

Socio-Economic Impact Of Climate Change In India

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Climate change and its impact are being discussed world-wide. Especially in the context of COP-15 this has become a very prominent issue. India is known for its varied climate and in fact represents almost every type of climate that the world has. Therefore, it will not be erroneous, if we consider the impact of climate change on almost every type of eco-climatic region that India has. Nevertheless, we are also one of the most vulnerable countries to face the calamity of climate change and its impact because of the highly climatic sensitive regions, ill-equipped mitigation systems and high density of vulnerable population.

Popular awareness on the impact of climate change has been increasing since 1960 when a group of people gathered together protesting against a polluting industry in Great Britain. The thinkers and social scientists have recognized the impact of climate change and have started a movement to save the Planet Earth and the life existing on it. The Stockholm Conference in 1972 –

the first international step towards protecting the Mother Nature was undertaken to address the affect of climate change on developing as well as developed countries. After this the various conferences have been held to address this issue which stands to threat the existence of life on this earth.

Climate change and its impact on socio-economic and ecological system has become the biggest challenge for the whole world at the present time The Third Assessment Report of the IPCC (Intergovernmental Panel on Climate Change) emphasizes upon the fact that the impacts of climate change will be more severe for developing countries and the poor people in all the countries. Give the geo-physical conditions, agro-ecological systems and socio-economic characteristic, our country India is more vulnerable for a variety of climate induced stresses. The impacts of this predicament is more less being perceived in different forms in various parts of the country and is no more a distant concern. Climate change will have differential impacts across nations, regions, sectors and societies. There will be gainers as well as losers.

The Inter-Governmental Panel on Climate Change (IPCC) defines climate change as *‘a change in the state of the climate that can be identified (e.g., using statistical tests) by changes in the mean and/or variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity’*¹

India is the seventh largest country in the world with 1.2 billion growing population and the second largest in Asia with a land frontier of 15,200 Km and a coastline of 7,516 Km long (densely populated and low lying), it is a major greenhouse gas emitter and one of the most vulnerable countries in the world to face impact of climate change. This change is exhibited in the form of water stress, heat waves and droughts, severe storms and flooding and above all negative consequences on health and livelihoods. Thus, there is additional stress

on ecological and socio-economic system along with existing pressure due to rapid industrialization, urbanization and economic development.

Climate change in India-

- India uses perennial rivers apart from the monsoon rains, which originate and depend on the glacial melt water in the Hindukush and Himalayan

1 India's Official Statistics on Climate Change – Data needs and availability by Representative of CSO, MOS&PI

ranges. The melting season coincides with the summer monsoon season and any intensification of the monsoon is likely to contribute to flood disasters in the Himalayan region. Rising temperature further exaggerate the risk of floods.

- A warming of 0.5 degree centigrade is likely to be experienced all over India by the year 2030 and a warming of 2.4 degree centigrade by the end of this century. Increased warming is likely to lead to higher levels of troposphere ozone pollution and other air pollution in the major cities.
- Increased precipitation would lead to heavy rains leading to floods. It is projected that agricultural production in India will be adversely affected. Growing emission of aerosols from energy production and other sources may suppress rainfall leading to drier conditions with more dust and smoke and further effect both regional and global hydrological cycles and agricultural production.

FACTORS INFLUENCING THE CLIMATE CHANGE

Although there are various natural forces which are responsible for climate change but there are many important factors which are contributed by human beings on this Earth which are-

- ✓ *Green House Gases(GHG)*
- ✓ *Deforestation*
- ✓ *Land use change*
- ✓ *Energy usage*
- ✓ *Vehicular usage*
- ✓ *Generation of solid waste*

AREAS WHICH ARE VULNERABLE TO CLIMATE CHANGE IMPACT

The three main impacts of climate change are those on agriculture, sea level rise leading to submergence of coastal areas, as well as increased frequency of extreme events. India is second most populated country in the world, where the majority of rural population is still dependent on agriculture for their livelihood and over 600 million farmers are involved in agriculture related activities. “Agriculture and allied activities contribute about 33% to the gross domestic product of India employs nearly 62 per cent of the population. It accounts for 8.56 % of India’s exports. About one third of the cropland in India is irrigated, but rain fed agriculture is central to the Indian economy. Despite technological advances, such as improved crop varieties and irrigation systems, weather and climate are still playing key role in Indian agricultural productivity thereby national prosperity.”²

India has 52% of cultivable land and varied climates. With arable land area of 168 million hectares, India ranks second only to the U.S. in size of agricultural area. India, a developing nation quite vulnerable to climate change, can also cause tremendous impact on world food demand. Though, the demand for food and other agricultural products will rise due to increase in population but millions of small holder and marginal farmers will experience difficulty in

predicting the climate condition. IPCC has estimated a sea level rise of 1 to 2 mm per year globally. In India, a study conducted by Unnikrishanan and Shankar also showed a trend of 1.06 to 1.75 mm rise of sea level per year. No official data is available in India to empirically check the authenticity of these estimated figures.

