Climate Change and Global Warming: A Challenge to Humankind

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Climate change and Global Warming

Climate change is a daunting challenge on humankind. It will bring about severe adverse impacts on people, especially those living in developing countries.

During the 20th century, the earth's global average surface temperature rose by 0.6°C. Since 2000, additional warming of 0.14°C was measured. Although this increase was small, it recorded extraordinary rapid changes as compared to the previous 10,000 years. Scientists have now conclusively proved that over the 21st century, the earth's temperature will continue to rise, the consequences of which will be raising global sea level, increasing frequency and intensity of heat waves, droughts and floods.[1]

Sri Lanka, over the past two decades, has experienced such changes, except sea level rise, and these changes continue to impact on human and environmental health and economic prosperity, especially, of the rural masses. Further, such changes are also an outcome of increased human activities in a limited land area.

The increase in global surface temperature is attributed to uncontrolled release of green house gases, namely, carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). These emissions were released from the developed countries to the atmosphere about150 years ago, and continued unabated to achieve rapid industrial growth. Burning of fossil fuels, such as, hydrocarbons and coal, also contributed in a significant manner to such emissions.[2]

Protection of the Ozone Layer

The first assessment of emissions that impacted on the atmosphere was made by scientists in 1973. It was revealed that chlorofluorocarbons (CFCs) that were widely used in refrigeration and as aerosols, when broken down by ultraviolet radiation released chlorine atoms which destroyed large amounts of ozone in the stratosphere, preventing the absorption of ultraviolet B (UV-B) radiation that eventually lead to skin cancer and suppression of the immune system, leading to a higher incidence of some infectious diseases. Increased UV-B radiation could result in decreased crop production and change in species composition of natural aquatic ecosystems, making them unstable.

In response to the above findings, the United Nations Environment Programme (UNEP) initiated negotiations aimed at a global Convention to protect the ozone layer. Accordingly, the Vienna Convention for the Protection of the Ozone Layer was signed by 22 countries in 1985. It established a mechanism for international cooperation in research, monitoring and exchange of data on the state of the stratospheric ozone layer and on emissions and concentration of CFCs and other relevant chemicals. It was further discovered that hydro-chlorofluorocarbons (HCFCs) and hydrobromofluorocarbons (HBFCs) have less depleting potential on the ozone layer than CFCs and were temporary substitutes in industry.[3]

The Montreal Protocol

The Montreal Protocol on Substances that Deplete the Ozone Layer was signed on 16 September 1987 and entered into force on 1 January 1989. At present, 191 nations have become party to the Montreal Protocol. Since HBFCs and HCFCs are less effective than CFCs in depletion of the Ozone layer, the Protocol is structured to phase out the use of CFCs in industry, gradually from 1991 to 2010.

A multilateral fund for the implementation of the Montreal Protocol was created in 1992 to help developing countries to phase out the use of ozone-depleting substances used in refrigeration, foam extrusion, industrial cleaning, fire safety and fumigation. This fund was the first financial mechanism created under an international treaty. It is managed by an executive committee with an equal representation of seven industrialised nations and seven developing countries elected annually by a meeting of the Parties (MOP).The fund is replenished on a three-year basis by the donors. Pledges amounting to US$ 2.1 billion over the period 1991 to 2005 were made and were used to finance conversion of the existing manufacturing processes, train personnel, pay royalties and rights on new technologies and establish national ozone offices. The total budget for 2009 to 2011 is US $ 490 million.[4]

United Nations Framework Convention on Climate Change (UNFCCC)

In recognition of a wider impact of climate change caused by greenhouse gases, apart from those identified by the Montreal Protocol, and its non-restriction to national boundaries, it was realised that a concerted international effort is necessary to combat such activity. Accordingly the United Nations Framework Convention on Climate Change (UNFCCC) was adopted at the historical Earth Summit in 1992 in Rio de Janeiro.[5]

The UNFCCC also referred to as the Convention entered into force on 24 March 1994, the 90th day after receiving 50 ratifications or acceptances. The main objective of the Convention is to achieve stabilisation of greenhouse gas concentrations in the atmosphere at a low level to prevent dangerous anthropogenic interference with the climate system. Signatories to the Convention are split into 3 groups, namely, Annex 1 countries – industrialised countries, Annex 2 countries –developed countries which pay for costs of developing countries to combat greenhouse gases, and developing countries. Sri Lanka ratified the Convention on 23 November 1993.

