Impact of climate change on the developing economies like india

YACHNA SURYAVANSHI , Department of Humanities , Graphic Era Hill University, Dehradun, Uttarakhand, India 248002,

Abstract

Changes in the climate are caused by an imbalance between the amount of radiation entering and leaving the atmosphere. The pace at which the planet is warming due to climate change is different from that of previous warming periods. Temperatures throughout the world might climb by as much as 5.4 degrees Celsius by the year 2100. Changes in solar activity and volcanic eruptions have played smaller roles than human activities in driving climate change during the last century. The human activity of massively changing natural systems over the past several decades has led to a net increase in atmospheric carbon dioxide levels. There is widespread agreement that climate change poses a major risk to ecosystems, biodiversity, and human health. Changes in the Earth's physical environment are linked to this phenomenon, which has far-reaching consequences for all forms of life on the planet. Challenges facing society today include adapting to the effects of climate change and working to stop its worsening. It is essential for policymakers to apply individualised policies, particularly for at-risk groups.

Keywords: global warming, climate change, radiation, volcanic eruptions, solar activity, natural systems, carbon dioxide

DOI Number: 10.48047/nq.2019.17.02.1999 NeuroQuantology2019;17(02): 185-193

Introduction

The word "climate" originates from the Ancient Greek word "klima" (which means "inclination") (the standard period is 30 years). Thousands of weather stations all across the globe have recorded temperatures and rainfall data, providing the basis for the satellite record of climate change. Variations in Climate vs. Global Warming While the terms are commonly used interchangeably, "climate change" and "global warming" really refer to two separate physical processes. Although the phrase "global warming" is used to

describe the gradual rise in Earth's average surface temperature over time, "climate change" encompasses both warming and the adverse repercussions of warming (such as extreme precipitation and stronger winds).

"As heat-trapping greenhouse gases (such carbon dioxide, methane, and nitrous oxide) in the atmosphere increase, the average temperature of Earth's surface rises, causing climate change." There has never been a moment in the last 800,000 years with greater concentrations of greenhouse gases than the present. Evaporation from the seas and other water sources into the atmosphere contributes to the rise in temperature. Both natural and human activities contribute significantly to the amount of carbon dioxide in the air (human-induced). Most animals, as a byproduct of their metabolic processes, are natural suppliers of carbon dioxide. "Since the early 20th century (the industrial revolution), human activities, including as the burning of fossil fuels (such as coal, oil, and natural gas), as well as agricultural emissions and deforestation", have been the primary drivers of anthropogenic sources of carbon dioxide. There are 5 top countries responsible for the emissions of carbon-dioxide are

(i) United States of America (USA),
(ii) China
(iii) Russia,
(iv) India,
(v) Japan

Climate Change Consequences

Around 5.1 billion metric tonnes of carbon dioxide were released into the atmosphere due to energy production in the United States in 2017. This contributed to a global total of roughly 32.5 billion metric tonnes. Amazonian deforestation in Brazil, mostly for agricultural interests, is a major contributor to global warming, with annual losses equal to about one million sports fields of forest cover.

The physical environment of Earth and the living species on the planet suffer a wide variety of negative consequences as a direct result of climate change. The physical environment of Earth has an effect on all forms of life on the planet. Climate change threatens coral reefs, woodlands, and coastal settlements. In most cases, climate change heightens receptivity to the harmful effects of chemical pollution. The majority of the impacts associated with climate change are anticipated to be negative. Depending on the area, the health advantages may be minimal. Warmer winters, for instance, may lead to fewer heat-related illnesses and deaths.

The idea of core accretion proposes that Earth originated about 4.54 billion years ago (roughly the one age of the universe) by ingestion from the protoplanetary disk. Over Earth's vast history, the planet has had to deal with climatic shifts. Several aspects of Earth's physical environment are being negatively impacted by the present climate change. The occurrence and intensity of natural catastrophes and extreme occurrences are both influenced by this phenomenon.

