

Climate Change and Its Implication on Policy Formulation: With Reference to Some Countries in the MENA Region

Ahmed Hamam

Lecturer of Political Science and Public Administration, Faculty of Commerce, Assiut University, Egypt

ahmedhammam@aun.edu.eg

التغير المناخي وتداعياته على صياغة
السياسة العامة: مع إشارة لبعض دول منطقة
الشرق الأوسط وشمال إفريقيا

أحمد همام

مدرس العلوم السياسية والإدارة العامة، كلية التجارة، جامعة أسيوط، مصر

ahmedhammam@aun.edu.eg

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Abstract

This study aims at providing insight into understanding the climate change crisis, its dimensions, various impacts, and regional and global repercussions that threaten international peace and security externally and jeopardize the political, social, and economic stability of countries internally. It also aims at identifying the available courses of action to address this global crisis, ensure global climate security, and explore the necessary strategies to confront this challenge. This study assesses how climate change impacts policy formulation at local, national, and international levels. The research will focus on understanding the current frameworks, challenges, and opportunities in formulating effective climate policies by using the rational choice model and system analysis approach. Climate change, characterized by rising temperatures, shifting weather patterns, and increasing frequency of extreme weather events, presents a critical global challenge. Its pervasive impacts on ecosystems, human health, and economies necessitate comprehensive policy responses. Climate change leads to pressure on natural resources, such as water, soil, and ecosystems, which affects the requirements for achieving human security and providing human needs and leads to political and social instability. The Middle East and North Africa region is one of the world's most vulnerable areas to the impacts of climate change. In recent years, the effects of environmental degradation have become evident in political and societal stability due to drought and food insecurity caused by rising temperatures. A continuous temperature increase will likely occur in several countries in the Middle East and North Africa.

Keywords: Climate change, policy formulation, climate security, global strategies

Introduction

Worldwide warming and the observed and projected climate changes for the twenty-first century are two of the most significant worldwide developments during the previous 65 years. With its impact on many different aspects of the global economy, climate change is an enormously complicated task. Comprehensive long-haul patterns in temperature and precipitation, along with other environmental factors like pressure and humidity, are used to characterize climate change. Moreover, the most well-known local and worldwide repercussions of climate change include erratic weather patterns, melting of the world's ice sheets, and the resulting rise in sea level.

Natural sources, such as volcanoes, forest fires, and seismic activity, were thought to be the primary producers of greenhouse gases (GHGs), such as CO₂, CH₄, N₂O, and H₂O into the atmosphere before the Industrial Revolution (Usman et al., 2022; Murshed, 2020).

Increased temperatures occur in many worlds due to climate change (Schuermans, 2021; Yadav et al., 2015). The Earth's climatic issue became much more pressing with the beginning of the industrial revolution (Lipczynska-Kochany, 2018).

All of this contributes to climate changes that threaten the states' climate security. Therefore, decision-makers must make rational decisions to address these climate security challenges by building effective policies to overcome the issues that threaten both individuals and the state. For this reason, the researcher uses the rational choice approach. The rational choice model is a theoretical framework used to explain decision-making processes by assuming that individuals or institutions act in a way that maximizes their benefits while minimizing costs. When applied to climate change policy formulation, this model helps analyze how governments, policymakers, and stakeholders make decisions regarding climate action.

The rational choice model provides a structured way to analyze how policymakers balance the costs and benefits of climate action. It highlights the strategic interactions and trade-offs involved in addressing climate change, helping explain the often slow and incremental nature of climate policy formulation. However, critics argue that this model may overlook the urgency of climate action, focusing too much on short-term calculations rather than long-term sustainability (Satz & Ferejohn, 1994).

The systems analysis approach is an effective tool for understanding the complex interactions among environmental, social, and economic components related to climate change, enabling the formulation of sustainable public policies. The approach involves defining system boundaries, analyzing key components such as emissions and economic policies, and clarifying dynamic relationships using tools like system dynamics modeling. By studying feedback loops and forecasting scenarios, targeted and measurable policies can be developed, such as reducing emissions through promoting renewable energy and sustainable transportation, with continuous review based on performance indicator.

The main research question of this study is: What are the impacts of climate change on the process of public policy formulation for the state in the MENA region?

Based on the study objectives and the main research question, the research can be structured into several key areas. First, it explores climate change and public policy formulation: a literature

review, providing an overview of existing studies on the subject. Second, it examines the regional and global implications of climate change in the MENA region, analyzing its broader impact. Third, it discusses the considerations of climate change in the process of public policy formulation in the MENA region, focusing on how climate concerns are integrated into policy-making. Fourth, the research addresses courses of action and strategies adopted to achieve climate security, highlighting measures taken to mitigate risks. Fifth, it evaluates the future of global climate security in light of ongoing climate changes, assessing potential developments and challenges. Finally, the study concludes with a comprehensive conclusion summarizing the key findings and insights.

Climate Change and Public Policy Formulation: A Literature Review

The United Nations has placed community participation in creating and implementing climate change policies at the top of its global agenda as sustainable development objective number 13. The importance of policymakers in rich and developing nations encouraging community involvement during the corresponding stages of policy formulation and implementation has been emphasized by this global agenda. Climate change may result in 100 million people living in poverty by 2030 if this global issue is not resolved through climate governance and the implementation of suitable policies (Chatanga & Biljohn, 2023).

Despite this widespread issue, little study and literature exists on how community involvement may be effectively promoted throughout the climate change policy process (Uittenbroek et al., 2019).

Additionally, there is a limited understanding of the policymaker's role in supporting community engagement throughout climate change policy processes. The role of policymakers is especially important in places that are susceptible to climate change and where community participation is essential for both adaptation and mitigation (Uittenbroek et al. 2019).

(Mburia, 2015) research highlights that policymakers' ability to improve community involvement in developing and executing climate change policies is still elusive in several African countries and throughout the continent.

Climate change governance and related policies diverge significantly throughout the African continent. Many issues, including a lack of climate change participation frameworks, inadequate adaptation strategies, a lack of leadership foresight in national development planning for climate change, and poor coordination between the implementation of existing legislation, are blamed for this gap.

Public Policy Formulation in the Context of Climate Change

The creation of policies is faced with special difficulties because of climate change, including long time horizons, global scope, and scientific uncertainty. Policymakers need to use a variety of theoretical strategies to address these issues.

Informing policy decisions on climate change is a critical function of science. Policymakers consult scientific evidence to evaluate the efficacy of proposed policies, find viable remedies, and assess the hazards associated with climate change (Pielke, 2007).

Policy related to climate change is greatly influenced by public opinion. The public's beliefs and preferences, which can be influenced by things like media coverage, political ideologies, and cultural attitudes, must be weighed against the scientific facts by policymakers (Nisbet and Myers, 2007).

