

India and Climate Change: Are We Fighting a Lost Battle?

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Abstract

India is among the fastest growing economies and the third largest emitting country in the world but has always held the onus of climate change on developed countries for their historical emissions. It has been a global scenario of increasing intensities of flood and droughts, and increasing sea level, so it is high time that adaption measures to fight climate change is sought out. Since the Paris climate negotiations in 2015, India's tone of dialogue has changed considerably. There are several policies being implemented in by the Government of India related to the climate change such as Pradhan Mantri Ujjwala Yojana (PMUY), Unnat Jyoti by Affordable Lighting for All (UJALA) etc whose implementation is tackling climate change in its own way. Climate change which was seen as threat in India is now being viewed as a business opportunity in the form of investment in renewable energy. Currently, the push towards renewable energy, with a focus on solar parks is being looked at, policy wise, as a measure to mitigate emissions.

Keywords: Increasing sea level, policies implementation, renewable energy, pollution mitigation

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INTRODUCTION

Climate change is one of the most important global environmental challenges facing humanity with implications for food production, natural ecosystems, freshwater supply, health, etc. According to the latest scientific assessment, the earth's climate system has demonstrably changed on both global and regional scales since the pre-industrial era. Further evidence shows that most of the warming (of 0.1°C per decade) observed over the last 50 years, is attributable to human activities [1]. India is both a major greenhouse gas emitter and one of the most vulnerable countries in the world to projected climate change. The country is already experiencing changes in climate and the impacts of climate change, including water stress, heat waves and drought, severe storms and flooding, and associated negative consequences on health and livelihoods. With a 1.2 billion but growing population and dependence on agriculture, India probably will be severely impacted by continuing climate change.

Moreover, potential climate impacts in India are severe: sea level rise, changes in the monsoon, increased severe storms and

flooding, more drought, and severe water stress. Recently, climate variability in the form of floods and cyclones has resulted in destruction of crops, property and infrastructure, as well as in negative impacts on human health and well-being. All of these impacts set back general socio-economic development. Rural dwellers' continuing dependence upon agriculture for food and livelihood (17.5 percent of gross domestic product (GDP) and more than 60 percent of the labour force) [2] makes the Indian people particularly vulnerable to climate variability and change.

IMPACT OF CLIMATE CHANGE IN INDIA'S SOCIO-ECONOMIC CONDITIONS

India is a large developing country with nearly 700 million rural population directly depending on climate-sensitive sectors (agriculture, forests and fisheries) and natural re-sources (such as water, biodiversity, mangroves, coastal zones, grasslands) for their subsistence and livelihoods. Further, the adaptive capacity of dry land farmers, forest dwellers, fisher folk, and nomadic shepherds is

very low [3]. Climate change is likely to impact all the natural ecosystems as well as socio-economic systems as shown by the National Communications Report of India to the United Nations Framework on Climate Change (UNFCCC).

The latest high-resolution climate change scenarios and projections for India, based on Regional Climate Modelling (RCM) system, known as PRECIS developed by Hadley Centre and applied for India using Intergovernmental Panel on Climate Change (IPCC) scenarios A2 and B212 shows the following [4]:

- An annual mean surface temperature rises by the end of century, ranging from 3 to 5°C under A2 scenario and 2.5 to 4°C under B2 scenario, with warming more pronounced in the northern parts of India.
- A 20% rise in all India summer monsoon rainfall and further rise in rainfall is projected over all states except Punjab, Rajasthan and Tamil Nadu, which show a slight decrease.
- Extremes in maximum and minimum temperatures are also expected to increase and similarly extreme precipitation also shows substantial increases, particularly over the west coast of India and west central India.

The climate change policy discussions which is held at a global level now includes the discussion of Sustainable development in it, particularly due to Kyoto Protocol. The generally accepted and used definition as given by the Brundtland Commission is 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' [5]. The concept of sustainable development is however not acceptable to many developing countries since it seems to affect their aspirations for growth and development. Further, sustainable development cannot be achieved without significant economic growth in the developing countries [6].

