*Eurasian Journal of Agricultural Research 2024; Vol: 8, Issue: 1, pp: 77-84*

# The Impact of Climate Change on Countries in World

**Oluwatosin Abidemi OGUNKALU**

*Nigde Omer Halisdemir University, Faulty of Agricultural Sciences and Technologies, Nigde, Türkiye*

*Corresponding Author:* ogunkaluoluwatosin1@gmail.com

*ORCID: 0000-0002-9188-7473*

**Abstract**

Climate change controls the activities of human life entirely. Climate change effects daily resulted in disaster in our world. Climate change causes erratic weather patterns, melting ice sheets, and rising sea levels, which are well-known both globally and domestically. Thereby, impacting the environment negatively through biodiversity loss, food insecurity, lack of water, and Consumption of fossil fuels contributes to climate change and has implications for energy security. Climate change and energy security are two interconnected but distinct concerns for many countries, with varied approaches to balancing energy security, access, and affordability with sustainability and elevated and dried environment is likely to have an impact on wildfire activity, not only by creating more favourable conditions for burning but also by altering the structure of the fuel to be burned. Several effects of climate change have been discussed that affect some different countries of the world. This review highlights the impacts of climate change in countries around the world, creating awareness of its impacts can help to overcome its effects and this can result in a sustainable environment for the world at large.

**Keywords:** Climate Change, Global Warming, World

*Review article*
*Received Date: 11 June 2024*
*Accepted Date: 22 June 2024*

## INTRODUCTION

The global perceived and predicted change in climatic conditions for the 21st century, the warming of the earth's surface is a remarkable alteration to the globe which is usually experienced in sixty-five years. Climate change is a compounded government-related situation across the globe and its impacts are seen on all the parameters of ecological, surrounding, socio-political, and socio-economic aspects (Abbass et al., 2022). There is variation in the effects of climatic conditions around nations as do the demographics, socioeconomics, infrastructure, institutional capacity, and resilience of health systems. Therefore, there are regional variations in the capacity and complexity related to the health effects of climate (Schnitter and Berry, 2019). The rise in temperatures leads to food shortage For example, there is already an increasing chance of countless “breadbasket failures” (causing a food price shock) Amongst the top four maize-producing divisions (resulting in about 87% of maize production), The certainty of maize production misplacement is higher than 10% bounced from 7% yearly under a 2 °C temperature increase to 86% under 4 °C.

Increasing the necessary studies and measures to minimize the emissions of carbon emissions should be taken all over the world and measures that will minimize the greenhouse gas effect will play an important role in reducing the effects of global warming (Bağdatlı and Arıkan, 2020). Changing climate conditions will be an important factor in the current situation and the problems that may arise in the coming years. For this reason, solutions are needed for global warming and reduction of greenhouse gases that cause climate change (Bağdatlı and Arslan, 2020). The decrease over time of the changes in the surface of the water is noticeable. This also shows itself as the effect of disorder in the vaporization and current precipitation regime in the water sources dependent on climate change (Albut at al., 2018). Climate change has become the focus of constant attention of living things and civilizations take into account the climatic parameters determined their lifestyles. Climate increasing or decreasing in changes affect living things negatively. Decrease in productivity, especially in agricultural production causes (İstanbulluoğlu et al., 2013). Soil temperature decreases, plants that are not suitable for climatic conditions and resistant to cold will be affected by root and cause drying. As a result, a constantly increasing soil temperature will adversely affect plant life. It will decrease the efficiency (Bağdatlı and Ballı, 2020).

World effects of global warming caused by changes in the climate system of the highest peaks, ocean depths, is felt throughout much of the world from the equator to the poles. The polar ice caps are melting, sea level is rising and soil losses are experienced in coastal areas. Sea level due to melting of glaciers Increasing the temperature rose from 10 to 20 centimeters (Bağdatlı and Bellitürk, 2016a). Global climate change affects the world negatively day by day and reveals negative results in agricultural product yield. In particular, it is inevitable to evaluate the regional temperatures and to review the product pattern in parallel with the increasing global climate change (Bağdatlı et al., 2014)

The report from IPCC, in its 6th evaluation details, that the world populace of about fifty to seventy-five percent 50 to 75% of the global rendered vulnerable to life-threatening climatic conditions towards the end of the century as a result of excessive heat and humidity due which threatened the life of the populace. Production and outputs of important cereals crops can be unfavourably impacted as a result of high temperature with the combination of excess humidity. South and Southwest Asia can potentially be altered by this dangerous heat situation (Kemp et al., 2022). This review highlights the impacts of climate change on the countries of the world.