Global issues like climate change necessitate collaboration between national and international policy. To guarantee cogent and efficient responses to climate change, national and international policies must be integrated (Held & McGrew, 2007).

Challenges of Climate Change in Policy Formulation

Developing successful measures to combat climate change is challenging because of political opposition, financial limitations, and global cooperation requirements.

Ideological opposition, entrenched interests, or popular doubt over climate change can all lead to political resistance. To enact successful climate policies, policymakers must overcome these challenges.

The range of available policy options may be constrained by economic factors, such as the possible effects of climate policies on employment and economic growth. Economic realities and the necessity for climate action must be balanced by policymakers (Stern, 2008).

Global collaboration is necessary to combat climate change, but reaching an agreement amongst states with disparate interests and capacities is difficult. Achieving global climate change mitigation requires strong international agreements (Keohane & Victor, 2011).

Therefore, there are several regional and global implications in this regard due to the relationship between climate change and the ability of countries, particularly those most affected by climate change, to formulate their public policies.

Regional and Global Implications of Climate Change in the MENA Region

Global climate change has significant and far-reaching effects. Although its effects are seen globally, there are notable regional differences in both their intensity and kind. This part of the research examines how climate change affects regions and the world at large, with an emphasis on the social, political, economic, and environmental aspects.

At the Conference of the Parties (COP-21) in Paris on December 12, 2015, the United Nations Framework Convention on Climate Change (UNFCCC) reached a significant agreement to address climate change and expedite and intensify the actions and investments necessary for a sustainable low-carbon future. The Paris Agreement builds on the Convention by uniting all countries for the first time behind a common goal to take bold action to stop climate change and prepare for its effects, along with more funds to support developing nations in their efforts. Thus, it represents a sea change in the global climate battle (Usman & Balsalobre-Lorente, 2022).

The main objective of the Paris Agreement is to strengthen the global response to the threat posed by climate change by pursuing efforts to keep the increase in global temperature this century well below 2 °C over pre-industrial levels and to limit it to 1.5 °C (Chien et al., 2021).

The agreement additionally attempts to increase nations' ability to adjust to climate change and align financial inflows with low greenhouse gas emissions and climate-resilient travel routes (Anwar et al., 2022).

The effects of climate change are unevenly distributed across the globe, with certain regions experiencing more severe consequences than others. Key regional impacts include:

Asia is seeing various effects, from more frequent extreme weather events like typhoons and floods to coastal towns being put at risk by rising sea levels due to climate change. Particularly in low-lying and densely populated places, these changes exacerbate preexisting vulnerability.

Europe is seeing various effects from climate change, such as increased frequency and severity of heat waves and flooding, especially in the central and eastern parts of the continent. There are serious risks associated with these changes to infrastructure, economy, and public health (Kovats & Jendritzky, 2006).

Increased intensity of storms, wildfires, and altered precipitation patterns are all consequences of climate change in North America. These modifications have major economic ramifications for public health, agriculture, and water resources (Parry, 2007).

Rapid ice melt, thawing permafrost, and ecological shifts are among the most striking effects of climate change in the Arctic and Antarctic areas. These alterations impact the entire world, especially sea level rise and weather patterns (Serreze & Barry, 2011).

Concerns about how climate change would affect Africa have heightened anxieties that environmental deterioration and population pressure may force millions of people to migrate and cause severe social unrest. According to the majority of experts researching the possible effects of climate change, a large portion of Africa's population may be impacted by rising sea levels, altered rainfall patterns, greater temperatures, and increasing climate unpredictability.

Numerous facets of people's daily live are impacted by the real and potential effects of climate change in Africa. In many regions of sub-Saharan Africa (SSA), some climate models indicate that climate change would severely impact agricultural productivity and food security (Al et al., 2008).

One of the biggest environmental, social, and economic threats facing Africa is climate change, which is indicated by rising temperatures, drying out soils, increased pressure from pests and diseases, changes in areas that are suitable for raising crops and livestock, increased desertification in the Sahara region, floods, deforestation, and erosion. The world's poorest countries—many of which are in Africa—will bear a disproportionate amount of the brunt of climate change (Al et al., 2008).

The poor are already disproportionately affected by pollution, natural disasters, and the depletion of land and resources. For them, survival is the only thing that needs to adapt (Van Walraven et al., 2008).

Middle East and North Africa's climate change: The MENA region's countries have similar cultures, languages, histories, and religions, but there are also notable differences in the level of income in high-income nations like the GCC, low-income nations like Yemen, lower-middle-

income nations like Algeria, Egypt, Morocco, and Tunisia, and upper-middle-income nations like Iraq, Iran, and Libya.

Certain countries encounter financial and/or economic difficulties, like Lebanon, which is experiencing a crisis marked by rising demonstrations because of exorbitant pricing and joblessness. Social discontent is mostly caused by these factors, and Algeria and Tunisia are no exception. Countries like Syria, Libya, Iraq, and Palestine, as well as those that indirectly result from regional conflicts like Jordan and Lebanon, are equally vulnerable to risks of fragility, violence, and conflict.

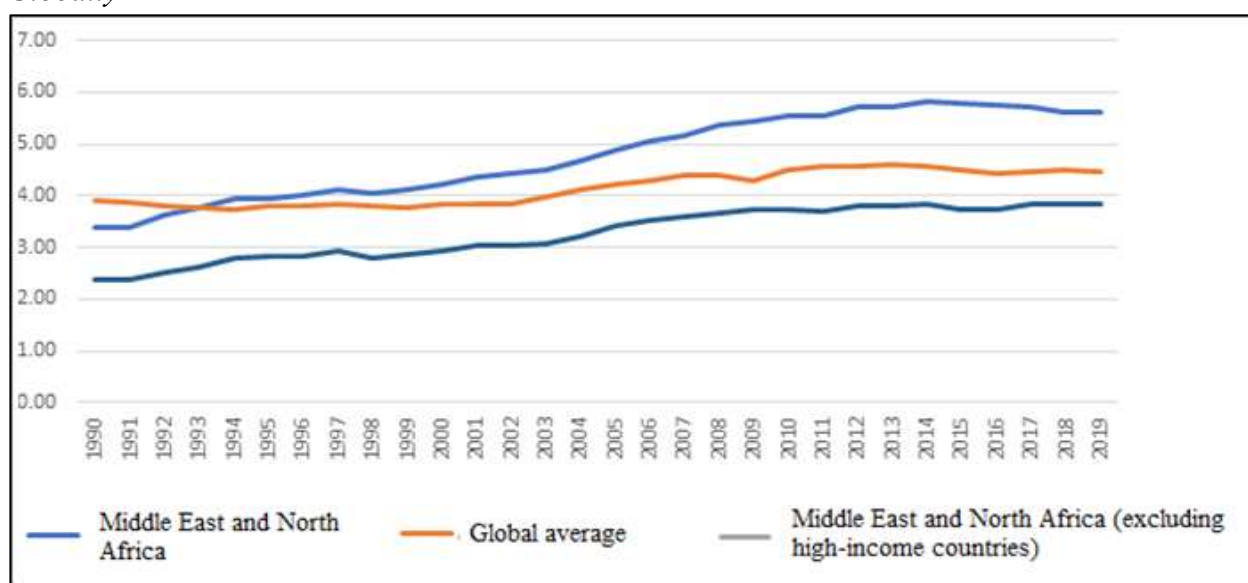
The Russia-Ukraine war has made matters worse and caused the region to lag in achieving most sustainable development goals (SDGs), including economic growth, gender equality, healthcare coverage, educational quality, and, most importantly, climate change. The region is still dealing with the negative effects of the COVID-19 pandemic. Many of the Middle East and North Africa's countries are experiencing the effects of climate change (Miniaoui, 2022).

