ZooScan: ISSN 0000-0000 (Online) 2023

Contents lists available at KulDevWeb

ZooScan

journal homepage: www.zooscan.kuldevpublication.com

Review Article

Climate Change's Effect on the Water: A Case Study

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ARTICLE INFO

Article history:
Received 02 September 2023
Accepted 07 October 2023
Available online xxxx xxxx

Keywords:
Sea Level ,
Climate Change.
Biodiversity.
Green House Gases.
Rain Fall.

ABSTRACT

Climate change is a widely recognized problem on a global scale. There is no denying that climate change is currently the greatest threat to world society and that action on it is urgently needed. According to statistics, during the late 19th century, the average surface temperature of the Earth has increased by roughly 1.62 degrees Fahrenheit (0.9 degrees Celsius). Aside from this, during the last century, the sea level has also risen by almost 8 inches. It's evident from statistics that we should take climate change seriously right now. Biodiversity will be impacted by climate change. It takes time for any species to adapt. If he doesn't adjust, a sudden shift in the surroundings will cause his death. The marshy vegetation present along the sea's shoreline, which stabilizes the shore and serves as a perfect breeding ground for marine life, will be most affected by climate change. Degradation of biodiversity will raise the risk of ecological imbalance..

Selection and peer-review under responsibility of scientific committee of editorial board members of ZooScan and author (s) and suggested reviewer.

1. Introduction

The Arabic word mausim is where the term "weather" also comes from. The International Meteorological Department has set a timeframe of 31 years for the climate; there is no time restriction for the weather. While the climate has both regional and global standards, the weather is endemic, fluctuating based on time and place. parallels1. While there is evidence of global climate change, such as during the Pleistocene ice age, local climate change is also present. Climate is the integration of weather, while weather is a condition of climate. Temperature, insolubility, air pressure, humidity, precipitation, wind speed, and cloud cover are the primary components of climate. Even though each of these components is highly varied, some symmetry may be seen in them.2- 4. The climate of one state differs from the climate of another state because of variations in the quantity, intensity, and distribution of the aforementioned elements on the bottom floor. The excessive exploitation of natural resources and the burning of fossil fuels have resulted in the grave issue of climate change. Millions of people would experience hardships like malnutrition, water shortages, and flooding if climate change is not halted in time. The entire planet will be impacted by this calamity. Though poorer nations will be most affected by climate change.

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https://doi.org/10

As a result, the nations most accountable for climate change will bear the brunt of the hardship. Developing and underdeveloped nations will be more vulnerable to climate change-related issues. Africa, the Arctic, and small islands are among the areas most impacted by climate change. The Arctic (North Pole) is warming twice as quickly as the global average 4-6.

Scientists predict that in the next years, summertime melting of the North Pole ice will occur. Another study claims that this can also occur over a period of six years. In the past century, Antarctica's temperature has doubled. As a result, Antarctica's icy region has shrunk. As a result, every organism that exists there is impacted by the changes in the environment. About 80% of the Alps mountain range's glaciers would melt by the end of this century if the rate of temperature increase continues. The fact that the glaciers in the Himalayan region are melting more quickly than those in other parts of the world worries us. The average rise in ocean water level has been 27 centimeters, as a result of the acceleration of glacier and polar region ice melting brought on by global temperature increases. Climate scientists predict that if greenhouse gas concentrations in the atmosphere continue to grow, global temperatures will rise and the melting rate of glaciers and polar regions will accelerate, increasing the likelihood of ocean levels rising and coastlines sinking.

2 Hazardous Substances

There is still a layer of greenhouse gases, such as carbon dioxide, methane, and nitrous oxide, around the Earth. It takes this layer of greenhouse gases to keep the temperature stable. Scientists predict that the absence of this layer will result in a major drop in Earth's temperature. equilibrium on the planet's surface. The contemporary era's growing human activity is also leading to an increase in greenhouse gas emissions, which is raising the earth's temperature.8–9.

3 Principal Air Pollutants

3.1 The gas carbon

The majority of greenhouse gases are thought to be released for both natural and man-made causes. The primary source of carbon dioxide emissions, according to scientists, is the combustion of fossil fuels for energy. According to statistics, the amount of carbon dioxide in the atmosphere has increased globally by 30% during the Industrial Revolution.

