

Climate Change Effect and Mitigation- Global Initiatives versus Local Action

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ABSTRACT

Climate change phenomena have now become the greatest concern not only of regional boundaries but also at the global level, causing flooding, drought, temperature rise, sea level rise, cold attack, etc. at the same time in different parts of a country; posing every threat to the sustainability of the ecosystem, development, etc. especially in the developing country. The effects of climate change are proving to be disastrous in some part of a country. In spite of the greater concern and step taken through policies and framework by the global agencies, very little and the developing countries in mitigating the effect of climate change have taken limited actions. This paper discusses the global initiatives undertaken by the global agencies and developed countries across the world and actions initiated at the local level. By analyzing the gap between the initiatives and actions, this paper also tried to put-forth some suggestions to achieve the mitigation target.

Keywords

Climate Change, Mitigation, Green House Gases, United Nation, Declaration, Carbon Emission, Sustainable Development

1. INTRODUCTION

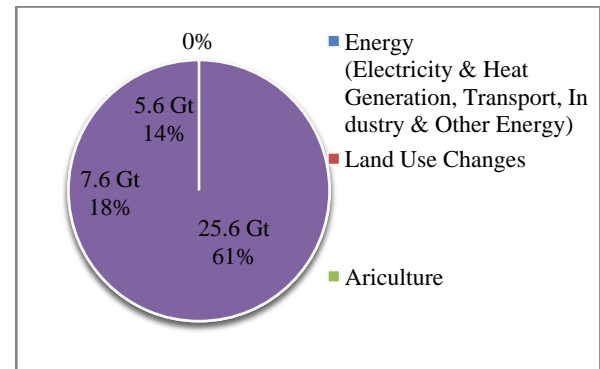
The major concern about an environment protection began in early 1970 with an international conference of environment & development, focusing on global environmental pollution and its effect on global climate.

The climate change is the combined effect House Gases fort of man & machinery. The emission of Green House Gases led to rise in the earth temperature, which, in-turn is responsible for many ill effects. It is estimated that developed countries alone are responsible for rise of 6.8% of emission of GHGs causing major contribution towards rise in global temperature.

According to the magazine the Nature Conservancy, the global temperature has increased by 1°C in the 20th century.

Furthermore, the Arctic Climate Assessment Report says that Alaska, Western Canada, & eastern Russia have witnessed around 3 to 4 c temperature rise in last 50 years.

The effect of Climate Change has been severely experienced by a developing country. As per the climate change facts & statistics magazine, Transport, Agriculture, Thermal Power Generation & Industrial sector are playing major role in GHGs emission. The magazine also reported that deforestation is responsible for almost 15% of CO₂ emission in the world.



Source: [1]

Fig 1 GHG Emission

The temperature rise is not the only effect of Climate Change but it is also supplemented by flood and drought in parts of the world. Extreme rainfall can also be related to climate change effect. It may affect the global food production, which will make it more complex to fight against it. The effect may also cause submergence of coastal land due to rise in water level in large water bodies.

India, in its attempt of economic development post liberalization in 1991 is now facing the heat of Climate change. The Indian economy is largely depending upon rainfall & Climate change effect is experiencing appreciable change in monsoon pattern. A report says that in last 100 years, there is an increasing trend of 10 to 12% along North-West region and West coast & Andhra Pradesh. Also, it shows decreasing trend from 6 to 8% in the last 100 years along North eastern India, parts of Gujarat, Kerala, eastern MP. Although, India's contribution in the emission of GHG gases is very low but, being fastest growing economy, the entire world is looking it cautiously, not only in terms of emission of GHG gases, but also its contribution to carry and support the climate change mitigation initiatives undertaken by the world.

2. CLIMATE CHANGE MITIGATION GLOBAL INITIATIVES

Essentially, the climate is ever changing phenomena since the birth of the earth; however, its adversity is a combined effect of man and machinery through the process of their development. The pollution level, after the industrialization in the late 17th century, was high enough to attract the attention of scientist world over and that led to first major combined international effort in containing the pollution level in the atmosphere; thereby, preventing adverse change in the climate. Therefore, The UN Conference on Human

Environment organized in the year 1972 in Stockholm. The conference adopted a theme of sustainable development process to protect the environment from pollution. The conference also stood as a foundation stone of United Nation Environment Program (UNEP). The conference led to resolve three action plans, which emphasized on:

1. The Global Environmental Assessment Program widely called as 'Earth Watch'
2. The Environment Management Activities; and
3. International Measures to support the above two action plans.

Subsequently, international community threw their more seriousness in taking action on environmental protection and thus to prevent adverse climate change phenomena. One such conference was organized in May 1982 at Kenya, which is, later named as the Nairobi Declaration [1] wherein urgent and intensifying efforts were felt necessary in fighting the rising menace. Similarly, in October 1982, the UN General Assembly (UNGA) adopted 'The World Charter for Nature' and first time drafted the guiding principles of environmental conservation, protection and implementation of the entire action plan there for. Later, in the year 1987, based on the UNGA resolution in 1983, The World Commission on Environment and Development was constituted under the leadership of Mrs. Gro Bruntland to suggest legal principles based on Stockholm and Nairobi Declaration and report of the same was submitted to the UNGA.

