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Review of the Effect of Rising Temperature on the Pace of Indian Economy

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Abstract

Rising global temperatures, fuelled by climate change, pose a significant threat to the pace of economic growth and development worldwide. Rising temperatures have emerged as a catalyst for multifaceted economic challenges, with significant implications for food security and inflation dynamics. As temperatures soar, agricultural productivity faces unprecedented threats, potentially deepening existing food supply crises and exacerbating inflationary pressures. Additionally, extreme heat conditions can curtail working hours and reduce labour productivity, posing obstacles to sustained economic activity. With an emphasis on the possible barriers to economic growth, this study explores the complex relationship between rising temperatures and their effects on the economy. The study thoroughly examines the interactions between rising temperatures brought on by climate change and important economic variables as the availability of food, inflation, labour productivity, and employment.

Keywords: *Global Warming, Agriculture, Working hours, Tourism, health, energy, Inflation etc.*

Introduction

The history of global climate change is a complex tale spanning millions of years. The widespread use of fossil fuels, such as coal, oil, and natural gas, led to a significant increase in greenhouse gas emissions, particularly carbon dioxide (CO₂), due to combustion processes. This marked the beginning of anthropogenic (human-caused) climate change. The Industrial Revolution intensified, leading to a further rise in greenhouse gas emissions. However, the awareness of climate change as a global issue was minimal during this time. Scientists began to recognize the potential impact of human activities on the climate. Concerns about climate change grew, and scientific evidence became more robust. In 1988, the Intergovernmental Panel on Climate Change (IPCC) was established by the United Nations to assess scientific information on climate change and its impacts. The IPCC has since released several comprehensive assessment reports highlighting the evidence for human-induced climate change. The impacts of climate change became increasingly evident. Rising global temperatures led to more frequent and intense heatwaves, storms, droughts, and other extreme weather events. Glaciers and ice caps started melting at accelerated rates, contributing to sea level rise. The international community engaged in climate

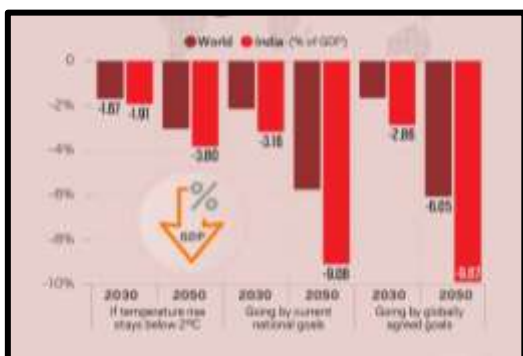
negotiations, culminating in agreements like the Kyoto Protocol (1997) and the Paris Agreement (2015), aimed at reducing greenhouse gas emissions and limiting global warming.

Global warming and climate change affect the economy of a country in two ways. The initial effects encompass short-term impacts, which stem from direct consequences induced by extreme weather occurrences. Other effects will subside, but will last a long time. For example, one of the most important aspects of the Indian subcontinent is the western monsoon. 75% of India's annual rainfall comes from here. Uncertainty has increased due to global warming and climate change. Uncertainty in this would mean long-term disastrous effects on agricultural production, energy supply, and hence employment. This can have many effects.

Food supply crisis may deepen, inflation will increase

Rising temperatures, changing precipitation patterns, and extreme weather events like droughts and floods can lead to decreased crop yields or even crop failures. Heat stress can reduce livestock productivity, affecting meat, dairy, and egg supplies. This can lead to higher prices for animal products as well. Farmers may face increased costs due to the need for irrigation, pest control, and other adaptation measures to cope

with changing climate conditions. These additional costs can trickle down the supply chain, ultimately leading to higher prices for consumers. During the post-monsoon season, perishable vegetables like tomato, onion, and potato (TOP) are especially vulnerable to extreme weather conditions including cyclones and unseasonal rainfall. According to economists' estimates, the combination of TOP prices typically moves in lockstep, and price volatility in these three essential goods has an impact on food inflation.



Source: <https://www.indiatoday.in/diu/story/india-climate-change-economic-impact-2381534-2023-05-19>

Figure 1: Cost of Climate Change in India
Working hours will decrease, jobs may go away

As temperatures climb, particularly in regions with already warm climates, performing tasks outdoors or in poorly ventilated areas can become increasingly challenging and hazardous. Consequently, this situation may result in diminished productivity and the necessity to shorten work hours to mitigate health risks. Sectors reliant on outdoor labour, such as agriculture, construction, and tourism, could face disturbances due to extreme weather phenomena like heatwaves, storms, and floods. These disruptions may lead to job cuts, decreased incomes, and economic instability in affected areas.