**Climate change and Food Security in some country**

Population growth rate along with the climate change phenomenon will cause lots of problems for worldwide food supply and we will face numerous nutritional problems in the near future. By gradually reaching to the 8 billion population on the earth, the mankind is really in challenge to provide the growing population food needs (Bağdatlı et al., 2015). Food production is a major concern that might be affected by climatic fluctuations (Bağdatlı et al., 2023; Elsheikh et al., 2023). For example, rising sea levels due to climate change can devastate forests, which are essential sources of food in many locations (Afreen et al., 2022). There is a direct impact of climate conditions on food security and the source of income for people who are involved in food products including their value chains. Currently, the total number of populaces impacted by starvation around the globe hit its high point in 2014.The channel of food distribution is affected by climate conditions which prevent physical access to markets through many means. The infrastructure is affected by heavy floods and snow and storms, road vandalization, bridges, and overpowering transportation channel transportation (Raj et al., 2022).

The variation in climatic conditions and their results such as floods, drought, heat, stress, cold waves, and storms yield unfavourable effects on agricultural production, specifically during cropping. The season is so important in food security and essential in food security, Hence, resulting in problems and complications in Asia. There was a challenge in the production of rice-wheat production, and this resulted in fifty percent of the food required to sustain Asia. The impacts of climate change are also felt in the quantity and quality of rice and wheat. For example, there was a reduction in protein composition and grain productivity as a result of the deadly impacts of increased temperatures (Habib-ur-Rahman et al.,2022). There are predictions that China's agriculture will have certain problems in upcoming years, majorly because of the increase in the pressure of food needs and, due to restricted land and water assets. China's challenges with food security will increase in the future as the populace, income, and resources become scarcer, there is likelihood of a reduction in the China food self-owned 94.5% in 2015 to approximately 91% by 2025 (Xie et al.,2020). The global and domestic food structure could be impacted by climate conditions and the repercussions can be direct and indirect. In the world at large, It has been reported that climate conditions could yield a remarkable impact on malnutrition, a dangerous health risk in this century. Thirty endangered nations to climate change impacts were evaluated for malnutrition, it was seen that there was six percent from 398 million people in 1990 to 422 million populaces in 2016. Seventy-five million additional undersized children by 2030 and 10.1 million by 2050.Moreover, projection of malnutrition in children that are below age 5 by 2050. The world at large recently experienced an increase in climate-associated shocks related have aggravated the movement. The case of climate change impacts in Canada, majorly on food security, specifically in the northern and the local populace. The impacts of climate such as reduction in time, thickness, sea and lake ice, and thawing permafrost. More especially in uncertain weather -like freezing rain, wildfires, shorter winter duration, food safety, and preservation and security (Schnitter and Berry, 2019).

**Impacts of Climate change on water**

Climate change and global warming are reducing the available water resources almost everywhere in the world (Uçak and Bağdatlı, 2017). The increase in the impact of global climate change will cause global water crises between countries. Necessary measures and measures should be taken in advance to reduce the impact of global climate change (Bağdatlı and Arslan, 2019).

According to Research by Lange (2019); The Middle East and North African region is anticipated to face future climatic changes that exceed worldwide averages. As a result, the region has been designated as one of the Earth's climate change "hot spots". Extreme weather conditions will have substantial implications for water and energy security in at least sections of the Middle East and North African area. Climate change has a significant impact on water availability and security in the Middle East and North African region, including a longer dry season for most countries, a 30-70% reduction in aquifer recharge on the Mediterranean Coast, affecting groundwater quantity and quality and significant reductions in surface and subsurface water availability, affecting river flow, instream flow, and soil water reservoirs (with negative consequences). Jordan's accessible water resources are predicted to fall below the 50 m3 per capita/year barrier, which has been designated as the minimum amount needed for social and economic development. According to Chen et al., (2023) stated that coastal floods caused by tropical storms, as well as the lack of sustainable water resources in many other locations, are even more concerning consequences of climate change. Climate change modifies precipitation patterns, which may significantly exacerbate the water scarcity issue.

