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The Negative Effects of Climate Change in Asia

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Abstract

Climate change is a major environmental concern issues, that climate change will have far-reaching effects on the ecologies, economic growth, and human well-being. one of the world's region, including Asia, the changing climate will have a wide range of effects over the course of the next century and beyond ,which vulnerability to climate change is an important set of interactions between society and the environment. Since this continent is one of the most vulnerable regions against climate threats due to its (temperate deserts, semi-deserts, vastness) and relative underdevelopment due to economic reasons. Therefore, this revised article discusses the negative effects of climate change in Asia. These Climate variabilities in Asia can have negative impacts on enhanced temperatures, glaciers, sea-level rise, agriculture, aquaculture, and fishing, migratory birds, health.

Keywords: Climate change, Global warming, Asia

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INTRODUCTION

Climate change is one of the gravest dangers and challenges confronting humanity. It is widely acknowledged and has been a point of consensus among scientists that "the climate change will have far-reaching effects on the ecologies (Hoegh-Guldberget al., 2010; IPCC, 2014), economic growth (Dell et al., 2014; Burke et al., 2015), and human well-being." In addition to thoroughly confirming the threat posed by this phenomena, new scientific papers, methodological developments, and new data sets are used to shape the IPCC's final report in 2022, which considers climate change to be more serious than anticipated. (Tollefson, 2020). 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, 2020a; Bağdatlı and Arıkan 2020b). Evidence from observations of the climate system has led to the conclusion that human activities directly and indirectly effects climate change. The main factors affecting the concentration of air components or features of the Earth's surface that absorb or scatter radiant energy are the burning of fossil fuels and changes in land cover (Unlukal and Erguven, 2024).

In particular, increases in the concentrations of greenhouse gases (GHGs) and aerosols are strongly implicated as contributors to climatic change observed during the twentieth century. (Sivakumar et al., 2011). For the majority of the world's regions, including Asia, the changing climate will have a wide range of effects over the course of the next century and beyond. (McCarthy et al., 2001; Preston et al., 2006; Watson et al., 1998).

Asia has some of the world's highest levels of cultural, economic, and biological diversity. It is the largest and most populous continent in the world, home to more than 60% of the world's population, and more than half of whom reside in coastal regions. Therefore, nearly 9% of the Earth's surface is occupied by Asia. (Preston et al., 2006). Due to the unique features of the continent (people, topography, economic structure, GHG emissions, and sensitivity to natural disasters), Asia is one of the regions that is most vulnerable to climate threats. (Islam et al., 2018) In general, climate trends and variability in Asia can be characterized by increasing temperatures (Sivakumar et al., 2011). Recent decades, the observed increases in some parts of Asia have ranged between less than 1–3°C per century. (Cazzolla et al,. 2019). Climate variability in Asia have negative impacts of enhanced temperatures, on Glaciers melting and sea-level rise, Agriculture, Aquaculture and Fisheries, Migratory birds, Health and so on. Here are some of the specific negative impacts that Asia is experiencing due to climate change:

Impacts of Enhanced Temperatures

Overall, temperatures in Asia have been increasing due to climate change. This trend is consistent with global temperature rise, but some parts of Asia have experienced more pronounced warming (Revadekar et al,. 2013). The Intergovernmental Panel on Climate Change (IPCC) reports that average temperatures in the region have increased at a rate higher than the global average. High temperatures can lead to heat-related illnesses, crop failures, increased energy demands for cooling, and even loss of human life, resulting in both direct and indirect consequences for human and natural systems (McMichae et al,. 2003). As well as climate change is altering monsoon patterns, leading to shifts in rainfall distribution and intensity. Some regions are experiencing more intense rainfall events, resulting in flooding and landslides, while others face prolonged dry spells and droughts. These changes have significant implications for agriculture, water availability, and overall ecosystem health (Lemi et al,. 2019; Loo et al,. 2015; Hussain,. 2016).

Glaciers and Sea-Level Rise

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). Another important component is an upsurge in sea-level because of changes in climate, leads to the destruction of forests which are key source of food in many countries (Afreen et al., 2022). 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). 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).

Another manifestation of changes in the climate system is a warming in the world's oceans. As temperatures increase, ice sheets and glaciers melt, contributing to sea-level rise. (Solomon et al 2007). Therefore, the glaciers across the High Mountain regions of Asia have shown measurable signs of recession. However Rising temperatures have accelerated the melting of these glaciers, leading to their extinction (Thompson et al,. 2011; Pritchard et al,.2007). Available climate change impact assessments have shown an increase of both the risk of flooding and water shortages, as the natural storage capacities of glaciers diminish while glacial lake outburst floods become more likely (Palmer et al,.2008). As a result, the dependency on rainwater increases. While flooding risks will increase in the Asian monsoon region due to heavy precipitation and runoff (Kumari,.2019). According Sivakumar et al., 2011 mentioned Sea level rise in Asia's coastal regions is currently estimated to be between 1 and 3 mm/year, which is slightly faster than the global average. The rate of sea level rise has been measured to be 3.1 mm/year over the last ten years as opposed to 1.7–2.4 mm/year over the twentieth century, suggesting that the rate has increased in comparison to the long-term average. (Sivakumar et al., 2011). Coastal regions in Asia, including low-lying areas and small island nations, are at risk of flooding, saltwater intrusion into freshwater sources, and increased coastal erosion. This poses threats to human settlements, agriculture, and biodiversity.