Countries in the region face risks associated with climate change in addition to the geopolitical ones listed above. These hazards include the possibility of famine in Yemen, severe water scarcity in Morocco, Libya, Oman, and Djibouti, and desertification and land degradation in Libya, Egypt, and Djibouti. These environmental issues may make the effects of sea level rise more severe (Ouda, 2013).

The World Bank has announced since 2014 that by 2050, average temperatures in the Middle East and North Africa (MENA) region will rise by four degrees Celsius. This will lead to several problems, including the insecurity of food, water, and energy. It will also put more strain on the economies of many of these countries, which are already sensitive due to social and political dynamics. The integration of climate action into crisis recovery efforts is therefore becoming more and more imperative. Here, our three primary axes of emphasis are as follows: Natural resources, energy, and atmospheric contamination (Heger et al., 2022).

Figure 1

Evolution of Carbon Dioxide Emissions (Metric Tons Per Capita) in the MENA Region and Globally



Source: Miniaoui, 2022.

Sea level rise and warming are related, and the latter is predicted to have a major impact on the MENA region. Actually, flooding and powerful tropical storms are being brought on by sea level rise, which is besieging the coastal cities in the area. Sea level rise is predicted to have a substantial impact on the MENA region because 7% of the region's population lives in places that are less than five meters above sea level, including important metropolitan metropolises like Alexandria in Egypt, and Basra in Iraq (Miniaoui, 2022).

The governments of the MENA countries ought to employ a range of economic tools that have the potential to significantly contribute to the mitigation and adaptation to climate change in the area. These tools include carbon taxes, energy efficiency standards, green bonds, and subsidy reform—the latter of which was already implemented by the United Arab Emirates in 2018—as well as energy efficiency standards (Miniaoui, 2022).

In accordance with SDG 17, policymakers in the region should improve their institutional and technical capacities to combat climate change and foster greater cooperation and integration among the participating nations (Heger et al., 2022).

Furthermore, they ought to augment the quantity of financing and technology accessible, expedite the establishment of capacity concerning climate action in the region, depending on public-private collaborations, and cultivate an atmosphere that is favorable to investments in renewable energy and eco-friendly technologies, encompassing the execution of appropriate legislation that mitigates or modifies the associated risks and stimulates substantial private sector investments.

Regional Crisis of Water and Food:

The MENA region is the most water-stressed area globally. From surface or aquifer sources, more water is taken out for residential, industrial, and agricultural purposes than is refilled. Aquifers in some Gulf nations, such as Saudi Arabia and the United Arab Emirates, are depleted 21–30 times more frequently than refilled (El-Keblawy, 2018).

Prices and water subsidies are incompatible with water conservation in most MENA countries. Instead, to address the water scarcity, larger and deeper wells are drilled, and seawater is desalinated, leading to increased production and environmental issues (Paris Agreement, 2020).

Water supply is adversely affected by a confluence of factors such as climate change, water shortage, and unsustainable water management. Indeed, according to World Bank estimates, 80:100 million people in the region will experience water stress by 2025. As the situation gets worse, we should anticipate that the lack of water will cause economic losses equal to roughly 6.14 percent of the gross domestic product (Zawahri, 2017).

The fact that every state in the MENA region shares at least one aquifer with one or more of its neighbors and that over 60% of rivers and lakes cross borders further complicates the management of this precious and vital resource. Therefore, Transboundary agreements between governments that are sufficiently flexible to account for fluctuating water levels in light of the effects of climate change are necessary for effective water management. Such agreements are rare, and increasing competition for diminishing water supplies will put them to the test.

The public's understanding of climate change is low even though all MENA nations have ratified the Framework Convention on Climate Change, and most of them have filed their Nationally Determined Contributions (NDCs) as part of their efforts to combat the issue. After waste, water pollution, and poor air quality, respondents to a recent survey conducted in 12 MENA nations ranked climate change as the fourth most important environmental issue (World Resources Institute, 2019).

Kuwait had the lowest awareness, with only 12% perceiving climate change as a very severe concern, while Lebanon had the most awareness, with 51% perceiving it as such. In terms of public knowledge of climate change, Tunisia, Morocco, and Jordan—the three MENA nations with the most ambitious climate plans—rank 42, 40, and 40%, respectively (World Resources Institute, 2019).

The 2014 constitution of Tunisia serves as the foundation for its climate policies, while Morocco has created unique climate change legislation. Building institutions and implementing governance reform are necessary and crucial to enhancing adaptive ability, given the importance of governance quality as a constitutive aspect of adaptive capacity and its low level in much of the MENA area (De Haas, 2020).

MENA countries can also work together to support vulnerable nations, share best practices and information, invest in water infrastructure, advance renewable energy, and work together on research and development projects. Through programs like carbon pricing, climate finance, and green bonds, the region's wealthy nations can also make up for lost ground to developing nations (De Haas, 2020).

In addition to these suggestions, local, regional, and global financial institutions are crucial players in this space due to the huge financial costs associated with addressing climate change. In this regard, the Arab Monetary Fund (2021) released guidelines on how central banks deal with the effects of natural disasters and climate change on the banking system and financial stability. They covered a wide range of topics pertaining to concerns about financial stability, chief among them the creation of stress tests that consider the possible effects of climate change and natural disasters on the insurance and banking industries.

Along with analyzing the effects of the switch from "carbon-intensive" to "low-carbon" products, it also published a report on the impact of this shift on various sectors and evaluated the systemic risks associated with climate change.

The agreement reached at the 2022 United Nations Climate Change Conference (COP27) in Egypt to establish a loss and damage fund will undoubtedly help the developing nations in the region, which are especially vulnerable to the negative consequences of climate change.

