

**INDIA'S APPROACH TOWARDS CLIMATE CHANGE
NEGOTIATIONS**

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SALMA KOUSER



South Asian Studies

Centre for South, Central, South East Asian and

South West Pacific Studies

School of International Studies

Jawaharlal Nehru University

New Delhi – 110067


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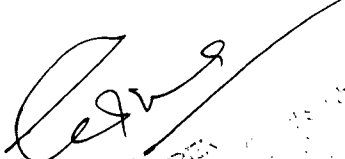
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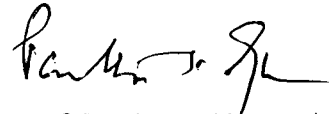
I declare that the dissertation entitled “**INDIA’S APPROACH TOWARDS CLIMATE CHANGE NEGOTIATIONS**” submitted by me for the award of the degree of **Master of Philosophy** of Jawaharlal Nehru University is my own work. The dissertation has not been submitted for any other degree of this University or any other university.


 Salma Kouser

CERTIFICATE

We recommend that this dissertation be placed before the examiners for evaluation


 Prof. Ganganath Jha
 (CHAIRPERSON)


 Prof. Partha S. Ghosh
 SUPERVISOR
 (SUPERVISOR)



Centre for South, Central, Southeast Asian and South West Pacific Studies
 School of International Studies
 Jawaharlal Nehru University
 New Delhi - 110067

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CHAPTER I

INTRODUCTION

Global Climate change is the most serious environmental challenge that the humankind is ever going to face and hence a global collective action is very imperative to solve this global crisis. It will have a tremendous impact on every nation's future. Nations can no longer ignore the catastrophe that is going to take place due to climate change. They have started to occur and have intensified over the decades. The world is replete with examples that is has had to face due to the extreme changes in the temperature.

Though natural climate changes have been taking place from a long time, it has aggravated more after the human-induced climate change (anthropogenic climate change) has emerged with the Industrial revolution taking place and the availability of cheap fossil fuels like coal, oil and natural gas after the World War II has goaded industrialization to take charge more so than ever. What had initially started in the developed industrialized countries has now spread to the developing economies like India, Brazil and China.

Climate change in IPCC Working Group I usage refers to any change in climate over time whether due to natural variability or as a result of human activity. This differs from the usage in the United Nations Framework Convention on Climate Change where climate change refers to a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.¹

Given scientific connotation, the earth's atmosphere contains within itself a large number of greenhouse gases. The prominent greenhouse gases include carbon dioxide, methane, nitrous oxides, chlorofluorocarbons (CFCs), hydro fluorocarbons, ozone, and aerosols.

¹ Report of the Intergovernmental Panel on Climate Change (1996), "Climate Change: Evidence and Implications", *Foreign Policy Bulletin*, March/April 1996, pp 53-76, p 53.

The earth is capable of absorbing the energy from the sun and then radiates back into the space. However, these greenhouse gases trap the sun's energy and this energy is further reflected back to the earth's surface. This phenomenon is called the "Greenhouse Effect" because it is likened to the temperature that is present in the greenhouse, where the temperature is much higher than it is outside due to the trapping of the energy of the sun by carbon-dioxide. These greenhouse gases raise the temperature of the earth and bring about extreme climate changes which are not desirable for mankind, flora and fauna alike.

The primary source of greenhouse gas emissions is the burning of fossil fuels, mainly coal, oil and gas which release carbon-dioxide into the atmosphere, which has been the foremost greenhouse gas responsible for climate change. Other sources of greenhouse gases include methane from agriculture and energy production and distribution, nitrous oxide (N₂O) which is released during agriculture and industrial processes. The sources also include synthetic greenhouse gases² like the hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexachloride (SF₆) from a variety of industrial and consumer uses. The loss of carbon sinks such as forests which do the job of sequestration is also a source of greenhouse gases. It is thus obvious that efforts to curb greenhouse gases emissions potentially involve activities of profound importance to society and the world economy.³

² The inclusion of the three synthetic greenhouse gases categories, HFCs, PFCs and SF₆, was the subject of lengthy debate in the initial climate change negotiations. Because these gases are primarily used as substitutes for the stratospheric ozone-depleting substances controlled by the Montreal Protocol, their emissions have rapidly grown since 1990 and are projected to continue to grow. Unfortunately from a climate change perspective, these gases are potent greenhouse gases with long atmospheric residence times and high radiative forcing effects. For these reasons, several of the parties, however, adamantly opposed their inclusion arguing that to do so would greatly increase the difficulty of attaining overall emission targets. As a compromise, the Kyoto Protocol requires Annex I countries to include the synthetic gases in their emission targets that allow them to use 1995 as the base year for emission reductions of those gases. Since the later base year accounts for an additional five years of growth in emissions, the target is effectively increased for these gases. [Clare Breidenich et.al (1998), "The Kyoto Protocol to the United Nations Framework Convention on Climate Change", *The American Journal of International Law*, Vol. 92, No. 2 (Apr., 1998), pp. 315-331, pp 321-322].

³ Clare Breidenich et.al (1998). "The Kyoto Protocol to the United Nations Framework Convention on Climate Change", *The American Journal of International Law*, Vol. 92, No. 2 (Apr., 1998), pp. 315-331, p 317.

The Intergovernmental Panel on Climate Change in its report (March 2001) which was later endorsed by the World Meteorological Organization indicated clearly that human activities are altering the atmosphere of the earth through the presence of greenhouse gases due to which the global temperatures have been rising. Some of the human activities which have aggravated the concentration of greenhouse gases in the atmosphere include deforestations, burning of fossil fuels, industrialization, certain agricultural practices, consumption patterns.

The atmosphere which has been a home to all these greenhouse gases is also home to the human kind and the biodiversity which has been a part of its existence. It is a common public good which man has been using selfishly for his desired purposes. From when the process of industrialization began and with the improvements of standard of living of the man the concentration of these greenhouse gases has it has led to activities which are not conducive to the containment of these gases. Nordhaus has called climate change ‘the granddaddy of public goods problems – emissions affect climate globally for centuries to come’.⁴

Atmospheric greenhouse gases tend to increase and continue to warm the temperature. These particular gases have the tendency to accumulate and exist in the atmosphere between ten to 150 years. In such a scenario it is widely possible that they are not easy to eliminate but there can only be reduction of these gases.

Carbon dioxide has a very long life span: it exists for hundreds of years in the atmosphere, making this a multigenerational issue.⁵ The current concentration of carbon-dioxide in the atmosphere is approximately 379 parts per million (ppm) as of 2005. For 2008, the global average is about 385 ppm (Carbon Dioxide Information Analysis Center 2009). It is carbon-dioxide which has been the most prominent greenhouse gas and is largely responsible for the climate changes that are taking place.

⁴ Nordhaus, William (1993), ‘Reflections on the Economics of Climate Change’, *Journal of Economic Perspectives*, 7(4), pp 11–25 Quoted in Andrew Green (2006), “Trade rules and climate change subsidies”, *World Trade Review*, 5: 3, pp 377–414, p 380.

⁵ John Browne (2004), “Beyond Kyoto”, *Foreign Affairs*, Vol. 83. No. 4 (Jul. - Aug., 2004), pp. 20-32, p 21.

The Stern Review by Nicholas Stern lists out a series of impacts that the global warming can have on the earth. Climate change threatens the basic elements of life for people around the world – access to water, food, health, and use of land and the environment. Melting glaciers will increase flood risk during the wet season and strongly reduce dry-season water supplies to one-sixth of the world's population, predominantly in the Indian sub-continent, parts of China, and the Andes in South America. Declining crop yields, especially in Africa, are likely to leave hundreds of millions without the ability to produce or purchase sufficient food – particularly if the carbon fertilization effect is weaker than previously thought. Ocean acidification, a direct result of rising carbon dioxide levels, will have major effects on marine ecosystems, with possible adverse consequences on fish stocks. Rising sea levels will result in tens to hundreds of millions more people flooded each year with a warming of 3 to 4°C. There will be serious risks and increasing pressures for coastal protection in Bangladesh and Vietnam, small islands in the Caribbean and the Pacific, and large coastal cities, such as Tokyo, Shanghai, Hong Kong, Mumbai, Calcutta, Karachi, Buenos Aires, St Petersburg, New York, Miami and London. Climate change will increase worldwide deaths from malnutrition and heat stress. Vector-borne diseases such as malaria and dengue fever could become more widespread if effective control measures are not in place. In higher latitudes, cold-related deaths will decrease. By the middle of the century, 200 million more people may become permanently displaced due to rising sea levels, heavier floods, and more intense droughts, according to one estimate.

The warming of the global temperatures would result in rising sea levels which is caused by the thermal expansion of the seas and oceans and this has contributed to increases in natural disasters like floods, tsunamis, etc. There is also widespread melting of the snow and retreating mountain glaciers many regions of the world.

Desertification, food security, water supply and other climate-related issues are strongly integrated.⁶ Climate change will make poverty reduction objectives more difficult and more expensive.⁷ The extreme weather conditions is likely to become more frequent with global warming, creating high annual variability in crop production. But more prolonged high temperatures and periods of drought will force large regions of marginal agriculture out of production.⁸

Several models indicate an increase in precipitation intensity, suggesting a possibility for more extreme rainfall events.⁹ Climate change is creating mayhem for our ecosystems, livelihoods and also threatening some of our indigenous communities. Most of the human communities in the developing countries are settled in the vulnerable areas on the world which cannot cope with the extremities of climate change. Climate change might further aggravate the chronic hunger conditions of poverty-ridden countries. It is further believed that climate change will aggravate the existing international crisis and tribulations. It is going to exacerbate the existing tensions between nations over the sharing of the natural resources, and further lead to conflicts.

Climate would have an adverse impact on the human health. The rise in global temperatures would result in the excessive breeding of disease carrying insects which result in diseases like malaria spreading. Developing countries' populations, particularly in densely populated areas of coastal regions are most vulnerable. Warmer temperatures and shifting rainfall patterns could influence the occurrence of diseases such as malaria, dengue and diarrhea. Excessive exposure to the harmful ultraviolet rays of the sun gives rise many skin disorders and excessive exposure to hot temperatures may result in heat strokes.

⁶ Ajay Chhibber and Rachid Laajaj (2008), "Disasters, Climate Change and Economic Development in Sub-Saharan Africa: Lessons and Directions", *Journal of African Economics*, Vol. 17, AERC Supplement 2, pp. ii7–ii49, p. 32.

⁷ Paul Collier et. al. (2008), "Climate change and Africa", *Oxford Review of Economic Policy*. Volume 24, Number 2, 2008, pp.337–353, p. 352.

⁸ *Ibid.*, p. 341.

⁹ Report of the Intergovernmental Panel on Climate Change (1996), "Climate Change: Evidence and Implications", *Foreign Policy Bulletin*, March/April 1996, pp 53-76, p 56.

Even with the best climate models that are at disposal it has not been possible to discern the probable impacts of the predicted global climate change. Nevertheless it is very clear from the models that climate change is going to have a profound impact. The predictability question makes it a more uncertainty issue where it not possible to ascertain before hand what would be the cost of the impacts of climate change is going to carry and hence can raise the financial obligations of the government.

Climate is a public good which has been exploited by the individuals for his private needs. Since it is a public good which is freely available it is impossible to make allotments to the individuals. It is not like a market product which can be brought and sold as and when required and is available in best of conditions. It has become the most vulnerable public good, for the very fact that no human can survive without a climate. Every part of his routine is influenced by the climate and man himself influences the climate around him.

There are no simple mechanisms to redistribute wealth to future citizens, nor can they be represented in current deliberations, yet the conflict of interest is precisely between future and present generations.¹⁰ The atmosphere as a whole cannot be divided into property rights, governments have made some attempts to make emissions into a form of property through emissions trading schemes.¹¹ The atmosphere is a common good which is not governed by any international authority and hence the human beings have been misusing this fact to advance their own interests without changing their lifestyle and consumption patters. When taking atmosphere as a common good it should be kept in mind that it is not only the present generation which has all the authority to lay claims over the atmosphere and use it to so extensively, the future generation also has equal rights to have a share of the atmosphere. But if we see the current trend at which the global

¹⁰ Cameron Hepburn and Nicholas Stern (2008), "A new global deal on climate change", *Oxford Review of Economic Policy*, Volume 24, Number 2, 2008, pp.259–279, p. 261.

¹¹ Andrew Green (2006), "Trade rules and climate change subsidies", *World Trade Review*, 5: 3, pp 377–414, p 380.

warming is taking place the future generation may not be able to use the atmosphere to their advantage, forget the issue of using the atmosphere, conditions may be such that the environment will not be a safe haven any longer to consider a healthy living.

In a country like India climate is a major problem. India is already facing high degree of climate variability and may face additional challenge because of climate change. It has been noticed that the Gangotri glacier, one of the largest in the Himalayas, has been retreating since long and more rapidly in recent decades. As glaciers retreat, they become more fragmented and the smaller glaciers are more sensitive to global warming. As per the Geological Survey of India, glaciers worldwide are in a phase of recession as a natural cyclic process. The accelerated melting which these glaciers are experiencing as a result of the earth's warming may have a profound effect on future water availability.¹²

Populations in coastal regions are vulnerable to natural disasters like cyclones, floods, droughts, soil and land erosion. These phenomena may accentuate due to climate change leading to irreparable loss or damage to sown areas. About 40 million hectares of land is flood-prone, including river-deltas on three sides of the country, affecting about 30 million people on an average each year.¹³ India has a coastline of 7,516 km. A trend of sea level rise of 1 cm per decade has been recorded along the Indian coast. Sea level rise due to thermal expansion of sea water in the Indian Ocean is expected to be about 25-40 cm by 2050. This could inundate low lying areas, drown coastal marshes and wetlands, erode beaches, exacerbate flooding and increase the salinity of rivers, bays and aquifers.¹⁴

The rising sea levels can also vanquish the places like Maldives and Bangladesh which can threaten the security of India. It can create a group of people who are termed as Climate refugees. India has its own population to care for. Then the Climate refugees of

¹² R. R. Rashmi and S. Satapathy (2010). "Facing the Challenge", *Yojana*. Vol. 54, April 2010, pp. 5-10, p. 6.

¹³ S. Chakrabarti and S. Suresh Kumar (2010), "A short appraisal of Climate change data", *Yojana*, Vol. 54, April 2010, pp. 21-24, pp. 23-24.

¹⁴ Krishna Murari (2010), "Coping with Climate change", *Yojana*, Vol. 54, April 2010, pp. 45-49, p. 46.

Maldives and Bangladesh would be an extra burden for a developing country like India. And it would involve many security threats if such a situation occurs.

GENESIS OF THE CLIMATE DEBATE:

Political and legal control over human activities contributing to climate change is fragmented between states, international organizations and an array of other actors. Climate change thus necessitates concurrent policy-making at multiple levels of governance.¹⁵ The first World Climate Conference was concluded in 1979 that climate change was a serious threat to humankind. At Toronto in 1988, 300 scientists and policy-makers from 46 countries met to discuss the issue of climate change and called on the countries to reduce carbon dioxide emissions by at least 20 per cent by 2005 in relation to 1988 levels as a first step. Again in the year 1989, environment ministers from 67 countries met at Noordwijk in the Netherland to agree to take action not only to reduce emissions of developed countries but also to provide assistance to developing countries to reduce their emissions.¹⁶

Climate change first entered onto the international political stage at a grand scale in 1988, when the UN General Assembly (acting on a proposal from Malta) took up the issue for the first time and adopted resolution 43/53, declaring climate change to be ‘a common concern of mankind’. The debate in the UNGA came in the wake of the establishment of the IPCC, along with a confluence of other factors, including an unusually hot summer in the US, the discovery of the hole in the ozone layer in 1987 and the successful adoption of the Montreal Protocol on Substances That Deplete the Ozone Layer that same year.¹⁷

It was in 1988 that the World Meteorological Organization and the United Nations Environment Programme sponsored the Intergovernmental Panel on Climate Change

¹⁵ Farhana Yamin and Joanna Depledge (2004), “The International Climate change regime: a guide to rules, institutions and procedure”, Cambridge: Cambridge University Press, p. 3.

¹⁶ Joyeeta Gupta (2001), *Our Simmering Planet-What to do about Global Warming?*, London, New York: Zed Books Ltd, pp. 29-30.

¹⁷ Farhana Yamin and Joanna Depledge (2004), “The International Climate change regime: a guide to rules, institutions and procedure”, Cambridge: Cambridge University Press, pp. 23-24.

(IPCC). At the first IPCC meeting, in November 1988, three working groups were set up: Working Group I, to provide a scientific assessment of climate change; Working Group II, to provide a scientific assessment of impacts of climate change; and Working Group III, to consider response strategies.¹⁸

In the Earth Summit that was held in 1992 in Rio de Janeiro no mandatory limits on emissions were set, it just specified that greenhouse gases have to be controlled. However it was instrumental in the establishment of the IPCC (Inter-governmental Panel on Climate Change). The IPCC was mainly entrusted with the task of examining the science and policies involving climate change. The predictions and facts which the IPCC came up with formed the basis on which the international negotiations were conducted on the policies to be formulated to climate change.

The United Nations Intergovernmental Panel on Climate Change (IPCC) is widely considered as the world's most dependable voice on climate change science and the policies that are related to the science of climate change. They have released a series of four reports¹⁹ that summarizes decades of research representing the work of hundreds of scientists in the field of science of climate change. The IPCC assessment reports are published every seven years or so.

Rio Summit had been an important step that was forged to bridge the differences between North-South countries. The Summit attempted to bridge the North-South differences through mechanisms like the concept of sustainable development and a set of doctrines for global environmental agreements that accounted for key concerns of the South. The Summit holds a significant weight as it was here that Group of 77 (G77), a bargaining group representing the Southern countries was formed which was to play a vital role in the coming debates on Climate change.

¹⁸ Daniel J. Evans et. al. (1991), "Policy implications of Greenhouse Warming", Washington D.C.: National Academy Press, p. 65.

¹⁹ The four reports cover the following topics – (1) Climate Change Synthesis Report (AR4 Report); (2) Working Group I Report, "The Physical Science Basis"; (3) Working Group II Report, "Impacts, Adaptation and Vulnerability"; (4) Working Group III Report, "Mitigation of Climate Change".

Then came the Berlin Mandate where it was explicitly stated that no new commitments would be introduced for developing country parties. But for the developed country parties, quantified limitation and reduction objectives would be set, together with deadlines for their fulfillment.²⁰

The international community has negotiated two major treaties: the 1992 UN Framework Convention on Climate Change (UNFCCC) which was opened for signature at the Earth Summit in June 1992 and it entered into force in March 1994.²¹ And the second most important treaty was the 1997 Kyoto Protocol. Both treaties have been significantly elaborated through additional legal instruments and decisions adopted by the Climate Convention's governing body, the Conference of the Parties (COP), on the basis of developments in science and politics.

Countries which are Parties to the United Nations Framework Convention on Climate Change are divided into three categories, which reflect their respective rights and duties under the Treaty. Annex I Parties are industrialized countries that have committed to take the lead in reducing greenhouse gas emissions, in the light of their responsibility for past emission. These parties aimed to return their emissions to their 1990 levels by 2000. Annex I Parties are divided into: a) Annex II Parties include members of the Organization for Economic Co-operation and Development (OECD) as of 1992, including European countries and the European Union as such (EU), Canada, the U.S., Japan, Australia, New Zealand and Turkey; b) Industrialized countries with economies in transition (EITs), including countries from the former Soviet Union, and from Central and Eastern Europe. The non-annex I Parties are the developing countries, subject to lighter obligations, which reflect their less advanced economic development and their low greenhouse gas

²⁰ Duncan French (1998), "1997 Kyoto Protocol to the 1992 UN Framework Convention on Climate Change".

Journal of Environmental Law, Vol 10, No. 2, Oxford University Press, pp 227-239, p 229.

²¹ It was the Earth Summit held in Rio in 1992 that gave rise to the setting up of the UNFCCC (United Nations Framework on Climate Change).

emissions to date. These countries' overall emissions are now growing much faster than those of annex I Parties.²²

The 1997 Kyoto Protocol was an agreement that was accepted by around 160 nations in which most of the countries party to the agreement had to reduce their emissions by 5 to 10% relative to the levels emitted in 1990. The long term challenge of this agreement was to meet the objectives of the Article 2 of the United Nations Framework on Climate Change, i.e., stabilization of greenhouse gas concentration in the atmosphere at levels that would prevent dangerous anthropogenic interference with the climate system, with specific attention being paid to food security, ecological systems, and sustainable economic development. All major industrialized countries have ratified the Kyoto Protocol except for United States, Russia and Australia. But United States has come forward with its own reasons to not ratify the Kyoto Protocol on the grounds that the Protocol does not bind large developing economies like India and China to reduce their emissions and also the high compliance costs would hurt the U.S. economy. Under the Protocol, the developing countries do not have reduction targets unlike the developed industrialized countries.

The most immediate benefit of being a party to the Kyoto protocol gave the right to receive financial assistance from the Global Environment Facility (GEF). With regard to climate change, this US\$2,000 million fund is designed to pay the difference between the cheapest development option and the one that would have the least-damaging global consequences. Although the benefits are designed to be 'global' in nature, there are inevitably some 'national' advantages as well – for example, improvements in the quality of the local environment.²³ The GEF was mainly entrusted to provide funds for funding projects that were climate-friendly. Hence this implied that ratifying the Kyoto protocol also meant that it would bring benefits otherwise the countries were only left with burdens of restricting their carbon emissions. The primary responsibility is to provide

²² International Energy Agency (2001), "International Emission Trading: from Concept to Reality", Paris: Publications Service of Organization for Economic Co-operation and Development (OECD), p. 21-22.

²³ Ian H. Rowlands (1996), "South Africa and Global Climate Change", *The Journal of Modern African Studies*, 34, 1, pp. 163-178, p. 168, Cambridge University Press.

developing countries with funds under the Climate change convention's financial obligations.

The 13th Conference of Parties to the UNFCCC was held in Bali in December 2007. The Conference took place against the backdrop of the 4th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) which concluded that there was undeniable evidence that global climate change was taking place as a result of anthropogenic buildup of greenhouse gases emissions in the earth's atmosphere. The Assessment report further suggested that there was a 50% chance that if global warming went beyond the 2°C, there could be irrevocable and potentially appalling consequences for the planet's life-sustaining ecosystems. It was suggested in the report that the developed countries in response to this had to cut their emissions by at least 25-40% by 2020, with 1990 as the base year, in order to limit the rise of temperature to less than 2°C. Therefore, at the Bali Conference it was concluded that there was an urgent need to enhance the implementation of the only existing climate change treaty which the world possesses, that is the UNFCCC.²⁴

At Bali, U.S. negotiators rejected proposals by the European Union and others to agree to seek agreement on measures requiring industrialized countries to cut emissions by 2020 to levels 25 to 40 percent below 1990 levels. U.S. negotiators maintained that it was inappropriate to set such targets at the outset of negotiations, that the proposed targets were unrealistic and unattainable, and that any outcome also must include meaningful participation by rapidly industrializing countries like Brazil, China, and India.²⁵

The recent in the global Climate change negotiations is the Copenhagen Accord that was signed on December 18th 2009. Delegates from 193 countries and numerous NGO's

²⁴ Shyam Saran (2010), "India at Copenhagen", *Seminar- Climate change conundrum*, No. 606, pp. 1-120, p. 12.

²⁵ Judith Eilperin, For U.S., Policy Discord Plays Out at Bali Climate Change Talks, WASH. POST, Dec. 11, 2007, at A 16; Thomas Fuller, Peter Gelling, & Andrew C. Revkin, U.S. Stand on Quotas Deadlocks Climate Talks, N.Y. TIMES, Dec. 12, 2007, at A 12; Juliet Eilperin, Hard Choices on Climate Can Wait for Next President, Aides Indicate, WASH. POST, Dec. 12, 2007, at A24 Quoted in American Society of International Law (2005), "U.S. Positions in International Climate Change Negotiations". *The American Journal of International Law*, Vol. 102, No. 1 (Jan., 2008), pp. 164-168, p 165.

convened in the 15th Conference of Parties and more than 100 heads of states participated during the conference. Under the prevailing chaos and confusion, the accord was signed by Brazil, South Africa, India and China (BASIC countries) along with United States outside the UNFCCC process.²⁶ The Copenhagen Accord has been extensively dealt in the third chapter.

NORTH-SOUTH DEBATE:

The South which implies the developing countries argues that it is precisely the North that has taken a free ride on the South, since it has contributed large greenhouse gases emissions into the atmosphere it is using the free-rider argument to force environmental constraints on the development agenda of the South.²⁷ There exists an imbalanced relationship between the developed North countries and developing South countries and this remains at the centre of continued 'North-South' divide in the ongoing Climate change debate. The developed industrialized countries owe their success to historical emissions which were initiated with the start of the industrialization as discussed earlier and have contributed to the current lot of emissions. The developing countries, on the other hand, have just started with their process of industrialization.

The United States, Canada, and Australia emit around 20 tonnes of CO₂e *per capita*, Europe and Japan around 10 tonnes, China around 5 tonnes, and India around 2 tonnes, while most of sub-Saharan Africa emits much less than 1 tonne.²⁸ U.S. has contributed an estimated 30 per cent of all the CO₂ already in the earth's atmosphere. The success of the global climate change negotiations depend on as to how well the developed and developing countries sort out their differences over various issues which has stalled the progress of any substantive action being taken on climate change.

²⁶ Namrata Kala and Alark Saxena (2010), "Maintaining momentum post Copenhagen", *Yojana*, Vol. 54, April 2010, pp. 14-17, p. 14.

²⁷ Joyeeta Gupta (2001), *Our Simmering Planet-What to do about Global Warming?*, London, New York: Zed Books Ltd, pp. 10-11.

²⁸ Cameron Hepburn and Nicholas Stern (2008), "A new global deal on climate change", *Oxford Review of Economic Policy*, Volume 24, Number 2, 2008, pp.259-279, p. 266.

The World Bank estimated that from 1990 to 2000, natural disasters have caused damage representing between 2% and 15% of an exposed country's annual GDP.²⁹ The U.N. estimates say that the fight against climate change would cost about \$300 billion a year in the long term. The developed world should pledge funds to developing and poor countries so that they adapt to climate change, and clean technologies to enable them to grow economically without growing their emissions.

