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Research Article

"Socio-Economic Impact Of Climate Change An Indian Scenario"

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ABSTRACT

Climate change poses and existential threat to the socio-economic development trajectory of India, a nation characterized high population density, significant reliance on climate-sensitive sectors like Agriculture and deep seated socio-economic inequalities. This paper argues the significance of climate change in the earth with special reference to India it Analyzes the Socio-economic impact of the climate changes in India and its impact on people. Environment. Social life Agriculture and all living things. The rest of the paper is divided in to three first section reviews the climate change scenario in India. The second section examines the socio-economics of climate changes the third section gives suggestion to protecting environment.

Objectives :-

The main objective of this paper is analysis of the significance of climate change in the earth with special references to India and it reviews impact of climate change in India.

Methodology :-

In order to analyse the objective the data about the emission is collected from the journals and state environment Report.

1. Introduction :-

Changing climatic conditions can have a big effect on our life and our environment. In fact, it is the greatest environmental treat faced by planet earth. The change in weather conditions can be best observed through the extreme rise in temperature, melting of glaciers and student rise in sea level. These changes are causing serious problems to humans and other forms of life. Biologists and environmentalists are constantly searching for new solutions to combat these environmental changes.

There is a saying "climate is what you expect; weather is what you get." We often confuse between weather and climate. Weather is what is reported on the TV every night-minimum and maximum of different places, cloud cover, wind conditions, rainfall, humidity, etc. Weather describes what is happening outdoors in a given place at a given time.

The word climate describes the total of all weather occurring in a place over a period of years. Climatologists generally consider 30 years as the time needed to find out the climate of a place. It includes average weather conditions. Climate tells us what it's usually like in the place where you live. For example Ahmedabad and Delhi have generally dry climate, but Mumbai and Visakhapatnam have humid climate; the climate in Bangalore and Pune is said to be pleasant, while Kochi has largely rainy climate.

Global climate change is caused by the accumulation of greenhouse gases in the lower atmosphere. The global concentration of these gases is increasing, mainly due to human activities, such as the combustion of fossil fuels (which release carbon dioxide) and deforestation (because forests remove carbon from the atmosphere). The atmospheric concentration of carbon dioxide, the main greenhouse gas, has increased by 30 percent since preindustrial times.

2. Climate Change Scenario in India :-

Climate change is likely to have a much greater impact on India than other countries in similar positions, according to an assessment by the South Asia regional office of the United Nations Industrial Development

Organization (UNIDO). India's dependence on fossil fuels such as coal and oil for energy generation and transport 'could lead to heavy environmental, social and regulatory costs, causing a drain on the nation's resources as a direct impact of Climate Change over the next century, says the assessment report.
The assessment is based on the Carbon Disclosure Project (CDP) 2007 of Britain. According to calculations done by the CDP, cost of climate change could have a major impact on the Indian economy by causing a 9-13 percent loss in the country's gross domestic product (GDP) in real terms by the year 2100. The report lists other possible impact of climate change-related developments on India:
-Increase in temperature in India could be higher than the global average, as predicted by the United Nations Intergovernmental Panel on Climate Change (IPCC).
-Rapidly changing and increasingly unpredictable patterns of monsoon and rainfall.
-Decline in crop yields of up to 30 percent in India and other South Asian countries by 2080.
-Rise in sea levels, which could submerge coastal areas and also infuse salt water into fresh water sources. This in turn could create a large number of so-called climate change refugees not only in India but also from across the borders into the country, thereby leading to further strain on resources.
The increased pace of retreating of the Himalayan glaciers would reduce India's fresh water sources in the future.
-Incidence of more severe vector-borne diseases such as dengue, bacterial and arboviral diseases.
-Increased frequency of extreme weather conditions such as droughts and floods.

According to the IPCC, India will experience the greatest increase in energy and greenhouse gas emission in the world if it sustains eight percent annual economic growth or more as its primary energy demand will then multiply at least three to four times its present levels. India has a 7500-km long densely-populated and low-lying coastline, and an economy that is closely tie to its natural resource base. Hence, it is considerably vulnerable to the impact of climate change. Change in climate could mean:

-Additional pressure on ecological and social-economic systems that are already under stress due to rapid industrialization, and economic urbanization, development.
-Extreme precipitation events and the possibility of more frequent flash floods in part of India and drought in others. An increase in rainfall is simulated over the eastern region of India but the northwestern deserts may see a small decrease in the absolute amount of rainfall.
-Increase in temperature and seasonal variability in precipitation are expected to result in more rapid recession of Himalayan glaciers. In fact, the Gangotri glacier is already retreating at a rate of 18-20 metres a year
-Warmer and wetter conditions would increase the potential for a higher incidence of heat-related and infectious diseases. The incidence and extent of vector-borne diseases, which are significant causes of mortality and morbidity in tropical Asia, are likely to spread into new regions on the margins of present endemic areas as a result of climate change.
-Reduction in agricultural productivity especially in areas growing wheat is expected. Further, yield of rice could also decrease due to change in rainfall pattern.

