

SEC-2 Economic impact of climate change

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Introduction:

Global climate change, driven primarily by human activities, has significant economic implications for societies and economies worldwide. The impacts of climate change span various sectors, including agriculture, tourism, infrastructure, energy, and public health. Rising temperatures, changing precipitation patterns, sea-level rise, and extreme weather events pose challenges to economic growth, sustainable development, and poverty eradication efforts. This note explores the economic impacts of climate change, highlighting specific examples from India and around the world.

Agriculture and Food Security:

Climate change affects agricultural productivity, food availability, and food prices. Changes in temperature and precipitation patterns disrupt crop growth cycles, leading to reduced yields, crop failures, and decreased agricultural income. Extreme weather events such as droughts, floods, and heatwaves pose additional risks to agricultural systems.

Agriculture, a crucial sector for India's economy, is vulnerable to climate change impacts. Changing rainfall patterns, increased temperatures, and extreme weather events disrupt agricultural practices, leading to crop failures, reduced yields, and income losses for farmers. For example, in 2019, Maharashtra experienced severe drought, resulting in agricultural losses estimated at USD 2.5 billion.

Climate change threatens global food security. Changes in temperature and precipitation patterns affect crop productivity and food availability. In Sub-Saharan Africa, droughts and heatwaves have led to food shortages and increased reliance on food imports, straining economies and exacerbating poverty.

Water Resources and Infrastructure:

Climate change impacts water availability and quality, affecting various sectors such as agriculture, industry, and domestic use. Changes in precipitation patterns, including increased intensity of rainfall in some regions and prolonged droughts in others, lead to water scarcity and challenges in water management. This, in turn, affects hydroelectric power generation, irrigation systems, and water-dependent industries. It also necessitates investments in water storage, treatment, and distribution infrastructure.

Changing precipitation patterns and increased water demand pose challenges to water resources and infrastructure. Irregular monsoons and glacial retreat affect water availability, impacting hydropower generation, irrigation, and industrial activities. The city of Chennai faced severe water scarcity in 2019, leading to disruptions in commercial and industrial operations.

Rising sea levels and increased intensity of storms pose risks to coastal infrastructure and settlements. In 2012, Hurricane Sandy caused extensive damage to infrastructure in the United States, with estimated losses of USD 70 billion. Such events strain economies, hinder trade, and require substantial investments in rebuilding and resilience measures. In Cape Town, South Africa, a severe drought in 2017-2018 led to water shortages and had significant economic impacts on sectors like tourism and agriculture.

Energy Sector:

Climate change affects energy systems, including electricity generation, distribution, and consumption. Changing weather patterns influence energy demand for cooling and heating, while extreme events such as storms and heatwaves disrupt energy infrastructure, causing power outages and infrastructure damage.

Furthermore, the need to transition to low-carbon energy sources to mitigate climate change leads to the transformation of energy systems, requiring significant investments in renewable energy technologies and infrastructure. These changes impact energy prices, energy security, and the profitability of energy-intensive industries.

The energy sector in India is vulnerable to climate change impacts. Changes in temperature patterns affect energy demand, particularly for cooling purposes. Additionally, hydropower generation is impacted by changing precipitation patterns and glacial melt. For instance, reduced water flow in rivers affected hydropower production in Himachal Pradesh in 2019, leading to increased reliance on fossil fuel-based power generation.

Climate change affects energy infrastructure, such as power plants and transmission lines, due to extreme weather events. Hurricanes, floods, and wildfires damage energy infrastructure and disrupt power supply, leading to economic losses and increased costs for repairs and maintenance.

Coastal areas infrastructure, Tourism and Recreation:

Sea-level rise and increased frequency and intensity of storms pose risks to coastal areas and infrastructure. Coastal erosion, saltwater intrusion, and storm surges threaten infrastructure such as ports, roads, and buildings. These impacts result in substantial economic losses related to repairs, relocations, and disruptions to coastal industries and tourism.

Small island nations and low-lying coastal regions are particularly vulnerable. For instance, the Maldives faces threats from rising sea levels, which can potentially lead to the loss of land and displacement of communities, impacting tourism, fisheries, and coastal livelihoods.

Climate change affects tourism, a significant contributor to India's economy. Changing weather patterns, such as the unpredictability of monsoons, impact tourist activities and destinations. For example, the decline in coral reefs due to warming temperatures affects marine tourism in places like the Andaman and Nicobar Islands.

Climate change impacts iconic tourism destinations globally. Rising temperatures and reduced snowfall affect winter tourism in ski resorts, while the bleaching of coral reefs threatens the appeal of coastal destinations. These impacts reduce tourist arrivals, affect local economies, and lead to job losses in the tourism sector.

Public Health and Healthcare Costs:

Climate change affects public health and healthcare systems, leading to increased healthcare costs and productivity losses. Heatwaves and extreme temperatures can cause heat-related illnesses and deaths, while changes in disease patterns and vector-borne diseases influence public health outcomes.

For instance, the spread of diseases like malaria and dengue fever is influenced by changing climatic conditions. The economic burden includes increased healthcare expenditures, reduced workforce productivity, and the strain on healthcare infrastructure and resources.

For instance, the 2015 heatwave in India caused over 2,000 deaths and increased healthcare expenditures.

Climate change contributes to the spread of vector-borne diseases such as malaria and dengue fever. Changing climatic conditions expand the range of disease vectors, increasing the burden on healthcare systems and public health expenditures.

Conclusion:

The economic impacts of global climate change are far-reaching, affecting multiple sectors and economies. The examples provided from India and around the world highlight the diverse ways in which climate change poses risks to agriculture, water resources, infrastructure, energy, tourism, and public health. Addressing these economic impacts requires comprehensive strategies, including adaptation measures, investments in resilient infrastructure, sustainable agricultural practices, and transitioning to low-carbon economies. By integrating climate change considerations into economic planning and policy-making, societies can work towards building more resilient and sustainable economies for the future.