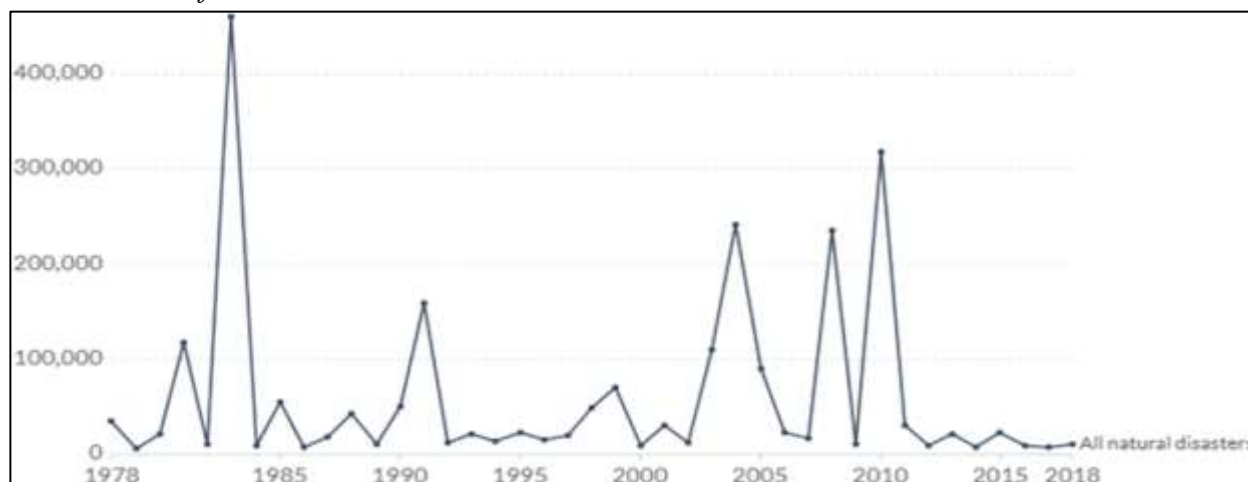
Natural Disasters and Climate Change's Socio-Economic Consequences

The frequency of natural and environmental disasters varies greatly from year to year; some go by with relatively few fatalities before a major disaster takes many lives (Symanski et al., 2022). Over the previous ten years, the average annual death toll from natural disasters worldwide was over 60,000 (Wiranata & Simbolon, 2021).

Based on the data in Figure 2, fatalities caused by natural disasters represent a mere 0.1% of all global deaths. The figure highlights the yearly variations in both the number and percentage of these deaths over the past few decades, with some years witnessing a decline to as little as 0.01% of total deaths and fewer than 10,000 fatalities. Nonetheless, certain abrupt events can lead to devastating consequences. Examples include the COVID-19 pandemic, the 2010 earthquake in Port-au-Prince, Haiti, Cyclone Nargis that hit Myanmar in 2008, the Ethiopian famine and drought between 1983 and 1985, and the 2004 Indian Ocean earthquake and tsunami, among others (Erman et al., 2021). Over 200,000 people lost their lives to disasters worldwide as a result of these incidents, accounting for more than 0.4% of all fatalities during this time.

Figure 2

Global Deaths from Natural Disasters, 1978 to 2020



Source: (Erman et al., 2021).

Rising temperatures are probably going to affect the interior portions of the continent. Many plant species are projected to go extinct as a result of changing weather patterns brought on by a lack of natural resources (water), an increase in glacier melting, and rising mercury levels (Mihiretu et al, 2021).

However, there is a risk of catastrophic destruction to the coastal ecology. The recurring trends of rising temperatures, outbreaks of bug diseases, health issues, and changes in seasonal and lifestyle patterns are highly likely to continue in the future (Abbass et al., 2022).

A lack of adequate infrastructure and a lack of adaptability are the biggest problems on a worldwide scale. Concerns from the general population are exacerbated by the government's lack of commitment to addressing climate change, the lack of laws, outmoded consumer behavior, incentives, and environmental education and awareness gaps, in addition to the previously mentioned issues. Significant repercussions could arise by 2050, from a 2 to 3% increase in temperature and a significant alteration in rainfall patterns (Huang et al., 2022).

Globally, natural and environmental disasters have resulted in enormous losses, including reduced agricultural yields, system restoration, and the reconstruction of essential technology. In addition, the world has seen an increase in vehicle accidents because of poor visibility and eye and skin problems linked to smog in the previous three or four years (Yu et al., 2021).

Global agriculture is the industry most responsible for 30–40% of greenhouse gas emissions, making it both a major contributor to and a major victim of climate change. Floods, forest fires, and droughts are only a few of the agro-environmental and climatic elements that are greatly impacted by precipitation extremes and have a major influence on agriculture productivity (Pautasso et al., 2012).

Furthermore, the extreme reliance on finite resources feeds the fire and makes the world's agriculture vulnerable to destruction. (Krampe et al., 2024) noted that because climate change has a major impact on food and water supplies, the reduction in agriculture poses a challenge to farmers' quality of life and is a major contributor to poverty (Ortiz et al., 2021).

Agricultural systems are vital components of economic systems, particularly in developing nations, where they have a significant impact on the general economy and may also positively impact household well-being (Schlenker & Roberts, 2009).

Changes in essential abiotic elements, including temperature, solar radiation, precipitation, and CO₂, will significantly impact crop yield during the next few decades. All of these variables—such as development and growth, weather-induced fluctuations, pest invasions, concomitant disease complications, water availability, high pricing of agricultural products in the global agriculture sector, and predominant fertilizer consumption—are covered by several regulatory instruments.

According to Parry (2007), rising temperatures were the main cause of the considerable decrease in wheat crop output between 1962 and 2002.

Furthermore, humid and subtropical areas should anticipate being a common target for the impending heat waves, according to global climate projections. However, in crop production, grain production is the product of two variables: average weight and grain output/m². Grain quantity is the primary factor attributed to crop output (Araus et al., 2008).

Climate change is causing a significant loss of species, and one of the main victims of this loss is global biodiversity. Studies have shown that a wide range of climatic events are significantly correlated with the dynamics of large-scale species (Ortiz et al., 2021).

The compatible habitat ranges for living things in freshwater, marine, and terrestrial locations are changing due to the speed and severity of climate change. Via changes in the relative abundance of species, range shifts, activity timing, and microhabitat use, among other factors, alterations in general climate regimes impact the integrity of ecosystems (Manes et al., 2021).

It is common knowledge that one of the main victims of climate change is human health. The World Health Organization estimates that between 2030 and 2050, climate change might cause an additional 250,000 deaths annually. The cause of these deaths is a combination of the global spread of vector-borne diseases, mortality, and morbidity caused by harsh weather. A quick overview of some of the new health concerns related to this worldwide issue is provided here (Meierrieks, 2021).

Climate change has been identified as a contributing factor to the rapid spread and amplification of certain epidemics and pandemics. In addition to its well-documented impacts on

forestry, agriculture, public health, and other sectors, climate change can also exert significant psychological stress on vulnerable populations. (Pal, 2021) highlights the COVID-19 outbreak across several countries as a relevant example of this phenomenon.