Since the UNFCCC entered into force, the parties have been meeting annually in Conference of Parties (COP) to assess the progress related to climate change.

Under the UNFCCC, two separate subsidiary bodies were formed, namely, "Subsidiary Body for Scientific and Technical Advice (SBSTA) and the Subsidiary Body for Implementation (SBI).The SBSTA provides the COP with advice on scientific, technological and methodological matters and SBI gives advice on matters concerning the implementation of the UNFCCC.

The Kyoto Protocol (KP) to the UNFCCC

The Kyoto Protocol (KP) to the UNFCCC, as provided for in Article 17, was adopted at the 3rd Session of the Conference of Parties (COP 3) meeting in Kyoto Japan in 1997. This Protocol further strengthened the international response to climate change. It contains legally binding emission targets in developed countries for CO_2, CH_4, N_2O, HFCs, Perfluorocarbons (PFCs), and Sulphur hexafluoride (SF6).[6]

The countries were grouped as Annex 1 Developed and Non Annex 1 Developing countries. Developed countries were legally bound to commit themselves to reduce their collective emissions of the 6 greenhouse gases stated above by at least 5 per cent from the base 1990 levels. Each country's emission target was to be achieved by the period 2008-2012. Industrial and agricultural activities in both developed and developing countries that emit greenhouse gases were burning of fossil fuels, manufacture of chemicals and mineral products, burning of coal and other solid fuels, agriculture, rice cultivation, manure management ,solid waste disposal, etc. However, there were no commitments on the part of developing countries to reduce such greenhouse gases.

Article 12 of KP defines a Clean Development Mechanism (CDM) to assist parties who are not included in Annex 1 (developing countries) in achieving sustainable development and assist parties in Annex 1 (developed countries) in achieving compliance with their emission limitation. An international "emissions trading" regime was established allowing the industrialised countries to buy and sell emission credits amongst themselves. They will also be able to acquire "emission reduction units" by financing certain kinds of projects in other developed countries through a mechanism known as Joint Implementation. CDM for promoting sustainable development enables industrialised countries to finance emission reduction projects in developing countries and receive credit.

Emission cuts in a wide range of economic sectors and cooperation between governments to improve energy efficiency, reform the energy and transportation sectors promote renewable forms of energy, phase out inappropriate fiscal measures and market imperfections, limit methane emissions from waste management and protect forests and carbon sinks are actively pursued by the KP. Further, cooperation between developed and developing countries to limit emissions, and promote adaptations to future climate change impacts, submit information on national climate change programmes and inventories, promote technology transfer, etc. were also agreed by state parties to the KP. The protocol also reiterates the need to provide "new" and additional "financial resources" to meet the "agreed full costs" incurred by developing countries in carrying out these commitments.

The Conference of Parties (COP) of the UNFCCC also serves as the meeting of the Parties (MOP) for the KP.

The KP legally entered into force on 16 February 2005 after 55 parties of UNFCCC in Annex 1 that accounted, in total, for at least 55 per cent of total CO_2 emissions for 1990 had deposited their instruments of ratification, acceptance, approval or accession. As of 14 January 2009, 184 countries had acceded or ratified the KP which will be reviewed in 2012. Sri Lanka acceded the KP on 3 September 2002.

The UNFCCC (COP 11 /MOP 1) was a global event that took place in

Montreal from 28 November to 09 December, 2005. The conference attended by 10 000 delegates adopted the Montreal Action Plan (MAP), to extend the life of the KP beyond 2012 and negotiate deeper cuts in greenhouse gas emissions.

Intergovernmental Panel on Climate Change (IPCC)

In 2007, Intergovernmental Panel on Climate Change (IPCC), the leading body to review climate change, published the Fourth Assessment Report which gave undisputed scientific evidence that climate change is happening and accelerating mainly caused by emissions of greenhouse gases from human activities and can have severe irreversible consequences, especially for developing countries and Small Island Developing States (SIDS), in particular.[7]

In response to the IPCC findings, in a non binding "Washington Declaration" on 16 February 2007, the G8 +5 group of leaders agreed in principle to a global cap -and-trade system that would apply to both industrialised and developing countries which they hoped would be in place by 2009.[8]