Article 4.4 of the UNFCCC³⁰ requires annex II countries to assist those developing countries that are most vulnerable to the adverse effects of climate change to meet the costs of adapting to those adverse effects. However, the annex II countries have resisted the links between Article 4.4 and the Convention's financial mechanism.³¹ From this we can further conclude that it is the developed countries that have been entrusted with the funds being provided for the developing countries. Climate change is a long term problem and is here to stay. The world can no longer remain oblivious to the effects of climate change. No country would be spared from the harm such a disaster that would take place.

RATIONALE AND SCOPE OF THE PROPOSED STUDY:

India is a key player in the climate negotiations. The domestic social realities and consequent political obstacles underlying India's tough negotiating stance need to be recognized. It is fairly well recognized within India that the country is acutely vulnerable to climate change. Impacts on water will be critical, with a less predictable and weaker monsoon impacting 65 percent of the population that depends on agriculture. With fewer but more intense periods of rainfall, there will be increased flooding. And the Himalayan

²⁹ World Bank (2004) 'Natural Disasters: Counting the Cost', Feature Story, 2 March 2004. Washington, DC: World Bank, www.worldbank.org. Quoted in Ajay Chhibber and Rachid Laajaj (2008), "Disasters, Climate Change and Economic Development in Sub-Saharan Africa: Lessons and Directions", *Journal of African Economics*, Vol. 17, AERC Supplement 2, pp. ii7–ii49, p. ii12, Oxford University Press.

³⁰ For UNFCCC treaty see appendix i.

³¹ Graciela Chichilnisky and Geoffrey Heal (eds.) (2000), "Environmental markets: equity and efficiency", New York: Cambridge University Press, p 225.

glacier melt will put at risk irrigated agriculture and river-fed urban water supplies. Food production will fall and health impacts are likely to be severe. This study will explore the relevant dimensions and challenges posed by climate change to India and the Climate policy that has been pursued by India with regard to climate change negotiations.

On greenhouse gas mitigation front, India advances an argument for equity. Equity is not just a negotiating stance for India but a strongly felt moral imperative. With almost 456 million people below the international poverty line, four infant deaths a minute, and a maternal death every four minutes poverty is chronic. Consequently, the key Indian voices resist any suggestion of action on climate change which could hamper the fight against poverty and energy insecurity – at least without compensating finance and suitable technologies from the West.

India being a developing country yet at the same time poised for a massive growth in near future is in the thick of the controversy over policies to be implemented across the nations in reducing the emission levels of CO₂. There is a significant hiatus between the developed countries on the one hand and those developing on the other whose growth trajectories are showing positive signs of development, such as, Brazil, South Africa, India and China (BASIC countries). As such an interesting debate is emerging in India as well as in the rest of the world about India and its policy postures on the issue. The proposed dissertation is aimed at understanding this discourse and makes a critical analysis of India's climate diplomacy in this regard.

RESEARCH METHODOLOGY:

The proposed study is based on historical, descriptive and analytical review of the kind of relationship India has been making in the global climate negotiations. For a better and thorough understanding of this study we need to have an insight into the historical background of India's climate policy. It would be descriptive in terms that it would give an account of all the facts and data regarding the happenings due to Climate change on India. It would be analytical in terms that the varied linkages that exist between Climate

change and development would be examined. It would analyze the various shifts that have been taking place in India's policy in pertinent to Climate change.

In all, a comprehensive approach, with multifaceted generalizations of facts and data on the one hand and higher level of conceptualization on the other is needed. I acknowledge that the means by which these facts will be arranged and analyzed is going to be invariably a subjective undertaking.

The study will rely both on primary and secondary sources of information. The primary source would include government documents and responses, reports of delegations, official statements of the International organizations. The secondary sources would include books, articles in journals, articles in newspapers published from time to time and the internet sources.

HYPOTHESIS:

- The concerted attempts by the developed countries to impose new obligations on developing countries like India to limit emission of greenhouse gases will impact on its economic development.
- India's National Action Plan on Climate Change is a qualitative shift in development trajectory toward greater environmental sustainability as a way of realizing co-benefits.

The first chapter titled "Linkages between Climate change and Development in India" would focus on the relationship between Climate change and development and then examine whether climate change poses a threat to the development issues of India. It would further examine whether setting emission targets would hamper the economic development of India. This chapter would also examine as to how the developing state of India is managing and will manage the impacts of Climate change.

The second chapter titled "India's role in global Climate change negotiations" would discuss as to how India has been negotiating its response to Climate change with regard

to domestic Climate change policy. It would assess as to what role India has been playing at various international conferences with regard to its Climate policy.

In the concluding chapter, based on the deep analysis of the above findings a conclusion will be drawn accordingly.

CHAPTER II

LINKAGES BETWEEN CLIMATE CHANGE AND DEVELOPMENT IN INDIA

This chapter would focus on the relationship between Climate change and development and then examine whether climate change poses a threat to the development issues of India. It would further examine whether setting emission targets would hamper the economic development of India. This chapter would also examine as to how the developing state of India is capable of managing the problems posed by Climate change considering the fact that it also has to keep in mind its development strategies while simultaneously dealing with the impacts of Climate change.

There is a very strong relationship between the nature and development. If nature plays havoc in a country then it would also hamper the pace of development of that particular country. Thus in this chapter we would analyze as to what are the linkages between climate change and development. The debate between development and climate change forms the crux of the climate change negotiations. Come to think of it, climate has been disturbed due to development and again it is climate which is an impediment to development. But in the battle between climate and development it is always development which is chosen by the inhabitants of the earth.

The term 'development' refers to broader social goals, in addition to economic growth. It should be noted here that development is a process and not a level. Therefore it is a path to achieve certain goals be it social, economic or political through a series of progressive changes.

A nation can survive the havocs of climate change only if it is adequately equipped to deal with them. Most of the developing countries do not have the capacity and flexibility to mitigate the carbon-dioxide emissions as this would mean abandoning of their development plans. Justifiably, they do not limit their carbon emissions until the

developed industrialized nations have done so. And this is where the north-south debate comes to play.

The IPCC projections suggest that the impacts associated with climate change will be distributed unequally across the globe and will have serious implications for some world regions than the others. It is widely improbable to locate as to where the effect of climate change is going to be more pronounced and it is also difficult to assess its impacts accurately. But Climate change poses a significant threat to developing countries because they are more vulnerable and have fewer resources to cope with their vulnerability. Developing regions in Africa, Asia and Latin America are likely to experience some severe effects due to the climate change. Most of the developing countries in these regions are situated in climate sensitive zone and their economies rely mostly on agriculture and labor intensive technologies which have fewer adaptation¹ opportunities.

The effect of climate change is going to be different in the developed countries when compared what effect it might have on the developing countries. The developed countries are situated in such latitudes where the temperatures are generally cold and even a slight increase in temperature would actually do these countries good by making the climate more congenial. Some countries like Russia and Northern Europe are so warm that global warming might prove beneficial for the economy of these countries. Whereas the developing countries are majorly located in lower latitudes and the temperature in these countries is usually warm, in such a scenario if there is an increase in temperature then it would have a devastating effect. Both the developed and developing countries have climate-sensitive resources but what makes a large difference here is that the developing countries are dependent on the resources while the developed countries are not so dependent.

¹ Adaptation implies the costs to persons of adopting measures which enable them and/or others to cope with the ill-effects of climate change. For there are ways in which people can adapt to some of the predicted outcomes of global climate change. They might, for example, spend more on drugs designed to minimize the spread of cholera and malaria. Or they might spend more on strengthening coastal regions against rising sea levels. [Simon Caney (2005), "Cosmopolitan Justice, Responsibility, and Global Climate Change". *Leiden Journal of International Law*, Vol. 18, p. 752, pp. 747-775. United Kingdom].

Meeting international environmental objectives at the lowest cost to economic growth in the developing world will require policies that recognize the differing circumstances of individual countries and that are both equitable and efficient.² Developed countries are adequately equipped by all means potentially as they have the required financial resources, educational and technological resources, and developed political and institutional factors to cope with the economic impacts and social dislocations brought about by climate change and they are also in a better situation to compensate their citizens who suffer large economic losses from the greenhouse effect. Developed countries will be able to act in response more effectively than the developing countries to the economic effects of climate change as these countries are less dependent on economic sectors that would be directly affected by climate change.

The developing countries have started with their process of economic growth only from last four-five decades and it is from here that we can trace their path to progress. Until then these countries were exploited due to presence of colonialism and most of its valuable resources were depleted. After colonialism came the various forms of feudalism which marred the economic growth of developing countries even more and resultant low standards of living characterized by low levels of health, education, infrastructure and high incidence of poverty. All these further stalled the process of economic growth. However from the last four decades developing countries like India have exceptionally taken efforts to march towards industrialization. But still a large chunk of population lives below poverty line in these countries with inadequate supplies of nutrition, health, education and infrastructure. Since these countries face the exclusive risks of the impacts of climate change there should be given adequate say in the negotiations to come out with their vulnerabilities at the negotiating table before coming out with any substantial treaty on climate change mitigations and adaptations.

Most greenhouse gases emissions are directly linked to basic processes of economic development and this is what makes the greenhouse effect a tricky political challenge for

² Danielle Donovan (1997), "*International Climate Change Policy: impacts on developing countries*", Canberra: Australia Bureau of Agricultural and Resource Economics. p 64.

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the developing countries which have deep-rooted economic interests.³ The course that has been chosen by these countries towards their agriculture and industries is also not very climate-friendly and is responsible for greenhouse gas emissions. And also the exhaustive use of pesticides and fertilizers for their agrarian purposes has narrowed down the quality of the water, soil and further still damages the health of the persons who consume these agriculture produce. The technologies that have been adopted for industrial purposes are also not environment friendly as these are also responsible for emitting greenhouse gases.

We are very much aware of the fact that climate change is taking place and to prove that we have the receding coastal lines, imbalances in weather conditions across the world and many of the island nations like Maldives may have to face extinction if this goes unchecked. But is it Maldives fault that it is almost at the verge of disappearance. It is being widely argued in the ongoing climate change negotiations that it is the historic responsibility of the developed countries. Agreed to the fact that the developing countries should participate in greenhouse gases reduction measures but they should be very well be compensated for the measures taken.

The question arises as to who should bear the burden the climate change. Considering the historical role that the developed industrialized countries have had in increasing the greenhouse emissions it then makes it more appropriate for them to bear the burden of climate change. In other words the key principle is that 'the polluter should pay'. The IPCC has addressed the 'polluter pays' principle in *Climate Change 2001: Mitigation*. It sought not to recommend any one course of action but it did cite the 'polluter pays' principle, along with various others, as a possible principle of justice. How appropriate, then, is the 'polluter pays' principle for determining the responsibility to bear the costs of climate change?⁴ So if certain developed industrialized countries have gained development and have a high standard of living at the cost of others then they are the ones who should be made responsible for the environmental damage. They owe

³ Leiv Lunde (1991), "North/South and Global Warming - Conflict or Cooperation?", *Security Dialogue*, Vol. 22 (2), pp. 199-210. p. 201.

⁴ Simon Caney (2005), "Cosmopolitan Justice, Responsibility, and Global Climate Change". *Leiden Journal of International Law*. Vol. 18. p. 753. pp. 747-775. United Kingdom.



obligations towards the developing countries then who are found to be in a handicapped position when the stage has been set for development of the developing countries.

But the 'polluter pays' principle has not had many takers as the principle has been challenged by many a climate change experts. A related doctrine which has been commonly affirmed in the international treaties on climate change is the concept of "common but differentiated responsibility". The concept of "common but differentiated responsibility" was given expression in the 1992 Rio Declaration.⁵ The same idea is also affirmed in Article 3(1) of the United Nations Framework Convention on Climate Change. In addition to this, the concept of 'common but differentiated responsibility' is evident in the 1997 Kyoto Protocol. For example, the Preamble⁶ stipulates that the Protocol is 'guided by Article 3' of the United Nations Framework Convention on Climate Change and the principle of 'common but differentiated responsibility' is explicitly affirmed in Article 10.⁷

While discussing the development and climate change linkages it becomes very imperative to also understand the flexibility mechanisms. The Kyoto Protocol specifies that countries are to employ domestic measures to meet their commitments regarding greenhouse gases emissions. In addition to domestic measures, the Kyoto Protocol provides for flexibility mechanisms countries can use to meet their targets. The flexibility mechanisms that have been adopted by the Kyoto Protocol in the context of reducing greenhouse gases include Joint Implementation (JI, article 6) under which certain (Annex I) countries can obtain credits by investing in projects in other (Annex I) countries that

⁵ The Principle 7 of the Declaration affirms that States shall co-operate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have *common but differentiated* responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they Command. [Simon Caney (2005), "Cosmopolitan Justice, Responsibility, and Global Climate Change", *Leiden Journal of International Law*, Vol. 18, p. 753, pp. 747-775. United Kingdom].

⁶ For the Preamble and Art. 10 of the Kyoto Protocol see appendix ii.

⁷ Simon Caney (2005), "Cosmopolitan Justice, Responsibility, and Global Climate Change", *Leiden Journal of International Law*, Vol. 18, p. 753, pp. 747-775. United Kingdom.

reduce greenhouse gas emissions, emissions trading (article 17)⁸ under which the greenhouse gas emissions trading takes place and finally the Clean Development Mechanism (CDM, article 12) under which certain (Annex I) countries or private entities in those countries can invest in projects in developing countries that reduce emissions and use the emissions reduction to meet their own targets).⁹ The Flexibility mechanisms could not only result in a substantial emissions reduction, but also increase each nation's economic performance.¹⁰ Hence the whole purpose of discussing the flexibility mechanisms in this chapter.

The Joint implementation (JI) implies cooperative agreements for reducing emissions. In such an agreement, a developed country receives credits for "jointly implementing" an abatement project in a host country.¹¹ Many annex I countries view JI through emissions reduction projects in developing countries as a cost-effective way to reduce global emissions, while promoting the transfer of climate-friendly technology, if credit for reductions is provided to the annex – country. The developing countries, however, fear that industrialised nations would use JI as a way to avoid taking domestic action to reduce greenhouse emissions.¹² The developing countries are not wrong in their assumptions. This mechanism might be more fruitful to developed countries as it can open avenues for a possible avoidance of their actions to reduce greenhouse gases emissions, The developing countries also have cheap emission reductions which the developed countries can exploit it now and still continue with their advancement whereas

⁸ Article 17 of the Kyoto Protocol allows emissions trading among Annex B countries only. Countries such as India are not part of the emissions trading regime since it has no binding targets to reduce greenhouse gases under the Protocol. In other words, the main mechanism by which developing countries figure in the Protocol is through hosting CDM projects. [Shreekant Gupta (2003), "India, CDM and Kyoto Protocol", *Economic and Political Weekly*, Vol. 38, No. 41 (Oct. 11-17, 2003), pp. 4292-4298, p 4292].

⁹ Andrew Green (2006), "Trade rules and climate change subsidies", *World Trade Review*, 5: 3, pp 377–414, p 378.

¹⁰ Axel Michaelowa and Michael Dutschke(2002), "Outlook on Climate and Development Policies", p. 210 in Axel Michaelowa and Michael Dutschke (eds.) *Climate Policy and Development – Flexible instruments and Developing countries*, Gloucestershire: Edward Elgar Publishing Limited.

¹¹ Larry Karp and Xuemei Liu (2001), "The Clean Development Mechanism and its controversies", in Darwin C. Hall and Richard B. Howarth (eds.), "*The long-term economics of Climate change: Beyond a doubling of greenhouse gas concentrations*", Amsterdam: Elsevier Science B. V., p. 267.

¹² Clare Breidenich et.al (1998), "The Kyoto Protocol to the United Nations Framework Convention on Climate Change", *The American Journal of International Law*, Vol. 92, No. 2 (Apr., 1998), pp. 315-331, p. 323.

the developing countries would be left with expensive reductions when they want to accomplish their targets.

Emission trading is assumed to be the most efficient way to reduce greenhouse gas emissions in the long run. Developing countries will accept such a system if it takes into account the concept of equity. An equitable climate policy implies that each inhabitant of the world has equal rights to the atmosphere. In economic terms, this signifies that everyone would be entitled to the same quota. The target meanwhile should take into account the historical emissions of developed industrialized to be ensured a fair and justifiable one.¹³

In the Kyoto protocol, the right to trade emissions is granted only to those countries that have accepted quantitative emission commitments. The emission targets were assigned to the developed countries and they exercised the right to sell that part of their assigned amount that they do not use to countries that use more than their assigned amounts. This was beneficial for the developing countries, since their emissions are very low it gave them an opportunity to increase their emissions.¹⁴ Emissions' trading, however, gives an impetus to the developing countries to sell their quotas to the developed countries who would further continue with their greenhouse gases emissions. And also the selling of quotas would open up several issues like as to what should be the maximum limit of the quotas that is to be allotted to various countries.

Developed countries under the Protocol are given greenhouse gas emissions "budgets" (or emissions "caps") for the compliance period 2008-2012 based on a percentage of their 1990 or 1995 emissions levels (depending on the particular greenhouse gas). If a country determined that it would exceed its emissions limit during the compliance period,

¹³ Anil Agarwal and Sunita Narain (1991), *Global Warming in an Unequal World*, New Delhi: Centre for Science and Environment. Quoted in Axel Michaelowa and Michael Dutschke(2002), "Outlook on Climate and Development Policies", p. 229 in Axel Michaelowa and Michael Dutschke (eds.) *Climate Policy and Development – Flexible instruments and Developing countries*, Gloucestershire: Edward Elgar Publishing Limited.

¹⁴ Joyeeta Gupta (2001), *Our Simmering Planet-What to do about Global Warming?*, London. New York: Zed Books Ltd, p. 70.

emissions trading¹⁵ would permit it to purchase emissions reductions “credits” from another country that determined it would achieve more emissions reductions than necessary to comply. With emissions trading, countries that can make relatively inexpensive emissions reductions have an incentive to reduce emissions below the level required by the Kyoto Protocol, and sell the extra credits to other countries whose emissions control costs are more expensive. Thus, both the seller and the buyer would have lower costs by virtue of the seller’s profit and the buyer’s savings. This type of implementation scheme is commonly called a “cap-and-trade” program.¹⁶ The developing countries demand the allocation of emission rights proportionally to each country according to the size of its population. However the concept of emissions trading has its own drawbacks. The involving of the private player in the system of emissions trading is bound to create irregularities. And since it requires fixing a limited emission rights for each country it can be distorted by the developed countries to fix the limits to their benefit.

Under the Kyoto Protocol, the North-South cooperation on emission reductions takes place through the Clean Development Mechanism (CDM). The CDM is usually seen as a key that would solve the barriers existing in the Kyoto Protocol. It was initiated with the purpose of helping the annex I countries as stratified in the Kyoto Protocol to achieve their emissions reductions targets and the other purpose of promoting the non-annex I countries in their economies to achieve sustainable development (Sustainable development, as the paradigm for environmental policies, gained prominence at the Earth Summit in Rio de Janeiro in 1992. It is defined as a balance between the economic,

¹⁵ This mechanism, however, comes with significant restrictions under the Kyoto Protocol. First, emissions’ trading is restricted to countries that have legally binding greenhouse gas emission limitations — the Annex 1 parties, which as noted above includes only developed, industrialized countries that have ratified the Protocol. Another requirement is that emissions credits must “be supplemental to domestic actions for the purpose of meeting quantified emission limitations and reduction commitments...” However, the Protocol is vague as to what “supplemental” means, and the term is subject to continuing interpretation.[n. 18].

¹⁶ Susan R. Fletcher and Larry Parker (2008), “Climate Change: The Kyoto Protocol. Bali “Action Plan.” and International Actions”. Congressional Research Service, p. 7-8, pp. 1- 24. May 30, 2008. URL: <http://ncseonline.org/NLE/CRSreports/08Jun/RL33826.pdf>.

environmental and social needs of the present with those of all future generations.¹⁷ Climate being a public good is going to have its effect not only on the present generation but also on the future generation). The developed countries undertake part of their emission reduction obligations in developing countries, thereby improving efficiency, and they have to bear the full burden of costs that are incurred in these emission reduction projects. In other words, the objective of the CDM is to attain measurable emissions reductions at the lowest cost possible in the process of transferring resources and technology to developing countries.

In the climate change negotiations, it is foreseen that mitigation¹⁸ (that is to say, reduction of greenhouse gases in the atmosphere) will mainly occur not through reduction of production and economic growth, which many environmentalists see as essential, but through economic growth where new, cleaner technologies are substituted for the old. The countries that are held responsible internationally for reduction of emissions (Annex 1 countries - the developed countries) have, with the exception of the USA, accepted reduction quotas, and plan to achieve these reductions not only in their own economies but by a number of so called flexible mechanisms abroad. Through Clean Development Mechanism (CDM) carbon saved by the transfer of clean technology to a developing country can be deducted from the quota of the developed country, which sponsors at least

¹⁷ Karsten Krause (2000), "The impact of Climate cooperation on renewable energy technologies", p. 205 in Axel Michaelowa and Michael Dutschke (eds.) *Climate Policy and Development – Flexible instruments and Developing countries*, Gloucestershire: Edward Elgar Publishing Limited.

¹⁸ Mitigation implies the costs to actors of not engaging in activities that contribute to global climate change. Those who engage in a policy of mitigation bear an opportunity cost: they forego benefits that they could have had if they had engaged in activities which involve the emission of high levels of greenhouse gases (GHGs). To make this concrete, mitigation will involve cutting back on activities like the burning of fossil fuels and, as such, it requires either that persons cut back on their use of cars, electricity, and air flight or that they invest in other kinds of energy resource. Either way, mitigation is, of course, a cost for some.

The mitigation costs incurred by an actor A are not restricted to cases where A minimizes A's own GHG emissions. Consider, e.g., the 'Clean Development Mechanism' policy enunciated in Art.12 of the Kyoto Protocol. Under this proposal certain countries (those listed in Annex I) may be given credit for cutting GHG emissions if they support the use of development projects that enable developing countries to develop in away which does not emit high levels of GHGs. Since what they do has the effect of lowering GHG emissions and it has a cost for them (the cost of supporting clean development) then, in principle, this cost should be included under the heading of mitigation costs: they are making a sacrifice which enables there to be a reduction in GHG emissions. [Simon Caney (2005), "Cosmopolitan Justice, Responsibility, and Global Climate Change", *Leiden Journal of International Law*, Vol. 18, p. 751, pp. 747-775. United Kingdom].

part of the costs of this clean technology. The kinds of technologies most likely to be involved are those with the lowest cost per tonne of carbon saved, and include energy conservation technology (for example, in power generation, transport and manufacturing, fuel switching, and substitution of fossil fuel equipment by renewable energy technology where this is economic - although solar PV technology cannot compete price-wise in the carbon stakes at present). Under CDM, the setting up of 'sinks' (carbon sequestration in the form of forests) is also allowed, but only for the case of 'afforestation' and 'reforestation', which in practice means putting up forests where there were none before. CDM projects have to demonstrate that they have 'development effects' before they can be certified, but the definition of 'development effects' will be locally determined by individual developing countries. There is no specification in the law that CDM projects have to have any particular gender consideration: this is an aspect of development that also has to be determined by the host country. Despite the fact that projects are supposed to have a development effect as well as a carbon mitigation effect, the reality is that carbon mitigation will be uppermost in the minds of the sponsors, who will select the cheapest and 'most efficient' ways of reducing greenhouse gas emissions. The cheapest ways of saving carbon are large-scale projects in the power and manufacturing sectors, and forestry sink projects.¹⁹

Moreover, the CDM and other emissions trading mechanisms adopted at Kyoto are regarded as the standard bearers of a new era in international environmental policy marked by a greater reliance on market mechanisms to achieve cost-effective solutions and to bring about international transfers of financial and technological resources. Using market approaches for the first time to achieve the goals of environmental policy rather than relying entirely on regulatory rules is seen by many as an Institutional breakthrough in itself.²⁰

¹⁹ Margaret M. Skutsch(2002), "Protocols, Treaties, and Action: The 'Climate Change Process' Viewed through Gender Spectacles", *Gender and Development*, Vol. 10, No. 2, Climate Change , Taylor & Francis, Ltd., pp 35-36.

²⁰ Sandor, R. L. and M.J. Walsh (1998). 'Market architecture, quality control and liability: Can the capital markets inform the design of the international emissions trading system?.' unpublished paper, Environmental Financial Products. Chicago, IL. October. Quoted in Robert Repetto (2001), "The Clean

However, since international carbon trade guidelines are not clear, there is some uncertainty on the division of gains from carbon trade under the CDM between the north and south. It is therefore desirable for developing countries like India to engage in carbon trading with other market based instruments such as carbon taxes and energy price reforms.²¹ CDM delivers the required finance to the developing countries. It also provides economically viable alternatives and transfer of technology to the host country while forcing developing countries to reduce emissions indirectly. But again the CDM projects are essentially in the hands of giant companies and have a strong tendency to be driven by profit orientation and are not particularly driven towards the development of the rural poor as most of these are private companies having an eye for lucrative business. Most of the times private companies being characteristic of their nature are usually engaged in short-term benefits during their CDM transactions. And also the CDM projects that are being implemented mostly are in developing countries which are again characterized by corruption and weak administration. This might give rise to a whole new breed of CDM mafia being generated in the developing countries. In such a scenario it is always recommended that monitoring is done by a third party who is duly represented by the international community.

The estimated costs of various mitigation options which are adopted are higher because it involves annual maintenance costs and monitoring and evaluation costs. Carbon sequestration is one such option through which fossil fuel emissions can be brought in India and this is carried out by means of afforestation of degraded forest-lands, farm forestry, agro forestry, protection from unwanted grazing and fire, rehabilitation of degraded lands. But since it involves high cost estimates, forestry is no longer a preferable option for carbon sequestration under the CDM.

Development Mechanism: Institutional Breakthrough or Institutional Nightmare?", Policy Sciences, Vol. 34, No. 3/4 (2001), p. 304, pp. 303-327.

²¹ Vijaya Gupta (2004), "India's Stand on Climate Change", book review of "India and Global Climate Change: Perspectives on Economics and Policy from a Developing Country" by Michael A. Toman ; Ujjayant Chakravorty ; Shreekant Gupta", *Economic and Political Weekly*, Vol. 39, No. 48 (Nov. 27 - Dec. 3, 2004), p 597. pp. 5096- 5097+5100

Coming back to the debate of Climate change and development, it is widely pursued that Climate policy diverts the attention from the development debate as it affects the process of development adversely. A climate policy which focuses on the efficiency of the environment indicators loses out on the development side. A climate policy should consider the various indicators of development. These indicators are linked to the greenhouse gas emissions.

