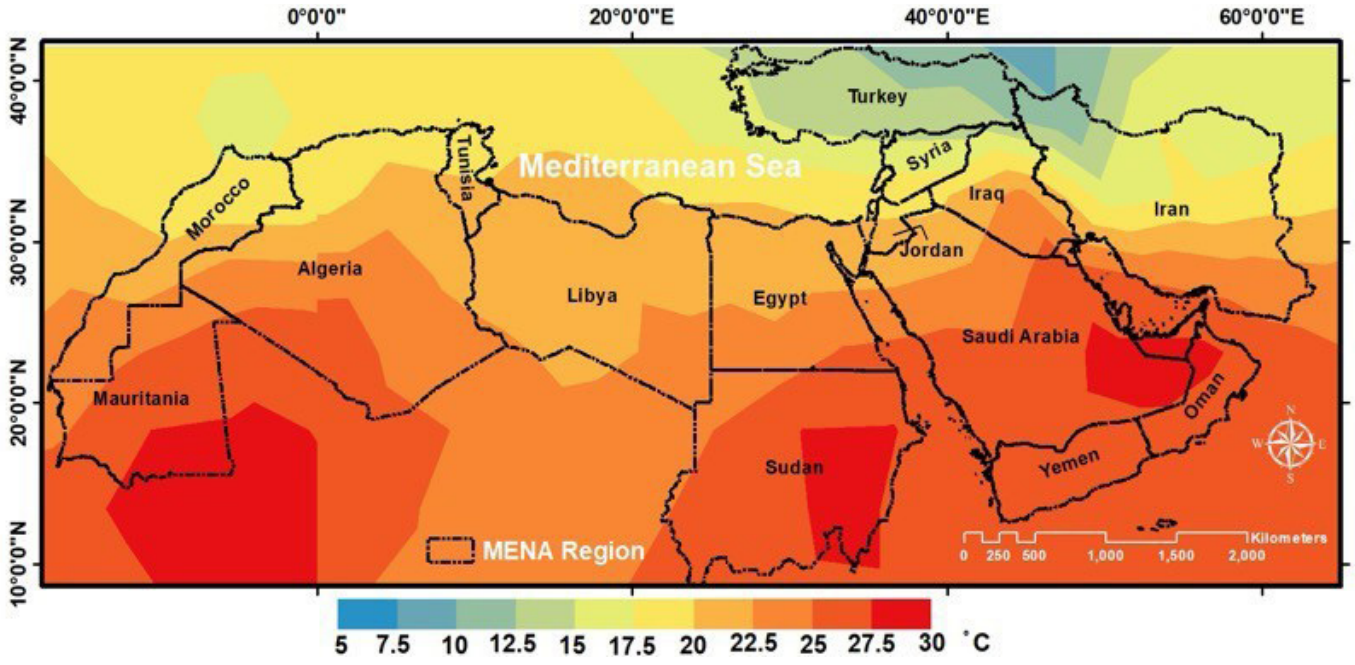
The MENA region is the most complex regions of the world. In terms of economics, the annual Gross Domestic Product (GDP) per capita ranged from just US$ 1400 in Yemen to more than US$ 20,000 in the Arab Gulf States in 2013. The oil-rich Arab countries of Qatar, Kuwait, and the United Arab Emirates ranked 3, 19, and 24 in Income per capita on the scale of 195 countries in 2013, respectively. Whereas Morocco, Egypt, and Yemen listed 129, 132, and 155 on the same ranking, respectively. As a result, adaptation and sensitivity to climate risks vary enormously across the region, especially between the Gulf States and the other MENA countries.

Figure 2 depicts the relationship between GDP per capita and temperature (°C). This plot shows an apparent negative relationship. Furthermore, the existence of two groups of countries facing a downward slope; blue points represent GCC countries and black ones represents non-GCC countries. However, the GCC countries have higher inverse slope as a result of higher GDP per capita and higher exposure to heat. Figure 3 maps the temperature rise for MENA countries per year over 1980-2017.