India could be more at risks than many other countries from changes in temperature and sea level. Models predict an average increase in temperature in India of 2.3 to 4.8°C for the benchmark doubling of carbon dioxide scenario Temperatures would raise more in Northern India than in Southern India. In the North Indian Ocean, under a doubling, the average number of tropical disturbance days could increase from 17 to 29 a year while, without protection, approximately 7 million people would be displaced, and 5,760 km² of land and 4,200 km of road would be lost. The dominant cost would be the land loss, accounting for

Climate Change Impact in Developing Countries

Environmental Impact	**Socio-economic Resources and Sectors Affected**
3. Changes in rainfall patterns	4. Water resources
5. Increased frequency	6. Agriculture and forestry
7. Severity of: Floods	8. Food security
9. Droughts	10. Human health
11. Storms	12. Infrastructure (e.g. Transport)
13. Heat waves	14. Settlements: displacement of Inhabitants and loss of livelihood
15. Changes in growing seasons and regions	16. Coastal management
17. Changes in water quality and quantity	18. Industry and energy
19. Rise in sea level	20. Disaster response and recovery
21. Glacial melt	22. Plans

83 percent of all damages. For the same CO_2 doubling scenario, a crop simulation study estimates that wheat yields could decrease between 28 and 68 percent even allowing for adaptation options, agricultural losses

could be significant. The loss in farm revenues is estimated at 9 to 25 percent for a temperature rise of 2 to 30°C.

5 Evidence of Climate change :-

Evidence of climate change includes rising global. Temperatures, ocean warming melting glaciers and polar ice, sea level rise. Increasing atmospheric Co_2 levels, and more frequent and severe extreme Weather events like heatwaves and drought these changes are documented through direct.

(i) Tempexaluar and atmospheric changes:

- **Rising global temperatures-**

Both land and ocean temperatures have increased, with the last decade being the Warmest on record and each decade being Warmer than the last since the 1980s

- **Increasing cos levels:-**

At mes pheric carbon dioxide is about so higher than before the industrial Revolution, a rise primarily attributed to the burning of fossil fuels.

(ii) Ice and sea level changes:-

- **Melting Ice:-**

Glaciers have been losing ice for decades and the Arctic has seen a significant decrease in sea ice coverage.

- **Rising sea levels :-**

Global average sea level has risen by 8-9 inches since 1980 and the rate of rise has accelerated.

(ii) Extreme Weather and Ocean Impacts:-

- **More frequent and Intense extreme weather!**

Climate change is linked to more frequent and intense heatwaves, wild fires droughts, and floods.

- **Ocean changes :-**

The ocean are Warming, becoming more acidic and experiencing reduced oxygen levels.

- **Changes in precipitation:-**

Rainfall Patterns are changing with some regions experiencing more precipitation and others less.

(iv) observable blological and physical changes-

- **Earlier snowmelt :-**

Snow is melting earlier in the Northern Hemisphere.

- **Permafrost thaw.**

Further Warming is expected to increase permafrost thawing.

- **Changing in ecosystems:-**

These changes are affecting ecosystems and people who rely on them leading to impacts on food security, health and migration, says the UN.

6 Indias Contribution to Global GHE Emission

India share of global greenhouse gas (GHG) emissions was approximately 7.41. To 7.8 % in 2023, ranking it as the third. Largest Emitter after china and the united states. While to its total annual emissions are high, India's per capita emissions remain significantly lower than the global average, and it's historical contribution. To cumulative global emissions is about 4%.

I) Current and historical share-

India's share was about 7.8% in 2023 according to Business Line and around 7. 47. Of Co2 emissions from Combustible fuels in 2022, according to the IEA.

Ii) Historical Share :-

India’s Historical Cumulative Share of Emissions is around 4% to 4.6% a much smaller figure than its current share, due to the high emissions from developed countries very much longer period.

(iii) Per Capita emissions :-

Indias per capita emissions are significantly lower than the world average at approximately 1.85 to 2.9 tonnes this is largly because of its large population.

(iv) Other key facts :-

1. Third larger emitter :-
   India is the third largest emitter of ghgs in the world.
2. Decoupling emissions and growth ;-
   Between 2005 and 2020 India reduced its Gdp emission intensity by 36% showing a trend of decoupling economic growth from emission growth, says business standard.
3. Climate Policy :-
   India has committed to low Carbon development and has implemented policies like the Energy Conservation act wich mandates a minimum share of non fossil fuel energy.