Food security, energy security and climate change are integral to each other and hence cannot be seen in isolation. In the developing countries particularly climate change will have an immense impact on agriculture as the greenhouse effect will result in a drop in agricultural production. Climate change is accompanied by uncertainty in weather predictions. The loss of arable land to the impacts of climate change like rise in sea level would result in the shifting of agricultural production to areas where the soils are less fertile and also result in higher production costs. Developing countries may be forced to consider alternative development policies. Shifts in patterns of agricultural production may require the farmers of the developing countries to adapt to new agricultural techniques involving intensive farm management practices and this would in further result in increased pricing of agricultural commodities creating shifts also in the consumption patterns. In the process of adapting to new scientific techniques which are more energy efficient then require financial resources which a developing country like India cannot afford to, hence the developed countries are required to provide financial funding to cope with the economic effects of climate change.

Let's take a simple example of the transportation needs of the developing countries and the sustainability of the non-fossil fuels. If large-scale substitutes for fossil energies are not made available at a reasonable cost to the transportation needs of the populace of the developing countries then they might not want to use the alternate fuel energies. And not only that, it might also not be able to meet the potential demand of the populace as well.

Transport in India is characterized by a dominant road sector, both in the freight and passenger segments. Over the period 2000-01 to 2004-05, GDP growth of 6% was

accompanied by an average annual growth of 8.7% in the transport sector. While the road sector grew at 10%, the railways grew at 6%. In India the demand elasticity of transport services ranges from 1.2 to 1.4. While elasticity of road transport is around 1.2, rail transport has an elasticity of unity. Thus, a higher growth in the road transport sector would be required to sustain the 9% targeted growth in GDP.²² As economic activity rises and the transport sector grows at rates of 10-12%, emissions from this sector will only rise, given the current modal ratios. A study on future energy and emission trends for India has projected an almost five-fold increase in transport related emissions during 1995-2035, the present CO₂ emission share of 11% cascading to a massive 21%.²³

Developed countries should make serious efforts to keep their per capita emissions within the tolerable levels. The financial support that should be provided by the developed countries to the poor and developing countries is not to be seen as a case of charity by the developed countries. It is the historical responsibility that the developed countries owe to the developing countries.

The principle of fully compensating developing countries for their incremental reduction costs has also been agreed to in other international agreements. Most notably, it resembles the arrangements in place in the international regime for the protection of the ozone layer (Montreal Protocol), which has generally been praised for its fairness; countries with low CFC emissions have been fully compensated for their additional reduction costs.²⁴

²² Working Group Report on Road Transport, XI Plan. Planning Commission, Government of India, New Delhi. and India Transportation Infrastructure Blueprint <http://www.weforum.org/pdf/India/Infrastructure.pdf>. Quoted in Anjali Goyal (2010), "Ultra low carbon mega rail projects", *Seminar- Climate change conundrum*, No. 606, pp. 1-120, p. 56.

²³ P.R. Shukla, Debyani Ghosh and Amit Garg, (2001) Future Energy Trends and GHG Emissions for India, <http://www.decisioncraft.com/energy/papers/ecc/eghgm/India/et.pdf>. Quoted in Anjali Goyal (2010), "Ultra low carbon mega rail projects", *Seminar- Climate change conundrum*, No. 606, pp. 1-120, p. 57.

²⁴ Biermann, F. (1997), 'Financing environmental policies in the South: experience from the multilateral ozone fund', *International Environmental Affairs* Vol.9, pp 179-218. Quoted in Carsten Helm (2008), "fair division theory and climate change policy", *Environment and Development Economics*, Vol. 13, pp 441-455. United Kingdom: Cambridge University Press. 19 June 2008.

Energy has become a prerequisite for economic and social development and hence has come to occupy as the basic human need. Energy policy is inseparable from the entire national development strategy. The global energy consumption will continue to rise in the future also with the high levels of population growth and with this the further increase in economic activity. Economic development is dependent upon expansion of infrastructure and growth in industrial base. Enhancement of energy sector is an obligatory stipulation for sustaining the growth of Indian economy. As energy intensive sectors, such as petroleum, steel, cement, etc are very crucial for economic development, the consumption of energy is bound to enhance with the increase in development process. Since there is going to be more of consumption then there is going to be increase in greenhouse gases emissions.

If mitigation actions involve cutting down on the carbon intensities in the atmosphere then India would have a lower energy supply as most of the energy that derives is from carbon based fossil fuels like coal, oil, etc. It can particularly be argued that the issue of climate change should in no way come between the developing countries raising their standards of living. Emission targets and financing are the prime most important things which should will be negotiated to protect the right of the developing countries to economic development, with development based on cleaner and sustainable technologies in the power sector, transport sector and industrial sector so that there can be less reliability on the carbon based energy.

Developing countries still account for a small portion of total global carbon emissions than when compared to the developed industrialized nations, but most projections have suggested that with forecast rates of economic and population growth, the future share of developing countries in the global carbon emissions will increase.²⁵

India is a developing country with a population of nearly one billion people. There has been a rapid rise in the use of energy resources and greenhouse gas emissions because of

²⁵ Report of the Intergovernmental Panel on Climate Change (1996). "Climate Change: Evidence and Implications", *Foreign Policy Bulletin*, March/April 1996, pp 53-76. p 63.

the structural changes in the Indian economy in the past 50 years from a predominantly agrarian base to a sizable industrial base. As is typical of developing countries, the energy needs of nearly 700 million rural people and various rural industries are met by biomass. However, the growth of biomass energy has stagnated over the past decade because of growth in fossil fuel consumption. The energy mix has shifted toward coal as a result of higher endowment of coal relative to oil and gas. This has led to a rapidly rising trend of energy emissions intensities. This trend, which is likely to continue, will enhance India's share in the global emissions in the next few decades.²⁶

India's economy grew at a rate of almost 6.6 per cent per year during the 1990s, nearly doubling over that time. The energy use grew even faster, at a rate close to 7 per cent. The demand for electric power has grown still faster, in the order of 8% per year. Despite this growth, India's per capita electricity use averages at only one-sixth of the world average. It is endowed with diverse energy resources, wherein coal has a dominant share. Therefore, the Indian energy system evolved with a large share of coal in the energy consumption. This, coupled with the rising energy consumption, led to a rising carbon emissions trajectory in the past. India's energy, power, and carbon intensities of the GDP have declined after the mid-nineties, due to factors such as increased share of service sector in the GDP, and energy efficiency improvements.²⁷

Climate change will result in unpredictable weather conditions and this may affect the farmers of India who depend on the seasonal rains for their crop yields. The uncertainty in the rainfall would lessen the crop productivity and could also result in famines. In such a situation, the farmers might not want to adapt to climate-friendly technologies which require large investments to be made. They would definitely look for alternatives that are more easily available not realizing the hazardous nature of such technologies that are carbon based. In India, farmers for example in the Vidarbha region in Maharashtra, commit suicide due to crop failure resulting from monsoon failure and their subsequent

²⁶ P.R. Shukla et al. (2004), "Future energy trends and greenhouse gas emissions", in Michael A. Toman et. al. (eds) (2004), *India and Global Climate Change, perspectives on Economics and Policy from a developing country*, Delhi: Oxford University Press, p. 11.

²⁷ Government of India, Ministry of Environment and Forests (2004), "*India's initial national communication to the United Nations Framework Convention on Climate Change*". New Delhi. p. 196.

inability to pay the farm loans. This would again give way to a skewed path of development.

Agriculture involving livestock raising and cultivation of rice paddies accounts for around 50 percent of world manmade methane emissions and around one-third of nitrous oxide emissions, particularly from nitrogen fertilizer applications and land conversion.²⁸ In a detailed study of India, Kumar and Parikh, examined the impact on agriculture of climate change. They estimated that yield losses (without considering the carbon fertilization effect) for rice vary between 15 and 42 per cent and for wheat between 25 and 55 per cent for temperature increases of 2.5°C to 4.9°C. GDP would drop by between 1.8 to 3.4 per cent and agricultural relative to non-agricultural prices would increase by 7 to 18 per cent. The difference when carbon fertilization effect was applied was very minimal. With a temperature change of +2°C and an accompanying precipitation change of +7 per cent, farm level total net revenue would fall by 9 per cent, whereas with a temperature increase of +3.5°C and precipitation change of +15 per cent, the fall in farm level total net revenue would be nearly 25 per cent. For developing countries, these are very large changes which can cause much human misery. From India's point of view, a 2°C increase would be clearly intolerable from the above conclusion drawn from the study.²⁹

However, much remains to be achieved, the Government is committed to development targets that are even more ambitious than the United Nations Millennium Development Goals. The high incidence of poverty underlines the need for rapid economic development to create more remunerative employment opportunities, and to invest in social infrastructure such as health and education. Notwithstanding the climate-friendly

²⁸ Edward B. Barbier et al. (1991), "Technological substitution options for controlling greenhouse gases emissions", p 109-110 in Rudiger Dornbusch and James M. Poterba (eds.) *Global warming – Economic Policy Responses*, Massachusetts: The Massachusetts Institute of Technology, reprinted 1992.

²⁹ K.S. Kavi Kumar and Jyoti Parikh (1997), 'Potential impacts of global climate change on Indian agriculture', presented at the workshop, Measuring the impacts of Climate Change on Indian and Brazilian agriculture, held at the World Bank, Washington D.C., 5–7 May and K.S. Kavi Kumar and Jyoti Parikh (1998) 'Climate change impacts on Indian agriculture: The Ricardian approach', in Dinar et al., *Measuring the Impacts of Climate Change on Indian Agriculture*, World Bank Technical Paper No. 402. Quoted in Jyoti Parikh and Kirit Parikh (1998), "Free ride through delay: risk and accountability climate change" *Environment and Development Economics* 3. Cambridge University Press, p385, p 384-389.

orientation of the national policies, the development pathways to meet the basic needs and aspirations of a vast and growing population can only be expected to lead to increased greenhouse gases emissions in the future.³⁰ Climate change and its global economic consequences may come in the way of achieving Millennium Development Goals (MDGs).

Economic development and poverty alleviation constitute primordial preoccupations for Indian policymakers. By some estimates, India will need to maintain economic growth rates of 8 per cent to 10 per cent in order to eradicate poverty and attain its human development goals. To realize sustained 8 percent annual growth, India would in turn need to expand its primary energy supply three to fourfold and boost electricity supply by some five to seven times current levels by 2031, according to the studies by The Energy and Resources Institute (TERI) in New Delhi.³¹

Institutions being strong are intrinsic to the path of development. Developing countries have weak institutional structures, and are not outfitted to face the any major alteration in the climate. And this is often accompanied by weak Government policies which mostly look for short-term gains through which political mileage can be derived. Adopting long-term strategies may prove to be costlier initially but the result that is drawn from it is really cost effective i.e., it will prove to be cheaper in the long run. However the Government and its cohorts more often are reluctant to bring about substantial changes in the institutional structures.

A lot depends on the vulnerability and uncertainty of the country. India being a vulnerable country would want action to be initiated as fast as possible to impede the risks that it has to face from climate change. On the other hand, a country with more resources and a robust economy like the USA which is not so vulnerable to the impacts of climate change and wants to delay action. If, however, the risks turn out to be as India

³⁰ Government of India, Ministry of Environment and Forests (2004), "*India's initial national communication to the United Nations Framework Convention on Climate Change*", New Delhi, p.17.

³¹ David Michel and Amit Pandya (2009), *Indian climate policy: choices and challenges*, Washington D.C. : The Henry L. Stimson Center, p. 2-3.

fears, will there be compensation from the developed industrialized countries like USA for the delay? One should note here the inequity. The distribution of per capita carbon emissions between regions is highly skewed. The USA has a per capita emission which is approximately 20 times that of India.³²

Then there are development linkages with the population growth as well. A higher population growth implies that there are increasing greenhouse gases emissions because a higher population leads to increase in economic activities that further emit greenhouse gases. The growth of India has not been static, it has been constantly on a developing phase. When a country starts developing many other sectors also start developing. With development the per capita income also improves which leads to needs, demands and desires of the people being aggravated. These requires to execute activities relating to transportation services, housing, education, health services, etc which mean that there will be even more increased greenhouse gases emissions than before.

Equity is an issue as well for the present and future distribution of emission rights. Development indicators being positively linked to greenhouse gases emissions, it is only natural that developing nations feel deprived of their right to development by the demand to limit their emissions. This is one reason why developed industrialized nations should go ahead and demonstrate that wealth can be achieved and maintained while decreasing greenhouse gases emissions.³³

Why is that the developing countries are at the peril of climate change. The poverty of the developing countries and the obstacles in their path of development have had their inevitable impact on environment.³⁴ Since the developing countries have high incidence

³² Jyoti Parikh and Kirit Parikh (1998), "Free ride through delay: risk and accountability for climate change", *Environment and Development Economics*, Vol. 3, p 386, pp 347-409, United Kingdom, Cambridge University Press.

³³ Axel Michaelowa and Michael Dutschke (2000), "Outlook on climate and development policies", p. 209 in Axel Michaelowa and Michael Dutschke (eds.) *Climate Policy and Development – Flexible instruments and Developing countries*, Gloucestershire: Edward Elgar Publishing Limited Quoted in Robert Engelmann (1998), "Population, consumption and equity", *Tiempo*, 30 December, 3-10.

³⁴ V.P. Singh (1990), "*Technology transfer and funding mechanisms*". speech delivered on 23-25 April, 1990 at the Conference of Select Developing Countries on Global Environmental Issues. New Delhi.

of poverty it will all the more be beneficial if the programmes and policies on climate change can go hand in hand with the programmes and policies for poverty eradication, as poverty is both a cause and an outcome of environmental degradation.

Globalization of the world economy puts the developing economies at a disadvantage due to their weak bargaining position in the global market. Due to the nature of the structure and trade conditions in the world market, many environmentally unfriendly production practices which lead to deforestation occur as a response to market signals at the global market level. Tariff structures have been found to encourage the export of unprocessed extractive primary and agricultural products which are produced in a way that harm the environment. The export of unprocessed or even low-level processed exports, reduce their value added content and hence result in the net transfer of resources from developing to developed industrialized countries. The resources needed to enhance sustainable development of these countries are concentrated in the hands of those who have the competitive advantage technologically and global market power.³⁵

The developing countries should participate in the greenhouse gases reduction measures so that they are not kept isolated and then blamed for not doing anything to reduce the global emissions but it should also be kept in mind that they should be very well compensated for the abatement measures adopted by them keeping in purview the principle of equity as enshrined in the UNFCCC and the historical responsibility which the developed countries have towards these countries.

The Second Assessment Report makes clear that in the long run the stabilization of atmospheric greenhouse gas concentration will only be possible if developing and industrialized developed countries both shift to a low carbon development path.³⁶ Environment per se is not the priority option of most of the developing countries, this is the case so also for the developed countries. The resources that are used in the mitigation

³⁵ Kassim Kulindwa (1998), "Implications of global climate change and the economics of development in Sub Sahara Africa", *Environment and Development Economics*, Vol. 3, p379-380, pp 347-409, United Kingdom, Cambridge University Press.

³⁶ Samuel Fankhauser (1998), "Global climate change: the challenges for development policy" , *Environment and Development Economics* 3 , p. 370, pp 369-372. Cambridge University Press.

actions to check environmental damage are those that are in high demand for poverty alleviation and provision of other basic needs. As the name itself suggests, the developing countries are at a developing phase and have wide-spread poverty running in such countries, in such a scenario the mitigation actions that would be adopted as part of controlling environmental damage by reallocation of meager resources which they possess and further changing their production and consumption practices on the pretext of providing alternative paths may prove to be very idealistic.

The developed countries can also not ignore the internal issues that are taking place in the developing countries. Any international discussion on climate change should also involve the domestic conditions which exist in the developing countries which might have a global impact on the negotiations.

We are dealing with nation states, undefined rights to global environmental space, and varying contributions to the concentrations of GHGs in the atmosphere, which are the result of cumulative emissions historically produced by different communities and countries while talking of climate change. Theoretically, at least, therefore, it should be possible to assign a price for cumulative emissions to those countries who have been responsible for such emissions in the past, and who should, therefore, pay for them if they are to continue to emit GHGs now and in the future. Since the current regime does not assign such costs, there may be some logic in the view that the developing countries are actually subsidizing the growth and economic well being of the developed countries, since they have already occupied far more than their due in environmental space.³⁷

Any action on Climate change requires also a change in energy use in the countries which are implementing it. Since it involves a shift away from the existing growth patterns in the countries it requires massive resources, both financial and technological. Ensuring energy security and addressing climate change issues in a cost-effective manner can be only solved through technological cooperation in the long run.

³⁷ R.K. Pachauri (1998), "Global climate change: science and sustainable policies", *Environment and Development Economics*, Vol. 3, p 383. pp 347–409, United Kingdom, Cambridge University Press.

A recent International Energy Agency (IEA, 2008) report has claimed that clean technology innovations must rise by a factor of between two and ten times to meet global climate change goals, including reducing GHG emissions by 50 percent by 2050.³⁸ Moreover, Article 4.7 of the UNFCCC states that the extent to which developing countries will implement their commitments depends on the effectiveness of measures developed countries take in respect of financial resources and technology transfer.³⁹ Most of the technology is invented and innovated in the developed industrialised countries. Since the developing countries have to face the nexus between climate change and development issues they should be very well compensated by the developed industrialized countries. If global environmental objectives as envisaged in various treaties in these regard are to be met then the developed countries have to play the crucial role of providing funds to the developing countries so that they can initiate climate-friendly technologies in the various spheres of development.

Adaptation to a changing climate has to become an increasingly important element of development policy.⁴⁰ There is a need to change the technologies that are in use for the production of goods in the developing countries and this requires large investments to be made for the purpose. And developing countries that are still at a developing phase are not adequately equipped to fight these challenges. There is a need then to adopt compatible and clean industrial technologies. These technologies have to be economically resourceful and appropriate to the needs of these countries.

Adoption of these technologies by countries will need promotion of information dissemination, demonstration, research, training and education. The constraints for adoption of these technologies such as lack of necessary institutions in the developing

³⁸ Maskus, K. (2010), "Differentiated Intellectual Property Regimes for Environmental and Climate Technologies", *OECD Environment Working Papers*, No. 17, pp. 1-35, p. 11, OECD Publishing. Quoted in International Energy Agency, 2008, "Energy Technology Perspectives," available at <http://www.iea.org/Textbase/npsum/EPT2008SUM.pdf>.

³⁹ Maskus, K. (2010), "Differentiated Intellectual Property Regimes for Environmental and Climate Technologies", *OECD Environment Working Papers*, No. 17, pp. 1-35, p. 11, OECD Publishing.

⁴⁰ Samuel Fankhauser (1998), "Global climate change: the challenges for development policy" , *Environment and Development Economics* 3 , p. 371, pp 369-372, Cambridge University Press.

countries, legal barriers and restrictive trade practices, lack of resources for purchasing and operation of technologies and the higher initial capital costs of plants and equipments need to be removed if the technologies are to be adopted by the developing countries. There are also issues like high prices for the transfer of technologies. The price is even higher where the technologies are held only by a few and where the holders of the technologies are confident of getting greater profits through their monopolization. The intellectual property regulations in various developing countries are also quoted as one of the reasons for refusing transfer of technologies.⁴¹

Technology transfer can be made effective by liberalising trade in environmental and climate-friendly technologies. When fewer trade barriers are applied to the movement of goods, technology then the expansion is quicker and cheaper, and clean technologies can be adapted at a faster rate.⁴² The argument of Intellectual property rights over climate-friendly technologies that are to be liberalised for the technology transfer is not the only option to promote the use of such technologies.

The action that has to be taken with regard to Climate change is largely depended on the support and funds that would be provided by the developed countries. If the developed countries fail to provide for the funds and technology transfer required by the developing countries then the developing countries will have to face the whole brunt of the mistakes which they have not committed and this will amount to environmental injustices on them as they are not entitled to their share of growth prospects.

The path of development chosen by the developing countries has also been conducive to environmental degradation. Take for example the linkages that exist between poverty, population growth and development in the developing countries. Though the resources are in abundance in the developing countries but these countries are unable to allocate any significant amounts to environmental restoration as the resources are needed for their development. The very poverty of the people of the developing countries and their

⁴¹ V.P. Singh (1990), "*Technology transfer and funding mechanisms*", speech delivered on 23-25 April, 1990 at the Conference of Select Developing Countries on Global Environmental Issues, New Delhi.

⁴² Jorma Korhonen (2010), "It's Time to Act on Climate Change", *Bridges*, Vol, 14, No. 2, May 2010, pp. 1-3, p 2.

dependence on the natural resources will definitely amount to environmental degradation. And if the environmental degradation continues unchecked, these countries will not be contributing much to the solutions of the global problems and will only aggravate the process of climate change.

In 1990, the three largest sectors of energy consumption in the world were industry (45% of total CO₂ releases), residential/commercial sector (29%), and transport (21%).⁴³ The IEA predicts a 50 per cent increase in global energy demand by 2030—i.e. in just over two decades' time—with China and India accounting for around 45 per cent of that increase. These enormous increases map almost exactly on to projected CO₂ increases. Both energy demand and carbon emissions are rising faster than population growth.⁴⁴

It is often stated that India belongs to the category of large emitters which must take on carbon reduction commitments in order to mitigate global climate change. India is described as the third largest emitter after the US and China. The latest data shows that while U.S. and China are each responsible for about 20% of global CO₂ emissions, India, with its billion plus population, generates only 4% of such emissions. Furthermore, as against a per capita CO₂ emission of 20 tonnes for the US, India's is a low 1.8 tonnes per capita. Therefore, to club India together with so-called major emitters is misleading and unfair.⁴⁵ Indian economy is carbon dependent for its energy demands. India is place to extensive coal reserves which has driven its process of industrialization.

If a growth rate of 8% to 10% per annum in our GDP is essential to eradicate poverty in our lifetime, then India must overcome the energy constraint on its growth and must do so in a global environment of increasingly finite and depleting sources of energy. Today,

⁴³ Report of the Intergovernmental Panel on Climate Change (1996), "Climate Change: Evidence and Implications", *Foreign Policy Bulletin*, March/April 1996, pp 53-76, p 63.

⁴⁴ Dieter Helm (2008), "Climate-change policy: why has so little been achieved?", *Oxford Review of Economic Policy*, Volume 24, Number 2, 2008, p. 214, pp.211–238.

⁴⁵ Shyam Saran (2009), "India's Climate Change Initiatives: Strategies for a Greener Future", Speech delivered on March 24, 2009 at Carnegie Endowment for International Peace, Washington, D.C. URL: http://www.carnegieendowment.org/files/Saran_Speech%20at%20Carnegie.pdf.

over 70% of our oil requirements are met through imports. It is likely to exceed 90% by 2030. This is no energy security.⁴⁶

Considering the fact that the alternative strategies to fossil fuels are not available at a reasonable and reduced cost to the populace then they will be discouraged to resort to these strategies. Since the population in India has been ever increasing it might put an additional pressure on sectors such as transportation, industries which thrive on the fossil fuels for their growth.

Consecutive natural disasters which come as a part of the changing climate create an atmosphere of uncertainty that discourages potential investors.⁴⁷ India depends also on the foreign capital for its development process. The foreign entrepreneurs may not want to invest in countries that may be very much prone to the impacts of climate change. Not only the foreign entrepreneurs but also the native entrepreneurs and huge industrial houses might not want to invest in places where there is a great possibility of a natural hazard occurring. It is mainly the infrastructure of a place which attracts the industrial houses. And in case of a natural hazard like floods, droughts and tsunamis there is wide possibility that the developed infrastructure can also be destroyed. The funds that are then allocated for re-building of the infrastructure that has been destroyed in the natural disasters hold a value. These funds if not for these natural disasters could have been used for development purposes.

It has now become very important to mitigate greenhouse gases emissions adopt strategies like energy conservation, improved building materials and transport processes, carbon capture and sequestration, and new products that use alternative energy sources such as hybrid and electric vehicles. And also technologies that manage the effects of global warming must be developed and implemented, such as better agricultural

⁴⁶ V.P. Singh (1990), "*Technology transfer and funding mechanisms*", speech delivered on 23-25 April, 1990 at the Conference of Select Developing Countries on Global Environmental Issues, New Delhi.

⁴⁷ Benson, C. and J. Clay (2004) 'Understanding the Economic and Financial Impacts of Natural Disasters', Disaster Risk Management Series No. 4, The World Bank. Quoted in Ajay Chhibber and Rachid Laajaj (2008), "Disasters, Climate Change and Economic Development in Sub-Saharan Africa: Lessons and Directions". *Journal of African Economics*, Vol. 17, AERC Supplement 2, pp. ii7-ii49. p. ii13.

techniques and forest management, drought-resistant plant varieties and biogenetic materials, and desalinization plants.⁴⁸

Hence from the above discussion we can come to the conclusion that there are several linkages when it comes to climate change and development in India. Taking into consideration all the aspects like technology transfer, international funding, climate-friendly initiatives, mitigation actions, adaption plans that have to be taken by India adequately supported from the developed industrialized countries for a sustainable development. Only when the above strategies are efficiently implemented that we can assume that the India does not have to abandon its development plans and also taking care of the climate change issues.

⁴⁸ Maskus, K. (2010), "Differentiated Intellectual Property Regimes for Environmental and Climate Technologies", *OECD Environment Working Papers*, No. 17, pp. 1-35, p. 10, OECD Publishing.

CHAPTER III

INDIA'S ROLE IN GLOBAL CLIMATE CHANGE NEGOTIATIONS

This chapter would assess as to what has been India's role in the climate change negotiations. In the process it would take into account the important climate summits where India has played an active role. Though India has been an integral part of the climate change negotiations but it has played a distinct role in particularly two of them- the Kyoto Protocol and the Copenhagen Accord. It would be also discussed in the chapter as to what position the Indian main opposition parties have been taking in recent past in terms of India's role in international negotiations on climate change i.e., the global negotiations that are now underway and aimed at achieving a climate regime after 2012 (the official end of the Kyoto commitment period). The negotiations for a second climate change regime were initiated in Bali in December 2007 and continued in the Copenhagen summit in Denmark in 2009. The negotiations in Copenhagen are the second round of global climate change negotiations following their first initiation in Kyoto in 1997 and hence it becomes very imperative to understand the recent political developments which ultimately led to the Copenhagen accord. The chapter would also discuss as to how India has been negotiating its response to Climate change with regard to domestic Climate change policy.