**Impacts of Climate Change on Energy**

Warming has had a long-term influence on annual economic growth, resulting in significant decreases in output in hotter, poorer countries. In contrast to coastal flooding caused by tropical storms, the availability of reliable water resources in many other locations is more concerning issue related to climate change. Climate change modifies precipitation patterns, potentially exacerbating the water scarcity problem. Energy is necessary for socioeconomic operations, overall development, and quality of life. Infrastructure, price, and service disruptions caused by disasters and extreme weather occurrences, which are frequently linked to climate change, all impede adequate energy access. However, energy usage and climate change have a complex relationship. Consumption of fossil fuels contributes to climate change and has implications for energy security. Climate change and energy security are two interconnected but distinct concerns for many countries, with varied approaches to balancing energy security, access, and affordability with sustainability. Hurricanes are predicted to be responsible for nine out of ten significant outages in the United States, and long-term outage risk is proportional to climate change-induced storm frequency and intensity (Chen et al., 2023).

**Impacts of Climate on Economics**

Global investment from fossil fuels increased significantly in 2022. Despite an overall downward trend, direct fossil fuel subsidies rose to US $440 billion in 2021, a concerning increase from levels below US $200 billion. The fraction of greenhouse gas emissions covered by carbon pricing remained generally stable between 2021 and 2022, as did the global emissions-weighted average price per ton of $CO_2$ (about US$14.20 as of 2022). To effectively reduce global fossil fuel consumption, both the fraction of emissions covered, and the price of carbon must significantly increase.

**Climate change on Natural disasters (Flooding)**

According to the research of Ripple et al., (2022) The complex interrelated mechanisms of climate conditions resulted in excess weather conditions in the world. Climate change effects increased sea level change in rainfall form and change in jet streams. Heating of the surface of rapid artic could elevate the possibility of the Northern Hemisphere's summer jet stream causing obstruction, which led to heat waves, flooding, droughts, and other natural calamities. The populace in low-income areas is affected by undernutrition and they are among the categories that contribute to greenhouse gas emissions. Flooding displaced thirty-three people and sixteen million children were affected in Pakistan during summer in the year twenty-twenty two. Eastern Australia, river drying in China and Europe, and the South-eastern United States experienced serious hurricanes, and Bangladesh and India experienced storms and flooding.

**Climate change and Natural disasters (Wildfire)**

Excessive increase and decrease of temperatures negatively affect the life of living things. It will be difficult to find clean water in the future as the increase of temperatures will increase the evaporation level. Increasing or falling temperatures will cause climate change (Bağdatlı and Can, 2020). The impacts of climate change on land occurs in several channels and its effects result in unpredictable weather styles. The dangerous elements of weather such as continuous heat waves, increased cold storms, droughts, widespread wildfires, dangerous inland floods, landslides, mudflows, urban heat islands, and air pollution, all result from high temperatures and unpredictable rainfall patterns.

Three variables are needed for wildfire to occur which are ignition, fuel, oxygen, and the root cause of ignition. The temperature between land and sea is projected to increase because of climate change and this variance in temperature of land and sea leads to land-sea constraints variation that later cause coarseness of wind power in the tropical and southern subtropical regions. As the wind becomes stronger, there is an increase in the supply of oxygen to the wildfires and this increases their spread to cover larger space which usually results in an uncontrollable fire incident for the firefighters departments (Xu, et al., 2020; Ripple et al., 2022). Lately, an unparalleled magnitude of wildfires occurred globally. Canadian government stated an uninterrupted record-breaking wildfire in the year 2023 should be a concern for the world. Australia reported wildfire occurrence between 2019 to 2020, Brazil in 2019 and 2020 and the United States of America reported wildfire between 2018 and 2020 in the western part of their country. British Columbia, Canada reported in 2017, 2018 and Southern Europe in 2017 (Chen et al., 2023).