In an attempt to protect Ozone layer, stated to be depleted due to emission of GHGs, Vienna convention was organized in 1985, which established the platform for global multilateral undertakings in protecting the environment responsible for ozone layer depletion and other adverse effects. Immediately thereafter, 47 countries signed a protocol including European Community and USA at Montreal Conference in 1987 held under the aegis of UNEP [1]. The Montreal protocol draft, that signed by the member countries mentioned the specific obligations to control the use and emission of CFC. It also practiced the financial motivation from the developed countries to the developing countries for doing so.

The second most important step taken in climate change mitigation program was the Rio Summit held in 1992 at Rio-de-Jenerio, Brazil [1]. The conference essentially addressed all the important elements of environment system and biodiversity protection by way of the declaration that consist of 27 principles dealt with the rights and responsibilities of the countries. The summit is widely known for its 'Blueprint on Sustainable Development' adopting the Agenda 21 comprises of global document specifying the comprehensive action plan for the 21st century to resolve the issues of present and future.

Another milestone effort was taken in the form of organization of the convention called as the United Nations Framework Convention on Climate Change in 1992 in which 154 countries signed the pact on preventing the climate change by taking rigorous steps. After a long deliberations, it was resolved that till the year 2000, the GHGs emission were to reduce at the 1990 level. The Table below shows the CO₂ emitted by the few countries

Table 1 Energy Related Cumulative Co₂ Emission [2]

Country /Region	1990-2006 (CO ₂ in Mn Tonnes)	1850-2006 (CO ₂ in Mn Tonnes)	1990-2006 (%)	1850-2006 (%)
World	400834	1150702	100.0	100.0
India	15977	27433	4.0	2.4
China	61360	99204	15.3	8.6
Brazil	4925	9457	1.2	0.8
USA	92641	333747	23.1	29.0
Europe	55377	252148	13.8	21.9

The next significant step of world countries was the adoption of The Kyoto Protocol in 1997 within the ambit of the UN Framework Convention on Climate Change [4]. The protocol stressed upon the developed countries to stick to the reduction of GHG emission at least by 5% of what it was in the year 1990 by putting an efforts individually or jointly. It was the protocol, wherein the Carbon Credit System was introduced and the countries. The member countries can reduce the overall pollution and can claim the Carbon Credit. A country can sell or purchase the Carbon Credit for its development planning. This system encouraged the countries to reduce the polluting gases.

Later, the world recognized the importance of respecting the nature and included as the Fundamental Values of the United Nation's Millennium Declaration, which held in New York in September 2000 [1]. The declaration resolved to intensify the efforts at the global level to save the forest, water resources, and bio-diversity by adopting the right strategies and sustainable approach in the development. It was also considered as the soft law.

Looking at the expiry of the Kyoto Protocol on 2012 and content of the UN Millennium Declaration 2000, to obtain the long-term cooperative action among the member countries, Copenhagen Conference was called on December 2009 [1, 7]. The conference formulated legally not-binding framework called Copenhagen Accord. The accord resolved to keep increasing in the global temperature due to GHG emission below 2 degree Celsius as a short-term goal and below 1.5 degree Celsius as a long-term goal until the year 2050 by reducing the GHG emission by 50% of what it was in the year 1990. Although, the entire world is striving hard to reduce the adverse effect of GHG emission and related activities on climate change, the actual results will be visible only when the efforts get converted in actual implementation at local level i.e. country specific. Therefore, it is the responsibility of every country to act locally with a significant approach in implementing the initiatives taken at the global level.

3. CLIMATE CHANGE: INDIAN PERSPECTIVE AND RESPONSE

Undoubtedly, India is also reeling under the threat of climate change effect. Being the agrarian country, the agricultural production is getting affected year-by-year due to uncertain climate and unpredicted monsoon pattern [11, 12]. It is posing the un-calculated threat on country's food stock and food security [8, 14, 15]. The temperature gradient in India has increased to the worst condition and the seasons have

almost shifted by a month or two thereby posing health problems, inflation, and economic losses [10]. Therefore, to adopt strong approaches to fight against the menace of climate change is inevitable for India too.

UNDP Report with a specific reference to the Indian rivers is giving an alarming situation. Few noting have been briefed below:

- The flow of the Indus, which receives nearly 90% of its water from upper mountain catchments, could decline by as much as 70% by 2080.
- The Ganges could lose two-thirds of its July–September flow, causing water shortages for over 500 million people and one-third of India's irrigated land area.
- Projections for the Brahmaputra point to reduced flows of between 14 & 20% by 2050

In response to the global initiatives, India too is making efforts in the adverse effect of climate change, however, not very much significant against the present conditions [9]. In continuation of the global initiatives, Tata Energy Research Institute (TERI) convened The Delhi Sustainable Summit in February 2002. The summit emphasized on Clean Development Mechanism under which sustainable development activities [6] were wooed from the private parties as a foreign direct investment. It was resolved that sustainability has to match appropriately with the basic needs of the poor, but it should not hamper poverty alleviation, which is the uphill task of the Indian government. The outcomes of the summit served as the recommendations to the world summit on sustainable development held later in Johannesburg in August 2002. Another conference was organized by the International Law Association, New Delhi in April 2002 [1] to discuss the legal aspects of sustainable development, especially in the context of developing countries striving for poverty alleviation. The declaration of the conference was, later, submitted to the UN Commission for Sustainable development through its General Secretary.