At the core of the countries getting on board the negotiation process is the prisoner's dilemma, it is in the interests of each country or a grouping that the others reduce emissions, rather than themselves. That way, it is possible to gain the benefits of others' actions without bearing the costs oneself. In such a scenario, no individual country can achieve on its own the outcome of stabilization, and all share in the benefits. The free-riding incentives owing to the prisoner's dilemma would remain.¹ The international climate change negotiations gained momentum with the setting up the UNFCCC and the subsequent Kyoto Protocol which we discussed in the introductory chapter. And with this

¹ Dieter Helm (2008). "Climate-change policy: why has so little been achieved?", *Oxford Review of Economic Policy*, Volume 24, Number 2, 2008, pp.211-238, p 234.

we have been seeing that India is actively participating in the climate change negotiations as this would facilitate a developing country like India to guide and influence the global climate change negotiations towards effective and fair outcomes. Negotiations between the developed and developing countries are all about bargaining where each country or group of countries give in their best possible efforts to concede as little as possible and extract as much as it can from the other country or grouping. India's position with regard to climate change negotiations applies virtually to all developing nations.

Prior to the UNFCCC and Kyoto Protocol India had created its own draft convention on climate change which had found support from many developing nations. Then India held the view that since developed countries are majorly responsible for enormous quantities of greenhouse gases pollution then it becomes their duty now to adopt a corrective action. It had proposed to the UN that the developed countries should reduce CO₂ emissions with the long range goal of equalizing global per capita emissions. In other words it meant that people in all countries should be allowed to emit equal amounts of the key greenhouse gas, carbon dioxide, in order to reach equal living standards. Applying the time honored principle of "the polluter pays", India proposed that net cumulative CO₂ emissions-greenhouse pollution created over the past century-should be taken into account in setting a target level on which national per capita emissions would all eventually converge. India's draft convention declared that, "Developed countries shall immediately provide new and additional financial resources for developing countries to 'adapt to and mitigate' the adverse effects of climate change, and give access to appropriate, environmentally sound technology on preferential and non-commercial terms". India also wanted a climate fund paid for by developed countries to give grant aid to the South so that it can adopt environmentally sound technology to avoid becoming a major new source of pollution. Both of these proposals put India and its supporters directly at odds with the United States' consistent refusal to control CO₂ emissions or

assume any financial or technical responsibility for assisting developing nations to combat global warming.²

At the COP 3 meeting at Kyoto in 1997, 34 of the world's industrialized countries agreed to cut their emissions of greenhouse gases mainly CO₂, by 5.2 per cent from 1990 levels, over a five-year period from 2008- 2012. Much attention since has been focused on making the so-called Kyoto Protocol happen. In order to make the targets legally binding, at least 55 countries among 185 signatories to the UNFCCC have to ratify the Protocol. In addition, these must include developed industrialized countries (Annex I Parties to UNFCCC) accounting for 55 per cent of that group's carbon dioxide emissions in 1990. So far, 96 countries have ratified the Protocol including 25 Annex I Parties that account for about 37.4 per cent of total Annex I carbon dioxide emissions.³

The developing countries, the non-Annex I countries, had not agreed to bind themselves into legally enforced commitments as they did not have the wealth and resources to implement the measures according to the protocol. The group of 77 countries and China subsequently reiterated at the Bonn meeting of the subsidiary bodies on UNFCCC in June 1998 that there must be no new commitments, voluntary or otherwise, imposed on the developing countries.⁴ But the Annex-I parties were of the view that the Kyoto Protocol would not be successful without the active participation of the developing countries. The idea that some of the developed countries like had chosen to remain outside the Kyoto Protocol was that they would come up with a commitment that will be comparable to the commitments which are being made by the parties to the Protocol. But just to bring in one party or to make it easier for the other parties would mean skewing the whole Kyoto Protocol itself.⁵

²Craig P. Collins (1991), "Climate Change Negotiations Polarize", *Ambio*, Vol. 20, No. 7 (Nov 1991), pp 342-343. pp. 340-345. Allen Press Publishing Services on behalf of Royal Swedish Academy of Sciences.

³Shreekant Gupta (2002), "Dithering on Climate Change", *Economic and Political Weekly*, Vol. 37, No. 51 (Dec 21-27, 2002), p 5073. pp. 5073-5076.

⁴Deb Kumar Bose, (1999), "International Trade in Emission of Greenhouse Gases: Costly Bargain for Developing Countries", *Economic and Political Weekly*, Vol. 34, No. 1/2 (Jan. 2-15, 1999), p 17. pp. 17-18

⁵P.S.Suryanarayana (2009), "India against moves for 'weak' climate accord", *The Hindu*, New Delhi, 9 October, 2009

India being a part of the developing countries consortium did not ratify the Kyoto Protocol. But India did ratify the Kyoto Protocol a lot later than when the Protocol came into existence. There was sudden change of attitude in India's climate strategy. It had acceded to the Protocol in 2002 presumably as a run up to the COP 8⁶ to be held in New Delhi. Developing countries such as India also stood to gain from the Kyoto Protocol in the form of Clean Development Mechanism (CDM).

The first draft of the Ministerial Declaration at COP 8 (grandiosely titled the Delhi Ministerial Declaration on Climate Change and Sustainable Development) released by the Indian environment minister T R Baalu on October 28 set off howls of protest among the delegates by omitting any mention of the Kyoto Protocol. Even the final document was a limp one that papered over deep divisions among the parties. It made a perfunctory reference to the Protocol. At worse, the initial omission of Kyoto in the draft declaration fits into a pattern of kowtowing to the US.⁷ Here let's discuss as to why India was towing the line of US. The year previous to 2002, i.e., 2001 saw a series of attacks (also termed as September 11 attacks or 9/11 attacks in the media jargon) on United States prominent establishments and the subsequent global war on terrorism by the American government. And India also had recently seen the Parliament attacks in December 2001 and was continuously facing cross-border terrorism from Pakistan. Both these interests had brought the two governments more close than ever and the Vajpayee government which was then ruling India gave all its support to US and became its strategic ally. And hence the kowtowing of India in its climate policy also could be seen as way of impressing US.

The U.S. has been continuously rejecting the Kyoto Protocol and has set itself against the principle of common but differentiated responsibilities by insisting that it would sign no emission reduction commitments unless the major developing countries were on board. The principle of "common but differentiated responsibilities" recognizes the principle of non-reciprocity and differential treatment of the developed and developing countries.

⁶ the eighth annual Conference of Parties (COP 8) to the UN Framework Convention on Climate Change (UNFCCC) which was held in New Delhi in 2002.

⁷ Craig P. Collins (1991). "Climate Change Negotiations Polarize". *Ambio*, Vol. 20, No. 7 (Nov 1991), pp 342-343. pp. 340-345. Allen Press Publishing Services on behalf of Royal Swedish Academy of Sciences.

Has the Kyoto Protocol accomplished for what purpose it was meant. The Kyoto Protocol has not made any significant contributions. Europe has made some progress towards reducing its carbon dioxide emissions. But, of the 15 European Union countries represented at the Kyoto summit, 10 have still not met the targets agreed there. Neither have Japan or Canada. And the U.S. never even ratified the agreement. In all, barely 5% of the promised Kyoto reduction has been achieved.⁸ Will the Copenhagen Accord be able to accomplish its goals when it is believed to be only a political statement and not a legally binding treaty. The world might be heading towards another stalemate if the countries irrespective of their being developed, developing or poor don't make efforts to the promises made to undertake actions to reduce carbon emissions.

The developed countries have been making concerted attempts to impose new obligations on developing countries like India to limit their emission of greenhouse gases which could have an adverse impact on their economic development. For India food and energy security are central to its development goals. It should be ensured that India's interests have to be adequately protected in all international negotiations keeping in mind the country's vast demands. India also needs technology solutions that are appropriate, affordable and efficient.

Theoretically, it should be an exchange on equal terms between unequal partners. This is why international conventions have to provide for a level playing field.⁹ Any deal on climate change should now start with the international framework in existence. International agreements that are being negotiated will have considerable political as well as economic consequences. But the question arises that is it possible to forge a deal that is just, equitable, politically acceptable and in the outcome does not harm the planet also.

Developing countries cannot compromise on development to check climate change, but they cannot altogether ignore the problem of climate change. So as responsible members

⁸ Bjorn Lomborg (2009), "Climate change and Climategate", *The Economic Times*, Bangalore, 16 December 2009.

⁹ Axel Michaelowa and Michael Dutschke (2000), "Outlook on climate and development policies", p. 210 in Axel Michaelowa and Michael Dutschke (eds.) *Climate Policy and Development – Flexible instruments and Developing countries*, Gloucestershire: Edward Elgar Publishing Limited.

of the global community, these countries must do their bit to keep their emissions within the sustainable and equitable levels.

Although India did not commit for reducing greenhouse gases emissions previously it cannot do so now. However it is unjust to assume that India did not to anything regarding the global emissions. It was promoting energy efficiency and renewable energy and was reforming energy markets. The grouse which India exercised then, i.e., during the Kyoto Protocol era was mainly that since it had not reached a certain level of development it would be really unjust to reduce emissions.

India announced its National Action Plan on Climate Change on June 30, 2008. The National Action Plan stresses that maintaining a high growth is essential for increasing living standards of the vast majority of people of India and reducing their vulnerability of the impacts of climate change.¹⁰ The Plan has identified eight broad areas for focused action, encompassing both mitigation and adaptation. These National Missions are: National Solar Mission; National Mission for Enhanced Energy Efficiency; National Mission on Sustainable Habitat; National Water Mission; National Mission for Sustaining the Himalayan Ecosystem; National Mission for a “Green India”; National Mission for Sustainable Agriculture; National Mission on Strategic Knowledge for Climate Change.¹¹ The National Action Plan on Climate Change laid a special thrust on adoption of renewable sources of energy like the solar technologies. The Plan identifies measures that promote development objectives and simultaneously addresses the climate change issue effectively. These eight National Missions which comprise the Plan will constitute India’s strategy for ecologically sustainable development. The Plan was initiated with the objective to bring about a strategic shift in the India’s production and consumption processes which is currently based on usage of fossil-fuels to renewable sources of energy. The Plan had its co-benefits in the form of enhancing India’s energy security by shifting to renewable, improving energy security and adopting climate-friendly

¹⁰ R. R. Rashmi and S. Satapathy (2010), “Facing the Challenge”, *Yojana*, Vol. 54, April 2010, pp. 5-10, p. 9.

¹¹ Shyam Saran (2009), “India’s Climate Change Initiatives: Strategies for a Greener Future”, Speech delivered on March 24, 2009 at Carnegie Endowment for International Peace, Washington, D.C. URL: http://www.carnegieendowment.org/files/Saran_Speech%20at%20Carnegie.pdf.

sustainable practices in the development of agriculture. By the NAPCC India has reiterated that it wants to be a part of the international solution to Climate change.

Besides, the 8 Missions, the NAPCC also outlines 24 Initiatives aimed at promoting technologies and actions in the sectors pertaining to energy generation, transport, renewable. Disaster management and capacity building that will have substantial benefits in terms of addressing climate change, when integrated with the development plans of the Ministries.¹²

The NAPCC identifies specific opportunities to simultaneously advance India's development and climate related objectives of adaption and greenhouse gases mitigation. It also describes India's willingness and desire, as a responsible member of the global community, to do all that is possible for pragmatic and practical solutions for all, in accordance with the principle of common but differentiated responsibilities and respective capabilities.¹³ The NAPCC asserted that India would not sacrifice its development agenda for the sake of reduction of greenhouse gas emissions.

Prime Minister in his address to Ministers of Environment and Forests from various states on 18th August 2009 had called upon all state governments to prepare State level Action Plans on Climate Change consistent with the strategy outlined in the NAPCC. The state level plans will enable communities and ecosystems to adapt to climate change effectively and help achieve the objective of the NAPCC.¹⁴

The Bangkok climate change talks preceding the Copenhagen Summit which concluded in 9 October 2009 saw the developed countries advocating the U.S. model of watered down domestic targets rather than the kind of internationally binding greenhouse gas

¹² R. R. Rashmi and S. Satapathy (2010), "Facing the Challenge", *Yojana*, Vol. 54, April 2010, pp. 5-10, p. 9.

¹³ Prime Minister's Council on Climate Change (2008), "*National Action plan on climate change*", p. 14.

¹⁴ R. R. Rashmi and S. Satapathy (2010), "Facing the Challenge". *Yojana*, Vol. 54, April 2010, pp. 5-10, p. 9.

reduction targets embodied in the U.N. process so far.¹⁵ But a deal should take into account the per capita approach and along with that, historical emissions also have to be considered for seeking climate justice.

Even before the Copenhagen negotiations started there were statements circulating made by various Heads of the States of developed nations that it was not possible to come up with a legally binding treaty at the Copenhagen Summit and that it would be further delayed which marred the spirit of the developing countries. The delay was mainly attributed to the inability of the U.S. which is the world's biggest emitter of greenhouse gases to commit to specific targets and timetables by passing a domestic law.

The initial stages of the Copenhagen talks saw that there was a deadlock over the African nations boycotting the climate talks accusing the developed countries of killing the Kyoto Protocol. The African countries, with the support of India and China, demanded that the rich countries put down firm commitments on their emission targets under the Kyoto Protocol before proceeding with discussions on the parallel Bali track of discussions. The crisis was aggravated when Australia said the developed countries will not put down emission reduction targets till there is a legal binding in the Bali or Long-term Co-operative Action track. The demand of the Australians had the backing of the European Union and Japan. The EU had set as its redlines two issues. First, no emission reduction targets will be offered by the developed nations without a legal agreement in the Bali track. And the second, a stronger monitoring, review and verification of efforts to deal with climate change. The demand for a legal agreement on the long-term co-operative track was geared towards ensuring that the U.S. takes on legally binding emission targets. It was only after informal parleys and assurances that the Kyoto Protocol would not be killed that the African countries had returned to the negotiating table.¹⁶

It looked more or less from the deliberations that were taking place in Copenhagen that the developed countries were not prepared for a comprehensive outcome that would bind

¹⁵ Siddharth Varadarajan (2009). "Climate change lessons from a Nobel prize winner", *The Hindu*, New Delhi, 14 October 2009.

¹⁶ Urmi A. Goswami (2009), "Dark clouds over Copenhagen, developing countries boycott UN Climate talks over Kyoto Protocol row". *The Economic Times*, Copenhagen, 15 December 2009.

them in fulfilling the commitments for emission reductions under the guidelines of the Kyoto Protocol and the UNFCCC. Even before the Copenhagen Summit started there were talks that the developed world and their several delegations wanted to set aside the Kyoto Protocol and wanted to negotiate a new arrangement with carbon emission reductions. There were also efforts by the developed countries to blame the population growth of India for the increase in the emissions. A point which was dismissed by the Indian government saying that the high intensity of carbon emissions was more due to lifestyle and consumption pattern and not due to the increasing population growth.

India had initially in the run-up to the to the U.N. Climate Change Conference of Parties in Copenhagen was of the view that it would never accept internationally legally binding emission reduction targets or commitments as part of any agreement or deal. India had constantly reiterated that it wanted a balanced and equitable outcome at Copenhagen under the framework of the U.N. Framework Convention on Climate Change, Kyoto Protocol and the Bali Action Plan. The developing countries, including India, wanted to extend the Kyoto Protocol further under which the developed countries except the U.S. had set emission targets. However, many of the developed countries now want to merge the Kyoto Protocol into a new deal with emission reduction obligations set for developed and developing countries, including the U.S.

Union Minister of State for Environment and Forests Jairam Ramesh in his statement on October 20th 2009 said, "India will never accept any dilution or renegotiation of the provisions and principles of the United Nations Framework Convention on Climate Change (UNFCCC). In particular, we will never agree to the elimination of the distinction between developed and developing countries as far as internationally legally binding emission reduction obligations are concerned". The statement further said, "India will agree to consider international measurement, reporting and verification (MRV) of its mitigation actions only when such actions are enabled and supported by international finance and technology. India like other developing countries, fully expects developed countries to fulfill their obligations on transfer of technology and financial transfer that they committed to under the UNFCCC and the Bali Action Plan for both mitigation and

adaptation actions”.¹⁷ This statement clearly gave an indication that India was in no mood to compromise on the MRV of its mitigation actions and would not disembark from the path of development.

The United States had refused to sign the Kyoto Protocol and even today is trying its best efforts possible in avoiding the responsibility to cut its greenhouse gas emissions. Its position is that it can take on binding obligations only if emerging economies like India and China undertake similar obligations. It seems to have forgotten the fact that India with a per capita carbon emission of a little more than one tonne cannot create a problem for the survival of the planet. But a country like U.S. which has emissions running up to 23 tonnes certainly can make a huge difference.

The U.S. looks nowhere near in ratifying or arriving at a conclusion towards a legally binding deal on climate change because it has failed to evolve a domestic consensus in this regard. There are still huge lobbies existing in U.S. which are excruciatingly acting as a stoppage towards U.S. government ratifying the Kyoto Protocol. This gives the impression that the whole world is still at the mercy of the U.S. domestic politics, for the American President cannot fully commit with any of the actions in the climate change negotiations unless and until the U.S. Congress has approved of it.

In November 2009, India and U.S. came up with a joint statement which recognizes the key principle of common and differentiated responsibilities and respective capabilities enshrined in the UNFCCC. In accordance with that principle, the joint statement commits developed countries such as the U.S. to take on economy-wide emission reduction targets, while developing countries should take mitigation actions which are specific in nature such as India's renewable energy plan or afforestation target. India believes that there is recognition in the joint statement of the need for substantial scaled-up financial resources to support climate change action in developing countries. India has been

¹⁷ Aarti Dhar (2009), “Jairam: India not for legally binding emission cuts”, *The Hindu*, New Delhi, 21 October 2009.

repeatedly emphasizing this as one of the key determinants of success at Copenhagen.¹⁸ This statement more or less reiterated India's position on climate change.

India's demand is that the greenhouse gas emissions across nations should be equated on a per capita basis as this is the only just and fair basis for a long-term arrangement on climate change. With India's continuous rising gross domestic product (GDP), the country's demand for energy usage and total emissions would also rise unless and until new energy efficient technology was in usage which would reduce the amount of emissions. In spite of the fact that India is a developing country its per capita emissions would never exceed the average of the per capita emissions of the developed countries.

The four of the world's major developing economies -India, China, Brazil and South Africa had come up with their own 10-page draft (which was also termed as the BASIC draft) wherein these four countries came up with their specific recommendations to be unveiled at the summit. The draft included a list of four "non-negotiables" which included that the countries would never accept legally binding emission cuts, unsupported mitigation actions, international measurement, reporting and verification of unsupported mitigation actions, and the use of climate change as a trade barrier.¹⁹ The draft was prepared based on the Kyoto Protocol and the Bali Action Plan, particularly emphasizing the provision of finance and technology to support mitigation actions of developing nations.

The draft described the shared vision for long-term cooperative action as the target to achieve the ultimate objective of the UNFCCC to stabilize greenhouse gas concentrations in the atmosphere at a level that does not increase the global temperature by more than 2 degrees Celsius. This would prevent dangerous anthropogenic interference with the climate system and recognize that social and economic development and poverty eradication are the first and overriding priorities of developing countries. The draft further stated that to establish a long-term goal for emission reduction, it was essential for

¹⁸ Aarti Dhar (2009), "India satisfied with joint statement on climate change", *The Hindu*, New Delhi, 26 November 2009.

¹⁹ Ananth Krishnan (2009). "India, China ready climate draft", *The Hindu*, New Delhi, 29 November 2009.

developed countries to provide adequate and effective finance, technology transfer and capacity building support to developing countries, Such a goal shall allow developing countries equitable development space and ensure their right to development, taking into full account the scientific basis and economic and technological feasibility.²⁰

While talking of the alliances it is important to note the fact that India and China²¹ are cooperating in this issue keeping aside their other differences which they share be it boundary dispute or trade disputes. China and India as part of the four member BASIC group of developing countries, along with Brazil and South Africa, closely coordinated their negotiating positions at the Climate change talks. What is of prime significance is that both the countries have same positions, same concerns and same demands with regard to climate change and require each other than ever before. China and India both are sufferers of climate change. They together argue that developing countries are under no obligation to commit themselves to any binding emission targets. India and China had called the developed countries to cut emissions by 40 percent below the 1990 levels by 2020. However the United States before the start of Copenhagen summit took off had offered to cut its emissions only by 3 percent of the 1990 levels, while Europe had hinted at a 20-30 percent cut.

Realistically thinking, India if it pursues a 'independent' approach with regard to climate change negotiations will be in a more vulnerable and disadvantaged position and hence it is always better for a developing country like India to develop partnership with like-minded developing countries, then it would result in the increasing of their collective bargaining power. By this suggestion it does not mean that India is a meek country but a partnership would only add up to the bargaining power of India.

The developing countries were apprehensive of the Copenhagen Accord from the early stages itself. There were various attempts from the developed countries after the

²⁰ Aarti Dhar (2009), "BASIC draft not hopeful of Copenhagen pact", *The Hindu*. New Delhi, 6 December 2009.

²¹ China, as the world's largest emitter greenhouse gases, came under pressure from the West at the Copenhagen talks to do more to tackle the growth of its emissions. China accounts for 23 per cent of global emissions.

Copenhagen negotiations to promote the Accord as a first step towards a new legally binding agreement to be evolved during 2010. One of these attempts also was to send a joint letter endorsed by U.N. Secretary General and Danish Prime Minister²² which reiterated the deadline of January 31, 2010, set in Accord for both Annex I Parties (developed countries including the U.S.) and non-Annex I Parties (developing countries) to submit to the UNFCCC secretariat their emission reduction commitments to be listed in the Accord. These commitments include unilaterally chosen quantified economy-wide emission reduction targets for 2020 (with a base year also to be unilaterally decided) for Annex I countries and nationally appropriate mitigation actions for non-Annex I countries. The developed countries, in particular the European Union, have been promoting the Accord as a first step towards a new legally binding agreement to be evolved during 2010, something that the developing countries have been hesitant of.²³ Since the U.N. Secretary General himself was lending voice to the Copenhagen Accord and promoting it, this was seen by the developing countries as move towards dumping Kyoto Protocol. This clearly was disliked by the BASIC²⁴ countries as they did not want to legitimize the Copenhagen Accord and dump the Kyoto Protocol. Hence the BASIC countries have through their collective efforts made it known that the Accord be considered only as a political declaration and that their commitments lie with the Kyoto Protocol and the Bali Action Plan. And also ultimately the UNFCCC also clarified on the fact that the Copenhagen Accord was not legally binding but merely a political one. In addition to the BASIC group, the African group and the G-77 have worked very hard to bring the negotiations back on track.

The Danish draft that was proposed by the developed countries in the Copenhagen summit removed the distinction between developed and developing countries much to the anguish of the developing economies. It also proposed to give more power to the developed countries and significantly reduced the role of the U.N. process. The draft had

²² U.N. Secretary General Ban Ki-Moon and Danish Prime Minister Lars Lokke Rasmussen.

²³ R. Ramachandran (2010), "Manmohan responds to letter on Copenhagen Accord from Danish Premier and UN Chief, *The Hindu*, New Delhi, 24 January 2010.

²⁴ The BASIC group – made up of Brazil, South Africa, India and China – was born in the run-up to the U.N. climate talks at Copenhagen, when Beijing invited Environment Ministers from the three other nations to draft a common platform at the climate change negotiations. [Priscilla Jebraj (2009), "Birth of BASIC signals decline of G77". *The Hindu*, New Delhi, 19 December 2009.

proposed unequal caps on developing and wealthy countries and sought to reverse a key Kyoto Protocol mandate that requires rich countries to take the lead on curbing carbon emissions. According to the text, by 2050 poor countries would have to limit per capita emissions at 1.44 tonnes while rich countries would be given extra leeway at 2.67 tonnes per person. The developing countries argued that this would result in setting unequal limits on carbon emissions, enabling developed countries to emit more than those in developing countries. The draft proposed to give the control of climate change finance to the World Bank.²⁵This was clearly unfair as this meant the weakening of the United Nations role in handling the climate finance.

Now it is important to analyze how exactly that the deadlock over the Copenhagen summit was broken. The conference was heading towards the predicted conclusion of total failure. At this stage, President Obama stepped in. Initially, he was trying for a one-to-one meeting with the Chinese Prime Minister. However, he was prepared to meet Mr. Obama only along with the leaders of Brazil, South Africa and India (the BASIC Group). In fact, Mr. Obama virtually barged into a meeting of the BASIC leaders.

It was at this meeting that the so-called Copenhagen Accord was arrived at. The accord stated there should be an upper limit of 2°C for rise in global temperature by 2050. No intermediate targets were set. No commitments were made by the developed countries. With regard to the developing countries (such as the BASIC Group), their voluntary emission reduction programmes would be subject to an international consultation process. The developed countries had proposed to review the national strategies taken by the developing countries towards climate change. This was strongly objected to by the combined forces of the developing brigade and is now limited to international consultation and analysis of the national communications detailing with identified mitigation and adaptation measures. The U.S., on behalf of the developed countries, indicated that some \$30 billion would be available as assistance to the least developed and vulnerable island nations for mitigation programmes. This funding, which might go

²⁵ Urmi A. Goswami (2009). "Rich man's draft creates rift in Copenhagen". *The Economic Times*, Bangalore, 10 December 2009.

up to \$100 billion by 2020, would come from a basket of governmental, private sector and other sources.

The positive outcome which came after the Copenhagen summit was that the countries who were party to the Accord set a target to limit the temperature increase by 2°C. But still it is doubtful if this would be universally accepted and is widely believed that further still instead of being universally accepted it may receive resistance from some of the countries. So more or less the chances of achieving this proposed goal is rather slim now.

At the same time, we know that if the world is to stabilize temperature increase to between 2.0-2.4°C, then certain conditions would require to be met. The first of these conditions would imply that global emissions of greenhouse gases would have to peak no later than 2015. This outcome is now greatly in doubt, because the world has not come to any agreement on developed countries reducing their emissions of greenhouse gases by 2020 at levels at would aim to bring about stabilization of greenhouse concentration. Unless we have a clear roadmap for reduction in emissions by 2020, we cannot expect peaking of global emissions to take place any time before that year.²⁶

In brief, the Copenhagen Accord is a political statement with voluntary commitments to cut or limit greenhouse gas emissions that emerged out of the United Nations climate talks in Denmark in December 2009. The first commitment period of the Kyoto Protocol, which obligates all developed countries except the U.S. to cut emissions, ends in 2012, but most nations have fallen far short of their commitments. The Copenhagen Accord should not be seen a substitute for the Kyoto Protocol and other such long-term cooperative actions that are being negotiated under the UN Framework Convention on Climate Change, but should further complement the ongoing process to limit the greenhouse gases.