Wildfire could also occur in an environment that is generally warm and dried, this does not occur just because the warm and dried favours the burning but also because of the alteration of the structures of the fuel that is expected to burn. This implies that the connection between climate and fire is likely to be altered in the future, and this irregularity in the climatic conditions may result in oscillatory effects in wildfire effects as a result of production changes (Turco et al., 2018). Climate warming is projected to result in a quick increase in burning areas over the Mediterranean region, increasing from ~40% to ~100% depending on the scenario (Chen et al., 2023).

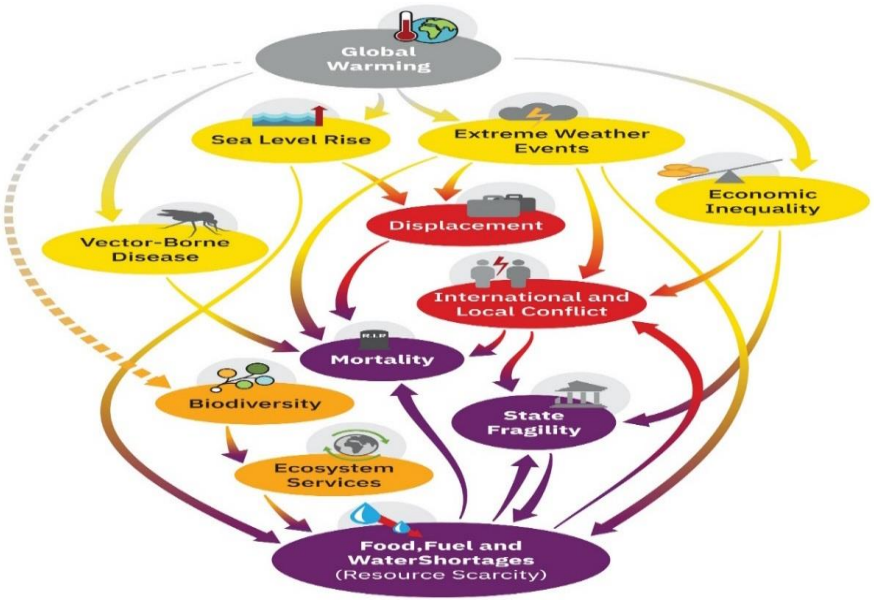


**Figure 1.** Diagram showing different aspects climate change affect the world. (Kemp et al., 2022).

**Impacts of climate change on crop and animal diseases**

Ayeri et al., (2012) reported changes in rainfall volume and pattern in Kenya, this occurrence alters soil erosion rates and moisture levels, both of which have a considerable impact on crop yields. Furthermore, rising temperatures make it harder for crops to thrive despite minimal rain, while increased wind puts crops at risk of being blown away or damaged.

The farmers at Muhonia, Kenya have a 76% perception of a high prevalence of animal diseases, compared to Umande's 54%. Heartwater, east coast fever (ngai), anaplasmosis (ndigana), and pneumonia (mahuri) were examples of diseases connected with climate change. Other diseases and pests listed were blindness, babesiosis, worms (njoka), and lumpy disease. Similarly, smallholders in Umande and Muhonia observe an increase in crop disease incidence of approximately 90% and 95%, respectively. Crop diseases addressed include blight and leaf rust. Crop pests described include spider mites, aphids, millipedes, and muthingiriri (little black ants).

**Climate change impacts on Biodiversity**

Gradually decreasing rainfalls due to climate changes endanger the living habitat. As a precaution, precise solutions are needed to reduce carbon dioxide in the air and slow down global warming and eventually end it. In this way, greenhouse effect and global warming can be prevented (Bağdatlı and Can, 2019).

International trade can put additional strain on habitats with a high potential for land conversion, such as tropical forests, which have serious implications for biodiversity. For example from 2000 to 2011, the cultivation of beef, soybeans, palm oil, and wood products in seven countries (Argentina, Bolivia, Brazil, Paraguay, Indonesia, Malaysia, and Papua New Guinea) accounted for 40% of total tropical deforestation and carbon losses. It is estimated that around 20% of the total global farmland area was used to grow crops for export in 2008 and that between 1969 and 2009, land for export production increased quickly (by about 100 Mha).