Some of the local actions have been taken by the ministry of water resources, government of India. They are:

- Central Water Commission (CWC), being the main organization for the hydrological data collection on the major river basins in the country has analyzed the flow trends in important Indian Rivers to study the effect of Climate Change effect on the same. A Climate Change Cell has started functioning in the CWC under Chief Engineer, P&D with seven Director Level Officers as members.
- Brahmaputra Board: The Board has created a Climate change Cell for taking up the related works. However, it has intimated that no work has been carried out by the Board so far in respect of Climate Change issues. The Board has submitted data availability, periodicity and procedure for dissemination; manpower and other resource availability.
- National Remote Sensing Agency (NRSA) has intimated that “Seasonal snowmelt runoff forecasting in Sutlej basin” is a ongoing work taken up by the Agency; The Agency has submitted data availability, periodicity and procedure for dissemination; manpower and other resource availability

- National Water Development Authority, Government of India (NWDA) has intimated that no work has been carried out by the Agency so far in respect of Climate Change issues.
- National Institute for Hydrology (NIH) has done substantial work in the field of Glaciology and snow-melt over the years. It has submitted information about manpower and works done, reports/papers published so far The Institute has created a Climate change Cell for taking up the related works. Officers of all three Climate change cells meet frequently for better coordination and information exchange.
- Central Ground Water Board, Government of India (CGWB) has intimated that no work has been carried out by the Board so far in respect of Climate Change issues. However necessary inputs on groundwater component in 26 Ganga, Brahmaputra & Indus River Basin for studies on the aforesaid subject will be provided by the Board.
- Survey of India (SOI) has intimated that no work has been carried out on the subject matter and no manpower can be spared due to acute shortage of staff.
- Wadia Institute of Himalayan Geology (WIHG) has done substantial work in the field of Glaciology and snow-melt over the years. It has submitted information about manpower and works done, reports/papers published so far.
- Geological Survey of India, Government of India (GSI) has done substantial work in the field of Glaciology and snow-melt over the years and is carrying out a scientific assessment on the recession of glaciers. It has submitted information about manpower and works done, data availability, reports/papers published so far.
- G. B. Pant Institute of Himalayan Environment & Development: has done substantial work in the field of Glaciology and snow-melt over the years. It has submitted information about manpower and works done, data availability, reports/papers published so far.

Although, the GHG emission [13] in India, as compared to the developed countries is significantly less, but it must be kept in mind that the Geo-environmental conditions in India are so vulnerable to even small increase in the GHG emission and rise in the ambient temperature. It is, therefore, utterly necessary to take significant measures in controlling climate change phenomena.

4. INDIAN APPROACH-A MUCHNEEDED STEP

In the context of the present climatic disturbances in the country, India really needs a stronger approach to combat the climate change effect. A strong constitutional provision in different aspects of environmental protection and exploitation of natural resources may help India managing its pollution and resources too. India must work towards overhauling of the agriculture policy and technical input in the field of cultivation process, which constitutes the major share of the carbon emission [14]. This will ensure the desired agricultural production and food security. It will also

achieve significant reduction in CO₂ whose advantages can be claimed in its Industrial Policy. A strong legally reinforced policy required adopting non-conventional energy resources such as solar energy and deviation in this regard may be made to attract heavy climate change cess. Afforestation [5] to stop desertification is one area that India needs to act relentlessly with a aim of not only plantation but also in the survival of the trees. This will ease the pressure on ambient atmosphere and will help in reducing the temperature rise.

The country needs effective management system of its water resources to reduce the exploitation of the sources and increase the carbon sinking efforts. It will also help in replenishment of natural sources as well. Reduce in the waste generation and utilizing it to the useful commodity. India should align the corporate sector for fighting the menace of climate change through Corporate Social Responsibility by making a law for compulsory CSR activities with at least 2% percent of their profit after tax amount. The proposed actions needs to be implemented with a stronger commitment and stringent monitoring will definitely lead India to sustainable country with a improved climatic conditions conducive to its development and economic growth.

5. CONCLUSION

Although, the world agencies and United Nation is taking significant initiatives and making it to happen around the globe, the actual results will be visible only when the initiative are supported by a strong and committed action of each country through its strong legal framework and community participations but, in case of India, it is yet to achieve this. India is a large and developing country having many of its growth sectors are climate dependent. And definitely, under the realms of Climate change scenario, the potential growth sector may get affected. Therefore, India needs to steps in this regard with profound consultation, collaboration and scientific advancements..

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