Due to sea level rise, the fresh water sources near the coastal areas will suffer from salt intrusion and inundation of coastal areas where the

² India's Official Statistics on Climate Change – Data needs and availability
by Representative of CSO, MOS&PI

density of population is high and their dependence on sea for livelihood activities. If a one-meter sea level rise were to take place today, it would displace 7 million persons in India (ADB, 1995). In future many more may be displaced. 35% of the land in Bangladesh would be submerged by a one-meter rise. These countries will not be able to pay for protective measures, tens of millions of people will be displaced in Bangladesh and many of them could spill over into India. Increased occurrence of extreme events due to climate change will also affect the poor most. In the cyclone in Andhra Pradesh in India in 1996, more than 1,000 people died and there was huge property loss. Cyclones of similar intensity in advanced countries like the U.S. may not lead to any deaths and much hardship, due to stable and durable housing and other infrastructure and extended safety net available to the people in distress. Severe storms due to climate change will cause damage to infrastructure and livelihood. The changed timings of the monsoon rain will make the production of food and other agricultural products uncertain.

The welfare of the large chunk of the population will be affected by the climate change and it will undoubtedly act as a force that has the power to change the government, strain the public budget and foster unrest in the country in the years to come.

“Impact of climate change on agriculture will be one of the major deciding factors influencing the future food security of mankind on the earth. Agriculture is not only sensitive to climate change but at the same time is one of the major drivers for climate change. Understanding the weather changes over a period of time and adjusting the management practices towards achieving better harvest is a challenge to the growth of agricultural sector as a whole. The climate sensitivity of agriculture is uncertain, as there is regional variation of

³Climate Change: Data Requirement and Availability,16-17 April 2009,Ministry of Statistics and Programme Implementation,Government of India, Central Statistical Organisation, New Delhi

rainfall, temperature, crops and cropping system, soils and management practices.”³ The inter annual variations in temperature and precipitation were much higher than the predicted changes in temperature and precipitation. The crop losses may increase if the predicted climate change increases the climate variability. Different crops respond differently as the global warming will have a complex impact.

Impact of climate change on socio-economic challenges in India

The most important challenges India is facing today is poverty, reduction in agriculture production (mainly destruction of agricultural land due to urbanization, industrialization and other climatic effect) and frequent disasters because of climate change and vulnerability issues. These arrays of formidable existing challenges will be further intensified by the effects of climate change.

- **POVERTY-**

Poverty is the country’s most severe challenge. Although the country has achieved significant success in overcoming poverty since 1980’s, still 60% of the Indian population lives in poverty. Despite the efforts made towards overcoming this social challenge, about 1/3rd of the population (400

million people) lives on less than a dollar a day. Thus, India is a home to the world's largest number of poor people and the climate change will further increase the proportion living below the poverty line. People in rural area are subject to multiple problems namely- lack of alternative employment, low education, inadequate training that restricts the entry of such people in the organized industrial and services sector. Apart from the above, the population which is dependent on agriculture is not well equipped to protect themselves from the vagaries of nature.

- **INEQUALITY**

Climate change will widen the gap between the two segments of the society-rich and the poor. It will undoubtedly benefit the richer segment of the population. The impact of climate change will unequally be distributed as some parts specially the coastline states will encounter flooding. Other deprived areas where the rainfall is minimal will increase agricultural yield a more suitable for the increased temperature and shift in rain pattern will make it more suitable for food and agricultural production. The climate change will further widen the inequalities of income and distribution and also between the rural and urban inequalities. Cross regional inequalities, regional inequalities will further reinforce existing economic inequalities. For example, increasing flooding may disproportionately impact poor coastal states such as Orissa and droughts may strike in lower per-capita income states such as Uttar Pradesh and Rajasthan. Overall the burden of hardships and natural disaster will fall on the female members of the poor families contributing to increased gender gap.