Temperature Down the Ages

When the universe was just 1035 seconds old, the temperature hovered at 1 octillion degrees Celsius. The temperature of the cosmos dropped to almost 1 billion degrees Celsius in less than 2 minutes. At least once every 100,000 years during the previous few million years, Earth has gone through ice ages followed by mild periods of time (interglacial) on average. Higher global average temperatures are correlated with the present climate change (land surfaces or the upper layers of the ocean). More land areas than ocean regions are seeing rapid warming. Increased average precipitation occurs because a warm air can contain more water vapour. Temperatures on Earth have risen by around 0.7 degrees Celsius during the last 70 years.

Since 1950, there has been a rise in the amount of warm days and a reduction in the number of cold ones. The pace of warming since 1976 has been higher than at any point in the previous thousand years. There are always certain periods with very high temperatures. Throughout the last two decades, the air temperature on Earth has ranged from a low of 94.7°C (measured in Antarctica in 2010) to a high of 70.7°C (recorded in Iran's Lut Desert in 2005). The average temperature of the Earth right now is somewhere around 15.0 degrees Celsius. Around 0.2 degrees Celsius are being added to surface temperatures per decade. The International Panel on Climate Change (IPCC) projects a 0.9–5.4°C increase in global mean temperatures by 2100, depending on which emissions scenarios are used.

Variation in the rate of increase of the global mean temperature is evident. The temperature of the Earth varies from one place to another. In the near term, some locations may even cool off. More warming is seen in more northern latitudes. “More rapid warming has occurred in the Northern Hemisphere and at the North Pole than in the Southern Hemisphere and at the South Pole.” Winter, as well as nighttime, is predicted to see larger temperature spikes than summer. Winters are shorter and spring arrives sooner.

The pace at which ice is being lost from Greenland and Antarctica is increasing, and climate change is a major contributor to this. A number of glaciers have significant religious and cultural significance for nearby people "(e.g., in the Peruvian Andes, the Nepalese Himalayas, and the Chinese Meili Snow Mountains)." Less ice forms on lakes during shorter periods of time all throughout the planet. Loss of winter ice cover on thousands of lakes is possible within a few decades.

Increasing sea levels are a direct result of human-caused climate change. Sea levels rise when either the mass of water in the ocean increases, as occurs when glaciers melt, or the volume of water in the ocean increases, as occurs when water warms and expands. The average height of the oceans has risen by around 0.20 metres since 1900. The average annual rise in sea level over the last quarter of a century has been 0.003 metres. Predictions for sea level increase by 2100 range from 0.40 to 1.50 metres, depending on emissions scenarios. Several islands will be washed

away, and water will invade towns, causing people to be forced to find new places to live and relocate. Native plant life and animal species will have to work harder to adjust to the new circumstances brought on by the ocean's salty water. Humans suffer because of this phenomenon because freshwater sources become salty and arable land is destroyed. Countries with a low per capita income (like Bangladesh) feel the effects the most.

Natural Catastrophes

Warmer ocean water from climate change causes more intense rainstorms and hurricanes. A rise of 1.0°C in average global temperature is associated with a 25-30% increase in the frequency of storms of Category 4 or 5 intensity. "One of the worst storms in recent U.S. history was Hurricane Katrina (Category 5, New Orleans, 2005). There were 1,833 deaths related to Hurricane Katrina (reports from state and local officials in five states). There were a total of six storms during the 2019 North Atlantic hurricane season (including three major hurricanes, e.g., Category 3 or higher)."

The frequency of wildfires is increasing due to climate change. Fires in several nations have been made more devastating by the dry, hot weather (e.g., Brazil, USA, and Australia). Deforestation, significant property destruction, exposure of large populations to contaminated and poisonous air for extended periods, and potential health implications (e.g., respiratory disorders) are all possible outcomes of wildfires. Recent droughts have made the Amazon (Brazil) more combustible and susceptible to flames. Recent years in California (USA) have seen terrible fall wildfires, with over one hundred lives lost attributable to the worst disasters in 2017 and 2018.