Three critical components in promoting sustainable development are economic growth, social equity and environmental sustainability. The question often asked is, should the current

economic growth be sacrificed for long-term environmental conservation? Policy makers in developing countries often perceive a trade-off between economic growth and environmental sustainability. However, there is a growing evidence to show that environmental conservation for sustainability of natural resources is not a luxury but a necessity when considering long-term economic growth and development, particularly in the least developed countries. The decline and degradation of natural resources such as land, soil, forests, biodiversity and groundwater, resulting from current unsustainable use patterns are likely to be aggravated due to climate change in the next 25 to 50 years. Africa, South Asia and some regions of Latin America are already experiencing severe land degradation and freshwater scarcity problems [7].

There are many ways to pursue sustainable development strategies that contribute to mitigation of climate change which has become a necessity to combat the climate change. Few examples of it are as follows:

- Adoption of cost-effective energy-efficient technologies in electricity generation, transmission distribution, and end-use can reduce costs and local pollution in addition to reduction of greenhouse gas emissions.
- Shift to renewables, some of which are already cost-effective, can enhance sustainable energy supply, can reduce local pollution and greenhouse gas emissions.
- Adoption of forest conservation, reforestation, afforestation and sustainable forest management practices can contribute to conservation of biodiversity, water-shed protection, rural employment generation, increased incomes to forest dwellers and carbon sink enhancement.
- Efficient, fast and reliable public transport systems such as metro-railways can reduce urban congestion, local pollution and greenhouse gas emissions [8].

EFFECT ON ECONOMIC GROWTH AND DEVELOPMENT

India is one of the fastest growing economies of the world. But the maximum population of India is still dependent on the agriculture in India. The impact of climate change is to be

initially felt in the agricultural sector and associated water availability, with many people affected by lower food productivity (e.g., hunger, malnutrition, and its consequences for education and productive economic life) and burdens on the central and state governments in dealing with smallholders and landless workers who will require assistance. Irrigation facilities in India are not of Global standards and is highly dependent on monsoon. The seasonal rainfall in India has its own problems like it being erratic and uncertain in nature.

Many regions of India already face water scarcity. Climate models predict an earlier snowmelt, which could have a significant effect on agricultural production, especially if the levels of moisture in the soils are reduced during the growing season. The retreat of snow and ice cover in and around the Himalayas is already having a drying effect on these regions [9].

The existing problems of poor farmers, if not addressed in time, will become more acute due to global warming induced climate change. The rate of CO₂ release into the atmosphere has increased by 30 times in the last three-four decades. It is estimated that a 0.5-degree Celsius rise in winter temperature would reduce wheat yield by 0.45 tonne per hectare.

Other effects of climate change are more pronounced. For instance, rise in sea levels, say about a meter by the next century, may displace millions of people. Sea level rise would lead to ingress of saline water and salination of ground water and surface water in coastal areas. Salt-water intrusion in low-lying agricultural plains could lead to food insecurity, further spread of water-related diseases and reduced freshwater supplies. With melting glaciers, flood risks would increase in the near future. In the long term, there can be no replacement for the water provided by glaciers that could result in water shortages on an unparalleled scale. Floods and drought are thus projected to multiply as a consequence of climate change. This will lead to huge crop loss and leave large patches of arable land unfit for cultivation. To sum up it will threaten food security.

STRATEGIES TO COMBAT BY INDIAN GOVERNMENT

At the Major Economies Forum on Energy and Climate in Italy in July 2009, India joined 16 other countries in declaring that the increase in global average temperature above pre-industrial levels should not exceed 2 degrees Celsius. This goal remains somewhat controversial, however, as there is still no clear agreement on how countries will share the burden for reducing global emissions. All countries that are party to the U.N. Framework Convention on Climate Change (UNFCCC) are required to submit periodic "national communications" that report on their carbon emissions and climate mitigation activities. But India, like other developing countries, has not had to submit these reports as regularly or in as much detail as industrialized countries, especially for those actions that are not internationally funded.