- **PUBLIC HEALTH**

The increased temperature in the warmer parts of the country results in heat waves which become intense and leads to incidence of heat strokes and other related diseases. Warmer climate worsen air pollution and the potency of airborne diseases. Water contamination due to floods and drought worsen the sanitary conditions and increase the chances of malaria or dysentery.

- **URBAN CHALLENGES**

The trend in urbanization and large scale migration of population from rural to urban areas is leading to large scale growth in urban slums. There is serious lack of civic amenities in cities and towns and lack of sanitation and hygiene is resulting in many diseases and health issues affecting the poor slum dwellers. The growing cost of land in cities is forcing people living in slums in unhygienic conditions in large number. There will be conflict between established urban populations and rural migrants as the employment issue will rise.

The growing urbanization is leading to high growth in generation of household and hazardous waste and resulting garbage related hygienic and sanitation related problems, specially water pollution and land degradation. With likely climate change in future, the rate of migration due to crop failures may increase significantly specially from rain fed agricultural areas.

Floods and heavy rains will sweep away the urban makeshift dwellings and the glacier melt down and rainfall shift pattern will reduce the supply of drinking water and the increased migration will increase the demand. In a way severe rural challenges will be exported to the cities. A mass migration will displace the urban system-health, transportation, housing, power, water etc.

The Indian agricultural states which are to be affected by climate change are those which have the lowest growth rates and the highest concentration of poor people living. e.g. Uttar Pradesh, Bihar ,Bengal and

Orissa. As agricultural sector becomes more capital intensive, marginal and small farmers will be forced to sell their land.

Impact of climate change on civil society

The climate change will affect the different segments of the economy differently.

- **The poor**

The poor people of the country are least equipped to face the challenge of climate change and there are likely to be the most severely affected by it. The % of landless lab ours rose from 17% in 1961 to 32% in 1991. These people are going to migrate to other areas putting a pressure of its system. The migration will definitely be in the urban areas rather than in other rural areas. The urbanization of poor will concentrate the burden on India's inadequate social services.

- **The middle class**

India's middle class includes people from different religion, caste and region based on income, profession and status aspirations. The burgeoning middle class and the rich in India have tended not to be receptive to environmental tradeoffs. The pressure of migrants from rural areas will be felt by the urban middle class in the form of higher prices, difficulty in accessing the social services etc.

Nearly 700 million rural people in India directly depend on climate sensitive sectors (agriculture, forests and fisheries) and natural resources (water, biodiversity, mangroves, coastal zones and grasslands) for their subsistence and livelihood. Under changing climate conditions food security of the Country

might come under threat. In addition, the adaptive capacity of dry-land farmers, forest and coastal communities is low.

Climate change is likely to impact all the natural ecosystems as well as health. Increase in weather extremes like torrential rains, heat waves, cold waves and floods besides year-to-year variability in rainfall affects agricultural productivity significantly and leads to stagnation/ decline in production across various agro-climatic zones. To mitigate the climate change effects on agricultural production and productivity, a range of adaptive strategies need to be considered.

Some Important suggestions

- Identification of *national and international public policy* measures supporting adaptation responses in regions of India vulnerable to climate change and globalization.
- An effective *data collection mechanism* to identify the areas to be affected and data used efficiently to arrive at results that benefit the society and the world as a whole.
- The *assessment should be done* on the basis of climate data for India by the agro climatic regions
- In India even now about 65% of the agricultural area is under rain fed irrigation and with climate variability, the possibility of droughts may increase in future after two decades. As such there is urgent need to *develop such varieties which need less water* and are more heat resistant as in the desert areas.
- Besides, more efforts are needed to be made for *rain water harvesting* water-shed development to conserve and store water as well as by using crop cycle to use soil moisture effectively. It reduces the impact of droughts and increase availability of water and power for irrigation and other uses besides for inland water

- *Use to bio technology* in different crops and food production
- Changing cropping calendars and pattern will be the immediate best available option like introducing new cropping sequences, late or early maturing crop varieties, etc.
- Adequate emphasis may be placed on *documentation of appropriate* regulation of markets in commodities and environment and eco-friendly consumption, accessible and sustainable health care practices;
- The *information on World economic and environmental conditions* may be regularly disseminated;

The availability of the information as proposed above at the national and state level would enable the country to effectively face the challenge of Climate Change and safeguard the interests of the different sections of the society.

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