A drought is a very costly natural calamity. Because of climate change, droughts are becoming more often and severe (particularly in subtropical areas), which contributes to the spread of deserts. The result will be suffering, malnutrition, and a shift in the population. Plant phenology is affected by climate change. Variables such as carbon dioxide in the atmosphere level, temperature, ocean level, rainfall, vegetation, and pests or microorganisms are all part of the picture when it comes to climate change. Climate change threatens plant life. Rising global temperatures and the milder winters they bring boost insect populations (by, for example, enabling more pine beetles to live), while saline water invading farmlands, wildfires, and droughts threaten plant life, culminating in the loss of forests and the ruination of human agriculture. Several studies suggest that farming is the most vulnerable industry to climate change. Food insecurity will increase as agricultural activity declines.

Plants bloom early for a shorter duration and die younger as a result of warmer springs and shorter winters. Some types of fruit trees need a cold winter environment to thrive. "Fruit tree yields may decrease as a result of climate change-induced changes in chilling requirements (e.g., less fruits, smaller fruits, and changes in color, texture, and taste of fruits)". It is estimated that pollinators are responsible for 75 percent of the seed and fruit yield for human consumption. The existence of

pollinators, notably bees, is being threatened in ways never seen before. The changing seasons and the loss in pollinator populations are throwing off the synchronisation between plants and pollinators, resulting in a drop in fruit yield and a rise in their prices.

Many stresses that animals are now more likely to encounter due to climate change are having an impact on metabolic and endocrine functioning, which may have long-term ramifications for the survival of some species. Due to climate change, more and more animal species are becoming extinct each year. Something in the neighbourhood of 700 different species of animals and birds are affected. Several species of animals will be vulnerable to the same threats to varying degrees. Animals that can't handle the heat will likely disappear if temperatures continue to rise. Polar bears, koalas, elephants, sea turtles, cheetahs, pandas, and penguins are just few of the creatures that are endangered or at risk of extinction (non-exhaustive list). Species vulnerable to the effects of climate change will have to relocate to safer areas (such as higher altitudes and latitudes) or adapt to the new conditions where they already live (e.g., habitat, feeding and breeding patterns). They may die out and disappear forever if they can't.

Many species may see degraded or lost habitat as a result of climate change (e.g., polar bears, koalas, and birds). Because of their reliance on sea ice, polar bears are threatened when it melts. Reduced sea ice in the Arctic as a result of rising temperatures is having a negative impact on polar bears. Koalas need eucalyptus trees for survival. Wildfires are spreading because to the increasing heat and dryness, which is damaging the koalas' natural habitat. Once a hotspot for visitors, birdwatchers now flock to Iran's Lake Urmia. To a large extent, climate change is to blame for the lake's diminishing water level.

Survival of Certain Species and Economic Sustenance

Species' capacity to survive in the wild may be compromised when water and food are available, but not of a high enough quality. There may be an increase in the occurrence of torpor and hibernation in small animals and hypometabolism in big mammals as a result of the unpredictability/shortage of water and food induced by climate change. If the sea ice continues to decrease and melt at earlier times, polar bears will have a harder time getting food. The polar bears must depend on their fat reserves since food is so scarce. Many young cubs perish due of the water since they are unable to swim the greater distances required to reach safety. For the koala, eucalyptus leaves are the best bet when it comes to nutrition. Koalas consume around 1 kilogramme of eucalyptus leaves per day. The eucalyptus tree is losing water due to climate change. The nutritional quality of plants suffers as a result of increasing carbon dioxide because elevated levels reduce protein levels in the tree. There will be dehydration, malnutrition, and famine as a result of all these shifts. Koalas are venturing dangerously low to the ground in quest of sustenance. Because

automobiles can't stop for them, they're easy prey for any number of animals. Over the course of only three generations, koala populations have dropped by more than 30 percent. Elephants need between 150 and 300 litres of water every day, and that doesn't include what they need for eating, bathing, and playing. Reduced population is one effect that droughts may have.

