Equity and Climate Change

Perspectives of the developing countries with particular reference to India

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INTRODUCTION

Equity and Climate Change

United Nations Framework Convention on Climate Change (UNFCCC) which is one most important international environmental treaty includes equity as one of its basic principles. It states that "the Parties (to the Convention) should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead incombating climate change and adverse effects therefore..... lack of full scientific certainly should not be used as a reason for postponing such measures, taking into account. Further in the Convention the developed country Parties accepted commitment to take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of or access to environmentally sound technologies (ESTs) and know-how to particularly developing country Parties to enable them to implement the provision of the Convention, including the adaptation. The position taken by the developing countries in this regard is that their contribution in the Convention depends on credible implementation of these commitments by developed countries.

Climate Change and poverty eradication, social and economic development in developing countries

On equity, the Convention further brings out that this important international environment treaty is not merely for stabilisation of the concentrations of the greenhouse gases (CO_2, N_2O, CH_4) particularly in the atmosphere, poverty eradication, economic and social development in the developing countries are also central though implicit in the Convention.

India's perspective on climate change

At this stage while discussion India's perspective on Climate Change, it may be worthwhile to recall some of the views heard during COP 6 at The Hague. John Prescott, Deputy Prime Minister of the United Kingdom in his address in the COP 6 pointing to sandbags placed on the podium and outside the Conference Center at the Hague said "the sandbags which were placed here yesterday were systematic to

people in my country. Two weeks ago much of my country was under water..... it was only thousands of these sandbags that saved York. This was a "wake-up call"..... we created the mess, we must pay..... I am aware many developing countries like India, China, South Africa are already limiting their emissions..... for sustainable development....."

Poverty and Population

India's population reached the one billion mark in May this year (2000), with a population density of 267 persons per km^2 and a substantial number living below the poverty line. Out of the 500 million people living in absolute poverty in South Asia, India alone has as many as 360 million people below poverty line (defined as per capita earning less than one dollar a day). Even those who have some income may not have access to basic amenities. Many in India live not only without safe drinking water, sanitation, and medical care, but also without homes. **Sustainable livelihoods need to be created in millions**. Around seven million jobs need to be created every year. Added to this, education facilities need to be provided to all children. In 1995, 48 percent of the adult population in the country was illiterate. Lack of education of such a large percentage of the population makes the situation still worse. India nees a huge investment in the field of education. Promises made by the industrialised countries to transfer goods to developing countries to address to sustainable development in the Convention and Agenda 21 have not been met yet.

Climate Change and Economic Growth

Against this backdrop, poverty alleviation, socio-economic development and environmental protection are the overriding sustainable development goals of India. To meet these goals, India needs rapid economic growth to fulfil the aspirations of the people. But this growth should not occur at the expense of India's environment as has happened in the past. The environment has inherent linkages with climate. The earth's climate is a complex system, resulting from an aggregated interaction of many components such as the ocean, the atmosphere, human beings, and living organisms like forests and the bio-diversity. The earth's climate has changed over the millennium, but what is causing concern is the projected rapid rate of change in the earth's climate due to increased human activities like energy use, industrial processes, agriculture and land use, land use change and forestry.

The Second Assessment Report of the Intergovernmental Panel on Climate Change (IPCC, 1995) has clearly brought out that the balance of scientific evidence suggests a discernible human influence on global climate change.

Climate Change Convention : India's proactive role

The Climate Change Convention is not merely meant for the stabilisation of the concentration of greenhouse gases (GHGs) in the atmosphere; **poverty eradication and economic and social development in the developing countries are also central, though implicit, in the Convention.** This is also reflected in Agenda 21.

Unless it can be demonstrated that certain policies will generate short and long term benefits for the environment (both national and global), and also address the core issue of poverty alleviation, developing countries like India will find it difficult to convince people to divert their meagre resources to climate change programmes and policies. **While it is true that climate change is not a priority area for developing countries, India has adopted a pro-active role in all international climate change initiatives and negotiations and is a signatory to the UNFCCC. In its development strategy, India has pursued measures which also address climate change mitigation.** India's strategy to contribute to global efforts **to reduce the risk of climate change** is in accordance with its common but differentiated responsibilities, capabilities, and socio-economic conditions as enunciated in the Convention. India is aiming to (i) develop institutional capability to formulate, assess and implement economic, social and technical responses to climate change; (ii) focus on transfer and adaptation of new environmentally sound technologies and (iii) integrate sustainable development with the national development programmes.