While knowledge about the impact of climate change on current water and crop production is still nascent, mitigating and bringing a halt to climate change is not within the capability of one country alone. Hence adaptation strategies by Indian government are more likely to save livelihoods and ensure food security than mitigation strategies.

Published in 2008 by the then-Prime Minister's Council on Climate Change (Government of India), the National Action Plan on Climate Change (NAPCC) aims at creating awareness among the representatives of the public, different agencies of the government, scientists, industry and the community as a whole, on the threat posed by climate change and the steps proposed at the level of India to counter these changes [10].

National Solar Mission

This initiative started in 2010 to promote the use of solar power. In January last year, India achieved 20 GW (giga watt) cumulative solar capacity -- achieving the milestone four years ahead of the target for 2022 originally set in the National Solar Mission. The objective of the National Solar Mission is to establish India as a global leader in solar energy, by creating the policy conditions for its diffusion across the country as quickly as possible [11].

National Mission for Enhanced Energy Efficiency

The initiative was undertaken to promote the market for energy efficiency by fostering innovative policies and effective market instruments [12]. In 2009, it was approved 'in principle' by the PM's Council on Climate Change.

National Mission on Sustainable Habitat

This mission was approved by the PM in 2011 and backed by the Ministry of Housing and Urban Affairs. It aims to make cities sustainable through improvements in energy efficiency in buildings, management of solid waste and shift to public transport.[13].

National Water Mission

This mission is backed by the National Water Policy as well as the Ministry of Water Resources, River Development and Ganga Rejuvenation. It was implemented to ensure integrated water resource management for conserving water, minimizing wastage and ensure more equitable distribution both across and within states.

National Mission for Sustaining the Himalayan Ecosystem

National Mission for Sustaining the Himalayan Ecosystem was approved by the Union Cabinet in 2014. Aimed at protecting the Himalayas, it has mapped institutes and civil society organisations working on the Himalayan ecology for ease of coordination between governmental and non-governmental agencies [14].

National Mission for a Green India

It is also termed as the Green India Mission/Scheme. It aims to protect; restore and enhance India's diminishing forest cover and responding to climate change by a combination of adaptation and mitigation measures [15]. Driven by the Ministry of Environment and Forests, it received the nod of approval from the Cabinet in 2014 [16].

National Mission for Sustainable Agriculture

National Mission for Sustainable Agriculture has been formulated for enhancing agricultural productivity especially in rain-fed areas focusing on integrated farming, water use efficiency, soil health management and

synergizing resource conservation. Livestock-based farming systems to create sustainable livelihoods in drought prone districts of Andhra Pradesh. The mission got approval in 2010 and has got approval for one of its key missions, National Bamboo Mission, in 2018 by the Cabinet [17].

National Mission on Strategic Knowledge for Climate Change

The mission is driven by the Department of Science and Technology and seeks to build a dynamic and vibrant knowledge system that informs and supports national policy and action for responding effectively to climate change challenges, while not compromising on the nation's growth goals [18].

CONCLUSION

The poor in India are the most vulnerable to climate change. Therefore, greater political and bureaucratic attention is needed to diversify their livelihoods and reduce their vulnerability. This would need investments in sectors other than crop production too. We need to have a significant increase of targeted investments in nutrition programs, clinics, disease control, irrigation, rural electrification, rural roads and other basic investments, especially in central and eastern India.

Administrative capacities are needed to be built for designing climate proof investment. These investments should be for conservation of wetland, wastewater reclamation etc.

Greater and imaginative governmental intervention would also need an efficient and professional administration that is tuned to the emerging but uncertain crises caused by global warming and climate change. However, these new problems cannot be cracked without addressing the long term and often neglected issues afflicting India's smallholder agriculture described in the first part of this paper.

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