Extreme weather events are becoming more frequent due to global warming. It contributes to higher rates of illness and death in a variety of ways. Several of the food supply networks that people rely on for survival have been severely damaged by this.

The human body maintains a steady 37.0 degrees Celsius in its core, with a tight control range of 33.2 degrees Celsius to 38.2 degrees Celsius to guarantee optimum physiological performance. Both hypothermia (when the core temperature drops below 27.0 degrees Celsius) and hyperthermia (when the core temperature rises over 42.0 degrees Celsius) are potentially lethal conditions. In many regions of the globe, people are becoming more vulnerable to extreme heat as a consequence of climate change.

The economic impact of the decreased job productivity (up to 10% in certain hot places) is substantial. Economic losses due to lower job productivity might exceed 20% of GDP by 2100 if nothing is done to adapt. The elderly, the impoverished, those who work outside or who must wear protective clothes and/or PPE, persons with preexisting medical disorders, and children are particularly vulnerable to heat stress. Around 1,500 people each year die in the United States due to heat-related causes. It is estimated that as many as 70,000 people died in Europe due to the heat wave that occurred that summer. Warmer temperatures have the potential to reduce the occurrence and fatality rate of certain winter-related events, such as heart attacks and strokes, by making them less severe. In addition, warmer and drier circumstances help lessen the spread of some infectious illnesses (e.g., malaria).

Food Insecurity and Migration Trends

Because of climate change, many nations are experiencing water and food shortages, which has serious consequences for people's health in terms of sanitation, nutrition, and the safety of their food supply. “High exposure to salt via drinking water, eating, and bathing may cause a variety of health concerns, particularly in low-income nations like Bangladesh that lack the resources to properly desalinate drinking water affected by increasing salinity due to sea-level rise (e.g., hypertension and skin diseases). Changes in the global climate have a detrimental effect on food production systems in many areas.” Researchers in the Philippines found that for every 1 degree Celsius increase in nighttime temperatures, rice yields drop by 10%. Many fish populations may shift to higher latitudes as ocean temperatures increase, threatening the protein sources for millions of humans.

Many people will have to relocate because of the effects of climate change on their quality of life (for example, desertification,

sea level rise, decreased freshwater availability, food shortages, and health difficulties) (forced displacement, planned resettlement, migration). The human migration has a disproportionate effect on low-income areas. It is predicted that by 2050, hundreds of millions of people would have been relocated. Because of migration, nations will face a wide range of new difficulties (e.g., social, health, and financial consequences and violent conflicts).

Generally, those most vulnerable to the effects of climate change include those who are young or old, members of marginalised communities, low-income, exposed to the elements on the job, or living or working in isolated areas. The health effects of climate change are felt most strongly in low-income and geographically susceptible nations (like Bangladesh, for example) (at least in its earlier stages). Yet, the Chicago heatwave of 1995 and Hurricane Katrina in New Orleans in 2005 showed that there is also a significant susceptibility among specific ethnic and socio-economic groups in nations with better incomes, such as the United States. World Health Organization estimates that in 2004, 141,000 people died all over the world due to the effects of climate change. The elderly were disproportionately impacted by deaths during the European heat wave of 2003.

Prevention of Climate Change Impact for Long Term Survival

Preventative measures (long-term tactics) are crucial. Greenhouse gas emissions should be lowered as quickly as feasible to save species and save humanity. Global warming might stabilise at a more tolerable level if we dramatically cut emissions of greenhouse gases. Policies to minimise the use of fossil fuels, forest preservation, and reforestation are all things that should be encouraged, as well as the research, development, and implementation of low-carbon energy technology. Carbon sequestration, which involves the removal and long-term storage of atmospheric carbon dioxide, may mitigate global warming by lowering atmospheric concentrations of carbon dioxide. We need more solar-powered, wind-powered, and wave-powered houses and cars. The usage of alternative modes of transportation such as walking, cycling, and public transit should be encouraged. It would also be beneficial if people would consume less animal products (particularly red meat) and more plants (fruits and vegetables). Changing one's diet in this way may have positive effects on one's health, the environment, and one's wallet.