Agriculture

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)**.** 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). As the 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). According to pervious research, climate change has already adversely affected economic growth and development in Asia (Gouldson et al., 2016; Ahmed et al., 2019) As a result; the agricultural industry has been negatively impacted by climate change and is predicted to suffer more significant in the future. Therefore, current research confirm that the five main factors of climate change would impact the productivity of agricultural crops are changes in temperature, precipitation, carbon dioxide (CO_2) fertilization (Abeysekara et al., 2023). According to (Jablonski et al. 2002; Ainsworth and Long 2005), the impact of increased CO_2 on plant growth and yield would vary based on species, development stage, photosynthetic pathway, and management practices such applying water. By raising water consumption, higher temperatures may potentially have a counterproductive effect on CO_2 emissions. (Guoju et al. 2005). Due to the shortened crop life cycle, particularly the grain filling period, higher temperatures are mainly due to cause a drop in yields. (Zhu et al,. 2019). 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).

Aquaculture and Fisheries

Asia also produces 80% of the world's aquaculture, which is of high quality, and 52% of the wild fish collected globally, which accounts for 77% of the value added. (Nguyen, 2015; Suryadi, 2020). Aquaculture has been significantly impacted by a number of climate extremes throughout Asia, including unpredictable rainfall, drought, floods, heat stress, salinity, cyclones, ocean acidification, and rising sea levels. (Ahmad et al., 2019). For instance, Hilsa Ilisha constituted the largest fishery in Bangladesh, India, and West Bengal and S. Yangi in China have lost their habitat because of climate variability. (Jahan et al., 2017; Wang et al., 2019).

Migratory birds

The migration of birds is one of their most fascinating characteristics. When habitat, food supply, climate, and other conditions change, they gain the ability to migrate hundreds or thousands of kilometers across borders to different parts of the world which, there are almost 828 species of migratory birds in Asia, while in Europe, there are 429 species (Wilcove et al., 2008; Gilroy et al., 2016). One of the most important aspects of migratory bird studies has been emphasized: the impact of climate change on the food sources and habitat of migratory bird species. (Walther et al., 2002). Food production is a major concern that might be affected by climatic fluctuations (Bağdatlı et al., 2023; Elsheikh et al., 2023). It is established that recent climate change effects have an impact on migratory bird movement patterns. (Both et al., 2006; Harris et al., 2013). According to Harries et al. (2013), some birds in Southeast Asia experience a change in their migration schedule due to climate change. Due to lengthier stays in northern breeding grounds due to warmer temperatures, long-distance migrants are delayed. The yearly cycles of migratory animals may be worn down by delayed arrivals in winter habitats, such as shifting the arrival date in breeding habitats, which can affect fitness. As a result, climate change may provide particular challenges for migratory birds that live in distant parts of the world and migrate at different times of the year. (Sillett et al., 2000).

Health

Changes in temperature, precipitation patterns, and extreme climatic events could ultimately lead to the spread of diverse human diseases (Kinney el al., 2008). The environment is unfavorable for microbial growth due to intense light, extreme temperature variations, low levels of organic matter, and limited water availability (Aydin et al., 2020). As rising temperatures can increase the concentrations of unhealthy air pollutants, , pollen pollution, wildfire smoke and smog all these can bring about diverse symptoms such as , headache, eye irritation, , wheezing, nasal stuffiness, coughing, chest pain and skin irritation. (Kim el al., 2013). Those most at risk from the effects of climate change include small children, the elderly, and people who have respiratory conditions including asthma, emphysema, and bronchitis. (Drechsler et al., 2005). Due to recent rapid economic growth and fossil fuel consumption, Asian countries have severe adverse health effects from air pollution (Kanat and Erguven, 2020). (China and India in particular suffer from PM2.5 and tropospheric ozone pollution. (Lelieveld et al., 2015; Rohde et al., 2015; Ghude et al., 2016). According to a World Health Organization (WHO) research, more than half of all air pollution-related deaths worldwide in 2015—6.5 million people occurred in Asia. (Landrigan et al., 2017).

As a result, Asian nations are important participants and contributors in ensuring the success of global climate mitigation. (Calvin et al., 2012; Paltsev et al., 2012). The relationship between air quality and health benefits in Asian nations has, however, barely been studied.

CONCLUSION

According to the data that has been studied, Climate change is one of the most challenges facing the world today that It is caused by global warming, which is caused when human activities, such as burning fossil fuels and deforestation, release more carbon dioxide into the atmosphere as compared to natural processes. So, Asia is one of the most vulnerable regions in the world to climate change in view of the huge population, geographical location, and undeveloped technologies, inappropriate soil and management practices on marginal lands in the semi-arid regions leading to increasing rates of land degradation. It affects both natural ecosystems and mankind, with potential impacts ranging from increased flooding to shifting weather patterns that threaten crop yields and increase risk of disease. So, Asian people are facing these problems that reducing gas emissions is essential to limit the pace and severity of climate change, and the world's nations must work together to tackle the problem. Countries in Asia have been taking steps to mitigate and adapt to climate change, including implementing renewable energy projects, promoting sustainable agriculture practices, and developing climate resilience strategies. 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 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; Elsheikh et al., 2022a). According to scientists, climate is the air that could modify in the atmosphere, means climate known as collection of different atmospheric actions. Generally, Change in climate means variations in weather for centuries which can be occur naturally or by human actions (Elsheikh et al., 2022b).

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