Global warming might prompt changes in the types of jobs and skills sought after. For instance, there could be a surge in demand for positions related to renewable energy, climate adaptation, and disaster management, while roles in carbon-intensive industries may dwindle. Alterations in climate patterns have the potential to disrupt supply chains, impacting industries on a global scale. This disruption could result in job losses in sectors reliant on smooth supply chain operations, such as manufacturing and logistics. Escalating temperatures can worsen health conditions, leading to heightened absenteeism and reduced workforce productivity. Consequently, this scenario could incur additional expenses for healthcare systems and diminish overall economic output



Source: ILO, 2024

Figure 2: Work Loss Due to heat

Adapting Adventures: Tourism in a Shifting Climate

With rising temperatures, traditional peak tourist seasons may shift. Cooler destinations like hill stations might experience increased visitation during hotter months as people seek relief from the heat. Conversely, coastal areas may see reduced footfall if temperatures become uncomfortably high.

Changing climate patterns can affect the attractiveness of natural attractions. For example, alterations in rainfall patterns may impact the lushness of landscapes, while temperature changes might affect the prevalence of certain wildlife species, influencing tourists' experiences.

Increased frequency and intensity of extreme weather events like cyclones and floods can disrupt tourism infrastructure and activities, leading to temporary closures of tourist sites and accommodation facilities, and potentially deterring visitors in the long run. Higher temperatures can raise concerns about heat-related illnesses for tourists, particularly in regions not accustomed to such conditions. This can lead to altered travel plans, reduced length of stays, or avoidance of destinations perceived as too hot or risky. Coastal areas and hill stations, which are popular tourist destinations, may face economic challenges due to changing climatic conditions. Coastal areas might suffer from erosion and loss of beaches due to sea-level rise, impacting tourism infrastructure and livelihoods dependent on tourism. Similarly, hill stations may face challenges such as reduced snowfall, affecting winter sports and recreational activities.

Heat Rising, Costs Following, Navigating Energy, Infrastructure, and Affordability

As temperatures rise, the demand for cooling, particularly air conditioning, also increases. This heightened demand places strain on electricity grids, especially during heatwaves when usage peaks. In India, where summers can be extremely hot, the demand for cooling is particularly significant. Meeting the increased demand for cooling requires robust energy infrastructure, including power generation, transmission, and distribution systems. However, aging infrastructure and inadequate investment may lead to capacity constraints and reliability issues, exacerbating the challenges posed by rising temperatures.

Heatwaves can lead to peak demand spikes, necessitating effective peak load management strategies to prevent blackouts and ensure grid stability. Without proper planning and infrastructure upgrades, the risk of power outages during periods of high demand increases, impacting businesses, households, and essential services. Rising temperatures not only increase energy demand but also drive up electricity bills, particularly for households heavily reliant on cooling solutions. Low-income households, in particular, may struggle to afford the additional energy costs associated with staying cool during hot weather, leading to energy poverty and potential health risks from inadequate cooling.

Transitioning to renewable energy sources such as solar and wind can help mitigate the impacts of rising temperatures on energy demand by providing clean and abundant energy for cooling. However, challenges remain in integrating variable renewable energy into the grid effectively and ensuring reliability and affordability for consumers. Promoting energy efficiency measures, such as building insulation, efficient cooling systems, and smart grid technologies, can help reduce overall energy demand and ease the strain on energy

infrastructure. Investing in energy-efficient appliances and buildings can also lower energy bills for consumers, improving affordability and sustainability in the long run.

Climate Fever: How Rising Temperatures Impact Public Health

As temperatures rise, so do the occurrences of heat-related illnesses such as heat exhaustion, heatstroke, and dehydration. Vulnerable populations like the elderly, children, and those with pre-existing health conditions are particularly at risk. Increased temperatures can worsen air quality, leading to higher concentrations of pollutants like ground-level ozone and particulate matter. This can aggravate respiratory conditions such as asthma and bronchitis, and increase the incidence of respiratory infections. Warmer temperatures can expand the habitats and breeding grounds of disease-carrying vectors like mosquitoes and ticks. This facilitates the spread of vector-borne diseases such as malaria, dengue fever, Lyme disease, and Zika virus. Higher temperatures can impact food safety by accelerating the growth of bacteria, increasing the risk of foodborne illnesses. Additionally, changes in precipitation patterns can affect water quality and availability, leading to waterborne diseases like cholera and typhoid fever.