Further, on 7 June 2007, leaders of the G8 countries at the 33rd Summit issued another a non-binding communiqué, announcing that the G8 nations would "aim to at least halve global CO_2 emissions by 2050. It was agreed that details enabling this to be achieved would be negotiated by environment ministers within UNFCCC in a process that would include emerging economies." Groups of countries would also be able to reach additional agreements on achieving the goal outside and in parallel with the United Nations process. The G8 also announced their desire to use proceeds from the auction of emission rights and other financial tools to support climate protection projects in developing countries. This proposal was blocked by the President of United States until the major greenhouse gas emitting countries, like India and China, make similar commitments.[9]

The United Nations First Plenary Session on Climate Change 2007

The United Nations General Assembly opened its first ever plenary session devoted exclusively to Climate Change on 31 July 2007. This meeting also included prominent scientists and business leaders. The debate, where 100 nations spoke, highlighted real dangers of climate change. SIDS issued serious warnings that their countries will be completely submerged by the sea due to sea level rise with increasing global sea temperature. The Secretary General urged the member States to work together and stated that time has come for decisive action on a global scale and called for a comprehensive agreement under the UNFCCC process that tackles climate change on all fronts, including adaptation, mitigation, clean environment, deforestation and resource mobilisation.[10]

A round of climate change talks under UNFCC concluded in Austria on 31 August 2007 with agreement on key elements for an effective international response to climate change. A key feature of the talks was a United Nations report that showed how energy efficiency could yield significant cuts in emissions at low costs.

On 24 September 2007, the Secretary General of the United Nations held informal high-level discussions on a post Kyoto treaty in terms of the mandate received from the MAP at the end of 2005. It was expected that these would pave way for the United Nations Climate Change Conference in Bali in December 2007. Three Special Envoys on Climate Change were appointed on 1 May 2007 to hold discussions with various governments to define and plan the event.

The Secretary General hoped that at these discussions the world leaders would send a powerful political signal to the negotiations in Bali that "business as usual" will not do and that they are ready to work jointly with others towards a comprehensive multilateral framework for action.[11]

2007 United Nations Conference on Climate Change in Bali -The Bali Action Plan (BAP)

At the United Nations Climate Change Conference in Bali from 03 to 15 December 2007 (COP13), governments from around the world, both developed and developing countries, agreed to step up their effort to combat climate change and adopted the "Bali Road Map" which consists of a number of forward looking decisions that represent various tracks that are essential to reaching a secure future climate. This includes the Bali Action Plan (BAP) adopted by COP13 as decision 1/CP 13 which is a comprehensive process to enable the full effective and sustained implementation of the Convention through long-term cooperative action now and beyond 2012 in order to reach an agreed outcome and adopt a decision at its 15th Session in Copenhagen in December 2009. The COP further decided that this process would be conducted under a new subsidiary body, the Adhoc Working Group on Long-Term Cooperative Action (LWG-LCA) under the UNFCCC and shall complete its work in 2009.[12]

Future international action on climate change will be pursued under a two-track action plan, namely, the UNFCCC track and the

KP track. The UNFCCC track focuses on; (a) building block adaptation, mitigation, technology transfer and financing (b) reducing emission from deforestation and forest degradation (REDD) and (c) mitigation commitments from developed countries.

The KP track agrees on; (a) developed country emission reduction targets by 2009. At the COP 3 in 2007, parties to the KP took note of the conclusion of the IPCC that GHG emissions reduction commitments between 25 to 40 per cent below 1990 levels were needed on the part of industrialised countries for the period beyond 2012 to limit the mean global temperature increase with GHG emissions peaking within the next 10 to 15 years before going down and (b) means to achieve targets market mechanisms, role of land use, land use change and forestry (LULUCF), etc.

Since the adoption of the BAP, the 1st session of the AWG-LCA was held in Bangkok from 31 March to 04 April 2008 and agreed to undertake its work on the four elements in the BAP, namely, mitigation, adaptation, technology and finance. It also agreed to organise work at each session to include each of the elements, taking into account the inter linkages among them and the work of the UNFCCC's subsidiary bodies in the context of the BAP.

The 2nd Session of the AWG-LCA took place in Bonn from 02 to 12 June 2008. At this session, the AWG-LCA focused on building a common understanding of the elements of the BAP. It focused on advancing adaptation, transfer of technology and finance.

The main focus of the 3rd session of the AWG-LCA in Accra in August 2008 was to continue to exchange ideas and clarify key elements of the BAP (Decision 1/CP.13), including a shared vision for long-term cooperative action, mitigation and adaptation technology and finance.