3.2 Carbon monoxide

One of the main sources of methane is the breakdown of biomass. Although methane has a smaller atmospheric volume than carbon dioxide, it is significant that methane is a more potent greenhouse gas.

3.3 Hydrocarbon Chloroforms

It greatly depletes the ozone layer and is mostly utilized in air conditioners and refrigerants, among other things.

4. The consequences of global warming

Many places have seen a rise in average temperature in recent decades as a result of the greenhouse effect. It is predicted by scientists that by 2020, global temperatures would reach their highest point in the previous millennium. The Intergovernmental Panel on Climate Change estimated in 1995 that temperatures in the twenty-first century would increase from 3.5 to 10 degrees Celsius if the current trend persisted. The global average surface temperature rose by 0.6 °C throughout the 20th century. The 1990s were the warmest decade on record and 1998 was the warmest year on record globally, demonstrating that the greenhouse effect is the cause of climate change.10–12. There will be numerous effects of climate change, the majority of which will be negative. The following are the consequences of climate change on water resources:

4.1. The amount of rain

The world's monsoon regions will experience more rainfall due to climate change, which will exacerbate issues including landslides, floods, and soil erosion. There will be a drop in water quality. The availability of fresh water will be significantly impacted. Regarding India, there will be higher rainfall in the northeast and southwest of the country and less in the country's central and northern regions.13–15. As a result,

Central and Northern India will experience a drought-like condition as a result of a shortage of precipitation, while the Northeast and South Western states will experience a flood-like scenario as a result of an abundance of rainfall. Agricultural productivity will suffer in either scenario. There will be less clean water available for drinking and washing clothes during droughts and floods. There will be contamination of the water and harm to the drainage systems.

4.2. Sea level

The end of the twenty-first century, the average sea level worldwide will have increased by 9 to 88 cm as a result of climate change brought on by the melting of polar ice.The population of the planet is predicted to grow by more than half, and it is located 60 kilometers from the sea. says the distance, but the outcome will be the reverse. By the year 2100, various small islands, including the Maldives, the Marshall Islands, the Nile Delta in Egypt, and the Ganges-Brahmaputra Delta in Bangladesh would all be gone. The Cabinet of the Maldives Government carried out a unique experiment in October 2009 while seated inside the water in an effort to draw attention to this threat to the entire world. A manifesto for the December 2009 Copenhagen Conference was also drafted during this conference. Because of rising water levels, the Pacific Ocean's Solomon Islands are in danger of sinking16. Climate change has affected the coastal regions of Tamil Nadu, Kerala, Orissa, and Andhra Pradesh in India. West Bengal, Goa, Gujarat, Maharashtra, and Karnataka will be impacted by immersion.

This will result in the displacement of over 10 crore people from the nearby villages and cities, and the disappearance of India's Andaman and Nicobar Islands and Lakshadweep due to rising sea levels. Sea level rise will contaminate freshwater sources, which will lead to issue with drinking water. The rich in biodiversity coral reefs present in the ocean, sometimes referred to as the "tropical rainforest of the seas," will be impacted by climate change. The algae (microbial flora) that give coral reefs their color and sustenance will suffer from the heat in the saltwater. The bleaching process that will devastate these highly productive ecosystems will be facilitated by warm ocean waters. The greatest cause of coral dying in 1997 was the intense heat brought on by El Nino in the Pacific Ocean17. An estimated 10% of the coral reefs on Earth are thought to have perished, 30% have been severely damaged, and 30% have degraded. According to the Global Coral Reef Monitoring Network (Australia), every coral reef will perish by 2050.