²⁶ R.K.Pachauri (2010). "Challenge of climate change. post-Copenhagen", *The Hindu*. New Delhi, 1 February 2010.

When this accord was brought before the final plenary, it was formally rejected by a number of countries because it was arrived at non-democratically by a small number of countries. The developed countries, expectedly, went along with the accord. The BASIC countries themselves entered the caveat that the accord was legally non-binding.²⁷

Again we come back to the question what went wrong in the Copenhagen summit. The Copenhagen talks were based on the assumption that a top-down mechanism of signaling works. Thus, it was envisaged that a consortium of global representatives could persuade individual countries to get producers operating within their boundaries to reduce their emissions. However, this plan underestimated the lobbying power that big businesses and the electorates have with national governments. Thus, Copenhagen outcomes turned out to be more of a reflection of what powerful domestic stakeholders wanted rather than unencumbered opinion of national representatives open to influence at the world stage.²⁸

Though Obama managed to strike a deal in the Copenhagen summit to certain extent by pledging a climate fund towards the developing countries however it still remains to be seen if he will be able to stand true to his promises. The U.S. now has to go through the difficult process of introducing the cap-and-trade legislation in the U.S. Senate without which it will be nowhere near the delivering the promised emission cuts, and further impossible to produce the promised funding of \$100 billion annually in mitigation and adaptation assistance to developing countries by 2020. It has widely been raised by the Copenhagen critics that Obama through is diplomatic talk and getting on board with the developing countries was able to dilute the process of Kyoto Protocol and made them party to willingly submit to a verification system.

After the Copenhagen accord Obama has been blamed by the strategic experts in U.S. that he has promised too much by pledging for emission cuts. Critics in U.S. point out the fact that by doing so would hurt the U.S. economy which is just coming out of recession. The U.S. House of Representatives had passed the legislation in June 2009 seeking a 17%

²⁷ M.R.Srinivasan (2010), "One month after Copenhagen", *The Hindu*. New Delhi, 30 January 2010.

²⁸ Pradeep S. Mehta (2009), "Cop flop: Civil society must step in", *The Economic Times*. Bangalore, 21 December 2009.

reduction in emissions by 2020. But the Senate is yet to take up the bill that was passed. Again it remains to be seen if the bill gets to see the light of the day as there has opposition to the bill both by the Democrats and the Republicans. Most of the Republicans and a section of the Democrats oppose the bill on the grounds that developing countries like China and India should also agree to emission cuts before the U.S. takes on any cuts and agree to a verification process.

The months after the Copenhagen summit in the U.S. also saw many big firms drop support to U.S. Climate bill. The Obama administration suffered a setback to his green energy agenda when three major corporations ConocoPhillips, America's third largest oil company; Caterpillar, which makes heavy equipment; and BP America dropped out of a coalition of business groups and environmental organizations that had been pressing Congress to pass climate change legislation. These companies said that the proposals before Congress for curbing greenhouse gas emissions did not do enough to recognize the importance of natural gas, and were too favourable to the coal industry. The House of Representatives had passed a climate change bill in June 2009, but the effort had been stalled in the Senate of the U.S. Now the departure of these three companies had all but killed off Mr. Obama's last chances of pushing his agenda through Congress.²⁹

The Centre for Public Integrity in Washington D.C. issued a report in March 2009, in which it reported that 770 companies had hired an estimated 2304 lobbyists to influence federal policy on climate change. That represented a 300 percent increase in numbers in just five years, amounting to four climate lobbyists for every member of Congress. As it happens, this enormous economic power and manifestation of vested interest is not confined to Washington alone, and the lobbyists and the skeptics are flexing their muscles right from Australia to Britain to North America. The outcome of the Copenhagen Conference of Parties has only emboldened those who resist change to try every tactic by which they can stall action both at the international as well as the national level in many countries. As a result, therefore, the legislation that is now with the U.S. Senate, as proposed by Senators John Kerry and Barbara Boxer, is running into stiff

²⁹ Suzanne Goldenberg (2010), "Big firms drop support for U.S. climate bill". *The Hindu*. New Delhi. 18 February 2010.

resistance, and it is possible that this piece of legislation may not see the light of day in the near future. Yet, in the absence of the U.S. being an important component of a global accord, any agreement would remain inadequate and ineffective.³⁰

This reminds of the Kyoto Protocol which was largely a U.S. invention. The other nations had come forward to ratify the treaty in the assumption that U.S. would be included in the global effort to curb greenhouse gas emissions. U.S. then was the largest emitter of greenhouse gas emissions. But what happened next was for the whole world to see. Though the Clinton administration had signed the treaty, the U.S. Congress had rejected it.

India's point of argument is that if there is constraint being put on the global emissions of greenhouse gases without working out a formula that would ensure equity in burden-sharing, then the development space for developing country like itself would be restricted. The Indian Prime Minister has reiterated that developing countries have the rights to atmospheric space which has from long been used by the developed countries.

By moving the multilateral discourse on climate change away from emissions to equitable access to atmospheric space, Manmohan Singh's persistence is as important as Indira Gandhi's initiative, at the Stockholm Conference on the Environment in 1972, in pointing to poverty as the greatest polluter, with the potential to shape future negotiations aptly pointed out by Mukul Sanwal. According to the accord, reducing global emissions by 50% in 2050 below 1990 levels will take into account "the right to equitable access to atmospheric space". Mukul Sanwal in his article further quotes Nicholas Stern who has pointed out that if the allocation of rights to emit in any given year took greater account both of history and of equity in stocks rather than flows, then rich countries would have rights to emit which were lower than two tones per capita (probably even negative). The negotiations of such rights involve substantial financial allocations: at \$40 per tonne of CO₂ equivalent a total world allocation of rights of, say, 30 Gt (roughly the required flows in 2030) would be worth \$1.2 trillion per annum". There is no reason why these rights should be considered differently from property rights, even if it entails large scale

³⁰ R.K.Pachauri (2010). "Challenge of climate change, post-Copenhagen", *The Hindu*. New Delhi. 1 February 2010.

transfers from developed to developing countries. The emerging market mechanisms, on the other hand, provide for developed countries allocating emissions allowances to themselves. They also earn emission credits from emission reductions of developing countries, moving towards commoditization of carbon, based on an inequitable occupation of atmospheric space and allocation based on annual flows, thereby disregarding historical emissions.³¹

The Copenhagen accord has also its drawbacks to be looked into. The demand which had been proposed by the developed countries to verify the national strategies of the developing but eventually acceded to was the process of international consultation. This could give way to the developed countries to impinge upon a nation's sovereignty in the garb of transparency and verification. Though the Accord did recognize the need to keep the carbon emissions reduced to keep the global temperatures below 2 degrees (3.6 degrees F) since preindustrial times but it does not seem to have any commitments made to do so.

Climate policy involves conflicts of interests between citizens of different countries. Hence equity issues cannot be ignored.³² Historical responsibility does not find any mention in the Copenhagen Accord where as Article 3³³ of the Framework Convention on Climate Change mentions equity as one of its general principles on which to base climate protection strategies.³⁴ In keeping in view of this article the leaders of the developed countries should take acceptability and responsibility of the historical emissions that these countries have been privy to.

There has been a shift in India's climate policy with regard to the fact that it allowed a provision for "international consultation and analysis" on its mitigation actions, instead of

³¹ Mukul Sanwal (2009), "Copenhagen deal marks strategic gain", *The Economic Times*, Bangalore, 22 December 2009.

³² Cameron Hepburn and Nicholas Stern (2008), "A new global deal on climate change", *Oxford Review of Economic Policy*, Volume 24, Number 2, 2008, pp.259–279, p. 261.

³³ Article 3(1) states that: 'Parties 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.'

³⁴ Carsten Helm (2008), "fair division theory and climate change policy". *Environment and Development Economics*, Vol. 13, pp 441-455. United Kingdom: Cambridge University Press. 19 June 2008.

the pre-conference assurance given to the Indian Parliament of “just informing” the UNFCCC.³⁵ But why then there was a shift also has to be analyzed. The decision of agreeing to the provision of “international consultation and analysis” was taken collectively by the BASIC (Brazil, South Africa, India and China) countries and not unilaterally by one country alone otherwise there was a wide possibility that if these countries had not been flexible and agreed to the provision they would have been held responsible for the failure of the Copenhagen summit something which the BASIC countries did not want to be tagged with. The Indian Prime Minister also reiterated this point that the shift in India’s climate policy was something that was necessitated by the dynamics of the negotiations at Copenhagen.

This can be seen in contrast to what India had initially started off with before going to the Copenhagen summit. India had assured in the parliament that it would not accept legally binding emission cuts, a peaking period for emissions and will not allow domestic climate change actions financed by domestic funds to be brought under international scrutiny. The official strategy of India at the Climate conferences from the year 1992 until now was that it was not going to commit to reduction of emissions.

The Indian opposition also played a major role during the Copenhagen negotiations. There was lot of pressure that was at play by the opposition parties with regard to India’s stand in climate change negotiations. The Communist Party of India (Marxist) has asked the government to firmly resist pressure from the United States and other advanced countries on emission targets and continue to seek funds and technology transfer in tackling climate change. The party’s Central Committee came up with five suggestive measures³⁶ that the government must undertake.³⁷

³⁵ Gargi Parsai (2009), “Sovereignty not compromised: Jairam”, *The Hindu*, New Delhi, 23 December 2009.

³⁶ The five set of measures that were suggested to the government are, (i) besides resisting pressure to abandon the Kyoto Protocol and UNFCCC framework it should stick to the principles of common and differentiated responsibilities for developed and developing countries; (ii) India should also continue to press for fund and technology transfers from developed to developing countries as compensation for damage caused by historical emissions, and freeing of technology transfers from Intellectual Property Rights restrictions; (iii) India should take up and announce steps for control and growth rates of emissions. These should be conditional upon the U.S. and other advanced countries undertaking the deep emission cuts as called for by the Inter-governmental Panel for Climate Change; (iv) India should work closely with

The left parties true to its being a U.S. bashing party has constantly blamed the UPA- led Indian government regarding its climate change policy. It has widely blamed India of having succumbed under the U.S. pressure with regard to the climate policy by agreeing to the narrow self-interests of America which prevail over the interests of the world community.

The UPA-led Indian government is constantly under pressure from the opposition parties to strike a fair deal with the developed nations. The left for instance in their resolution also charged that the Indian government is tacitly going along with the U.S. efforts to dilute the Copenhagen outcome by emphasizing general goals, some unequal technology collaborations and postponing if not abandoning the requisite stiff emission reduction targets for developed countries.³⁸

The leading opposition party in India, the Bharatiya Janata Party(BJP), has time and again advised the Indian government not to come under the pressure of the developed countries and further reject the their model of development and go for a low-energy and low-capital technology model.

It is also important to keep in mind the fact that the opposition in India has been rightly called as the watchdog of the Indian democracy. And hence the criticism of the government policies by the opposition will act as an instrument of checks on the government to adopt favourable ones in the interest of the whole nation.

India being a parliamentary democracy keeps information transparently in the public domain. Any faulty climate policy can create rout from the opposition parties which can blame the government for succumbing to the 'imperialist' pressure. But the Indian government has persistently been assuring the people of the country and the opposition that the Copenhagen Accord would not affect India's sovereignty as clear guidelines would be evolved that would keep in mind the national sovereignty.

the G5 group of countries and with the G77, especially the least developed countries and the Small Island Developing States, and maintain the unity of the developing countries.(v) India should move proactively on adaptation measures and to reduce energy inequality so that the country's climate policies serve to advance the interests of the poor and protect them from the worst effects of climate change.

³⁷ Special Correspondent (2009). "CPI(M): resist pressure on emission targets", *The Hindu*. New Delhi, 26 October 2009.

³⁸ Ibid.

Though the Indian government has said that those actions that are not supported by the developed countries with technology and finance would not be subjected to international scrutiny, but at the same time it has also made statements that the government would present to the United Nations Framework on Climate Change Convention (UNFCCC), for its consideration, periodic reports on steps taken to address the issue even for unsupported actions. India by doing so has characteristically proclaimed that it is ready to submit mitigation actions to the UNFCCC. But the developed countries are capable of influencing the matters at UNFCCC as it is widely known advanced countries like the US use their hegemonic power to influence the international institutions. This again leaves space for objections by the opposition parties that India is compromising on its sovereignty.

The post- Copenhagen summit saw the Indian government coming under the intense pressure from the Opposition for being part of the Copenhagen Accord that allows U.S. to undermine the Kyoto Protocol. The CPI(M) politburo said that the summit's failure to meet its goal of a legally binding agreement for the second commitment period of the Kyoto Protocol would hurt the interests of the developing world at the cost of development of rich industrialized nations.

Till Copenhagen, India had steadfastly maintained that only those efforts to deal with climate change that are supported by international finance and technology would be open for international monitoring, review and verification (MRV). On domestic unsupported efforts, the position has been that there would be no international MRV, only domestic monitoring and verification which would be done by Parliament. This position was re-worked to include detailed national communication once in two years to the UNFCCC giving information on all steps, including unsupported efforts, taken to deal with climate change.³⁹ This would mean that developing countries would come forth with the actions that they will take to reduce the growth in their efforts to tackle global warming by

³⁹ Political Bureau (2009). "Neutralised and Obamatized government goes back on climate stand after Barack blitzkrieg". *The Economic Times*, Bangalore, 23 December 2009.

specific amounts. Under the deal, the developed nations also have to list their individual emission targets.

The peaking year clause which was being advocated by the developed countries was also rejected by developing countries particularly India as it amounted to adversely affecting the development process of India because it did not oblivious of the fact that developing countries which are in the midst of their development process will suffer a hindrance if this kind of clause is applied on them

Reaching an agreement was important in Copenhagen because the negotiations would not only be about climate change but also on transfer technology and green technology. It is only with a tough political commitment that India can take any step forward towards developing green technology.

India should ensure that the post-Copenhagen negotiations are carried out on the basis of the principles and provisions of the Kyoto Protocol, UN Convention and the Bali Action Plan. And also be cognizant of the fact that any fresh political commitments does not detract from the Kyoto Protocol and Bali Action Plan and the fundamental differentiation between the nature of commitments amongst the developed and developing countries. The Copenhagen Accord may sound as a compromise to the opposition but it was not dilution from India's key principles as the Indian negotiators saw to it that they were not compromised.

The official U.S. policy now is that it accepts that global warming is real and that man is the key cause. The Obama administration for instance has moved fast to extract a 30 per cent increase in fuel efficiency from the carmakers, while a tenth of the stimulus – some \$80bn – has been set aside for investment in clean energy. He has struck bilateral deals with both China and India, undertaking joint research projects on clean coal and electric cars. Perhaps most substantial is that in the month of December 2009 there was a ruling by the U.S. Environmental Protection Agency that carbon dioxide and five other gases endanger human health – thereby allowing the agency to regulate emissions without

waiting for the nod from Congress. That could see the U.S. executive cracking down next year on car emissions, as well as those generated by coal and chemical plants.⁴⁰

The BASIC countries in January 2010 came up together to formally announce their intention to communicate information on their voluntary mitigation actions taken by them to the United Nations Framework Convention on Climate Change. It is significant to note that the BASIC countries have announced voluntary targets for diminution of intensity of GDP growth.

The developed industrialized countries have failed to achieve the targets that were set in the Kyoto Protocol. In spite of the efforts taken at the Copenhagen Summit, there is no guarantee that the developed countries would cut down on their emissions. In such a case, it appears that the developed countries would continue to devour the share of the developing countries which these countries require for their development. The minimum carbon emission budgets which these countries are authorized to use would have well crossed their limits when the developed countries would finally succumb to reduce carbon emissions.

It is still a wait and watch policy that can be applied to see if the Copenhagen Accord is able to negotiate further successfully probably in the Conference of Parties (COP)-16 that is scheduled to be held in Cancun in Mexico in December this year. Unless all 193 members of the United Nations agree the Accord will have no legal sanctity to it. But this provides a grim situation if it is seen in the context of the Kyoto Protocol, which had legal sanctity, has not made the developed countries cut their emissions as promised then. The differences between the developed and developing countries continue to persist on the global emissions and peak date and hence the Mexico summit also might end up with a political statement like that which happened in Copenhagen or a little more detailing could be added to the Copenhagen Accord. But would that result in an International agreement being arrived at is still a hard-thought reality.

⁴⁰ Jonathan Freedland (2009), "Obama is not saviour of the world. He's still a U.S. president". *The Hindu*, New Delhi, 17 December 2009.

Developing countries are faced with challenges on the road to Mexico, and hence there is dire need to ensure the coordination and unity of the negotiating positions among the BASIC group as this would be crucial for the countries to defend their interests.

CHAPTER IV

CONCLUSION

After having done the analysis on climate change issues keeping in view the Indian interests we can come to the conclusion India must now refine its position regarding climate change negotiations and become an even more aggressive climate negotiator because it cannot abandon its development plans and at the same time cannot keep itself away from doing anything on the climate change issue. It depends on the Indian government and its people to see as to how well they manage and balance both the issues of climate change and development.

The need to expand developing countries' scientific capacity and level of participation in the international scientific discourse on climate change takes on greater urgency in the light of the increasing vulnerabilities, growing populations, and persistent resource limitations these areas now face.¹ Though India came up with the National Action Plan on Climate Change, a plan which was initiated keeping both the co-benefits and development trajectories in mind, it has to continuously strive to make the plan a success.

India needs to strengthen its energy security requirements. It has to make a considerable shift towards the clean and renewable sources of energy like solar energy, wind energy, thermal energy, nuclear energy and other such energies to maintain its current growth progress. India though is on a development process cannot remain oblivious to the fact that the burning of fossil fuels for its energy requirements can aggravate the global warming effects. Hence, in spite of the limited options that it has at its disposal it will have to make major policy decisions to resort to a more environmental-friendly solution for its energy requirements. And also the fossil fuels are not a permanent source and its continuous usage will deplete the source from the face of the earth. Even for that purpose India has to be using the renewable forms of energy.

¹ Paul J. Runci (2007), "Expanding the Participation of Developing Country Scientists in International Climate Change Research". *Environmental Practice* 9 (4) December 2007, p 225, pp 225-227.

Energy derived from the fossil fuels is easily available and is also very cheap whereas using other sources of energy would imply additional costs. However it is desirable that the climate-friendly initiatives are taken by the developing countries. It should not stop at just initiating the process of climate-friendly technology but they should be extensively marketed to the masses.

What is required now is the restructuring of the energy sector of India so that renewable energy is made more use of than the traditional sources of energy which is mainly carbon based. The best thing about the renewable sources of energy is that they are mostly carbon free and hence reduce the greenhouse gases emissions widely.

The alternative technologies have to be made available at reduced prices than the available technologies if the people have to resort to these climate-friendly technologies. If there is no incentive given then it might be tough to assume that the alternative technologies would be readily accepted by the general public. Governments may be forced to abandon emission targets if the clean-free technologies do not prove to be cost-effective. The industries which manufacture the clean technologies cannot continue to do so if there is no demand for the same.

Keeping the development considerations of India and climate change in view, there should be a major revamp energy supply system. The conventional dependence on fossil fuel energy should be avoided as much as possible and alternatives like nuclear energy, hydro power energy, wind energy, solar energy and biomass should be undertaken industriously.

Due to the large scale deforestation the carbon sinks are fast diminishing. The consumption patterns of the mankind is such that he has been using the forest cover which forms the foremost place for carbon sinks, for his myriad activities and practices like agricultural expansion, shifting cultivations. The forests also provide man with timber and wood-fuel. For many the forests provide the basic natural resources for their survival. There should be both individual and government efforts to be taken so that there is expansion of carbon sinks so that the effects of greenhouse gases emissions are

reduced. Afforestation programmes have to be started no doubt to improve the forest cover but the masses should also be discouraged from activities which would harm the forests.

Take for example the option of solar energy and biogas as an alternative to burning of the fuels. The urban will be the foremost to not adopt these technologies. The elite in the urban areas due to the process of westernization have been aping the west in all forms of their life. The multinational companies through their marketing strategies have made the consumers' act slavish to the products produced by these western companies. It is not only the elite of India but also the middle-class which has been influenced by the consumerist strategies of the multinational companies, and people have invariably become brand-conscious.

The renewable technologies that are available in the market are costly and cannot be afforded by most of the citizens of India. Old habits die hard is the adage, so also it would be very difficult to persuade the people to suddenly resort to the new found technologies as people have got accustomed to the existing non-renewable technology which emit greenhouse gases emissions. The population residing in the rural areas who take pride in sticking to traditional customs would be the most hard to persuade to shift to the new and clean technology. It might take a lot of time before they start to accept the renewable technologies usage. See for example, the usage of solar heater for cooking has still not gained prominence even though there is no scarcity of this technologies availability in the market. The option of biogas is also has its own tribulations. It is technically workable only in rural areas where there is abundant availability of farm residues which are used for the production of this gas. But again the high costs which accompany the construction and installation of biogas digesters make it an unfavourable technology.

Switching to nuclear energy can also be one of the options of lessening the burden on the fossil fuels to provide for the energy needs of India. India and the U.S. have signed the Nuclear Deal in this regard to meet the future energy needs of India as nuclear energy provides clean and efficient energy in the long-run without being harmful to the

atmosphere. Again the production of nuclear energy involves harmful concerns which cannot be ignored. like the nuclear-reactor safety, radio-active waste disposal. India cannot afford to have another incident of the magnitude of the likes of Bhopal tragedy.

Energy research and modeling in developing countries are often conducted as components of short-term national energy and economic policy planning activities rather than as elements of longer-term emissions and climate change mitigation analyses.² A very significant step governments could take to address climate change is to reduce subsidies to such sectors like energy which contribute more towards carbon emissions.³ Instead government can give subsidies to individuals and industries which use renewable sources of energy and climate-friendly technologies.

Suppose that carbon sinks are to be maintained and hence the forest cover has to be improved. But many of the farmers still depend on the forest products for their livelihood and they are bound to destroy the forest cover. And in this case hoping for an additional forest cover to develop carbon sinks for the absorption of the carbon emissions is simply impossible. Man and his needs would force him to keep playing with the forest cover of the country.

Society transforms itself in a course of time and is not going to remain static. One class of people influences the other class of people to bring about the change in their consumption patterns and lifestyle. The rural classes are also being influenced by the lifestyle and economic activities that are adopted by the urban classes. In such a situation where all the classes of society have come under the influence of the consumerist culture, it is very difficult to persuade just one class of society to resort to environmental-friendly technological solutions which are still not popularized by the media.

Climate change negotiations can shape India's foreign policy. The negotiations building-up involve a lot of strategies which can shape India's relations with other countries.

² Paul J. Runci (2007), "Expanding the Participation of Developing Country Scientists in International Climate Change Research". *Environmental Practice* 9 (4) December 2007, p 225, pp 225-227.

³ Andrew Green (2006), "Trade rules and climate change subsidies", *World Trade Review*, 5: 3, pp 377-414, p 381.

Playing a central role now would help in shaping the future agreements on climate change. Doing so, would give India a substantive place in the international arena.

India clearly is in a unique position where it not only has a significant percentage of population that is extremely vulnerable to climate change but it is also projected to be one of the major greenhouse gas emitters in the world (in terms of total output). As countries move nationally from a reactionary to a proactive protection strategy towards Climate change and development, it is in India's best interest to focus strongly on the internal issues and create friendly image for other developing countries which have looked up to India for its development models and diplomacy.⁴

Countries form coalitions. The world groups and re-groups itself into formations of countries that have similar interests.⁵ Climate change negotiations have seen a number of coalitions and groupings formed. The North had the OECD grouping, whereas the South comprised of a number of groupings like the G-77 (this was the initial South countries grouping when the Climate change talks had started), BRIC (comprising of Brazil, Russia, India and China), Africa Consortium, the AOSIS (Association of Small Island States), the BASIC (Brazil, South Africa, India and China, the SAARC countries. The North-South divide does not seem to end if we see the climate change negotiations that are taking place. The concern now should be that they should cooperate and act together.

There are certain groupings which have traditional enemies within them. Like the BASIC group which has India and China, ultimately friends can become foes. Both these countries exercise mutual distrust towards each other as they have unresolved border issues. But with regard to climate change negotiations these two countries have worked hand in hand forgetting the traditional differences that exist between them. However, it still remains to be seen as to how far they would keep up the alliance intact. The BASIC group as a whole has played a very substantive role in the recent climate change negotiations that we saw taking place in Copenhagen. Cooperation is very important for

⁴ Namrata Kala and Alark Saxena (2010), "Maintaining momentum post Copenhagen", *Yojana*, Vol. 54, April 2010, pp. 14-17, p. 15.

⁵ Joyeeta Gupta (2001). "*Our Simmering Planet-What to do about Global Warming?*", London, New York: Zed Books Ltd, p. 101.

any grouping to have a substantial voice in the climate change negotiations. This group represented the interests of the developing countries very satisfactorily.

One more grouping that is of particular concern is the SAARC. The South Asian region has been the most volatile region in the world. There does not exist friendly relations among the countries, the most prominent being the India-Pakistan relationship. Both the countries have fought three wars with each other and are suspicious of each others activities. Almost a cold war type of situation exists between them even though there is no actual war taking place. Though various Summits have been concluded by them, it has still not helped in the cause of maintaining peaceful relations as they are marred by cross-border terrorism, Kashmir issue, water disputes and border disputes. And Pakistan blames India to be a hegemon in the SAARC Conferences. Then there is also the problem of illegal immigration with regard to Bangladesh an India. Then there is the influx of internally displaced persons in Tamil Nadu state of India from Sri Lanka. There is constant pressure on Sri Lanka to rehabilitate the Tamil ethnic community that has been displaced with the end of the LTTE. Taking all these factors into view and still having friendly relations would be very difficult. But there are no attempts lost to have cordial relations among the South Asian countries. The SAARC countries had come up with their own draft on climate change negotiation to be presented in the Copenhagen Summit. But this grouping has no been so successful in bargaining tactics. It would be very best for these countries if they also come up as a substantive bargaining group like BASIC group, because then there would be many a groupings to put pressure on the North countries to come up with emission reductions and for a favourable climate treaty.

The four components of a climate change response include mitigation, adaptation, finance and technology. Since these are all interrelated there must be equal priority to all the four issues for any climate deal to be called as a comprehensive one. Giving importance to only three of the components and leaving out even one of the component would make the deal a partial one. Again these components could be prioritized one over the other to suit the demands and interests of a particular country.