A multifaceted commercial activity, tourism is an effective tool for generating enough jobs, generating income, earning spectacular foreign exchange, enhancing cross-cultural cooperation, and serving as a business tool for entrepreneurs as well as for the eventual national development of the nation. In addition to many other fields, the tourism industry is particularly negatively impacted by climate change since one of the primary factors that makes a given region a desirable destination for tourists is its climate. Tourists from different countries are drawn to different regions at different seasons of the year based on the suitability and practicality of specific weather patterns.

Therefore, the enormous changes in these weather patterns brought about by climate change will eventually pose enormous problems to both the local and national economies in that particular location (Bujosa et al., 2015).

Growth in the economy and overall productivity are significantly influenced by the climate. As a result of its impact on economic growth and growing worldwide presence, climate change has emerged as a top priority for national and international environmental policymakers (Lamperti et al., 2021). Due to all these impacts of climate change at various levels in the countries of the MENA region, it becomes evident how climate change influences the formulation of public policy in these countries.

The Considerations of Climate Change in the Process of Public Policy Formulation in the MENA region

For policymakers everywhere, climate change poses a special and urgent challenge. There are many parties involved, competing interests, and a great deal of uncertainty in the process of developing public policy in response to climate change. This section of the report examines the major obstacles that legislators must overcome to create sensible climate change laws.

The difficulties posed by climate change in the process of developing public policy are complex and interconnected. Climate policy is heavily influenced by a variety of elements, including social and political dynamics, economic issues, scientific uncertainty, and the necessity of international cooperation. Innovative, inclusive, and flexible policy solutions that can adapt to the intricate and dynamic nature of climate change are needed to address these issues.

Scientific Uncertainty

Inherent scientific ambiguity on the particular impacts, timing, and magnitude of climate change poses a major problem in formulating policies related to it. Delays or insufficient policy responses are frequently the result of this ambiguity, which makes decision-making more difficult (Dessai & Hulme, 2004).

Economic Considerations

An important consideration in the process of formulating policy is the economy. Long-term environmental sustainability and short-term economic interests must be carefully balanced due to the high costs of climate change adaptation and mitigation (Dessai & Hulme, 2004).

Although cost-benefit analysis is a widely used tool in policy-making, its application to climate change presents issues because of the global size and extended time horizons involved. Determining the true costs of mitigation versus the costs of inaction is a difficult and controversial procedure (Stern, 2008).

Because poorer populations and regions are disproportionately affected by climate change, problems of justice and equity in the formation of policy are raised. The equitable distribution of the costs and rewards of climate action is a crucial consideration for policymakers (Adger, 2001).

Political and Institutional Challenges

The political environment has a big impact on how policies are made about climate change. Important elements that might help or impede the implementation of successful policy solutions are political will, institutional capability, and governance frameworks (Carter, 2014).

Political actors who are swayed by entrenched interests, short-term electoral cycles, or doubts about climate science frequently oppose climate change policies. One of the biggest obstacles to passing significant climate legislation is creating and maintaining political will (Carter, 2014).

One more significant obstacle is the ability of institutions to carry out and uphold climate policies. Strong institutions necessary to coordinate with the private sector, civic society, and government agencies at all levels and across sectors are necessary for effective policy-making (Burch, 2010).

Social and Cultural Factors

Social and cultural perspectives on climate change have a big impact on how policies are made. The demand for and adoption of climate policies are influenced by several factors, including cultural values, risk perceptions, and public awareness (Burch, 2010).

The public's impression of climate change, which is frequently influenced by political rhetoric and media coverage, has the power to help or hurt policy initiatives. The public may oppose important but potentially disruptive reforms due to misconceptions or ignorance (McCright & Dunlap, 2011).

The way that climate change is seen and dealt with can be influenced by cultural norms and beliefs. It may be necessary to formulate policies that are inclusive and attentive to the conflicts that exist between modern climate policies, customs, and beliefs in certain civilizations (Adger et al., 2013).

Global Coordination and Cooperation

Global concerns like climate change necessitate coordinated worldwide action. Global collaboration is difficult to achieve, nevertheless, because of disparate national interests, development stages, and contributions from civilizations with different amounts of greenhouse gas emissions (Adger et al., 2013).

Frameworks for international climate agreements, like the Paris Agreement, are crucial for advancing global climate action. That being said, the difficulties of reaching an agreement and guaranteeing compliance among heterogeneous nations frequently limit the effectiveness of these accords (Bodansky, 2016).

Regarding global climate policy, the gap between industrialized and developing nations is a major obstacle. (Roberts & Parks, 2006) noted that developing nations frequently lack the resources necessary to enact strong climate regulations and may place a higher priority on economic development than environmental preservation.

Courses of Action and Strategies Adopted to Achieve Climate Security

Achieving climate security requires a multifaceted approach that encompasses international, national, and local strategies. These strategies must be adaptive, inclusive, and resilient to address the complex and evolving nature of climate risks. Collaborative efforts across sectors and levels of governance are essential to ensure a secure and sustainable future in the face of climate change.

International Strategies for Climate Security

Global responses to climate security heavily rely on international accords like the Paris Agreement. These accords establish goals for strengthening resilience, lowering greenhouse gas emissions, and advancing sustainable development. The willingness of the signatory nations to carry out and respect their commitments determines how effective these agreements will be (Bodansky, 2016).

Addressing Transboundary climate concerns like water scarcity, migration, and extreme weather events requires multilateral cooperation. Diplomatic activities seek to promote international cooperation to exchange resources, expertise, and technology for climate adaptation and mitigation (Dellmuth & Gustafsson, 2021).

The goal of financial instruments like the Green Climate Fund is to assist developing nations in their attempts to reduce the effects of climate change and prepare for it. These grants give vulnerable areas the means to put climate security plans into action (Buchner et al., 2011).

National Strategies for Climate Security

National Adaptation Plans (NAPs) are frameworks that assist nations in identifying risks associated with climate change and creating plans to increase resilience. (Lesnikowski et al., 2013) highlighted that national policies should be in line with climate security objectives by concentrating on sectors including infrastructure, agriculture, and water resources.

Disaster Risk Reduction (DRR) strategies are crucial for reducing the vulnerability of communities to climate-induced disasters, such as floods, droughts, and hurricanes. These strategies involve early warning systems, emergency preparedness, and resilient infrastructure (Birkmann & von Teichman, 2010).

Transitioning to renewable energy sources and reducing carbon emissions are key components of national climate security strategies. These actions not only mitigate climate change but also reduce dependence on fossil fuels, enhancing energy security (Sovacool & Geels, 2016).

Local and Community-Based Strategies

Including local communities in the development and application of climate adaptation plans is known as community-based adaptation or CBA. CBA techniques make use of local resources and expertise to guarantee that adaptation strategies are acceptable locally and culturally (Reid & Huq, 2014).