Table 1 – Distribution of GHG Emission from India (Sectoral Distribution of CO_2 equivalent Emission)

Sectors	**Percentage**
Agricultural	(13.72)
Industrial Process	8.06
Waste	2.56
LULULF	1
Energy	75.66

Source: India's National Communication to UNFCCC, 2020.

Table 2 – Gas by Gas Emission Distribution

Gas Emission	**Percentage**
N_2O	4
CH_4	31
CO_2	65

Source: India's Initial National Communication To UNFCCC, 2020.

6. Social, Political and Economic Challenges

India faces an array of formidable existing social, economic, and political challenges such as poverty, low standards of health, and low agricultural productivity that will most likely be intensified by the effect of climate change. While experts are uncertain how climate change will affect India, it is likely to result in increased competition for scarce resources; increased stress on economic, social, and political systems across the board; and greater risk of extreme disruptive events such as severe droughts, floods, or storms.

7 Overall Socio-economic Challenges

1. Poverty

Indians consider poverty the most severe and pressing social challenge to the conntry. India has achieved significant success in combating poverty beginning in the early 1980s. Almost sixty percent of the Indian population lived in poverty in 1980. While anti-poverty programs have helped; the key to bring down the incidence of poverty on a sustained basis has been rapid growth. During the last five years (2003-08), the per capita growth rate has been as high as 7.3 percent. Despite the significant improvement, about one-third of the population (about 400 million people) live on less than a dollar a day. India is thus home to the world's largest number of poor people and climate change is likely to significantly increase the proportion of Indians living below the poverty line. Natural calamities such as floods, heavy rains, and droughts will most adversely impact poor population that is less able to protect themselves from the vagaries of nature.

2. Inequality

Paradoxically, while India is intensely stratified culturally and economically, inequality receives a great deal less attention in India than in the international community as a whole. The focus in India is on growth rather than distributive justice. Impending climate change may focus much greater attention on inequality. The impact of climate change in India will be distributed very unequally.

3. Public Helath

The relationship between climate change and health outcome is complex. If temperature rises in warmer parts of the country, heat waves may become more intense and longer lasting, resulting in increased incidence of heat stroke and related diseases. Warmer climate also worsens air pollution and increases the potency of airborne diseases. Floods and droughts may lead to water contamination and worsen insanitary conditions. Increasing incidence of diseases such as malaria or dysentery. The government is behind the curve in addressing public health problems. Corruption and inefficiency have been ongoing problems in the healthcare system as well as in other social services such as education.

8 Agricultural Challenges :-

India's agricultural sector-considered the Achilles heel of the Indian economy-faces a major systemic crisis even without additional stress from clime change. Despite the Green Revolution, significant portions of the agricultural sector are locked in a labor-intensive, inefficient and marginally productive model that is increasingly not viable. To compound the problem, this already stressed sector will suffer the greatest direct impact from climate change. Agriculture generates less than 18 percent of India's GDP, and this figure is rapidly declining. The decline in the economic importance of agriculture as the industrial and service sectors have expanded is misleading when considering the impact of climate change.

(i) Food Security :-

Gains in productivity from India's successful Green Revolution allowed India's to achieve self-sufficiency in food, a source of great national pride. Nevertheless, projected climate change impact will put pressure on India to make more effective use of its comparative advantages and turn away from self-sufficiency and towards crop specialization and trade on the international markets to maintain its food security. If such a transition does not being early and achieve success. India could once again face acute food shortages due to more frequent disruptions and overall decline in agricultural productivity as a result of climate change.

(ii) The Rural Labour Surplus

Once food security occurs, the principal problem for Indian agriculture was to determine what to do with India's enormous excess rural population. Industry and services will have to take over as the mainstay of Indian employment, but will take time to expand to meet that challenge. In the near term, agricultural employment has to be maintained at high levels in order to keep the migration of labor into urban areas to a rate that Indian industrial expansion can accommodate. The surplus of rural labor has therefore favored the persistence of small, labor-intensive traditional farms. This keeps a large-than-optimal population in areas at risk from climate change.

(iii) Flooding

Flooding generated both by increases in runoff from melting Himalayan glaciers and more frequent severe storms will pose a major threat to India's heavily populated river plains. In low-lying coastal areas, rise of sea level and storm surges will create similar challenges, with the added dimension of saltwater intrusion rendering soil infertile.

(iv) Droughts and water Scarcity

In the long terms, glacial melting will reach a tipping point where increased river flows from runoff subside, replaced by serious water shortages as the smaller ice mass provides less water to feed India's rivers. In addition, India will face more frequent and severe droughts long before the transition to sustained water scarcity.