The 4th session of the AWG-LCA was held in conjunction with COP 14 in Poznan, Poland, in December 2008 and was an important stepping stone to COP 15 in Copenhagen. Countries have agreed that an ambitious climate change agreement will be reached to follow the first phase of the Kyoto protocol that will end in 2012.

The AWG-LCA, at its sixth session held in Bonn from 01-12 June 2009, prepared a negotiating text which contains ideas and proposals in most recent submissions on the BAP by member states to UNFCCC.

The negotiating text contains all aspects of the BAP in accordance to the decision 1/CP 13 in a balanced manner, This is a working document which gives options under each topic, mainly to facilitate effective discussions to arrive at final texts. The structure of the negotiating text has four key chapters, namely (a) shared vision for a long-term cooperative action (b) enhanced action on adaptation (c) enhanced action on mitigation and (d) enhanced action on financing, technology and capacity building. The text is contained in Doc. ECCC/AWGLCA 20009/8.[13]

In the negotiating text, there is provision for establishment for a short-term work programme up to 2012, preparation and implementation of National Adaptation Programme of Action (NAPA) which is a new concept that focuses on developing countries to support the strengthening of observation systems, and creation of databases for climate data and targeted capacity building for long-term planning.

United Nations High-Level Summit on Climate Change, 2009

The Secretary General of the United Nations convened a High-Level Summit on 22 September 2009 at the General Assembly ahead of the COP 15 of UNFCCC scheduled from 07 to18 December 2009. In his opening remarks, the Secretary General stressed importance of reducing emissions that are causing climate change and to help the most vulnerable to adapt changes that are already underway to catalyse a new era of global green growth.

Many leaders spoke passionately and with grave concern of the devastating impacts of climate change that their countries are already experiencing.

The message of the summit was clear: Copenhagen deal must be comprehensive and ensure; (a) enhanced action to assist the most vulnerable and the poorest to adapt to the impacts of climate change, (b) ambitious emission reduction targets for industrialised countries, (c) nationally appropriate mitigation actions by developing countries with the necessary support, (d) significantly scaled-up financial and technological resources, and (e) an equitable governance structure.

Ambitious Structure of the Kyoto Protocol (KP) (2008 -2012)

Since the KP ambitious structure applied only to a short period (2008-2012) to industrialised countries, it will impose relatively high costs and generate only short-term benefits while failing to provide a real solution to the global community. Accordingly most economists see the agreement as deeply flawed, and the KP is not sufficient to meet the overall challenge. Accordingly, any post KP international global climate

agreement should address three crucial questions, namely, ensuring key nations, both industrialised and developing, are involved, extending time path for employing a cost effective mechanism and inclusion of market-based policy instruments.

2009 United Nations Climate Change Summit in Copenhagen

COP 15 of UNFCCC is to be held in Copenhagen from 07 to 18 December 2009, with the objective of establishing an ambitious global climate agreement for the period from 2012 when the first commitment period of KP expires. In the light of the above deficiencies, the question remains whether a new climate agreement is required or the KP should be further strengthened to achieve emission targets for both developed and developing nations.[14]

Preparatory Meetings to the Copenhagen Summit

The ninth session of the Adhoc Working Group for further commitments to Annex 1 of KP (AGW-KP) and the seventh session of AWG LCA held in Bangkok on 8 and 9 October 2009 ended in disarray as there was a doubt among delegates of G-77, representing 130 developing nations and those from industrialised nations in the talks which focused on whether the Kyoto Protocol should be extended or replaced with a new treaty that may appeal more to United States which refused to ratify KP as it has no restrictions to developing nations. The Group of 77 accused that the European Union (EU) of abandoning the KP that will be counter productive. The United States had stated that developing countries should pledge in any international treaty to boost at national level energy efficiency reduce deforestation and slash emissions. However, it was clarified by Sweden's chief climate negotiator, on behalf of the EU, that there is no intention to drop anything from the Kyoto agreement in a new treaty.[15]

According to the United Nations Development Programme (UNDP), focus on energy and poverty will be crucial to the Copenhagen Summit talks. A joint study carried out by UNDP and the World Health Organisation (WHO) points out that nearly one billion people in the world have no access to electricity and that 80 per cent of them live in South Asia and Sub–Saharan Africa. Since the Millennium Development Goals aim to slash poverty by 2015, it is unlikely to be achieved, if millions of people across the world continue to live without electricity and modern fuels, and such issues will impact negatively on control of emissions to generate non-renewable energy These issues have to be considered seriously when deciding on GHG emissions in a comprehensive global agreement.