Several international trade trends hurt biodiversity because they facilitate connections to reach growing global food demand through the expansion of agricultural land areas in highly biodiverse regions, as well as the displacement of local biodiversity by invasive species (Ortiz et al., 2021).

## CONCLUSION

Global climate change, the industrial revolution of the then mankind atmosphere to release the carbon dioxide, methane, ozone and nitrogen oxides as gases are very quickly heat the earth by the greenhouse effect that occurred as a result of the increase is a result of an increase above normal (Bağdatlı and Bellitürk, 2016a). Increasing world population, changing climate conditions and economic activities are growing with each passing day makes it more important than water (Bağdatlı and Bellitürk, 2016b). Climate change impacts include excessive weather such as dramatic changes in temperature, precipitation, and wind speed, productivity, food provision shortages and insecurity, disturbance of terrestrial and marine ecosystems, infrastructure and resource damage, as well as general economic and social instability,physical and mental diseases, and persistent socioeconomic and ecological stresses. The food system is interrelated and requires efforts from multiple sectors to function well. The impacts of climate change on different countries of the world cannot be overemphasized as it is obvious that the predicted changes in climatic conditions and their repercussions would heighten demands for basic needs and increase the risks to water and energy security in the world. Natural disasters such as flooding and wildfire which occurred as a result of elevated temperatures have caused a lot of families to be displaced while billions of people have lost their lives as a result of climate change globally. There is a need for policymakers to come up with policies to overcome the effects of climate change in the world.

## REFERENCES

Abbass K., Qasim M. Z., 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*(28), 42539-42559.

Afreen M., Ucak I. & Bağdatlı M. C. 2022. The Analysis of Climate Variability on Aquaculture Production in Karachi of Pakistan. *International Journal of Engineering Technologies and Management Research (IJETMR),* 9(8): 16–23.

Albut S., Bağdatlı M. C. & Dumanlı Ö., 2018. Remote Sensing Determination of Variation in Adjacent Agricultural Fields in the Ergene River, *Journal of Scientific and Engineering Research,* 5(1), 113-122.

Ayeri O. S., Christian V. R., Josef E. & Michael H. 2012. Local perceptions and responses to climate change and variability: The case of Laikipia District, Kenya. *Sustainability, 4*(12), 3302-3325.

Bağdatlı M.C. & Belliturk K. 2016a. Negative Effects of Climate Change in Turkey, *Advances in Plants & Agriculture Research, Med Crave Publishing,* 3(2), 44-46

Bağdatlı M.C & Belliturk K. 2016b. Water Resources Have Been Threatened in Thrace Region of Turkey, *Advances in Plants & Agriculture Research, MedCrave Publishing,* 4(1), 227- 228

Bağdatlı M. C., İstanbulluoğlu A., Altürk B. & Arslan C. 2014. Evaluation of the Change Trend in Long-Year Temperature Data in Terms of Agricultural Drought: The Case of Çorlu, *Düzce University Journal of Science and Technology,* 2(1):100-107, Düzce.

Bağdatlı M. C. & Arıkan E. N. 2020. Evaluation of Monthly Maximum, Minimum and Average Temperature Changes Observed for Many Years in Nevsehir Province of Turkey, *World Research Journal of Agricultural Science (WRJAS),* 7(2), 209-220.

Bağdatlı M.C. & Can E. 2019. Analysis of Precipitation Datas by Mann Kendall and Sperman's Rho Rank Correlation Statistical Approaches in Nevsehir Province of Turkey, *Recent Research in Science and Technology Journal,* (11), 24-31, doi: 10.25081/rrst.2019.11.6082

Bağdatlı M. C. & Arslan, O. 2020. Trend Analysis of Precipitation Datas Observed for Many Years (1970-2019) in Niğde Center and Ulukisla District of Turkey, *International Journal of Recent Development in Engineering and Technology (IJRDET),* 9(7), 1-8

Bağdatlı M.C. & Arslan O., 2019. Evaluation of The Number of Rainy Days Observed for Long Years Due to Global Climate Change in Nevşehir / Turkey, *Recent Research in Science and Technology Journal,* (11):9-11, doi: 10.25081/rrst.2019.11.6079

Bağdatlı M. C. & Ballı Y. 2020. Soil Temperature Changes (1970-2019) in Ulukışla District in Turkey by Trend Analysis Methods, *International Journal of Plant Breeding and Crop Science (IJPBCS),* 7(2), 851-864

Bağdatlı M. C. & Can E. 2020. Temperature Changes of Niğde Province in Turkey: Trend analysis of 50 years data, *International Journal of Ecology and Development Research (IJEDR),* 6(2),62-71.