(v) Energy Challenges

Just to maintain its current growth rate, India will need to more than double its energy consumption by 2020. The bulk of India's energy comes from fossil fuels, and India is poised to become a major contributor to global warming as emission from power generation, industry, and transportation increases. Climate change will impact India's energy needs in several respects. Temperature increases and migration into urban areas can be expected to generate increased demand for electricity and other forms of energy, which is already growing as India's economy grows and becomes more industrial. Climate change will reduce demand for winter heating and raise demand for summer cooling. Hydroelectric capacity could be substantially reduced by a diminution of river flows, reducing the potential for it to substitute for fossil fuels in power generation. Some studies suggest climate change may adversely affect the efficiency of power generation and transmission. In addition, climate change mitigation policies such as caps on emission and the necessity of developing cleaner energy production could impose greater constraints on the expansion of energy production in India.

(vi) Urban Challenges

India's cities will face increased challenges from climate change, although the direct effect on India's cities and towns may be less disruptive than those on rural areas. Overcrowding and poor air qualities are already serious problems in India's cities, and these challenges will be worsened by climate change.

9 Future Direction

Climate variability and change will have significant implications for agriculture, infrastructure, and environment and energy security, all of which will impose additional development burdens on economies. There are thus strong reasons to better integrate climate risks into project design and policy operations. The ability to respond to these risks depends crucially on the reliability and availability of local information, since developing climate risk management approaches will have to be tailored to fit local conditions. The future adaptation to include continuing support for programs that help the region better adapt to historical climate variability, as well as for anticipated climate change. However, there remain substantial gaps in understanding climate impact in the vulnerable zones in countries of South Asia.

10 Suggestions

Use energy efficient electric appliance

Efficient appliances save energy and money. In India, appliances like refrigerators and acs have efficiency rating labels ranging from 1 to 5 stars, the higher number being more efficient.

- **Use an energy efficient computer**
  Buy a laptop instead of a desktop. It consumes five times less electricity. If you buy a desktop, get an LCD screen. Switching off a computer extends its lifetime. Minimize printing.
- **Drive Less**
  Walk, join bike carpool or take public transport. You'll save 1.5 kg of carbon dioxide for every 5 km you don't drive. Switch off your car if you want to stop for more than two minutes.
- **Check Your Tyres**
  Keeping your tyres inflated properly can improve the fuel efficiency of your care, Every litre of petrol saved keeps 2.5 kg of carbon dioxide out of the atmosphere. Using radial tyres will help you save 3 to 7% of fuel.
- **Use Water Carefully**
  Don't waste water. Try to harvest rainwater in your locality. It takes a lot of energy to heat water. Use less hot water and use efficient heating appliances.

Say no to Plastic

Take a cloth bag with you for shopping. Use recycled paper. Avoid products with a lot of packaging.

- **Move your Air-conditioning thermostat up 2 degrees**
  You could save about 900 kg of carbon dioxide a year with this simple adjustment. Set the thermostat of the room air conditioner at 25°C to get the most comfort at the least cost.
- **Use renewable energy**
  Sunlight can be used in many different ways to save energy. Use solar water heater instead of an electric geyser. A 100-litre solar water heater can save around 1500 units of electricity every year. For lighting, use batteries that can be charged with sunlight. A solar cooker cooks rice and vegetables without losing their essential nutrients. Just leave the solar cooker outside in the sun to cook food.
- **Plant more Trees**
  A single tree will absorb one tonne of carbon dioxide over its lifetime.
- **Turn off electronic devices**
  Simply turning off your television, stereo, computer, fans, and lights when you are not using them will save you thousands of kilograms of carbon dioxide a year.
- **Reuse and Recycle**
  Recycling and re-using products like paper and bottle will help protect the environment. Use recycled paper. Recycle your office and household waste.

11 Conclusion :-

In such a scenario, where national security, carbon market and growth rate oriented economic development seem to occupy the attention of all, health as a crucial human security indicator found passing ritual mention on less than a dozen times even by the most ardent advocates of climate change at the Security Council. This is despite the fact that undeniably diseases of poverty are a bigger challenge than the possible adverse climate change induced health related problems. Once again inverted reasoning seems to be at work by suggesting that like economic development if an effort to combat global warming is undertaken future impoverished conditions of majority of the population can be ameliorated turning a blind eye towards the present poverty. If we do not incorporate such measures as suggested in Alma-Ata Declaration into the planning and development process instead of pursuing half hearted measures like UN Millennium Development Goals, the perilous collision course with the very environmental health conditions that give us life will continue.

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