While controlling for exogenous shocks of the COVID-19 pandemic, the GDP growth responses to high temperature shock are negative and statistically significant. These adverse effects of temperature on growth are persistent and long-lasting in most countries of the MENA region. These findings cast doubts on studies suggesting significant adverse growth impacts of increasing temperatures only in countries reliant on agriculture or those with fewer resources devoted to adaptation efforts. The effects of extreme temperatures may well go beyond the agricultural sector as it could negatively affect labor productivity, investment and health. Similarly, increasing output growth would contribute to increased temperature levels across MENA countries. Those findings align with climate research suggesting that economic activities increase carbon dioxide emissions, leading to rising global temperatures. Several empirical studies have documented such a strong coupling of economic growth and GHG emissions, which is contributing significantly to human-induced climate change.

Looking at precipitation levels, the key conclusion is that increased precipitation levels would contribute to increasing output growth levels in the MENA region. The latter findings are not surprising since rainfall is closely associated with economic growth, especially in dry areas. The volume of precipitation in the MENA region is relatively low, and research suggests positive growth impacts of rainfall across many MENA countries.

Figure 3: MENA countries spatial temperature rise °C per year, 1980-2017



Conclusion

Climate change has been drawing the path to development in the MENA region. Existing studies project climate change will materialize in the region with heat stress, increasing water scarcity, and poor air quality in urban areas. Empirical evidence of the interrelation between climate change and economic growth in the MENA region indicates that higher temperature levels (defined as deviation from historical norms) adversely impact GDP growth while increased economic activities (GDP growth) contribute significantly to higher temperature levels. Moreover, higher precipitation levels (defined as deviation from historical norms) could contribute to higher growth rates in MENA countries, while higher growth rates may lead to lower precipitation levels. These outcomes call for immediate measures to be taken by policy makers towards limiting climate change consequences.

Emergency action is indispensable to limit catastrophic climate disruptions. A changing climate can have a direct impact on demand. Businesses, for example, may reduce investment if they expect slower economic growth. Trade may be harmed as a result of global warming impact on transportation. More severe storms, shifts in precipitation patterns, and exceptionally high temperatures that may have additional unfavorable consequences. Potential consequences on the economy's supply side can be anticipated. Climate-related damage and reduced investment may have a considerable impact on the availability of some natural resources (agricultural, fishery, and forestry), and the capital stock may suffer as a result. Rising temperatures may also influence peoples' health and ability to work at higher temperatures, resulting in lesser labor input.

At the same time, climate change measures may have an impact on the whole economy. Mitigation and adaptation measures will necessitate significant investment, which will have an impact on the economy's demand side. Paying for this form of investment may imply an increase in energy costs (e.g., through taxation, levies, or carbon pricing), which may lead to lower real incomes and, as a result, lower consumption. If mitigation measures are not implemented evenly across countries, trade patterns may shift as countries with stricter policies specialize in less polluting industries.

Mitigation strategies, in particular, may have an impact on the economy's supply side. Mitigation entails essentially replacing an old fossil fuel-based system with a new technology based on renewable types of energy. This change will certainly have far-reaching consequences for the capital stock and the character of innovation. Changes in the economy's structure are also anticipated to result in a reallocation of employment away from falling high-carbon industries and toward rising low-carbon sectors.

ERF at a Glance: *The Economic Research Forum (ERF) is a regional network dedicated to promoting high-quality economic research for sustainable development in the Arab countries, Iran and Turkey. Established in 1993, ERF's core objectives are to build a strong research capacity in the region; to encourage the production of independent, high-quality research; and to disseminate research output to a wide and diverse audience. To achieve these objectives, ERF's portfolio of activities includes managing carefully selected regional research initiatives; providing training and mentoring to junior researchers; and disseminating the research findings through seminars, conferences and a variety of publications. The network is headquartered in Egypt but its affiliates come primarily from different countries in the region.*

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