The mitigation measures adopted should be such that they are attuned with the development needs of the developing countries. The economies of the developing countries are also to be tuned to reduce the costs incurred in adaptation. Economic instruments have to be simultaneously applied along with the mitigation actions so that the incurring costs are compensated. Carbon taxing and emissions trading have to be extensively made use of and formulated in the climate change policy of India so that it does not have bear the excessive crunch of the mitigation actions it employs.

Taking only climate change as the sole issue to budge from the current path of development would prove to be difficult for the policymakers in India. It would be very difficult to convince the populace especially the rural inhabitants in general to bring about a change in their production strategies and make them understand about the issue of climate change. And so also the urban inhabitants of India might not want to change their lifestyle and consumption patterns for a thing as climate change. It would also be very hard to press the people to change their consumption patterns if the alternatives that would be provided are not efficient enough and there is also a strong tendency among the public to always look for similarities in the products and technologies that they have been using all these years to which they have got accustomed. Most of the time, people are not serious about the fact that climate change is such serious an issue which would need immediate action by all countrymen.

Climate change is also accompanied by a certain level of uncertainty. The infrastructure should be so built that it can handle the pressure of any untoward disaster which may occur due to the adverse affects of climate change. The developed countries do not face much consequence of any uncertainties because they have mature infrastructural standards. When economic standards get linked to the adverse impacts of climate change which themselves face uncertainty then the country would be facing a worse situation. A developing country cannot undertake risks as the developed industrialized countries can afford to do so.

Then there is the issue of the institutional form involved in climate change negotiations. The current round for climate change negotiations has taken place under the UN and the UNFCCC, which in turn, has involved the three central entities of UNEP, WMO, and the IPCC.⁶ The IPCC processes and reports have, not surprisingly, been controversial, but the IPCC has largely achieved its main aims. It has provided the international scientific forum for analysis and debate, and although its conclusions have had to be negotiated, they have proved remarkably robust.⁷ Though IPCC has admitted recently that its melting glaciers predictions were exaggerated, but we cannot assume on this that climate change is not happening and hence necessary action should be taken. The ultimate goal of the climate change negotiations has been to stabilize the greenhouse gases concentrations but it still seems a far cry before the foremost negotiating countries come to a conclusion regarding the levels that these greenhouse gases should be aimed at.

Since no supranational authority exists that can impose a climate agreement, it is highly dependent on voluntary action.⁸ The developed industrialized countries should act now reduce their carbon emissions because much time has been lost. If they continue to put off their commitments then they would end up using the limited carbon emission budgets that rightfully belongs to the developing countries, not to forget the future generation as well. India also cannot escape from doing nothing to check the problem of climate change on the pretext of development. It should take various major policy measures in this regard.

Obama said- “Here is the bottom line: we can embrace this accord, take a substantial step forward, and continue to refine it and build on its foundation”. This he said with regard to the Copenhagen Accord. The developed industrialized countries failed to commit to emission reductions which they were meant to by the Kyoto Protocol. But the U.S. had not ratified the Protocol. But the above statement made by Obama does show that the

⁶ John Whalley and Sean Walsh (2009), “Bringing the Copenhagen Global Climate Change Negotiations to Conclusion”, *CEsifo Economic Studies*, Vol. 55, 2/2009, pp. 255–285, p. 284. Oxford University Press.

⁷ Dieter Helm (2008), “Climate-change policy: why has so little been achieved?”, *Oxford Review of Economic Policy*, Volume 24, Number 2, 2008, pp.211–238, p 217.

⁸ Adam Rose (1998), “Burden-sharing and climate change policy beyond Kyoto: implications for developing countries”, *Environment and Development Economics* 3, Cambridge University Press, pp. 392-398, p 393.

U.S. is leaning towards coming up with a substantive treaty on climate change. The world cannot completely rely on the leadership of United States alone to solve the problem of Climate change. It requires a coordinated international action. A momentum has to be built towards a meaningful solution. Though adequate pressure should be brought on U.S. to play a leading role as in the current international politics U.S. has become a single major big power.

The civil society can also play a substantive role by exerting pressure on the government to come up with policies to check on the adverse impacts of climate change. And also the fact that should importantly noted here is that it is the social responsibility of the present generation to keep the resources in usable position for the future generation. Agreed to the fact that the IPCC published a flawed report and over-estimated the melting glaciers of the Himalayas, but will this change the global truth of Climate change. The road ahead is difficult but nations should come together to solve the global problem which is bound to affect all the countries of the world. Consensus should be evolved so that countries can come up with emission reduction strategies and proceed towards a clean and sustainable development.

Coming back to the segment on India's climate policy instead of perceiving climate change as an inconvenient barrier to development imposed by the developed nations, India should perceive it as more of a global development challenge, and look for possible international partnerships to enable leapfrogging technologies, low-carbon infrastructure decisions, energy policies that would increase energy security and provide opportunities to foster innovation.⁹

⁹ Namrata Kala and Alark Saxena (2010), "Maintaining momentum post Copenhagen", *Yojana*, Vol. 54, April 2010, pp. 14-17, p. 15.

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Appendix – i

UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE.

The Parties to this Convention,

Acknowledging that change in the Earth's climate and its adverse effects are a common concern of humankind,

Concerned that human activities have been substantially increasing the atmospheric concentrations of greenhouse gases, that these increases enhance the natural greenhouse effect, and that this will result on average in an additional warming of the Earth's surface and atmosphere and may adversely affect natural ecosystems and humankind,

Noting that the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs,

Aware of the role and importance in terrestrial and marine ecosystems of sinks and reservoirs of greenhouse gases,

Noting that there are many uncertainties in predictions of climate change, particularly with regard to the timing, magnitude and regional patterns thereof,

Acknowledging that the global nature of climate change calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response, in accordance with their common but differentiated responsibilities and respective capabilities and their social and economic conditions,

Recalling the pertinent provisions of the Declaration of the United Nations Conference on the Human Environment, adopted at Stockholm on 16 June 1972,

Recalling also that States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction,

Reaffirming the principle of sovereignty of States in international cooperation to address climate change,

Recognizing that States should enact effective environmental legislation, that environmental standards, management objectives and priorities should reflect the environmental and developmental context to which they apply, and that standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular developing countries,

Recalling the provisions of General Assembly resolution 44/228 of 22 December 1989 on the United Nations Conference on Environment and Development, and resolutions 43/53 of 6 December 1988, 44/207 of 22 December 1989, 45/212 of 21 December 1990 and 46/169 of 19 December 1991 on protection of global climate for present and future generations of mankind,

Recalling also the provisions of General Assembly resolution 44/206 of 22 December 1989 on the possible adverse effects of sea-level rise on islands and coastal areas, particularly low-lying coastal areas and the pertinent provisions of General Assembly resolution 44/172 of 19 December 1989 on the implementation of the Plan of Action to Combat Desertification,

Recalling further the Vienna Convention for the Protection of the Ozone Layer, 1985, and the Montreal Protocol on Substances that Deplete the Ozone Layer, 1987, as adjusted and amended on 29 June 1990,

Noting the Ministerial Declaration of the Second World Climate Conference adopted on 7 November 1990,

Conscious of the valuable analytical work being conducted by many States on climate change and of the important contributions of the World Meteorological Organization, the United Nations Environment Programme and other organs, organizations and bodies of the United Nations system, as well as other international and intergovernmental bodies, to the exchange of results of scientific research and the coordination of research,

Recognizing that steps required to understand and address climate change will be environmentally, socially and economically most effective if they are based on relevant scientific, technical and economic considerations and continually re-evaluated in the light of new findings in these areas,

Recognizing that various actions to address climate change can be justified economically in their own right and can also help in solving other environmental problems,

Recognizing also the need for developed countries to take immediate action in a flexible manner on the basis of clear priorities, as a first step towards comprehensive response strategies at the global, national and, where agreed, regional levels that take into account all greenhouse gases, with due consideration of their relative contributions to the enhancement of the greenhouse effect,

Recognizing further that low-lying and other small island countries, countries with low-lying coastal, arid and semi-arid areas or areas liable to floods, drought and desertification, and developing countries with fragile mountainous ecosystems are particularly vulnerable to the adverse effects of climate change,

Recognizing the special difficulties of those countries, especially developing countries, whose economies are particularly dependent on fossil fuel production, use and exportation, as a consequence of action taken on limiting greenhouse gas emissions,

Affirming that responses to climate change should be coordinated with social and economic development in an integrated manner with a view to avoiding adverse impacts on the latter, taking into full account the legitimate priority needs of developing countries for the achievement of sustained economic growth and the eradication of poverty,

Recognizing that all countries, especially developing countries, need access to resources required to achieve sustainable social and economic development and that, in order for developing countries to progress towards that goal, their energy consumption will need to grow taking into account the possibilities for achieving greater energy efficiency and for controlling greenhouse gas emissions in general, including through the application of new technologies on terms which make such an application economically and socially beneficial,

Determined to protect the climate system for present and future generations,

Have agreed as follows:

ARTICLE 1 - DEFINITIONS*

For the purposes of this Convention:

1...."Adverse effects of climate change" means changes in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition, resilience or productivity of natural and managed ecosystems or on the operation of socio-economic systems or on human health and welfare.

2...."Climate change" means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

3...."Climate system" means the totality of the atmosphere, hydrosphere, biosphere and geosphere and their interactions.

4...."Emissions" means the release of greenhouse gases and/or their precursors into the atmosphere over a specified area and period of time.

5...."Greenhouse gases" means those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation.

6...."Regional economic integration organization" means an organization constituted by sovereign States of a given region which has competence in respect of matters governed by this Convention or its protocols and has been duly authorized, in accordance with its internal procedures, to sign, ratify, accept, approve or accede to the instruments concerned.

7...."Reservoir" means a component or components of the climate system where a greenhouse gas or a precursor of a greenhouse gas is stored.

8...."Sink" means any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere.

9...."Source" means any process or activity which releases a greenhouse gas, an aerosol or a precursor of a greenhouse gas into the atmosphere.

* Titles of articles are included solely to assist the reader.

ARTICLE 2 - OBJECTIVE

The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

ARTICLE 3 - PRINCIPLES

In their actions to achieve the objective of the Convention and to implement its provisions, the Parties shall be guided, *INTER ALIA*, by the following:

1....The Parties 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 in combating climate change and the adverse effects thereof.

2....The specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change, and of those Parties, especially developing country Parties, that would have to bear a disproportionate or abnormal burden under the Convention, should be given full consideration.

3....The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost. To achieve this, such policies and measures should take into account different socio-economic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors. Efforts to address climate change may be carried out cooperatively by interested Parties.

4....The Parties have a right to, and should, promote sustainable development. Policies and measures to protect the climate system against human-induced change should be appropriate for the specific conditions of each Party and should be integrated with national development programmes, taking into account that economic development is essential for adopting measures to address climate change.

5....The Parties should cooperate to promote a supportive and open international economic system that would lead to sustainable economic growth and development in all Parties, particularly developing country Parties, thus enabling them better to address the problems of climate change. Measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade.

ARTICLE 4 – COMMITMENTS

1....All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, shall:

(a)....Develop, periodically update, publish and make available to the Conference of the Parties, in accordance with Article 12, national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties;

(b)....Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change;

(c)....Promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors;

(d)....Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems;

(e)....Cooperate in preparing for adaptation to the impacts of climate change; develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods;

(f)....Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example impact assessments, formulated and determined nationally, with a view to minimizing adverse effects on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change;

(g)....Promote and cooperate in scientific, technological, technical, socio-economic and other research, systematic observation and development of data archives related to the climate system and intended to further the understanding and to reduce or eliminate the remaining uncertainties regarding the causes, effects, magnitude and timing of climate change and the economic and social consequences of various response strategies;

(h)....Promote and cooperate in the full, open and prompt exchange of relevant scientific, technological, technical, socio-economic and legal information related to the climate system and climate change, and to the economic and social consequences of various response strategies;

(i)....Promote and cooperate in education, training and public awareness related to climate change and encourage the widest participation in this process, including that of non- governmental organizations; and

(j)...Communicate to the Conference of the Parties information related to implementation, in accordance with Article 12.

2....The developed country Parties and other Parties included in Annex I commit themselves specifically as provided for in the following:

(a)...Each of these Parties shall adopt national policies and take corresponding measures on the mitigation of climate change, by limiting its anthropogenic emissions of greenhouse gases and protecting and enhancing its greenhouse gas sinks and reservoirs. These policies and measures will demonstrate that developed countries are taking the lead in modifying longer-term trends in anthropogenic emissions consistent with the objective of the Convention, recognizing that the return by the end of the present decade to earlier levels of anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol would contribute to such modification, and taking into account the differences in these Parties' starting points and approaches, economic structures and resource bases, the need to maintain strong and sustainable economic growth, available technologies and other individual circumstances, as well as the need for equitable and appropriate contributions by each of these Parties to the global effort regarding that objective. These Parties may implement such policies and measures jointly with other Parties and may assist other Parties in contributing to the achievement of the objective of the Convention and, in particular, that of this subparagraph;

(b)...In order to promote progress to this end, each of these Parties shall communicate, within six months of the entry into force of the Convention for it and periodically thereafter, and in accordance with Article 12, detailed information on its policies and measures referred to in subparagraph (a) above, as well as on its resulting projected anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol for the period referred to in subparagraph (a), with the aim of returning individually or jointly to their 1990 levels these anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol. This information will be reviewed by the Conference of the Parties, at its first session and periodically thereafter, in accordance with Article 7;

(c)...Calculations of emissions by sources and removals by sinks of greenhouse gases for the purposes of subparagraph (b) above should take into account the best available scientific knowledge, including of the effective capacity of sinks and the respective contributions of such gases to climate change. The Conference of the Parties shall consider and agree on methodologies for these calculations at its first session and review them regularly thereafter;

(d)...The Conference of the Parties shall, at its first session, review the adequacy of subparagraphs (a) and (b) above. Such review shall be carried out in the light of the best available scientific information and assessment on climate change and its impacts, as well as relevant technical, social and economic information. Based on this review, the Conference of the Parties shall take appropriate action, which may include the adoption of amendments to the commitments in subparagraphs (a) and (b) above. The Conference of the Parties, at its first session, shall also take decisions regarding criteria for joint implementation as indicated in subparagraph (a) above. A second review of subparagraphs (a) and (b) shall take place not later than 31 December 1998, and thereafter at regular intervals determined by the Conference of the Parties, until the objective of the Convention is met;

(e)...Each of these Parties shall :

i)...Coordinate as appropriate with other such Parties, relevant economic and administrative instruments developed to achieve the objective of the Convention; and

(ii)...Identify and periodically review its own policies and practices which encourage activities that lead to greater levels of anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol than would otherwise occur;

(f)...The Conference of the Parties shall review, not later than 31 December 1998, available information with a view to taking decisions regarding such amendments to the lists in Annexes I and II as may be appropriate, with the approval of the Party concerned;

(g)...Any Party not included in Annex I may, in its instrument of ratification, acceptance, approval or accession, or at any time thereafter, notify the Depositary that it intends to be bound by subparagraphs (a) and (b) above. The Depositary shall inform the other signatories and Parties of any such notification.

3...The developed country Parties and other developed Parties included in Annex II shall provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties in complying with their obligations under Article 12, paragraph 1. They shall also provide such financial resources, including for the transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs of implementing measures that are covered by paragraph 1 of this Article and that are agreed between a developing country Party and the international entity or entities referred to in Article 11, in accordance with that Article. The implementation of these commitments shall take into account the need for adequacy and predictability in the flow of funds and the importance of appropriate burden sharing among the developed country Parties.

4...The developed country Parties and other developed Parties included in Annex II shall also assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects.

5...The developed country Parties and other developed Parties included in Annex II shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention. In this process, the developed country Parties shall support the development and enhancement of endogenous capacities and technologies of developing country Parties. Other Parties and organizations in a position to do so may also assist in facilitating the transfer of such technologies.

6...In the implementation of their commitments under paragraph 2 above, a certain degree of flexibility shall be allowed by the Conference of the Parties to the Parties included in Annex I undergoing the process of transition to a market economy, in order to enhance the ability of these Parties to address climate change, including with regard to the historical level of anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol chosen as a reference.

7...The extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology and will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties.

8....In the implementation of the commitments in this Article, the Parties shall give full consideration to what actions are necessary under the Convention, including actions related to funding, insurance and the transfer of technology, to meet the specific needs and concerns of developing country Parties arising from the adverse effects of climate change and/or the impact of the implementation of response measures, especially on:

- (a)....Small island countries;
- (b)....Countries with low-lying coastal areas;
- (c)....Countries with arid and semi-arid areas, forested areas and areas liable to forest decay;
- (d)....Countries with areas prone to natural disasters;
- (e)....Countries with areas liable to drought and desertification;
- (f)....Countries with areas of high urban atmospheric pollution;
- (g)....Countries with areas with fragile ecosystems, including mountainous ecosystems;
- (h)....Countries whose economies are highly dependent on income generated from the production, processing and export, and/or on consumption of fossil fuels and associated energy-intensive products; and
- (i)....Land-locked and transit countries.

Further, the Conference of the Parties may take actions, as appropriate, with respect to this paragraph.

9....The Parties shall take full account of the specific needs and special situations of the least developed countries in their actions with regard to funding and transfer of technology.

10....The Parties shall, in accordance with Article 10, take into consideration in the implementation of the commitments of the Convention the situation of Parties, particularly developing country Parties, with economies that are vulnerable to the adverse effects of the implementation of measures to respond to climate change. This applies notably to Parties with economies that are highly dependent on income generated from the production, processing and export, and/or consumption of fossil fuels and associated energy-intensive products and/or the use of fossil fuels for which such Parties have serious difficulties in switching to alternatives.

ARTICLE 5 - RESEARCH AND SYSTEMATIC OBSERVATION

In carrying out their commitments under Article 4, paragraph 1(g), the Parties shall:

- (a)....Support and further develop, as appropriate, international and intergovernmental programmes and networks or organizations aimed at defining, conducting, assessing and financing research, data collection and systematic observation, taking into account the need to minimize duplication of effort;

(b)...Support international and intergovernmental efforts to strengthen systematic observation and national scientific and technical research capacities and capabilities, particularly in developing countries, and to promote access to, and the exchange of, data and analyses thereof obtained from areas beyond national jurisdiction; and

(c)...Take into account the particular concerns and needs of developing countries and cooperate in improving their endogenous capacities and capabilities to participate in the efforts referred to in subparagraphs (a) and (b) above.

ARTICLE 6 - EDUCATION, TRAINING AND PUBLIC AWARENESS

In carrying out their commitments under Article 4, paragraph 1(i), the Parties shall:

(a)...Promote and facilitate at the national and, as appropriate, subregional and regional levels, and in accordance with national laws and regulations, and within their respective capacities:

(i)...The development and implementation of educational and public awareness programmes on climate change and its effects;

(ii)...Public access to information on climate change and its effects;

(iii)...Public participation in addressing climate change and its effects and developing adequate responses; and

(iv)...Training of scientific, technical and managerial personnel.

(b)...Cooperate in and promote, at the international level, and, where appropriate, using existing bodies:

(i)...The development and exchange of educational and public awareness material on climate change and its effects; and

(ii)...The development and implementation of education and training programmes, including the strengthening of national institutions and the exchange or secondment of personnel to train experts in this field, in particular for developing countries.

ARTICLE 7 - CONFERENCE OF THE PARTIES

1...A Conference of the Parties is hereby established.

2...The Conference of the Parties, as the supreme body of this Convention, shall keep under regular review the implementation of the Convention and any related legal instruments that the Conference of the Parties may adopt, and shall make, within its mandate, the decisions necessary to promote the effective implementation of the Convention. To this end, it shall:

(a)...Periodically examine the obligations of the Parties and the institutional arrangements under the Convention, in the light of the objective of the Convention, the experience gained in its implementation and the evolution of scientific and technological knowledge;

(b)...Promote and facilitate the exchange of information on measures adopted by the Parties to address climate change and its effects, taking into account the differing circumstances, responsibilities and capabilities of the Parties and their respective commitments under the Convention;

(c)...Facilitate, at the request of two or more Parties, the coordination of measures adopted by them to address climate change and its effects, taking into account the differing circumstances, responsibilities and capabilities of the Parties and their respective commitments under the Convention;

(d)...Promote and guide, in accordance with the objective and provisions of the Convention, the development and periodic refinement of comparable methodologies, to be agreed on by the Conference of the Parties, inter alia, for preparing inventories of greenhouse gas emissions by sources and removals by sinks, and for evaluating the effectiveness of measures to limit the emissions and enhance the removals of these gases;

(e)...Assess, on the basis of all information made available to it in accordance with the provisions of the Convention, the implementation of the Convention by the Parties, the overall effects of the measures taken pursuant to the Convention, in particular environmental, economic and social effects as well as their cumulative impacts and the extent to which progress towards the objective of the Convention is being achieved;

(f)...Consider and adopt regular reports on the implementation of the Convention and ensure their publication;

(g)...Make recommendations on any matters necessary for the implementation of the Convention;

(h)...Seek to mobilize financial resources in accordance with Article 4, paragraphs 3, 4 and 5, and Article 11;

(i)...Establish such subsidiary bodies as are deemed necessary for the implementation of the Convention;

(j)...Review reports submitted by its subsidiary bodies and provide guidance to them;

(k)...Agree upon and adopt, by consensus, rules of procedure and financial rules for itself and for any subsidiary bodies;

(l)...Seek and utilize, where appropriate, the services and cooperation of, and information provided by, competent international organizations and intergovernmental and non-governmental bodies; and

(m)...Exercise such other functions as are required for the achievement of the objective of the Convention as well as all other functions assigned to it under the Convention.

3...The Conference of the Parties shall, at its first session, adopt its own rules of procedure as well as those of the subsidiary bodies established by the Convention, which shall include decision-making procedures for matters not already covered by decision-making procedures

stipulated in the Convention. Such procedures may include specified majorities required for the adoption of particular decisions.

4....The first session of the Conference of the Parties shall be convened by the interim secretariat referred to in Article 21 and shall take place not later than one year after the date of entry into force of the Convention. Thereafter, ordinary sessions of the Conference of the Parties shall be held every year unless otherwise decided by the Conference of the Parties.

5....Extraordinary sessions of the Conference of the Parties shall be held at such other times as may be deemed necessary by the Conference, or at the written request of any Party, provided that, within six months of the request being communicated to the Parties by the secretariat, it is supported by at least one third of the Parties.

6....The United Nations, its specialized agencies and the International Atomic Energy Agency, as well as any State member thereof or observers thereto not Party to the Convention, may be represented at sessions of the Conference of the Parties as observers. Any body or agency, whether national or international, governmental or non- governmental, which is qualified in matters covered by the Convention, and which has informed the secretariat of its wish to be represented at a session of the Conference of the Parties as an observer, may be so admitted unless at least one third of the Parties present object. The admission and participation of observers shall be subject to the rules of procedure adopted by the Conference of the Parties.

ARTICLE 8 - SECRETARIAT

1....A secretariat is hereby established.

2....The functions of the secretariat shall be:

(a)....To make arrangements for sessions of the Conference of the Parties and its subsidiary bodies established under the Convention and to provide them with services as required;

(b)....To compile and transmit reports submitted to it;

(c)....To facilitate assistance to the Parties, particularly developing country Parties, on request, in the compilation and communication of information required in accordance with the provisions of the Convention;

(d)....To prepare reports on its activities and present them to the Conference of the Parties;

(e)....To ensure the necessary coordination with the secretariats of other relevant international bodies;

(f)....To enter, under the overall guidance of the Conference of the Parties, into such administrative and contractual arrangements as may be required for the effective discharge of its functions; and

(g)....To perform the other secretariat functions specified in the Convention and in any of its protocols and such other functions as may be determined by the Conference of the Parties.

3....The Conference of the Parties, at its first session, shall designate a permanent secretariat and make arrangements for its functioning.

ARTICLE 9 - SUBSIDIARY BODY FOR SCIENTIFIC AND TECHNOLOGICAL ADVICE

1....A subsidiary body for scientific and technological advice is hereby established to provide the Conference of the Parties and, as appropriate, its other subsidiary bodies with timely information and advice on scientific and technological matters relating to the Convention. This body shall be open to participation by all Parties and shall be multidisciplinary. It shall comprise government representatives competent in the relevant field of expertise. It shall report regularly to the Conference of the Parties on all aspects of its work.

2....Under the guidance of the Conference of the Parties, and drawing upon existing competent international bodies, this body shall:

(a)...Provide assessments of the state of scientific knowledge relating to climate change and its effects;

(b)...Prepare scientific assessments on the effects of measures taken in the implementation of the Convention;

(c)...Identify innovative, efficient and state-of-the-art technologies and know-how and advise on the ways and means of promoting development and/or transferring such technologies;

(d)...Provide advice on scientific programmes, international cooperation in research and development related to climate change, as well as on ways and means of supporting endogenous capacity-building in developing countries; and

(e)...Respond to scientific, technological and methodological questions that the Conference of the Parties and its subsidiary bodies may put to the body.

3....The functions and terms of reference of this body may be further elaborated by the Conference of the Parties.

ARTICLE 10 - SUBSIDIARY BODY FOR IMPLEMENTATION

1....A subsidiary body for implementation is hereby established to assist the Conference of the Parties in the assessment and review of the effective implementation of the Convention. This body shall be open to participation by all Parties and comprise government representatives who are experts on matters related to climate change. It shall report regularly to the Conference of the Parties on all aspects of its work.

2....Under the guidance of the Conference of the Parties, this body shall:

(a)...Consider the information communicated in accordance with Article 12, paragraph 1, to assess the overall aggregated effect of the steps taken by the Parties in the light of the latest scientific assessments concerning climate change;

(b)...Consider the information communicated in accordance with Article 12, paragraph 2, in order to assist the Conference of the Parties in carrying out the reviews required by Article 4, paragraph 2(d); and

(c)...Assist the Conference of the Parties, as appropriate, in the preparation and implementation of its decisions.

ARTICLE 11 - FINANCIAL MECHANISM

1....A mechanism for the provision of financial resources on a grant or concessional basis, including for the transfer of technology, is hereby defined. It shall function under the guidance of and be accountable to the Conference of the Parties, which shall decide on its policies, programme priorities and eligibility criteria related to this Convention. Its operation shall be entrusted to one or more existing international entities.