Bağdatlı M.C., Belliturk K. & Jabbari A. 2015. Possible Effects on Soil and Water Resources Observed in Nevşehir Province in Long Annual Temperature and Rain Changing, *Eurasian Journal of Forest Science,* 3(2),19-27.

Bağdatlı M. C., Uçak I. & Elsheikh W. 2023. Impact of Global Warming on Aquaculture in Norway. *International Journal of Engineering Technologies and Management Research*. 10(3), 13–25.

Chen X. M., Sharma A., & Liu H. 2023. The impact of climate change on environmental sustainability and human mortality. *Environments, 10*(10), 165.

Elsheikh W., Uçak İ. & Bağdatlı M. C., 2023. Food Crisis and Global Warming in Africa. *International Congresses of Turkish Science and Technology Publishing*, 495-500.

Habib-ur-Rahman M., Ahmad A., Raza A., Hasnain M. U., Alharby H. F., Alzahrani Y. M., ... & El Sabagh A. 2022. Impact of climate change on agricultural production; Issues, challenges, and opportunities in Asia. *Frontiers in Plant Science*, *13*, 925548.

İstanbulluoğlu A., Bağdatlı M. C. & Arslan C. 2013. Uzun Yıllık Yağış Verilerinin Trend Analizi ile Değerlendirilmesi Tekirdağ-Çorlu İlçesi Uygulaması, *Tekirdağ Ziraat Fakültesi Dergisi*, 10(2), 70-77, Tekirdağ

Kemp L., Xu C., Depledge J., Ebi K. L., Gibbins G., Kohler T. A... & Lenton T. M. 2022. Climate Endgame: Exploring catastrophic climate change scenarios. *Proceedings of the National Academy of Sciences*, *119*(34), e2108146119.

Lange M. A. 2019. Impacts of climate change on the Eastern Mediterranean and the Middle East and North Africa region and the water–energy nexus. *Atmosphere*, *10*(8), 455.

Ortiz A. M. D., Outhwaite C. L., 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.

Raj S., Roodbar S., Brinkley C. & Wolfe D. W. 2022. Food Security and climate change: Differences in impacts and adaptation strategies for rural communities in the Global South and North. *Frontiers in Sustainable Food Systems*, *5*.

Ripple W. J., Wolf C., Gregg J. W., Levin K., Rockström J., Newsome T. M ... & Lenton T. M. 2022. World scientists' warning of a climate emergency

Schnitter R. & Berry P. 2019. The climate change, food security and human health nexus in Canada: A framework to protect population health. *International journal of environmental research and public health*, *16*(14), 2531.

Turco M., Rosa-Cánovas J. J., Bedia J., Jerez S., Montávez J. P., Llasat M. C. & Provenzale, A. 2018. Exacerbated fires in Mediterranean Europe due to anthropogenic warming projected with non-stationary climate-fire models. *Nature communications*, *9*(1), 3821.

Uçak A. B. & Bağdatlı M.C. 2017. Effects of Deficit Irrigation Treatments on Seed Yield, Oil Ratio and Water Use Efficiency of Sunflower (Helianthus annuusL.), *Fresenius Environmental Bulletin*, 26(4), 2983-2991

Xie W., Huang J., Wang J., Cui Q., Robertson R. & Chen K. 2020. Climate change impacts on China's agriculture: The responses from market and trade. *China Economic Review*, *62*, 101256.

Xu R., Yu P., Abramson M. J., Johnston F. H., Samet J. M., Bell M. L.... & Guo Y. 2020. Wildfires, global climate change, and human health. *New England Journal of Medicine*, *383*(22), 2173-2181.