Urban regions are more susceptible to the negative effects of climate change, including heat waves, rising sea levels, and flooding. To lessen climate vulnerability, urban resilience plans emphasize developing green spaces, boosting sustainable urban design, and upgrading infrastructure (Meerow & Newell, 2019).

Sustainable agricultural practices are essential for ensuring food security in the face of climate change. Strategies include diversifying crops, improving water management, and promoting agroecological practices that enhance resilience to climate variability (Altieri & Nicholls, 2017).

Military and Security Sector Responses

There is a growing recognition among the military and security communities of the connection between security hazards and climate change. Among the tactics are including climate risk assessments into defense planning, strengthening the military infrastructure's resilience, and taking part in disaster relief and humanitarian efforts (Trombetta, 2008).

International and national security is seriously threatened by migration brought on by climate change. Improving border security, creating legal frameworks for climate refugees, and helping displaced people are some approaches to resolving this problem (Gemenne, 2011).

The Future of Global Climate Security in Light of Ongoing Climate Changes

Climate security is becoming an important subject in international policy discussions as climate change continues to worsen. Resource shortages, environmental degradation, and conflict are only a few of the negative repercussions of climate change that human societies are protected against by climate security. With an emphasis on potential obstacles, new dangers, and tactical solutions, this section of the study looks at how global climate security will develop in the face of continued climate change (Krampe et al., 2024).

Climate change has a significant impact on both violence and peace. It is no longer possible to promote peace without acknowledging the consequences of climate change. There are indications

from peace-building activities that this has already been happening. Yet, science is moving slowly. This study agenda identifies the topics that should be covered in peace-building studies more generally rather than outlining how the effects of climate change will be studied for peace-building.

The most marginalized and vulnerable people are disproportionately affected by climate change, which exacerbates inequality and fuels resentment. As a result, maintaining or establishing peace becomes more challenging, and the dynamics of a society's ability to do so are altered. Because of this, research on peace-building and the formulation of policy need to change swiftly to make sure that they are genuinely promoting lasting peace (Krampe et al., 2024).

Countries around the globe experienced a minor slowdown in carbon dioxide emissions after 2013 as a result of the recession in most of their economies, high environmental consciousness, and the involvement of these countries in reaching the SDGs, especially SDG 13.

The achievement of climate action is intertwined with achieving many associated SDGs, including SDG 7, which promotes clean and affordable energy; SDG 2, which seeks to completely eradicate hunger and enhance food security; SDG 9 on reducing industrial emissions; SDG 12 on sustainable production and consumption; and SDGs 14 and 15 on the marine and terrestrial environment.

Because the SDGs are complementary, the countries in the region must consider a set of political, financial, and technical requirements in order to accelerate progress toward goal 13, which is related to climate action. Decision-makers must develop responses to mitigate and adapt to climate change by local conditions as well as international agreements, particularly the Paris Agreement.

Conclusion

It is widely acknowledged that the rate of climate change is accelerating, affecting every aspect of existence and presenting significant risks to biodiversity, ecosystems, and human health. Addressing the challenges posed by climate change requires a dual focus: mitigating its detrimental effects on health and preventing further escalation. The health sector plays a critical role in supporting climate research, educating healthcare workers, and disseminating information to the public and policymakers.

Adaptation to climate change demands a multifaceted approach, with measures implemented at various levels. Policymakers must prioritize tailored adaptation solutions, particularly for vulnerable populations most at risk from climate-related impacts. The influence of climate change on public policy formation is both profound and transformative, compelling governments to reevaluate traditional approaches and integrate sustainable, forward-thinking strategies.

This paradigm shift emphasizes the need for interdisciplinary collaboration, where scientific data, economic analysis, and social equity converge to create resilient and adaptive policy frameworks. Furthermore, climate change challenges the very foundations of governance, necessitating more flexible, long-term planning that transcends political cycles and addresses the global interconnectedness of environmental issues.

Ultimately, the integration of climate science into public policy is not merely reactive but essential for securing the sustainability of future generations. Through evolving policies, societies can better mitigate the risks of climate change while fostering innovation and promoting global environmental justice.

Study Limitations and Future Studies

Despite the expanding body of research on climate change and its influence on policy formulation in the MENA region, several critical limitations persist. A significant challenge is the scarcity of comprehensive, region-specific data, which impedes accurate climate modeling and the development of effective policies. Political and economic instability in certain MENA countries undermines the implementation of long-term climate strategies. Institutional and governance constraints further hinder the enforcement of environmental regulations, limiting their overall effectiveness. Moreover, climate adaptation and mitigation efforts often suffer from inadequate funding as economic priorities frequently take precedence over environmental concerns.

Future research should prioritize the development of localized climate models to generate precise projections tailored to the region's distinct environmental and socio-economic conditions. Additionally, investigating the role of international cooperation and financial mechanisms in supporting MENA countries' climate policies is essential. Further studies should explore innovative policy frameworks that integrate climate adaptation into national development plans while addressing socio-political challenges. Strengthening the connection between scientific research and policy-making through interdisciplinary approaches will be crucial in enhancing climate resilience and fostering sustainable governance in the region.

References

- Abbass, K., Qasim, M., Song, H., Murshed, M., Mahmood, H., & Younis, I. (2022). A review of the global climate change impacts, adaptation, and sustainable mitigation measures. *Environmental Science and Pollution Research*, 29, 42539–42559.
- Adger, W. (2001). Scales of governance and environmental justice for adaptation and mitigation of climate change. *Journal of International Development*, 13, 921–931.
- Adger, W., Barnett, J., Braun, K., Marshall, M., & O'Brien, K. (2013). Cultural dimensions of climate change impacts and adaptation. *Nature Climate Change*, 3, 112–117.
- Al, W., Orking, G., & Clima, O. (2008). Climate change and food security: a framework document. FAO Rome, 3.
- Altieri, M., & Nicholls, C. (2017). The adaptation and mitigation potential of traditional agriculture in a changing climate. *Climatic change*, 140, 33–45.
- Anwar, A., Avik, S., Arshian, S., Muhammad, S., Shoaib, I., Waseem, A., & Summaira, M. (2022). The nexus between urbanization, renewable energy consumption, financial development, and CO₂ emissions: Evidence from selected Asian countries. *Environment, Development and Sustainability*, 1–21.
- Araus, J., Slafer, G., Royo, C., & Serret, M. (2008). Breeding for yield potential and stress adaptation in cereals. *Critical Reviews in Plant Science*, 27, 377–412.
- Birkmann, J., & von Teichman, K. (2010). Integrating disaster risk reduction and climate change adaptation: Key challenges—scales, knowledge, and norms. *Sustainability Science*, 5, 171–184.
- Bodansky, D. (2016). The Paris Climate Change Agreement: A new hope? *American Journal of International Law*, 110(2), 288–319. <https://doi.org/10.5305/amerjintelaw.110.2.0288>
- Buchner, B., Falconer, A., Haug, M., Tschakert, C., & Blanchard, M. (2011). The landscape of climate finance. *Climate Policy Initiative*, Venice, 27.
- Bujosa, A., Rivas, A., & Mendez, C. (2015). Valuing tourism demand attributes to guide climate change adaptation measures efficiently: The case of the Spanish domestic travel market. *Tourism Management*, 47, 233–239.
- Burch, S. (2010). Transforming barriers into enablers of action on climate change: Insights from three municipal case studies in British Columbia, Canada. *Global Environmental Change*, 20, 287–297.
- Carter, N. (2014). The politics of climate change in the UK. *Wiley Interdisciplinary Reviews: Climate Change*, 5, 423–433.
- Intergovernmental Panel on Climate Change (IPCC). (2014). *Impacts, adaptation and vulnerability: Part A: Global and sectoral aspects*. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, 1132.