2....The financial mechanism shall have an equitable and balanced representation of all Parties within a transparent system of governance.

3....The Conference of the Parties and the entity or entities entrusted with the operation of the financial mechanism shall agree upon arrangements to give effect to the above paragraphs, which shall include the following:

(a)...Modalities to ensure that the funded projects to address climate change are in conformity with the policies, programme priorities and eligibility criteria established by the Conference of the Parties;

(b)...Modalities by which a particular funding decision may be reconsidered in light of these policies, programme priorities and eligibility criteria;

(c)...Provision by the entity or entities of regular reports to the Conference of the Parties on its funding operations, which is consistent with the requirement for accountability set out in paragraph 1 above; and

(d)...Determination in a predictable and identifiable manner of the amount of funding necessary and available for the implementation of this Convention and the conditions under which that amount shall be periodically reviewed.

4....The Conference of the Parties shall make arrangements to implement the above- mentioned provisions at its first session, reviewing and taking into account the interim arrangements referred to in Article 21, paragraph 3, and shall decide whether these interim arrangements shall be maintained. Within four years thereafter, the Conference of the Parties shall review the financial mechanism and take appropriate measures.

5....The developed country Parties may also provide and developing country Parties avail themselves of, financial resources related to the implementation of the Convention through bilateral, regional and other multilateral channels.

ARTICLE 12 - COMMUNICATION OF INFORMATION RELATED TO IMPLEMENTATION

1....In accordance with Article 4, paragraph 1, each Party shall communicate to the Conference of the Parties, through the secretariat, the following elements of information:

(a)....A national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, to the extent its capacities permit, using comparable methodologies to be promoted and agreed upon by the Conference of the Parties;

(b)....A general description of steps taken or envisaged by the Party to implement the Convention; and

(c)....Any other information that the Party considers relevant to the achievement of the objective of the Convention and suitable for inclusion in its communication, including, if feasible, material relevant for calculations of global emission trends.

2....Each developed country Party and each other Party included in Annex I shall incorporate in its communication the following elements of information:

(a)....A detailed description of the policies and measures that it has adopted to implement its commitment under Article 4, paragraphs 2(a) and 2(b); and

(b)....A specific estimate of the effects that the policies and measures referred to in subparagraph (a) immediately above will have on anthropogenic emissions by its sources and removals by its sinks of greenhouse gases during the period referred to in Article 4, paragraph 2(a).

3....In addition, each developed country Party and each other developed Party included in Annex II shall incorporate details of measures taken in accordance with Article 4, paragraphs 3, 4 and 5.

4....Developing country Parties may, on a voluntary basis, propose projects for financing, including specific technologies, materials, equipment, techniques or practices that would be needed to implement such projects, along with, if possible, an estimate of all incremental costs, of the reductions of emissions and increments of removals of greenhouse gases, as well as an estimate of the consequent benefits.

5....Each developed country Party and each other Party included in Annex I shall make its initial communication within six months of the entry into force of the Convention for that Party. Each Party not so listed shall make its initial communication within three years of the entry into force of the Convention for that Party, or of the availability of financial resources in accordance with Article 4, paragraph 3. Parties that are least developed countries may make their initial communication at their discretion. The frequency of subsequent communications by all Parties shall be determined by the Conference of the Parties, taking into account the differentiated timetable set by this paragraph.

6....Information communicated by Parties under this Article shall be transmitted by the secretariat as soon as possible to the Conference of the Parties and to any subsidiary bodies concerned. If necessary, the procedures for the communication of information may be further considered by the Conference of the Parties.

7....From its first session, the Conference of the Parties shall arrange for the provision to developing country Parties of technical and financial support, on request, in compiling and communicating information under this Article, as well as in identifying the technical and financial needs associated with proposed projects and response measures under Article 4. Such support may be provided by other Parties, by competent international organizations and by the secretariat, as appropriate.

8....Any group of Parties may, subject to guidelines adopted by the Conference of the Parties, and to prior notification to the Conference of the Parties, make a joint communication in fulfilment of their obligations under this Article, provided that such a communication includes information on the fulfilment by each of these Parties of its individual obligations under the Convention.

9....Information received by the secretariat that is designated by a Party as confidential, in accordance with criteria to be established by the Conference of the Parties, shall be aggregated by the secretariat to protect its confidentiality before being made available to any of the bodies involved in the communication and review of information.

10....Subject to paragraph 9 above, and without prejudice to the ability of any Party to make public its communication at any time, the secretariat shall make communications by Parties under this Article publicly available at the time they are submitted to the Conference of the Parties.

ARTICLE 13 - RESOLUTION OF QUESTIONS REGARDING IMPLEMENTATION

The Conference of the Parties shall, at its first session, consider the establishment of a multilateral consultative process, available to Parties on their request, for the resolution of questions regarding the implementation of the Convention.

ARTICLE 14 - SETTLEMENT OF DISPUTES

1....In the event of a dispute between any two or more Parties concerning the interpretation or application of the Convention, the Parties concerned shall seek a settlement of the dispute through negotiation or any other peaceful means of their own choice.

2....When ratifying, accepting, approving or acceding to the Convention, or at any time thereafter, a Party which is not a regional economic integration organization may declare in a written instrument submitted to the Depositary that, in respect of any dispute concerning the interpretation or application of the Convention, it recognizes as compulsory ipso facto and without special agreement, in relation to any Party accepting the same obligation:

(a)....Submission of the dispute to the International Court of Justice, and/or

(b)....Arbitration in accordance with procedures to be adopted by the Conference of the Parties as soon as practicable, in an annex on arbitration.

A Party which is a regional economic integration organization may make a declaration with like effect in relation to arbitration in accordance with the procedures referred to in subparagraph (b) above.

3....A declaration made under paragraph 2 above shall remain in force until it expires in accordance with its terms or until three months after written notice of its revocation has been deposited with the Depositary.

4....A new declaration, a notice of revocation or the expiry of a declaration shall not in any way affect proceedings pending before the International Court of Justice or the arbitral tribunal, unless the parties to the dispute otherwise agree.

5....Subject to the operation of paragraph 2 above, if after twelve months following notification by one Party to another that a dispute exists between them, the Parties concerned have not been able to settle their dispute through the means mentioned in paragraph 1 above, the dispute shall be submitted, at the request of any of the parties to the dispute, to conciliation.

6....A conciliation commission shall be created upon the request of one of the parties to the dispute. The commission shall be composed of an equal number of members appointed by each party concerned and a chairman chosen jointly by the members appointed by each party. The commission shall render a recommendatory award, which the parties shall consider in good faith.

7....Additional procedures relating to conciliation shall be adopted by the Conference of the Parties, as soon as practicable, in an annex on conciliation.

8....The provisions of this Article shall apply to any related legal instrument which the Conference of the Parties may adopt, unless the instrument provides otherwise.

ARTICLE 15 - AMENDMENTS TO THE CONVENTION

1....Any Party may propose amendments to the Convention.

2....Amendments to the Convention shall be adopted at an ordinary session of the Conference of the Parties. The text of any proposed amendment to the Convention shall be communicated to the Parties by the secretariat at least six months before the meeting at which it is proposed for adoption. The secretariat shall also communicate proposed amendments to the signatories to the Convention and, for information, to the Depositary.

3....The Parties shall make every effort to reach agreement on any proposed amendment to the Convention by consensus. If all efforts at consensus have been exhausted, and no agreement reached, the amendment shall as a last resort be adopted by a three-fourths majority vote of the Parties present and voting at the meeting. The adopted amendment shall be communicated by the secretariat to the Depositary, who shall circulate it to all Parties for their acceptance.

4....Instruments of acceptance in respect of an amendment shall be deposited with the Depositary. An amendment adopted in accordance with paragraph 3 above shall enter into force for those Parties having accepted it on the ninetieth day after the date of receipt by the Depositary of an instrument of acceptance by at least three fourths of the Parties to the Convention.

5....The amendment shall enter into force for any other Party on the ninetieth day after the date on which that Party deposits with the Depositary its instrument of acceptance of the said amendment.

6...For the purposes of this Article, "Parties present and voting" means Parties present and casting an affirmative or negative vote.

ARTICLE 16 - ADOPTION AND AMENDMENT OF ANNEXES TO THE CONVENTION

1...Annexes to the Convention shall form an integral part thereof and, unless otherwise expressly provided, a reference to the Convention constitutes at the same time a reference to any annexes thereto. Without prejudice to the provisions of Article 14, paragraphs 2(b) and 7, such annexes shall be restricted to lists, forms and any other material of a descriptive nature that is of a scientific, technical, procedural or administrative character.

2...Annexes to the Convention shall be proposed and adopted in accordance with the procedure set forth in Article 15, paragraphs 2, 3 and 4.

3...An annex that has been adopted in accordance with paragraph 2 above shall enter into force for all Parties to the Convention six months after the date of the communication by the Depositary to such Parties of the adoption of the annex, except for those Parties that have notified the Depositary, in writing, within that period of their non-acceptance of the annex. The annex shall enter into force for Parties which withdraw their notification of non-acceptance on the ninetieth day after the date on which withdrawal of such notification has been received by the Depositary.

4...The proposal, adoption and entry into force of amendments to annexes to the Convention shall be subject to the same procedure as that for the proposal, adoption and entry into force of annexes to the Convention in accordance with paragraphs 2 and 3 above.

5...If the adoption of an annex or an amendment to an annex involves an amendment to the Convention, that annex or amendment to an annex shall not enter into force until such time as the amendment to the Convention enters into force.

ARTICLE 17 - PROTOCOLS

1...The Conference of the Parties may, at any ordinary session, adopt protocols to the Convention.

2...The text of any proposed protocol shall be communicated to the Parties by the secretariat at least six months before such a session.

3...The requirements for the entry into force of any protocol shall be established by that instrument.

4...Only Parties to the Convention may be Parties to a protocol.

5...Decisions under any protocol shall be taken only by the Parties to the protocol concerned.

ARTICLE 18 - RIGHT TO VOTE

1....Each Party to the Convention shall have one vote, except as provided for in paragraph 2 below.

2....Regional economic integration organizations, in matters within their competence, shall exercise their right to vote with a number of votes equal to the number of their member States that are Parties to the Convention. Such an organization shall not exercise its right to vote if any of its member States exercises its right, and vice versa.

ARTICLE 19 - DEPOSITARY

The Secretary-General of the United Nations shall be the Depositary of the Convention and of protocols adopted in accordance with Article 17.

ARTICLE 20 - SIGNATURE

This Convention shall be open for signature by States Members of the United Nations or of any of its specialized agencies or that are Parties to the Statute of the International Court of Justice and by regional economic integration organizations at Rio de Janeiro, during the United Nations Conference on Environment and Development, and thereafter at United Nations Headquarters in New York from 20 June 1992 to 19 June 1993.

ARTICLE 21 - INTERIM ARRANGEMENTS

1....The secretariat functions referred to in Article 8 will be carried out on an interim basis by the secretariat established by the General Assembly of the United Nations in its resolution 45/212 of 21 December 1990, until the completion of the first session of the Conference of the Parties.

2....The head of the interim secretariat referred to in paragraph 1 above will cooperate closely with the Intergovernmental Panel on Climate Change to ensure that the Panel can respond to the need for objective scientific and technical advice. Other relevant scientific bodies could also be consulted.

3....The Global Environment Facility of the United Nations Development Programme, the United Nations Environment Programme and the International Bank for Reconstruction and Development shall be the international entity entrusted with the operation of the financial mechanism referred to in Article 11 on an interim basis. In this connection, the Global Environment Facility should be appropriately restructured and its membership made universal to enable it to fulfil the requirements of Article 11.

ARTICLE 22 - RATIFICATION, ACCEPTANCE, APPROVAL OR ACCESSION

1....The Convention shall be subject to ratification, acceptance, approval or accession by States and by regional economic integration organizations. It shall be open for accession from the day after the date on which the Convention is closed for signature. Instruments of ratification, acceptance, approval or accession shall be deposited with the Depositary.

2....Any regional economic integration organization which becomes a Party to the Convention without any of its member States being a Party shall be bound by all the obligations under the

Convention. In the case of such organizations, one or more of whose member States is a Party to the Convention, the organization and its member States shall decide on their respective responsibilities for the performance of their obligations under the Convention. In such cases, the organization and the member States shall not be entitled to exercise rights under the Convention concurrently.

3...In their instruments of ratification, acceptance, approval or accession, regional economic integration organizations shall declare the extent of their competence with respect to the matters governed by the Convention. These organizations shall also inform the Depositary, who shall in turn inform the Parties, of any substantial modification in the extent of their competence.

ARTICLE 23 - ENTRY INTO FORCE

1...The Convention shall enter into force on the ninetieth day after the date of deposit of the fiftieth instrument of ratification, acceptance, approval or accession.

2...For each State or regional economic integration organization that ratifies, accepts or approves the Convention or accedes thereto after the deposit of the fiftieth instrument of ratification, acceptance, approval or accession, the Convention shall enter into force on the ninetieth day after the date of deposit by such State or regional economic integration organization of its instrument of ratification, acceptance, approval or accession.

3...For the purposes of paragraphs 1 and 2 above, any instrument deposited by a regional economic integration organization shall not be counted as additional to those deposited by States members of the organization.

ARTICLE 24 - RESERVATIONS

No reservations may be made to the Convention.

ARTICLE 25 - WITHDRAWAL

1...At any time after three years from the date on which the Convention has entered into force for a Party, that Party may withdraw from the Convention by giving written notification to the Depositary.

2...Any such withdrawal shall take effect upon expiry of one year from the date of receipt by the Depositary of the notification of withdrawal, or on such later date as may be specified in the notification of withdrawal.

3...Any Party that withdraws from the Convention shall be considered as also having withdrawn from any protocol to which it is a Party.

ARTICLE 26 - AUTHENTIC TEXTS

The original of this Convention, of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Secretary- General of the United Nations.

IN WITNESS WHEREOF the undersigned, being duly authorized to that effect, have signed this Convention.

DONE at New York this ninth day of May one thousand nine hundred and ninety- two.

Annex I

Australia
Austria
Belarus*
Belgium
Bulgaria*
Canada
Czechoslovakia*
Denmark
European Economic Community
Estonia*
Finland
France
Germany
Greece
Hungary*
Iceland
Ireland
Italy
Japan
Latvia*
Lithuania*
Luxembourg
Netherlands
New Zealand
Norway
Poland*
Portugal
Romania*/
Russian Federation*
Spain
Sweden
Switzerland
Turkey
Ukraine*
United Kingdom of Great Britain and Northern Ireland
United States of America

*Countries that are undergoing the process of transition to a market economy.

Annex II

Australia
Austria
Belgium
Canada
Denmark
European Economic Community
Finland
France
Germany
Greece
Iceland
Ireland
Italy
Japan
Luxembourg
Netherlands
NewZealand
Norway
Portugal
Spain
Sweden
Switzerland
Turkey
United Kingdom of Great Britain and Northern Ireland
United States of America

Appendix - ii

KYOTO PROTOCOL TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE.

The Parties to this Protocol,

Being Parties to the United Nations Framework Convention on Climate Change, hereinafter referred to as "the Convention",

In pursuit of the ultimate objective of the Convention as stated in its Article 2,

Recalling the provisions of the Convention,

Being guided by Article 3 of the Convention,

Pursuant to the Berlin Mandate adopted by decision 1/CP.1 of the

Conference of the Parties to the Convention at its first session,

Have agreed as follows:

Article 1

For the purposes of this Protocol, the definitions contained in Article 1 of the Convention shall apply. In addition:

1. "Conference of the Parties" means the Conference of the Parties to the Convention.
2. "Convention" means the United Nations Framework Convention on Climate Change, adopted in New York on 9 May 1992.
3. "Intergovernmental Panel on Climate Change" means the Intergovernmental Panel on Climate Change established in 1988 jointly by the World Meteorological Organization and the United Nations Environment Programme.
4. "Montreal Protocol" means the Montreal Protocol on Substances that Deplete the Ozone Layer, adopted in Montreal on 16 September 1987 and as subsequently adjusted and amended.
5. "Parties present and voting" means Parties present and casting an affirmative or negative vote.
6. "Party" means, unless the context otherwise indicates, a Party to this Protocol.
7. "Party included in Annex I" means a Party included in Annex I to the Convention, as may be amended, or a Party which has made a notification under Article 4, paragraph 2(g), of the Convention.

Article 2

1. Each Party included in Annex I, in achieving its quantified emission limitation and reduction commitments under Article 3, in order to promote sustainable development, shall:

(a) Implement and/or further elaborate policies and measures in accordance with its national circumstances, such as:

(i) Enhancement of energy efficiency in relevant sectors of the national economy;

(ii) Protection and enhancement of sinks and reservoirs of greenhouse gases not controlled by the Montreal Protocol, taking into account its commitments under relevant international environmental agreements; promotion of sustainable forest management practices, afforestation and reforestation;

(iii) Promotion of sustainable forms of agriculture in light of climate change considerations;

(iv) Research on, and promotion, development and increased use of, new and renewable forms of energy, of carbon dioxide sequestration technologies and of advanced and innovative environmentally sound technologies;

(v) Progressive reduction or phasing out of market imperfections, fiscal incentives, tax and duty exemptions and subsidies in all greenhouse gas emitting sectors that run counter to the objective of the Convention and application of market instruments;

(vi) Encouragement of appropriate reforms in relevant sectors aimed at promoting policies and measures which limit or reduce emissions of greenhouse gases not controlled by the Montreal Protocol;

(vii) Measures to limit and/or reduce emissions of greenhouse gases not controlled by the Montreal Protocol in the transport sector;

(viii) Limitation and/or reduction of methane emissions through recovery and use in waste management, as well as in the production, transport and distribution of energy;

(b) Cooperate with other such Parties to enhance the individual and combined effectiveness of their policies and measures adopted under this Article, pursuant to Article 4, paragraph 2(e)(i), of the Convention. To this end, these Parties shall take steps to share their experience and exchange information on such policies and measures, including developing ways of improving their comparability, transparency and effectiveness. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session or as soon as practicable thereafter, consider ways to facilitate such cooperation, taking into account all relevant information.

2. The Parties included in Annex I shall pursue limitation or reduction of emissions of greenhouse gases not controlled by the Montreal Protocol from aviation and marine bunker fuels, working through the International Civil Aviation Organization and the International Maritime Organization, respectively.

3. The Parties included in Annex I shall strive to implement policies and measures under this Article in such a way as to minimize adverse effects, including the adverse effects of climate change, effects on international trade, and social, environmental and economic impacts on other Parties, especially developing country Parties and in particular those identified in Article 4, paragraphs 8 and 9, of the Convention, taking into account Article 3 of the Convention. The Conference of the Parties serving as the meeting of the Parties to this Protocol may take further action, as appropriate, to promote the implementation of the provisions of this paragraph.

4. The Conference of the Parties serving as the meeting of the Parties to this Protocol, if it decides that it would be beneficial to coordinate any of the policies and measures in paragraph 1(a) above, taking into account different national circumstances and potential effects, shall consider ways and means to elaborate the coordination of such policies and measures.

Article 3

1. The Parties included in Annex I shall, individually or jointly, ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts, calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of this Article, with a view to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012.

2. Each Party included in Annex I shall, by 2005, have made demonstrable progress in achieving its commitments under this Protocol.

3. The net changes in greenhouse gas emissions by sources and removals by sinks resulting from direct human-induced land-use change and forestry activities, limited to afforestation, reforestation and deforestation since 1990, measured as verifiable changes in carbon stocks in each commitment period, shall be used to meet the commitments under this Article of each Party included in Annex I. The greenhouse gas emissions by sources and removals by sinks associated with those activities shall be reported in a transparent and verifiable manner and reviewed in accordance with Articles 7 and 8.

4. Prior to the first session of the Conference of the Parties serving as the meeting of the Parties to this Protocol, each Party included in Annex I shall provide, for consideration by the Subsidiary Body for Scientific and Technological Advice, data to establish its level of carbon stocks in 1990 and to enable an estimate to be made of its changes in carbon stocks in subsequent years. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session or as soon as practicable thereafter, decide upon modalities, rules and guidelines as to how, and which, additional human-induced activities related to changes in greenhouse gas emissions by sources and removals by sinks in the agricultural soils and the land-use change and forestry categories shall be added to, or subtracted from, the assigned amounts for Parties included in Annex I, taking into account uncertainties, transparency in reporting, verifiability, the methodological work of the Intergovernmental Panel on Climate Change, the advice provided by the Subsidiary Body for Scientific and Technological Advice in accordance with Article 5 and the decisions of the Conference of the Parties. Such a decision shall apply in the second and subsequent commitment periods. A Party may choose to apply such a decision on these additional human-induced activities for its first commitment period, provided that these activities have taken place since 1990.

5. The Parties included in Annex I undergoing the process of transition to a market economy whose base year or period was established pursuant to decision 9/CP.2 of the Conference of the Parties at its second session shall use that base year or period for the implementation of their commitments under this Article. Any other Party included in Annex I undergoing the process of transition to a market economy which has not yet submitted its first national communication under Article 12 of the Convention may also notify the Conference of the Parties serving as the meeting of the Parties to this Protocol that it intends to use an historical base year or period other than 1990 for the implementation of its commitments under this Article. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall decide on the acceptance of such notification.
6. Taking into account Article 4, paragraph 6, of the Convention, in the implementation of their commitments under this Protocol other than those under this Article, a certain degree of flexibility shall be allowed by the Conference of the Parties serving as the meeting of the Parties to this Protocol to the Parties included in Annex I undergoing the process of transition to a market economy.
7. In the first quantified emission limitation and reduction commitment period, from 2008 to 2012, the assigned amount for each Party included in Annex I shall be equal to the percentage inscribed for it in Annex B of its aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A in 1990, or the base year or period determined in accordance with paragraph 5 above, multiplied by five. Those Parties included in Annex I for whom land-use change and forestry constituted a net source of greenhouse gas emissions in 1990 shall include in their 1990 emissions base year or period the aggregate anthropogenic carbon dioxide equivalent emissions by sources minus removals by sinks in 1990 from land-use change for the purposes of calculating their assigned amount.
8. Any Party included in Annex I may use 1995 as its base year for hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride, for the purposes of the calculation referred to in paragraph 7 above.
9. Commitments for subsequent periods for Parties included in Annex I shall be established in amendments to Annex B to this Protocol, which shall be adopted in accordance with the provisions of Article 21, paragraph 7. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall initiate the consideration of such commitments at least seven years before the end of the first commitment period referred to in paragraph 1 above.
10. Any emission reduction units, or any part of an assigned amount, which a Party acquires from another Party in accordance with the provisions of Article 6 or of Article 17 shall be added to the assigned amount for the acquiring Party.
11. Any emission reduction units, or any part of an assigned amount, which a Party transfers to another Party in accordance with the provisions of Article 6 or of Article 17 shall be subtracted from the assigned amount for the transferring Party.
12. Any certified emission reductions which a Party acquires from another Party in accordance with the provisions of Article 12 shall be added to the assigned amount for the acquiring Party.

13. If the emissions of a Party included in Annex I in a commitment period are less than its assigned amount under this Article, this difference shall, on request of that Party, be added to the assigned amount for that Party for subsequent commitment periods.

14. Each Party included in Annex I shall strive to implement the commitments mentioned in paragraph 1 above in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. In line with relevant decisions of the Conference of the Parties on the implementation of those paragraphs, the Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session, consider what actions are necessary to minimize the adverse effects of climate change and/or the impacts of response measures on Parties referred to in those paragraphs. Among the issues to be considered shall be the establishment of funding, insurance and transfer of technology.

Article 4

1. Any Parties included in Annex I that have reached an agreement to fulfil their commitments under Article 3 jointly, shall be deemed to have met those commitments provided that their total combined aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of Article 3. The respective emission level allocated to each of the Parties to the agreement shall be set out in that agreement.

2. The Parties to any such agreement shall notify the secretariat of the terms of the agreement on the date of deposit of their instruments of ratification, acceptance or approval of this Protocol, or accession thereto. The secretariat shall in turn inform the Parties and signatories to the Convention of the terms of the agreement.

3. Any such agreement shall remain in operation for the duration of the commitment period specified in Article 3, paragraph 7.

4. If Parties acting jointly do so in the framework of, and together with, a regional economic integration organization, any alteration in the composition of the organization after adoption of this Protocol shall not affect existing commitments under this Protocol. Any alteration in the composition of the organization shall only apply for the purposes of those commitments under Article 3 that are adopted subsequent to that alteration.

5. In the event of failure by the Parties to such an agreement to achieve their total combined level of emission reductions, each Party to that agreement shall be responsible for its own level of emissions set out in the agreement.

6. If Parties acting jointly do so in the framework of, and together with, a regional economic integration organization which is itself a Party to this Protocol, each member State of that regional economic integration organization individually, and together with the regional economic integration organization acting in accordance with Article 24, shall, in the event of failure to achieve the total combined level of emission reductions, be responsible for its level of emissions as notified in accordance with this Article.

Article 5

1. Each Party included in Annex I shall have in place, no later than one year prior to the start of the first commitment period, a national system for the estimation of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol. Guidelines for such national systems, which shall incorporate the methodologies specified in paragraph 2 below, shall be decided upon by the Conference of the Parties serving as the meeting of the Parties to this Protocol at its first session.

2. Methodologies for estimating anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol shall be those accepted by the Intergovernmental Panel on Climate Change and agreed upon by the Conference of the Parties at its third session. Where such methodologies are not used, appropriate adjustments shall be applied according to methodologies agreed upon by the Conference of the Parties serving as the meeting of the Parties to this Protocol at its first session. Based on the work of, *inter alia*, the Intergovernmental Panel on Climate Change and advice provided by the Subsidiary Body for Scientific and Technological Advice, the Conference of the Parties serving as the meeting of the Parties to this Protocol shall regularly review and, as appropriate, revise such methodologies and adjustments, taking fully into account any relevant decisions by the Conference of the Parties. Any revision to methodologies or adjustments shall be used only for the purposes of ascertaining compliance with commitments under Article 3 in respect of any commitment period adopted subsequent to that revision.

3. The global warming potentials used to calculate the carbon dioxide equivalence of anthropogenic emissions by sources and removals by sinks of greenhouse gases listed in Annex A shall be those accepted by the Intergovernmental Panel on Climate Change and agreed upon by the Conference of the Parties at its third session. Based on the work of, *inter alia*, the Intergovernmental Panel on Climate Change and advice provided by the Subsidiary Body for Scientific and Technological Advice, the Conference of the Parties serving as the meeting of the Parties to this Protocol shall regularly review and, as appropriate, revise the global warming potential of each such greenhouse gas, taking fully into account any relevant decisions by the Conference of the Parties. Any revision to a global warming potential shall apply only to commitments under Article 3 in respect of any commitment period adopted subsequent to that revision.