India's Vulnerability to climate change

Vulnerability of a system to climate change is defined as the extent to which climate change may damage or harm a system. It depends not only on a system's sensitivity but also on its ability to adapt to new climatic conditions. **The vulnerability of a system increases as its adaptive capacity decreases.** India's agriculture, water resources, coasts and islands, and population health are vulnerable to climate change.

It has been said that Indian agriculture is a gamble with the monsoon, thereby emphasising the interrelationship and linkages between agriculture and climate change. Climate change will have adverse impacts on food production. Agricultural research in India must lead to the discovery of varieties that can withstand adverse climatic conditions and thus meet the demand for food grains in the country.

Water resources are already scarce in many parts of India. Global warming and climate change may add additional stress to this scarce resource. India, however, utilises only a fraction of water from rains and from the melting of the Himalayan glaciers, the rest drains down to the sea. India needs to construct many thousands of check dams with the participatory efforts of the local community to store water during the rainy season for drinking, agriculture and other industrial requirements.

As already mentioned, a very large percentage of India's population lives below the poverty line and is already in poor health due to not only the lack of adequate food and nutrition, but also the affliction of tropical diseases. Human health will be under stress due to global warming and such a situation will exacerbate incidences of malaria, dengue fever, measles etc., and also deaths from heat stroke and scarcity of drinking water. India needs to invest a considerable part of the total plan outlay in the health sector to provide primary health facilities, particularly in rural India where about 75% of the population lives.

Indian coasts and islands

India has a coastline (that is more than 7000 km long) and islands with a high density of population, many economic activities and recreation sites, and fragile ecosystems. An all India study on the impact of a 100 cm sea level rise (SLR) on the Indian coast has shown that such a SLR would place 7.1 million people at the risk of displacement or severe disruptions. The SLR scenario puts Goa as the worst hit Indian state, the other two potential coastal states that could suffer large scale losses being the states of Gujarat and West Bengal. To develop an effective response strategy in the event of SLR of such a dimension, India needs to take up baseline studies on the vulnerabilities of economic activities, livelihoods, shelters, agriculture, fisheries, and the fragile ecosystems like the wetlands and mangroves to climate change.

GHG Emissions from India

For improving the quality of life of one billion people, the country must plan and implement rapid economic growth in all sectors of the economy. In doing so, the availability of a reliable, efficient and adequate power infrastructure in the country is very crucial. The power sector in India relies primarily on the thermal generation of power using coal, an indigenous source. Therefore, in the business-as-usual scenario, emissions of carbon dioxide (CO_2) and other greenhouse gases from fossil fuel uses in India are bound to increase. Most of the studies indicate a growth rate of 5.7% of GHG emissions in India from fossil fuels uses in the next 20 years. India, however, emits a mere 2.4% of the world total. When measured on a per capita basis, its energy related CO_2 emissions are a much lower 0.2 metric tonnes of carbon against a world average of 1.15 metric tonnes of carbon.

Estimates of CO_2 emissions (million tonnes of carbon) from India from the burning of fossil fuels (Table 1) show that India's total CO_2 emissions will grow considerably in the coming decades.

Table 1 : Estimates of total CO_2 emissions in million tonnes of CO_2 as carbon (from fossil fuels)

Source	1990	2000	2010	2020
Asia Climate Change Study				
- ADB (July 1994)	153	289	450	-
ALGAS study (Oct 1998)*	139	258	448	780

* *Asia Least Cost Greenhouse Gas Abatement Strategy*

Priority Economic Sectors For Development of India

India, during the past fifty years of independence, has pursued technological and policy options and measures to address its national development needs which directly or indirectly also address climate change mitigation. Some of the priority sectors for India's development are : Energy, Agriculture, Forestry and Building (construction sector).