- Chatanga, R., & Biljohn, M. (2023). New Public Governance Theory: A framework for Lesotho policymakers to enhance community participation during climate change policy formulation and implementation. *Administratio Publica*, 31, 1–24.
- Chien, F., Ahsan, A., Ching-Chi, H., Arshian, S., Asif, R., & Avik, S. (2021). The role of information and communication technology in encountering environmental degradation: Proposing an SDG framework for the BRICS countries. *Technology in Society*, 65, 101587.
- De Haas, H. (2020). Climate refugees: The fabrication of a migration threat. *The International Migration Institute (IMI)*.
- Dellmuth, L., & Gehring, M. (2021). Global adaptation governance: How intergovernmental organizations mainstream climate change adaptation. *Climate Policy*, 21, 868–883.
- Dessai, S., & Hulme, M. (2004). Does climate adaptation policy need probabilities? *Climate Policy*, 4, 107–128.
- El-Keblawy, A. (2018). Greening Gulf landscapes: Economic opportunities, social trade-offs, and sustainability challenges. *Environmental Politics in the Middle East: Local Struggles, Global Connections*, 99-120.
- Erman, A., Sophie, R., Stephan, F., Kayenat, K., & Mirai, M. (2021). Gender dimensions of disaster risk and resilience: Existing evidence.
- Gemenne, F. (2011). Why the numbers don't add up: A review of estimates and predictions of people displaced by environmental changes. *Global Environmental Change*, 21, S41-S49.
- Heger, M., Vashold, L., Palacios, A., Alahmadi, M., Bromhead, M., & Acerbi, M. (2022). *Middle East and North Africa Development Report*.
- Held, D., & McGrew, A. (2007). *Globalization/anti-globalization: Beyond the great divide*. Polity.
- Huang, Y., Hossain, M., Usman, M., & Ozturk, I. (2022). Dynamic association between ICT, renewable energy, economic complexity, and ecological footprint: Is there any difference between E-7 (developing) and G-7 (developed) countries? *Technology in Society*, 68, 101853.
- Keohane, R., & Victor, D. (2011). The regime complex for climate change. *Perspectives on Politics*, 9, 7-23.
- Kovats, R., & Jendritzky, G. (2006). Heat-waves and human health. *Climate change and adaptation strategies for human health*, 63-97.
- Krampe, F., O'Driscoll, D., Johnson, M., Simangan, D., Hegazi, F., & de Coning, C. (2024). Climate change and peacebuilding: sub-themes of an emerging research agenda. *International Affairs*, 100(3), 1111-1130.
- Lamperti, F., Bosetti, V., Roventini, A., Tavoni, M., & Treibich, T. (2021). Three green financial policies to address climate risks. *Journal of Financial Stability*, 54, 100875.
- Lesnikowski, A., Ford, J., Berrang-Ford, L., Barrera, M., Berry, P., Henderson, J., & Heymann, S. (2013). National-level factors affecting planned, public adaptation to health impacts of climate change. *Global Environmental Change*, 23(5), 1153-1163.

- Lipczynska-Kochany, E. (2018). Effect of climate change on humic substances and associated impacts on the quality of surface water and groundwater: A review. *Science of the total environment*, 640, 1548-1565.
- Manes, S., Costello, M., Beckett, H., Debnath, A., Devenish-Nelson, E., Grey, K., ... & Vale, M. (2021). Endemism increases species' climate change risk in areas of global biodiversity importance. *Biological Conservation*, 257, 109070.
- Mburia, R. (2015). Africa climate change policy: an adaptation and development challenge in a dangerous world. *Climate Emergency Institute, UNEP, Kenya*.
- McCright, A., & Dunlap, R. (2011). The politicization of climate change and polarization in the American public's views of global warming, 2001–2010. *The sociological quarterly*, 52(2), 155-194.
- Meerow, S., & Newell, J. (2019). Urban resilience for whom, what, when, where, and why?. *Urban geography*, 40(3), 309-329.
- Meierrieks, D. (2021). Weather shocks, climate change and human health. *World Development*, 138, 105228.
- Mihiretu, A., Okoyo, E., & Lemma, T. (2021). Awareness of climate change and its associated risks jointly explain context-specific adaptation in the Arid-tropics, Northeast Ethiopia. *SN Social Sciences*, 1, 1-18.
- Miniaoui, H. (2022). Climate Change in the Middle East and North Africa: Between the repercussions of a lived reality and opportunities for a brighter future.
- Murshed, M. (2020). An empirical analysis of the non-linear impacts of ICT-trade openness on renewable energy transition, energy efficiency, clean cooking fuel access and environmental sustainability in South Asia. *Environmental Science and Pollution Research*, 27(29), 36254-36281.
- Nisbet, M., & Myers, T. (2007). The polls—trends: Twenty years of public opinion about global warming. *Public Opinion Quarterly*, 71(3), 444-470.
- Ortiz, A., Outhwaite, C., Dalin, C., & Newbold, T. (2021). A review of the interactions between biodiversity, agriculture, climate change, and international trade: research and policy priorities. *One Earth*, 4(1), 88-101.
- Ouda, O. (2013). Review of Saudi Arabia municipal water tariff. *World Environment*, 3(2), 66-70.
- Pal, J. (2021). Visualizing the knowledge outburst in global research on COVID-19. *Scientometrics*, 126(5), 4173-4193.
- Paris Agreement. (2020). United Nations Framework Convention on Climate Change (UNFCCC), *Climate Change Secretariat: Bonn, Germany*.
- Parry, M. (2007). *Climate change 2007-impacts, adaptation and vulnerability: Working group II contribution to the fourth assessment report of the IPCC* (Vol. 4). Cambridge University Press.
- Pautasso, M., Döring, T., Garbelotto, M., Pellis, L., & Jeger, M. (2012). Impacts of climate change on plant diseases—opinions and trends. *European journal of plant pathology*, 133, 295-313.