Article 6

1. For the purpose of meeting its commitments under Article 3, any Party included in Annex I may transfer to, or acquire from, any other such Party emission reduction units resulting from projects aimed at reducing anthropogenic emissions by sources or enhancing anthropogenic removals by sinks of greenhouse gases in any sector of the economy, provided that:

- (a) Any such project has the approval of the Parties involved;
- (b) Any such project provides a reduction in emissions by sources, or an enhancement of removals by sinks, that is additional to any that would otherwise occur;
- (c) It does not acquire any emission reduction units if it is not in compliance with its obligations under Articles 5 and 7; and
- (d) The acquisition of emission reduction units shall be supplemental to domestic actions for the purposes of meeting commitments under Article 3.

2. The Conference of the Parties serving as the meeting of the Parties to this Protocol may, at its first session or as soon as practicable thereafter, further elaborate guidelines for the implementation of this Article, including for verification and reporting.

3. A Party included in Annex I may authorize legal entities to participate, under its responsibility, in actions leading to the generation, transfer or acquisition under this Article of emission reduction units.

4. If a question of implementation by a Party included in Annex I of the requirements referred to in this Article is identified in accordance with the relevant provisions of Article 8, transfers and acquisitions of emission reduction units may continue to be made after the question has been identified, provided that any such units may not be used by a Party to meet its commitments under Article 3 until any issue of compliance is resolved.

Article 7

1. Each Party included in Annex I shall incorporate in its annual inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol, submitted in accordance with the relevant decisions of the Conference of the Parties, the necessary supplementary information for the purposes of ensuring compliance with Article 3, to be determined in accordance with paragraph 4 below.

2. Each Party included in Annex I shall incorporate in its national communication, submitted under Article 12 of the Convention, the supplementary information necessary to demonstrate compliance with its commitments under this Protocol, to be determined in accordance with paragraph 4 below.

3. Each Party included in Annex I shall submit the information required under paragraph 1 above annually, beginning with the first inventory due under the Convention for the first year of the commitment period after this Protocol has entered into force for that Party. Each such Party shall submit the information required under paragraph 2 above as part of the first national communication due under the Convention after this Protocol has entered into force for it and after the adoption of guidelines as provided for in paragraph 4 below. The frequency of subsequent submission of information required under this Article shall be determined by the Conference of the Parties serving as the meeting of the Parties to this Protocol, taking into account any timetable for the submission of national communications decided upon by the Conference of the Parties.

4. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall adopt at its first session, and review periodically thereafter, guidelines for the preparation of the information required under this Article, taking into account guidelines for the preparation of national communications by Parties included in Annex I adopted by the Conference of the Parties. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall also, prior to the first commitment period, decide upon modalities for the accounting of assigned amounts.

Article 8

1. The information submitted under Article 7 by each Party included in Annex I shall be reviewed by expert review teams pursuant to the relevant decisions of the Conference of the Parties and in accordance with guidelines adopted for this purpose by the Conference of the Parties serving as the meeting of the Parties to this Protocol under paragraph 4 below. The information submitted

under Article 7, paragraph 1, by each Party included in Annex I shall be reviewed as part of the annual compilation and accounting of emissions inventories and assigned amounts. Additionally, the information submitted under Article 7, paragraph 2, by each Party included in Annex I shall be reviewed as part of the review of communications.

2. Expert review teams shall be coordinated by the secretariat and shall be composed of experts selected from those nominated by Parties to the Convention and, as appropriate, by intergovernmental organizations, in accordance with guidance provided for this purpose by the Conference of the Parties.

3. The review process shall provide a thorough and comprehensive technical assessment of all aspects of the implementation by a Party of this Protocol. The expert review teams shall prepare a report to the Conference of the Parties serving as the meeting of the Parties to this Protocol, assessing the implementation of the commitments of the Party and identifying any potential problems in, and factors influencing, the fulfilment of commitments. Such reports shall be circulated by the secretariat to all Parties to the Convention. The secretariat shall list those questions of implementation indicated in such reports for further consideration by the Conference of the Parties serving as the meeting of the Parties to this Protocol.

4. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall adopt at its first session, and review periodically thereafter, guidelines for the review of implementation of this Protocol by expert review teams taking into account the relevant decisions of the Conference of the Parties.

5. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, with the assistance of the Subsidiary Body for Implementation and, as appropriate, the Subsidiary Body for Scientific and Technological Advice, consider:

(a) The information submitted by Parties under Article 7 and the reports of the expert reviews thereon conducted under this Article; and

(b) Those questions of implementation listed by the secretariat under paragraph 3 above, as well as any questions raised by Parties.

6. Pursuant to its consideration of the information referred to in paragraph 5 above, the Conference of the Parties serving as the meeting of the Parties to this Protocol shall take decisions on any matter required for the implementation of this Protocol.

Article 9

1. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall periodically review this Protocol in the light of the best available scientific information and assessments on climate change and its impacts, as well as relevant technical, social and economic information. Such reviews shall be coordinated with pertinent reviews under the Convention, in particular those required by Article 4, paragraph 2(d), and Article 7, paragraph 2(a), of the Convention. Based on these reviews, the Conference of the Parties serving as the meeting of the Parties to this Protocol shall take appropriate action.

2. The first review shall take place at the second session of the Conference of the Parties serving as the meeting of the Parties to this Protocol. Further reviews shall take place at regular intervals and in a timely manner.

Article 10

All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, without introducing any new commitments for Parties not included in Annex I, but reaffirming existing commitments under Article 4, paragraph 1, of the Convention, and continuing to advance the implementation of these commitments in order to achieve sustainable development, taking into account Article 4, paragraphs 3, 5 and 7, of the Convention, shall:

- (a) Formulate, where relevant and to the extent possible, cost-effective national and, where appropriate, regional programmes to improve the quality of local emission factors, activity data and/or models which reflect the socio-economic conditions of each Party for the preparation and periodic updating of national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties, and consistent with the guidelines for the preparation of national communications adopted by the Conference of the Parties;
- (b) Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change and measures to facilitate adequate adaptation to climate change:
 - (i) Such programmes would, *inter alia*, concern the energy, transport and industry sectors as well as agriculture, forestry and waste management. Furthermore, adaptation technologies and methods for improving spatial planning would improve adaptation to climate change; and
 - (ii) Parties included in Annex I shall submit information on action under this Protocol, including national programmes, in accordance with Article 7; and other Parties shall seek to include in their national communications, as appropriate, information on programmes which contain measures that the Party believes contribute to addressing climate change and its adverse impacts, including the abatement of increases in greenhouse gas emissions, and enhancement of and removals by sinks, capacity building and adaptation measures;
- (c) Cooperate in the promotion of effective modalities for the development, application and diffusion of, and take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies, know-how, practices and processes pertinent to climate change, in particular to developing countries, including the formulation of policies and programmes for the effective transfer of environmentally sound technologies that are publicly owned or in the public domain and the creation of an enabling environment for the private sector, to promote and enhance the transfer of, and access to, environmentally sound technologies;
- (d) Cooperate in scientific and technical research and promote the maintenance and the development of systematic observation systems and development of data archives to reduce uncertainties related to the climate system, the adverse impacts of climate change and the economic and social consequences of various response strategies, and promote the development

and strengthening of endogenous capacities and capabilities to participate in international and intergovernmental efforts, programmes and networks on research and systematic observation, taking into account Article 5 of the Convention;

(e) Cooperate in and promote at the international level, and, where appropriate, using existing bodies, the development and implementation of education and training programmes, including the strengthening of national capacity building, in particular human and institutional capacities and the exchange or secondment of personnel to train experts in this field, in particular for developing countries, and facilitate at the national level public awareness of, and public access to information on, climate change. Suitable modalities should be developed to implement these activities through the relevant bodies of the Convention, taking into account Article 6 of the Convention;

(f) Include in their national communications information on programmes and activities undertaken pursuant to this Article in accordance with relevant decisions of the Conference of the Parties; and

(g) Give full consideration, in implementing the commitments under this Article, to Article 4, paragraph 8, of the Convention.

Article 11

1. In the implementation of Article 10, Parties shall take into account the provisions of Article 4, paragraphs 4, 5, 7, 8 and 9, of the Convention.

2. In the context of the implementation of Article 4, paragraph 1, of the Convention, in accordance with the provisions of Article 4, paragraph 3, and Article 11 of the Convention, and through the entity or entities entrusted with the operation of the financial mechanism of the Convention, the developed country Parties and other developed Parties included in Annex II to the Convention shall:

(a) Provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties in advancing the implementation of existing commitments under Article 4, paragraph 1(a), of the Convention that are covered in Article 10, subparagraph (a); and

(b) Also provide such financial resources, including for the transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs of advancing the implementation of existing commitments under Article 4, paragraph 1, of the Convention that are covered by Article 10 and that are agreed between a developing country Party and the international entity or entities referred to in Article 11 of the Convention, in accordance with that Article.

The implementation of these existing commitments shall take into account the need for adequacy and predictability in the flow of funds and the importance of appropriate burden sharing among developed country Parties. The guidance to the entity or entities entrusted with the operation of the financial mechanism of the Convention in relevant decisions of the Conference of the Parties, including those agreed before the adoption of this Protocol, shall apply *mutatis mutandis* to the provisions of this paragraph.

3. The developed country Parties and other developed Parties in Annex II to the Convention may also provide, and developing country Parties avail themselves of, financial resources for the implementation of Article 10, through bilateral, regional and other multilateral channels.

Article 12

1. A clean development mechanism is hereby defined.

2. The purpose of the clean development mechanism shall be to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under Article 3.

3. Under the clean development mechanism:

(a) Parties not included in Annex I will benefit from project activities resulting in certified emission reductions; and

(b) Parties included in Annex I may use the certified emission reductions accruing from such project activities to contribute to compliance with part of their quantified emission limitation and reduction commitments under Article 3, as determined by the Conference of the Parties serving as the meeting of the Parties to this Protocol.

4. The clean development mechanism shall be subject to the authority and guidance of the Conference of the Parties serving as the meeting of the Parties to this Protocol and be supervised by an executive board of the clean development mechanism.

5. Emission reductions resulting from each project activity shall be certified by operational entities to be designated by the Conference of the Parties serving as the meeting of the Parties to this Protocol, on the basis of:

(a) Voluntary participation approved by each Party involved;

(b) Real, measurable, and long-term benefits related to the mitigation of climate change; and

(c) Reductions in emissions that are additional to any that would occur in the absence of the certified project activity.

6. The clean development mechanism shall assist in arranging funding of certified project activities as necessary.

7. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session, elaborate modalities and procedures with the objective of ensuring transparency, efficiency and accountability through independent auditing and verification of project activities.

8. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall ensure that a share of the proceeds from certified project activities is used to cover administrative expenses as well as to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation.

9. Participation under the clean development mechanism, including in activities mentioned in paragraph 3(a) above and in the acquisition of certified emission reductions, may involve private and/or public entities, and is to be subject to whatever guidance may be provided by the executive board of the clean development mechanism.

10. Certified emission reductions obtained during the period from the year 2000 up to the beginning of the first commitment period can be used to assist in achieving compliance in the first commitment period.

Article 13

1. The Conference of the Parties, the supreme body of the Convention, shall serve as the meeting of the Parties to this Protocol.

2. Parties to the Convention that are not Parties to this Protocol may participate as observers in the proceedings of any session of the Conference of the Parties serving as the meeting of the Parties to this Protocol. When the Conference of the Parties serves as the meeting of the Parties to this Protocol, decisions under this Protocol shall be taken only by those that are Parties to this Protocol.

3. When the Conference of the Parties serves as the meeting of the Parties to this Protocol, any member of the Bureau of the Conference of the Parties representing a Party to the Convention but, at that time, not a Party to this Protocol, shall be replaced by an additional member to be elected by and from amongst the Parties to this Protocol.

4. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall keep under regular review the implementation of this Protocol and shall make, within its mandate, the decisions necessary to promote its effective implementation. It shall perform the functions assigned to it by this Protocol and shall:

(a) Assess, on the basis of all information made available to it in accordance with the provisions of this Protocol, the implementation of this Protocol by the Parties, the overall effects of the measures taken pursuant to this Protocol, in particular environmental, economic and social effects as well as their cumulative impacts and the extent to which progress towards the objective of the Convention is being achieved;

(b) Periodically examine the obligations of the Parties under this Protocol, giving due consideration to any reviews required by Article 4, paragraph 2(d), and Article 7, paragraph 2, of the Convention, in the light of the objective of the Convention, the experience gained in its implementation and the evolution of scientific and technological knowledge, and in this respect consider and adopt regular reports on the implementation of this Protocol;

(c) Promote and facilitate the exchange of information on measures adopted by the Parties to address climate change and its effects, taking into account the differing circumstances, responsibilities and capabilities of the Parties and their respective commitments under this Protocol;

(d) Facilitate, at the request of two or more Parties, the coordination of measures adopted by them to address climate change and its effects, taking into account the differing circumstances,

responsibilities and capabilities of the Parties and their respective commitments under this Protocol;

(e) Promote and guide, in accordance with the objective of the Convention and the provisions of this Protocol, and taking fully into account the relevant decisions by the Conference of the Parties, the development and periodic refinement of comparable methodologies for the effective implementation of this Protocol, to be agreed on by the Conference of the Parties serving as the meeting of the Parties to this Protocol;

(f) Make recommendations on any matters necessary for the implementation of this Protocol;

(g) Seek to mobilize additional financial resources in accordance with Article 11, paragraph 2;

(h) Establish such subsidiary bodies as are deemed necessary for the implementation of this Protocol;

(i) Seek and utilize, where appropriate, the services and cooperation of, and information provided by, competent international organizations and intergovernmental and non-governmental bodies; and

(j) Exercise such other functions as may be required for the implementation of this Protocol, and consider any assignment resulting from a decision by the Conference of the Parties.

5. The rules of procedure of the Conference of the Parties and financial procedures applied under the Convention shall be applied *mutatis mutandis* under this Protocol, except as may be otherwise decided by consensus by the Conference of the Parties serving as the meeting of the Parties to this Protocol.

6. The first session of the Conference of the Parties serving as the meeting of the Parties to this Protocol shall be convened by the secretariat in conjunction with the first session of the Conference of the Parties that is scheduled after the date of the entry into force of this Protocol. Subsequent ordinary sessions of the Conference of the Parties serving as the meeting of the Parties to this Protocol shall be held every year and in conjunction with ordinary sessions of the Conference of the Parties, unless otherwise decided by the Conference of the Parties serving as the meeting of the Parties to this Protocol.

7. Extraordinary sessions of the Conference of the Parties serving as the meeting of the Parties to this Protocol shall be held at such other times as may be deemed necessary by the Conference of the Parties serving as the meeting of the Parties to this Protocol, or at the written request of any Party, provided that, within six months of the request being communicated to the Parties by the secretariat, it is supported by at least one third of the Parties.

8. The United Nations, its specialized agencies and the International Atomic Energy

Agency, as well as any State member thereof or observers thereto not party to the Convention, may be represented at sessions of the Conference of the Parties serving as the meeting of the Parties to this Protocol as observers. Any body or agency, whether national or international, governmental or non-governmental, which is qualified in matters covered by this Protocol

and which has informed the secretariat of its wish to be represented at a session of the Conference of the Parties serving as the meeting of the Parties to this Protocol as an observer, may be so admitted unless at least one third of the Parties present object. The admission and participation of observers shall be subject to the rules of procedure, as referred to in paragraph 5 above.

Article 14

1. The secretariat established by Article 8 of the Convention shall serve as the secretariat of this Protocol.

2. Article 8, paragraph 2, of the Convention on the functions of the secretariat, and

Article 8, paragraph 3, of the Convention on arrangements made for the functioning of the secretariat, shall apply *mutatis mutandis* to this Protocol. The secretariat shall, in addition, exercise the functions assigned to it under this Protocol.

Article 15

1. The Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation established by Articles 9 and 10 of the Convention shall serve as, respectively, the Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation of this Protocol. The provisions relating to the functioning of these two bodies under the Convention shall apply *mutatis mutandis* to this Protocol. Sessions of the meetings of the Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation of this Protocol shall be held in conjunction with the meetings of, respectively, the Subsidiary Body for Scientific and Technological Advice and the Subsidiary Body for Implementation of the Convention.

2. Parties to the Convention that are not Parties to this Protocol may participate as observers in the proceedings of any session of the subsidiary bodies. When the subsidiary bodies serve as the subsidiary bodies of this Protocol, decisions under this Protocol shall be taken only by those that are Parties to this Protocol.

3. When the subsidiary bodies established by Articles 9 and 10 of the Convention exercise their functions with regard to matters concerning this Protocol, any member of the Bureaux of those subsidiary bodies representing a Party to the Convention but, at that time, not a party to this Protocol, shall be replaced by an additional member to be elected by and from amongst the Parties to this Protocol.

Article 16

The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, as soon as practicable, consider the application to this Protocol of, and modify as appropriate, the multilateral consultative process referred to in Article 13 of the Convention, in the light of any relevant decisions that may be taken by the Conference of the Parties. Any multilateral consultative process that may be applied to this Protocol shall operate without prejudice to the procedures and mechanisms established in accordance with Article 18.

Article 17

The Conference of the Parties shall define the relevant principles, modalities, rules and guidelines, in particular for verification, reporting and accountability for emissions trading. The Parties included in Annex B may participate in emissions trading for the purposes of

fulfilling their commitments under Article 3. Any such trading shall be supplemental to domestic actions for the purpose of meeting quantified emission limitation and reduction commitments under that Article.

Article 18

The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session, approve appropriate and effective procedures and mechanisms to determine and to address cases of non-compliance with the provisions of this Protocol, including through the development of an indicative list of consequences, taking into account the cause, type, degree and frequency of non-compliance. Any procedures and mechanisms under this Article entailing binding consequences shall be adopted by means of an amendment to this Protocol.

Article 19

The provisions of Article 14 of the Convention on settlement of disputes shall apply *mutatis mutandis* to this Protocol.

Article 20

1. Any Party may propose amendments to this Protocol.

2. Amendments to this Protocol shall be adopted at an ordinary session of the Conference of the Parties serving as the meeting of the Parties to this Protocol. The text of any proposed amendment to this Protocol shall be communicated to the Parties by the secretariat at least six months before the meeting at which it is proposed for adoption. The secretariat shall also communicate the text of any proposed amendments to the Parties and signatories to the Convention and, for information, to the Depositary.

3. The Parties shall make every effort to reach agreement on any proposed amendment to this Protocol by consensus. If all efforts at consensus have been exhausted, and no agreement reached, the amendment shall as a last resort be adopted by a three-fourths majority vote of the Parties present and voting at the meeting. The adopted amendment shall be communicated by the secretariat to the Depositary, who shall circulate it to all Parties for their acceptance.

4. Instruments of acceptance in respect of an amendment shall be deposited with the Depositary. An amendment adopted in accordance with paragraph 3 above shall enter into force for those Parties having accepted it on the ninetieth day after the date of receipt by the Depositary of an instrument of acceptance by at least three fourths of the Parties to this Protocol.

5. The amendment shall enter into force for any other Party on the ninetieth day after the date on which that Party deposits with the Depositary its instrument of acceptance of the said amendment.

Article 21

1. Annexes to this Protocol shall form an integral part thereof and, unless otherwise expressly provided, a reference to this Protocol constitutes at the same time a reference to any annexes thereto. Any annexes adopted after the entry into force of this Protocol shall be restricted to lists, forms and any other material of a descriptive nature that is of a scientific, technical, procedural or administrative character.

2. Any Party may make proposals for an annex to this Protocol and may propose amendments to annexes to this Protocol.

3. Annexes to this Protocol and amendments to annexes to this Protocol shall be adopted at an ordinary session of the Conference of the Parties serving as the meeting of the Parties to this Protocol. The text of any proposed annex or amendment to an annex shall be communicated to the Parties by the secretariat at least six months before the meeting at which it is proposed for adoption. The secretariat shall also communicate the text of any proposed annex or amendment to an annex to the Parties and signatories to the Convention and, for information, to the Depositary.

4. The Parties shall make every effort to reach agreement on any proposed annex or amendment to an annex by consensus. If all efforts at consensus have been exhausted, and no agreement reached, the annex or amendment to an annex shall as a last resort be adopted by a three-fourths majority vote of the Parties present and voting at the meeting. The adopted annex or amendment to an annex shall be communicated by the secretariat to the Depositary, who shall circulate it to all Parties for their acceptance.

5. An annex, or amendment to an annex other than Annex A or B, that has been adopted in accordance with paragraphs 3 and 4 above shall enter into force for all Parties to this Protocol six months after the date of the communication by the Depositary to such Parties of the adoption of the annex or adoption of the amendment to the annex, except for those Parties that have notified the Depositary, in writing, within that period of their non-acceptance of the annex or amendment to the annex. The annex or amendment to an annex shall enter into force for Parties which withdraw their notification of non-acceptance on the ninetieth day after the date on which withdrawal of such notification has been received by the Depositary.

6. If the adoption of an annex or an amendment to an annex involves an amendment to this Protocol, that annex or amendment to an annex shall not enter into force until such time as the amendment to this Protocol enters into force.

7. Amendments to Annexes A and B to this Protocol shall be adopted and enter into force in accordance with the procedure set out in Article 20, provided that any amendment to Annex B shall be adopted only with the written consent of the Party concerned.

Article 22

1. Each Party shall have one vote, except as provided for in paragraph 2 below.

2. Regional economic integration organizations, in matters within their competence, shall exercise their right to vote with a number of votes equal to the number of their member States that are Parties to this Protocol. Such an organization shall not exercise its right to vote if any of its member States exercises its right, and vice versa.

Article 23

The Secretary-General of the United Nations shall be the Depositary of this Protocol.

Article 24

1. This Protocol shall be open for signature and subject to ratification, acceptance or approval by States and regional economic integration organizations which are Parties to the Convention. It shall be open for signature at United Nations Headquarters in New York from

16 March 1998 to 15 March 1999. This Protocol shall be open for accession from the day after the date on which it is closed for signature. Instruments of ratification, acceptance, approval or accession shall be deposited with the Depositary.

2. Any regional economic integration organization which becomes a Party to this Protocol without any of its member States being a Party shall be bound by all the obligations under this Protocol. In the case of such organizations, one or more of whose member States is a Party to this Protocol, the organization and its member States shall decide on their respective responsibilities for the performance of their obligations under this Protocol. In such cases, the organization and the member States shall not be entitled to exercise rights under this Protocol concurrently.

3. In their instruments of ratification, acceptance, approval or accession, regional economic integration organizations shall declare the extent of their competence with respect to the matters governed by this Protocol. These organizations shall also inform the Depositary, who shall in turn inform the Parties, of any substantial modification in the extent of their competence.

Article 25

1. This Protocol shall enter into force on the ninetieth day after the date on which not less than 55 Parties to the Convention, incorporating Parties included in Annex I which accounted in total for at least 55 per cent of the total carbon dioxide emissions for 1990 of the Parties included in Annex I, have deposited their instruments of ratification, acceptance, approval or accession.

2. For the purposes of this Article, "the total carbon dioxide emissions for 1990 of the Parties included in Annex I" means the amount communicated on or before the date of adoption of this Protocol by the Parties included in Annex I in their first national communications submitted in accordance with Article 12 of the Convention.

3. For each State or regional economic integration organization that ratifies, accepts or

approves this Protocol or accedes thereto after the conditions set out in paragraph 1 above for entry into force have been fulfilled, this Protocol shall enter into force on the ninetieth day following the date of deposit of its instrument of ratification, acceptance, approval or accession.

4. For the purposes of this Article, any instrument deposited by a regional economic integration organization shall not be counted as additional to those deposited by States members of the organization.

Article 26

No reservations may be made to this Protocol.

Article 27

1. At any time after three years from the date on which this Protocol has entered into force for a Party, that Party may withdraw from this Protocol by giving written notification to the Depositary.

2. Any such withdrawal shall take effect upon expiry of one year from the date of receipt by the Depositary of the notification of withdrawal, or on such later date as may be specified in the notification of withdrawal.

3. Any Party that withdraws from the Convention shall be considered as also having withdrawn from this Protocol.

Article 28

The original of this Protocol, of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Secretary-General of the United Nations.

DONE at Kyoto this eleventh day of December one thousand nine hundred and ninety-seven.

IN WITNESS WHEREOF the undersigned, being duly authorized to that effect, have affixed their signatures to this Protocol on the dates indicated.

Annex A

Greenhouse gases

Carbon dioxide (CO₂)

Methane (CH₄)

Nitrous oxide (N₂O)

Hydrofluorocarbons (HFCs)

Perfluorocarbons (PFCs)

Sulphur hexafluoride (SF₆)

Sectors/source categories

Energy

Fuel combustion

Energy industries

Manufacturing industries and construction

Transport

Other sectors

Other

Fugitive emissions from fuels

Solid fuels

Oil and natural gas

Other

Industrial processes

Mineral products

Chemical industry

Metal production

Other production

Production of halocarbons and sulphur hexafluoride

Consumption of halocarbons and sulphur hexafluoride

Other

Solvent and other product use

Agriculture

Enteric fermentation

Manure management

Rice cultivation

Agricultural soils

Prescribed burning of savannas

Field burning of agricultural residues

Other

Waste

Solid waste disposal on land

Wastewater handling

Waste incineration

Other

Annex B

Party Quantified emission limitation or reduction commitment

(percentage of base year or period)

Australia 108

Austria 92
Belgium 92
Bulgaria* 92
Canada 94
Croatia* 95
Czech Republic* 92
Denmark 92
Estonia* 92
European Community 92
Finland 92
France 92
Germany 92
Greece 92
Hungary* 94
Iceland 110
Ireland 92
Italy 92
Japan 94
Latvia* 92
Liechtenstein 92
Lithuania* 92
Luxembourg 92
Monaco 92
Netherlands 92

New Zealand 100

Norway 101

Poland* 94

Portugal 92

Romania* 92

Russian Federation* 100

Slovakia* 92

Slovenia* 92

Spain 92

Sweden 92

Switzerland 92

Ukraine* 100

United Kingdom of Great Britain and Northern Ireland 92

United States of America 93

* Countries that are undergoing the process of transition to a market economy.