Extreme weather events associated with global warming, such as hurricanes, floods, and wildfires, can cause trauma, displacement, and loss of livelihoods, leading to increased stress, anxiety, and depression among affected populations. Changes in temperature and precipitation patterns can affect crop yields and food production, leading to food shortages and malnutrition, particularly in vulnerable regions. This can have long-term consequences on both physical and cognitive development. Certain populations, such as the elderly, children, low-income communities, and those living in urban heat islands, are more susceptible to the health impacts of global warming due to factors like limited access to healthcare, inadequate housing, and pre-existing health conditions.

Impact of global warming on global economy

1. Melting of snow will create flood conditions. On the other hand, by 2050, 20 percent of the country may face water crisis.
2. The need for energy will rise as a result of the rising temperatures, contributing to air pollution. By 2030, this could result in 70 lakh deaths.
3. 250000 people will start dying every year by 2030 due to rising temperatures.
4. Hunger will increase due to decline in agricultural production and famine-like situations may occur.
5. Global warming alone could cause economic loss of up to \$20 billion.

Empowering Change: Innovating Solutions for Global Warming

Implementing an early warning system for disasters can serve as a proactive measure in addressing the impacts of global warming. By anticipating and preparing for extreme weather events such as hurricanes, floods, wildfires, and heatwaves, communities can mitigate their adverse effects on the environment and human lives. Utilizing solar energy presents a compelling solution for mitigating global warming by reducing greenhouse gas emissions and transitioning towards a more sustainable energy future.

Addressing the carbon footprint stands as a pivotal solution in the battle against global warming. The carbon footprint represents the total amount of greenhouse gases emitted

directly and indirectly by individuals, organizations, products, or activities. By quantifying and reducing these emissions, significant strides can be made in mitigating climate change. This reduction involves minimizing the release of carbon dioxide (CO₂) and other greenhouse gases like methane (CH₄) and nitrous oxide (N₂O) that contribute to the warming of the planet. Efforts to reduce carbon footprints encompass a spectrum of actions, from enhancing energy efficiency in transportation, buildings, and industries to transitioning towards renewable energy sources such as solar and wind power.

Water, often overlooked in discussions about climate change, holds significant promise as an economically viable solution for mitigating global warming. Harnessing the power of water resources presents multifaceted benefits that extend beyond environmental conservation to economic prosperity and resilience. Firstly, investing in water management and conservation initiatives can enhance agricultural productivity and food security, particularly in regions vulnerable to droughts and water scarcity exacerbated by climate change. By optimizing irrigation practices, implementing water-saving technologies, and promoting sustainable farming methods, farmers can mitigate water-related risks and increase crop yields, thus bolstering rural livelihoods and economic growth.

References

1. Haines A, Patz J. Health effects of climate change. *J Am Med Assoc* 2004; 291:99–103.
2. McMichael AJ, Woodruff RE, Hales S. Climate change and human health: present and future risks. *Lancet* 2006; 367:859–69.
3. Ahern M, Kovats RS, Wilkinson P, Few R, Matthies F. Global health impacts of floods: epidemiologic evidence. *Epidemiol Rev* 2005; 27:36–46.
4. Langner J, Bergstrom R, Foltescu V. Impact of climate change on surface ozone and deposition of Sulphur and nitrogen in Europe. *Atmos Environ* 2005; 39:1129–41.
5. Kovats RS, Campbell-Lendrum D, McMichael AJ, Woodward A, Cox J. Early effects of climate change: do they include changes in vector-borne disease? *Philos Trans R Soc B* 2001; 356:1057–68.
6. Intergovernmental panel on climate change, working group In: McCarthy J, Canziani O, Leary N, Dokken D, White K, editors. *Climate change 2001: impacts, adaptation and vulnerability*. Cambridge, New York: Cambridge University Press; 2001.
7. Kovats RS, Campbell-Lendrum D, Matthies F. Climate change and human health: estimating avoidable deaths. *Risk Anal* 2005; 25:1409–18