- Pielke Jr, R. (2007). *The honest broker: Making sense of science in policy and politics*. Cambridge University Press.
- Reid, H., & Huq, S. (2014). Mainstreaming community-based adaptation into national and local planning. *Climate and Development*, 6(4), 291-292.
- Roberts, J., & Parks, B. (2006). *A climate of injustice: Global inequality, north-south politics, and climate policy*. MIT press.
- Satz, D., & Ferejohn, J. (1994). Rational choice and social theory. *The Journal of philosophy*, 91(2), 71-87.
- Schlenker, W., & Roberts, M. (2009). Nonlinear temperature effects indicate severe damages to US crop yields under climate change. *Proceedings of the National Academy of sciences*, 106(37), 15594-15598.
- Schuurmans, C. (2021). The world heat budget: expected changes. In *Climate Change Impact on Coastal Habitation* (pp. 1-15). CRC Press.
- Serreze, M., & Barry, R. (2011). Processes and impacts of Arctic amplification: A research synthesis. *Global and planetary change*, 77(1-2), 85-96.
- Sovacool, B., & Geels, F. (2016). Further reflections on the temporality of energy transitions: A response to critics. *Energy Research & Social Science*, 22, 232-237.
- Stern, N. (2008). The economics of climate change. *American Economic Review*, 98(2), 1-37.
- Symanski, E., Heyreoun, A., Inkyu, H., Michelle Mc., Kristina W., Sheryl Mc., William B., Amal R., Grace T., & George L. (2022). Responding to natural and industrial disasters: Partnerships and lessons learned. *Disaster Medicine and Public Health Preparedness*, 16, 885-888.
- Trombetta, M. (2008). Environmental security and climate change: analysing the discourse. *Cambridge review of international affairs*, 21(4), 585-602.
- Uittenbroek, C., Mees, H., Hegger, D., & Driessen, P. (2019). The design of public participation: who participates, when and how? Insights in climate adaptation planning from the Netherlands. *Journal of Environmental Planning and Management*, 62(14), 2529-2547.
- Usman, M., & Balsalobre-Lorente, D. (2022). Environmental concern in the era of industrialization: can financial development, renewable energy and natural resources alleviate some load?. *Energy Policy*, 162, 112780.
- Usman, M., Jahanger, A., Makhdom, M., Balsalobre-Lorente, D., & Bashir, A. (2022). How do financial development, energy consumption, natural resources, and globalization affect Arctic countries' economic growth and environmental quality? An advanced panel data simulation. *Energy*, 241, 122515.
- Van Walraven, K., Melber, H., & Mehler, A. (2008). II. United Nations and Sub-Saharan Africa. In *Africa Yearbook Volume 4* (pp. 15-25). Brill.
- Wiranata, I., & Simbolon, K. (2021). Increasing awareness capacity of disaster potential as a support to achieve sustainable development goal (sdg) 13 in lampung province. *Jurnal Pir: Power in International Relations*, 5(2), 129-146.

- World Resources Institute. (2019). All NDCs can be found at The Climate Watch portal, managed by the World Resources Institute, which provides a tool for comparative analysis of all NDCs. *Climate Watch*. <https://www.climatewatchdata.org/my-climate-watch> Arab Barometer. (n.d.). Environmental issues in the Middle East and North Africa.
- Yadav, M., Singh, R., Singh, K., Mall, R., Patel, C., Yadav, S., & Singh, M. (2015). Assessment of climate change impact on productivity of different cereal crops in Varanasi, India. *Journal of Agrometeorology*, 17(2), 179-184.
- Yu, Z., Razzaq, A., Rehman, A., Shah, A., Jameel, K., & Mor, R. (2021). Disruption in global supply chain and socio-economic shocks: a lesson from COVID-19 for sustainable production and consumption. *Operations Management Research*, 1-16.
- Zawahri, N. (2017). Water Security in the Middle East and North Africa.

Abbreviations

- *MENA: Middle East and North Africa.*
- *SDGs: Sustainable Development Goals.*
- *UNFCCC: United Nations Framework Convention on Climate Change.*
- *NDCs: Nationally Determined Contributions.*
- *CBA: Community-Based Adaptation.*
- *NAPs: National Adaptation Plans.*
- *DRR: Disaster Risk Reduction.*

تغير المناخ وتداعياته على صياغة السياسات: مع الإشارة إلى بعض دول منطقة الشرق الأوسط وشمال إفريقيا

المستخلص

تهدف هذه الدراسة إلى تقديم رؤى لفهم أزمة تغير المناخ، وأبعادها، وآثارها المتنوعة، وتداعياتها الإقليمية والعالمية التي تهدد السلم والأمن الدوليين خارجياً، وتعرض الاستقرار السياسي والاجتماعي والاقتصادي للدول داخلياً للخطر. كما تسعى إلى تحديد الإجراءات المتاحة لمعالجة هذه الأزمة العالمية، وضمان الأمن المناخي العالمي، واستكشاف الاستراتيجيات اللازمة لمواجهة هذا التحدي. وتعتمد هذه الدراسة على تقييم كيفية تأثير تغير المناخ على صياغة السياسات على المستويات المحلية والوطنية والدولية. ويركز البحث على فهم الأطر الحالية والتحديات والفرص في صياغة سياسات مناخية فعالة باستخدام نموذج الاختيار العقلاني ومدخل تحليل النظم. ويُعد تغير المناخ، الذي يتميز بارتفاع درجات الحرارة، وتغير أنماط الطقس، وزيادة تواتر الأحداث الجوية المتطرفة، تحدياً عالمياً حاسماً. وتتطلب آثاره الواسعة على النظم البيئية وصحة الإنسان والاقتصادات استجابة سياسية شاملة، حيث يؤدي تغير المناخ إلى الضغط على الموارد الطبيعية، مثل المياه والتربة والنظم البيئية، مما يؤثر على مُتطلبات تحقيق الأمن الإنساني وتلبية الاحتياجات الأساسية، وينتج عن ذلك حالات من عدم الاستقرار السياسي والاجتماعي. وتُعد منطقة الشرق الأوسط وشمال إفريقيا واحدة من أكثر المناطق عرضة لتأثيرات تغير المناخ في العالم. وفي السنوات الأخيرة، ظهرت آثار التدهور البيئي بشكل واضح على الاستقرار السياسي والاجتماعي بسبب الجفاف وانعدام الأمن الغذائي الناجم عن ارتفاع درجات الحرارة، ومن المرجح أن تستمر درجات الحرارة في الارتفاع في عدة دول في منطقة الشرق الأوسط وشمال إفريقيا.

الكلمات الدالة: التغير المناخي، صياغة السياسات، الأمن المناخي، الاستراتيجيات العالمية