The United Nations Framework Convention on Climate Change serves as the overarching framework for the cooperative efforts of a large number of nations. If we want to prevent catastrophic consequences, the IPCC says we need to limit global warming below 1.5 degrees Celsius. Unfortunatley, in certain nations, powerful political lobbying has evolved to discredit human responsibility for climate change and block the implementation of environmentally friendly legislation. The Paris Agreement, signed by all UN member states in 2015, sets an ambitious target of keeping global warming well below 2.0 °C. The pact was ratified by almost every nation in the

world. The United States, however, voted to leave the Paris Accord in 2017.

Conclusion

The cost to society and the economy as a whole is enormous due to the many effects of climate change. Up to $125 billion in direct damages were attributed to Hurricane Katrina, while over $40 billion was spent on putting out the fires in California in 2017 and 2018. By 2090, it is predicted that climate change would cost the US economy several hundred billion dollars annually. Significant resources must be invested on adaptive and preventative measures. It will cost around $50 trillion to reduce greenhouse gas emissions to extremely low levels by 2050 and put a stop to global warming. If we maintain emitting greenhouse gases at our present pace, by 2028 we will have used up our allowance for keeping global warming at 1.5°C.

Key issues for society include adapting to the health effects of climate change and preventing the worsening of climate change. In order to combat the effects of climate change, the health care industry must support scientific inquiry, medical training, and public and governmental awareness. To successfully adapt, a wide range of approaches at different levels are required. Particularly for at-risk groups, policymakers should use tailored, flexible approaches. “Reducing emissions of greenhouse gases and increasing the ability of land surfaces to absorb these gases from the atmosphere are both effective ways to lessen the effects of climate change. The economy is on shaky ground, and long-term investments in renewable energy and energy efficiency are essential to keeping it there and helping it thrive.”

References

1. McMichael AJ, Lindgren E. Climate change: Present and future risks to health, and necessary responses. Journal of Internal Medicine. 2011;270:401-413.
2. McMichael AJ. Globalization, climate change, and human health. The New England Journal of Medicine. 2013; 368: 1335-1343.
3. Wu X, Lu Y, Zhou S, Chen L, Xu B. Impact of climate change on human infectious diseases: Empirical evidence and human adaptation. Environment International. 2016;86:14-23.
4. Hsiang S, Kopp RE. An economist’s guide to climate change science. Journal of Economic Perspectives. 2018;32:3-32.
5. Allison EA. The spiritual significance of glaciers in an age of climate change. WIREs Climate Change. 2015;6:493-508.
6. Vineis P, Chan Q, Khan A. Climate change impacts on water salinity and health. Journal of Epidemiology and Global Health. 2011;1:5-10.
7. Holland G, Bruyère CL. Recentintense hurricane response to global climate change. Climate Dynamics.2014;42:617-627.
8. Wiens JJ. Climate-related local extinctions are already wide spread among plant and animal species. PLOS Biology. 2016;14: e2001104.
9. Karimi V, Karami E, Keshavarz M. Climate change and agriculture:

Impacts and adaptive responses in Iran. Journal of Integrative Agriculture. 2018;17:1-15.

10. Jenssen BM. Endocrine-disrupting chemicals and climate change: A worst case combination for arctic marine mammals and seabirds. Environmental Health Perspectives. 2006;114(Suppl1):76-80.
11. Noyes PD, Lema SC. Forecasting the impacts of chemical pollution and climate change interactions on the health of wildlife. Current Zoology.2015;61:669-689
12. Narayan EJ, Williams M. Understanding the dynamics of physiological impacts of environmental stressors on Australian marsupials, focus on the koala (Phascolarctos cinereus). 2016;1:2.