Conclusions

In conclusion, it has been reported that in the next couple of years, annual emissions of greenhouse gases are likely to reach a level of 50 gigatonnes of carbon dioxide equivalent. If there is a reasonable chance of avoiding a rise in global average temperature by more than 2°C, average emissions have to be cut down to no more than 20 gigatonnes by 2050. This means that 9 billion people who will be living on the planet in 2050 will produce no more than about two tonnes of greenhouse gases per head per year.

At present, rich industrialised countries of the European Union (EU) produce, on average, about 10 -12 tonnes of greenhouse gases per head of population while this figure for the United States is almost 24 tonnes. China, by contrast, emits about 6 tonnes per head at present. Therefore, the industrialised countries have to substantially reduce their emissions. Accordingly, the developed countries must demonstrate a political will to reach an effective agreement with developing countries in Copenhagento achieve GHG emission cuts and save the Planet from climate change that threaten all forms of life. (Nicolas Stern guardian.co.uk 23 September 2009).

Developing countries also should reduce their emissions without adversely affecting economic growth and must be supported financially as well as by transfer of technology by the industrialised countries. To this end developing countries should to adopt renewable energy initiatives and reduce dependence on burning of fuel, sustainable management of forests to expand carbon sinks etc.

It was also noted that 181 investors who are collectively responsible for management of US $ 13 trillion in assets globally attended the United Nations Summit in September 2009 to support a global agreement on climate change. This meeting highlighted innovative ideas from within the private sector for the low carbon transition.

Since the present use of fossil fuels and future use of coal as a major source of energy in Sri Lanka, action should be taken by the government to encourage the private sector to embark on generation of renewable energy, such as solar and wind energy as well as bio fuels. Another area that could be experimented is Ocean thermal Energy Conversion (OTEC). It is imperative that technology transfer for such projects have to be pursued under future global climate change agreements.

The government should take immediate action to appoint a high-level committee to formulate a comprehensive national policy on climate change to be discussed in Copenhagen in December 2009, within the context of an appropriate mitigation strategy with necessary support from developed countries for scaled up technological and financial resources. It must be stressed that such a policy should be in accordance with the BAP and other decisions at the 14 COPs as well as the KP of the UNFCCC since 1992.

The world leaders at the Copenhagen Summit is expected to reach agreement on a legally binding global climate Convention or Protocol. The US Secretary of State has stated that US, being the world's second largest emitter of greenhouse gases (GHGs) behind China, "is prepared to assume our share of responsibility and that Copenhagen would be a stepping stone towards full legal agreement".[16] US subsequently announced that it will cut GHGs by 17 per cent below 2005 levels in 2020. This translates to only a 3 per cent reduction below the 1990 levels China has made a bold commitment to reduce GHG emissions by 40-45 per cent by 2020 in terms of energy intensity per unit of gross domestic product (GDP).This means that China's emissions will continue to grow but at a slower rate but how much is actually achieved will depend on the rate at which China's economy grows.

Scientific studies have clearly demonstrated that developed countries should reduce their GHG emissions by 40 per cent from the 1990 levels. Accordingly it is rather skeptical to expect any effective agreement to reduce emissions and arrest global warming.

It has been reported, by the BBC recently, that the Copenhagen Summit will be represented by 193 Nations and 60 Heads of States. Sri Lanka will make seven proposals to achieve the proposed target for reducing GHGs and will also propose an "Adaptation Fund" as opposed to similar arrangement under Kyoto Protocol, as the latter cannot meet the needs of adaptation in developing countries.[17]

The most contentious issue at the Copenhagen Summit is to impress upon both the developed and developing nations that there should be bold sacrifices in arresting GHG emissions. To this end the collective action that will be taken by Brazil, China and India who will argue that emission cuts should be tied up with the GDP and not on a time frame as advocated by developed nations will be critical in reaching agreement with the developed nations. The cumulative effect in reducing GHG emissions adopting such a mechanism could be debated in the light of the fast growing economic development of these countries.

In conclusion the world leaders and their representatives meeting in Copenhagen in early December 2009 should be prepared to make bold sacrifices by way of emission cuts if we are to see a green world economy and save our planet for future generations to live without poverty and enjoy a sustainable quality of life.

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