4.3 The Biodiversity

Global warming is causing climate change, which has a negative impact on biodiversity. Seasonal variations are caused by biodiversity erosion, which is impacted by climate change. By our actions, we are harming the mechanisms available to address the issue of global climate change18. Approximately 60–70% of the world's biodiversity is found in India, making it one of the most biodiversity-rich countries in the world. The detrimental effects of climate change on fish in the Caribbean are evident. As a result, the fish there are turning extremely toxic. Following the investigation, researchers from the University of Florida stated this. Dr. Glenn Morris, the principal researcher, said that the frequent changes in the environment are causing harmful components to emerge in Caribbean fish. People who consume it are also growing increasingly poisonous, which leaves them open to a host of grave illnesses. Morris noted that the frequent variations in the weather are contributing to a large rise in water temperatures, which in turn is creating Gambiar discus algae. These algae are extremely poisonous. He claimed that algae is the sole thing allowing vegetarian fish to thrive in the ocean. The fish have no choice but to consume the deadly algae in order to survive.

As soon as fish consume it, they turn toxic. After that, when people consume these fish, they too become poisoned. Morris stated that the fish's venom is quite harmful. No matter how long the fish is cooked, these harmful ingredients still remain. Many of the people who have been eating these fish have fallen victim to terrible illnesses in recent years. Many first experience vomiting after consuming these toxic fish, and many more subsequently have diarrhea. This disease becomes dangerous when it begins to spread. Following that, shivers appear on the face, hands, and feet. In addition, the body experiences severe discomfort and deteriorates rapidly. Unusual symptoms can occasionally result from it. At the same time, cold water begins to warm up. Morris clarified that in order to address this issue, one must first consider its primary cause, which is the climate's perpetual change. He claimed that humans are mostly to blame for it and that its detrimental impacts are currently felt on a global scale. To begin with, it is important to take concrete action to find these causes in order to safeguard our ecosystem as well.

4.4 Water content change

The primary causes of the current strain on India's water resources are the country's growing population, fiercer competition for scarce supplies, poor quality, environmental concerns, and groundwater19. Climate change will make this strain on water resources even more imbalanced and severe. The home, agricultural, and industrial sectors will be impacted by the availability of water as well as by the pressure-induced decrease in rainfall and rise in temperature. It's projected that by 2025, water scarcity in major world countries might range from 34% (1995) to 63% based on only modest climate change.

4.5 Revisions to the water quality

Variations in rainfall patterns may be the cause of variations in water quality. Where there is a high water surface due to high temperatures, there is a chance that the salinity of the water will rise. Intense irrigation and higher temperature evaporation are additional causes of this. Furthermore, when waste that has been released from the soil into the ground water, such as during floods, it will have an impact on the ground water. The amount and quality of clean water in coastal locations will be negatively impacted by sea level rise-related salinity in the groundwater, which will also have an impact on the local population20.

4.6 A shift in the accessibility of water

Water cycle excesses have reduced water content and contaminated the water supply, increasing competition for scarce water resources. The need for water in interior regions and agriculture will increase, particularly during the summer and during dry spells. India is a nation that relies heavily on agriculture. Additionally, agriculture uses the majority of the water. There is a greater need for irrigation due to rising temperatures, less rainfall, and population growth. Water supplies will be tainted by crises as a result of rainy season uncertainty and over use of available resources.

4.7 Area Affected by Climate Change

Water is essential to human development, food security, industrial processes, and the maintenance of human life. Water availability and use can lead to competition in a number of industries, including agriculture, manufacturing, and health. Over a billion people are thought to have access to safe water.22, 21. As over two billion people do not have access to water. The human population will be greatly impacted by changes in water quantity, quality, and accessibility because of agriculture, food security, health, and other activities.

5. Final Thoughts

In order to prevent climate change, or the rise in global temperatures, significant efforts must be made at the local, regional, national, and international levels in a timely manner. Various tactics can also be developed in various regions based on time, place, and geography. Three components make up climate change policy measures: lowering the danger of climate change by limiting human contribution to causes impacting climate change and adapting to change; taking action; and conducting in-depth research and observation of the climate system and its impact on development. Thus, climate change poses a hazard to more than just our surroundings, as well as to development and progress. According to the most recent evaluation, the costs associated with mitigating the threat posed by climate change outweigh the benefits to human welfare. We must consider the effects of carbon and the globe it affects while formulating our development policies. The true national issue posed by climate change is the incorporation of climate-related risks into development strategies and initiatives. In the current context, raising public awareness of this issue will also be essential.

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