Energy Sector

Energy is central to economic development. Its expansion and modernisation are critical to India's rapid economic growth. The installed generation capacity has grown from approximately 1300 megawatt (MW) in 1947 to 83,288 MW in April 1996. Total electricity generation in 1995-96 was 380 billion Kwh, a 7.5% annual growth rate over 1947. Despite the increased generation of power over the years, India's per capita annual electricity consumption is about 315 Kwh compared to more than 5000 Kwh in Europe and 17000 Kwh in North America. The demand for power is rising in the country and requires more and more capacity addition. At present, 70-72% of commercial energy is generated by using fossil fuels, mainly coal, and this scenario is expected to continue in the coming decades, posing environmental problems at the local, national, and global levels.

The Government has initiated various short-term and long-term measures for the reduction of GHG emissions from the energy sector. Broadly, two types of options have been identified:

- improvement in energy efficiency through upgrading currently employed technologies
- introduction of advanced technologies that are more efficient or are based on renewable energy sources

The renewable energy sector in the country has made very laudable progress during the last decade. There is significant potential for generation of power from non-conventional energy sources, and a number of technologies which have been successfully harnessed are solar energy, wind power, mini / micro hydel power, biomass gasification and bagasse cogeneration.

Next to electricity generation, transportation is the other major sector utilising oil and natural gas and contributing to GHG emission reduction. In India, the government of Delhi has taken measures by weeding out commercial vehicles more than 8 year old, introducing lead free petrol for vehicles and CNG vehicles, and introducing EURO II standard norms for cars to bring down vehicular emissions.

Forest Sector : Due to deforestation and changes in land-use pattern, the CO_2 emissions from forest sector are projected to increase from 1.5 terra grams in 1990 to 77 terra grams of CO_2 in 2010. The emissions may be brought down through natural regeneration, and afforestation on degraded forest areas and other waste lands.

Agricultural Sector: Emissions of greenhouse gases particularly the non-CO_2 gases such as methane, nitrous oxide, carbon monoxide and nitrogen oxides from the agriculture sector are significant in India. The primary sources are the large agricultural areas, under paddy cultivation and high cattle population in India.

Since GHG emissions from rice paddy cultivation and domestic cattle population are 'SURVIVAL EMISSIONS' from developing countries like India, there is not much scope for mitigation in the near future. However, considerable research efforts and field experiments have been undertaken in India to make changes in the dietary pattern of cattle (use of MVBs etc.) and rice paddy cultivation practices to reduce emissions of GHGs, particularly CH_4 (by frequent draining of paddy fields, reduction in the use of nitrogenous fertilisers and animal manure etc.).

Building Sector: The construction sector in India is estimated to contribute 22% of the total CO_2 emissions from the country. 60% of the CO_2 emissions out of the 22% are from cement, steel, bricks, and lime, which are energy intensive. A study conducted by Development Alternatives has shown that the present housing gap is over 30 million and is growing. Natural resources like clay, slate and timber are in short supply, and the CO_2 emissions from brick-making, which are 17.75 mt (with technology as usual) at present (i.e. 2000) may be reduced to 13.83 mt using best current practices technology, and can be further reduced to 12.17 mt using new technology. In 1990, the brick demand was 45.31 billion, in 2000 it is 61.20 and is projected to be 73.00 and 89.00 billion by 2010 and 2020, respectively.

Therefore, by introducing a new technology like the vertical shaft brick kiln (VSBK), CO_2 emissions from brick making can be drastically brought down from 26.00 million tonnes of CO_2 to 15.3 million tonnes of CO_2 by 2020. This technological intervention reduces the consumption of fossil fuels drastically by as much as 60%.

India's Efforts at abating Climate Change

Developing countries like India do not have any binding commitments to reduce greenhouse gas emissions. Yet, India has initiated several co-ordinated climate research programmes to assess and understand the implications of climate change, and to enable the country to frame regulatory measures and policies. In addition, measures have been taken to identify GHG abatement options and opportunities in the energy, forestry and agriculture sectors for implementation in 1990 - 2020.

Conclusion

In its path to achieve sustainable development and rapid economic growth, India has adopted various policies and technological measures to increase the efficiency of all economic activities in order to conserve resources. In this process, India has not only addressed its prime agenda of poverty eradication but has also indirectly addressed the issue of climate change mitigation.

However, to enable India to take further positive steps, the country would need considerable finance (like in the power sector alone, India would need an investment of $134 billion) and transfer of technology to meet the challenge of development and climate change. **The developed countries must come forward to provide funds and technology as was envisaged in the UNFCCC**.