

# Towards a climate-friendly global economy *Emission*

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**P**ERHAPS no other treaty aimed at protecting the environment has aroused so much concern and interest the world over, as did Kyoto Protocol which came into effect on February 16. It was formulated on December 11, 1997 but became dead four years ago following withdrawal of the United States from it. It regained life only when Russia agreed to ratify it which, in turn, fulfilled its technical requirements.

The protocol regulates emission of six greenhouse gases which differ in their ability to absorb heat in the atmosphere. Scientists say that an emissions cut of at least 60 per cent is needed to prevent adverse impacts of climate change in this century. The current research suggests that emissions of carbon dioxide and other greenhouse gases will increase global average temperatures by 1.4 to 5.8 degree Celsius by the end of the century and will affect weather patterns, water resources, the cycling of seasons, ecosystems and extreme climate events.

The Kyoto protocol, which has so far been ratified by 141 nations, seeks to impose legally-binding caps on greenhouse gas emissions (fossil fuel burning in power plants, industries and automobiles) in 39 developed countries. In case these steps are not taken, it is feared that the consequent rise in temperature will raise mean sea levels, cause extreme weather conditions like droughts and hurricanes, disrupt agriculture, spread diseases and wipe out plants and animals by the year 2100.

According to Article 3 of the protocol, the ratifying countries shall, individually or jointly, ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases do not exceed their assigned amounts, with a view to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period of 2008-2012.

The protocol would expire in 2012. The second commitment period, in case the protocol is extended, will commence from that year. The post-2012 period is expected to propose more drastic cuts of the greenhouse gases. Kyoto treaty offers tools for building climate-friendly economy and promotes sustainable development. The protocol has Adaptation Fund, established in 2001, to assist developing countries to cope with the negative effects of climate change.

All the 25 nations of the European Union (EU) have ratified the Kyoto accord. The EU has to meet the Kyoto target of eight per cent greenhouse gases reduction

warming.

However, the US Environmental Protection Agency, quoting the US National Academy of Sciences, says that, the earth's surface temperature has risen by about one degree Fahrenheit in the past century with accelerated warming during the past two decades. There is a new and stronger evidence that most of the warming over the last 50 years is attributable to human activities.

Another reason for US administration's opposition of the Kyoto Protocol is its scientific assumption that the carbon dioxide is not a pollutant. This again is a wrong contention. Carbon dioxide is an air pollutant and causes serious adverse health effects. The European Union classifies carbon dioxide as a pollutant and holds it responsible for raising temperatures, triggering extreme weather and contributing to climate change. Higher concentrations of carbon dioxide in the atmosphere can affect respiratory function and cause excitation, followed by depression of the central nervous system.

The forth reason for US rejection of the protocol is the letting off the hook of some large developing countries like China, India and Brazil. These countries are significant polluters and, in fact for that matter, all developing countries should have been onboard. This would have sent a strong signal to all countries that environmental protection is everybody's concern.

According to a report submitted by Islamabad to the United Nations Conference on Environment and Development in 1992, Pakistan's emissions of carbon dioxide in 1991 were 1.53 million tons per year (0.79 per cent of the global emissions) while the

eases, will be under stress. Maintaining adequate personal and community hygiene will be difficult, due to the reduced quantities of water available and lack of sanitation. Skin and eye problems are expected to increase due to higher temperatures.

In agriculture, higher evapotranspiration rates coupled with the reduced soil moisture, due to elevated ambient temperatures, will affect the crop output. Growing season and growth pattern may change. Higher temperatures will reduce yields, mainly due to the shortening of the crop life cycle, especially the grain filling period. Wetlands are likely to be affected adversely, due to high water evaporation, due to elevated temperatures.

While Washington's decision to pull out from the treaty is essentially obstructive, its absence is unlikely to become a major obstacle in the implementation mechanism. Australia has also not ratified the treaty. Despite its withdrawal, the US administration must be given credit for adopting excellent plans for air pollution control, backed by effective legislation. California air pollution control laws (1995), for example, are very comprehensive. The US Clean Air Act of 1977 and 1990 brought significant improvement in the country's air quality, regulating ozone (implicated in global warming and smog), carbon monoxide and particulate matter (less than 10 micron in size).

The Act regulates 189 toxic and hazardous air pollutants from major sources, including industries. This includes chlorofluorocarbons, which are implicated in global warming and ozone layer depletion. The strict enforcement of air pollution standards and laws has lessened air pollution in many American cities. California and northeastern states already have policies on cutting carbon dioxide emissions. Nearly 40 US states have developed their own climate control plans. About 20 states have adopted aggressive standards for renewable energy.

Global warming and ozone hole, though different, are related issues. The greenhouse effect issue concerns the warming of the lower part of the atmosphere, the troposphere, by increasing concentrations of the greenhouse gases (carbon dioxide, methane, nitrous oxide, ozone, and others) in the troposphere. Greenhouse gases allow incoming solar radiation, but absorb infrared radiation from the Earth and re-radiate this back to Earth. The greenhouse gases are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF<sub>6</sub>).

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to meet the Kyoto target of eight per cent greenhouse gases reduction below 1990 levels and has created carbon trading system, by trading rights to emit carbon dioxide. For example, UK, which is a high emitter, can purchase allocations from Norway, which is relatively low emitter. This system will help them meet the Kyoto targets. Developing countries have to promise to do their best to control greenhouse gas emissions, but are not legally bound.

The United States remains a strong opponent of the Kyoto Protocol. It is interesting to note that the Clinton administration signed the protocol but the Bush administration pulled out of it in 2001. The reasons cited were: it is too costly, is based on flawed science, carbon dioxide is not a pollutant and that it unfairly excludes large developing countries like China, India and Brazil. Washington said that a cut in greenhouse gases to seven per cent below 1990 levels, as desired by the treaty, would cost it five million jobs and billion of dollars.

Americans had assumed that the pact would die its natural death because of their non-participation, but it came into life when Russia ratified it in November 2004. The protocol, under its Article 25, was to become effective on the 90th day after the date on which not less than 55 parties to the convention, which accounted for at least 55 per cent of the total carbon emissions (of 1990 level) had ratified it.

The US, whose population is about four per cent of the world's, is a leading polluter. It emits about 26 per cent of the world's emissions of the carbon dioxide. An average American emits about 20 tons of carbon dioxide per year, whereas an average Pakistani emits just 0.01 tons per year. Clearly, capping the carbon dioxide emissions would hit the US fossil fuel-using industries, but the fact remains that the cost of curtailing emissions, though exorbitant, is affordable by the US administration and its corporate sector.

Washington's argument that the treaty is based on flawed science is itself flawed. The Inter-governmental Panel on Climate Change (IPCC), established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, was mandated to produce reports on climate change. Several hundred working scientists from many countries, mostly the industrialized countries, participated in the preparation and review of the data and produced consensus predictions. Since the predictions are based on computer models and actual measurements cannot be done, the US researchers have disputed the findings about the global

emissions were 193.50 million tons per year. Although Pakistan's share in the emissions is negligible, it still needs to cut down its emissions to minimize the related health hazards. A typical case is the burning of roadside garbage and of industrial waste in Karachi.

The impact of global warming in Pakistan will vary from minor to significant, depending upon the specific attribute. Sea level rise in Karachi can pose major problems to the lands recently reclaimed by the Defence Housing Authority. Then, the population along the coast is not as sparse as it used to be. Additionally, mangroves, which used to be the first line of defence against tidal waves, have vanished, making the coastline more vulnerable. A 90 centimetre rise in sea level would be of concern for the people living in Seaview area.

In the lower Indus delta, which is already reeling under the pressures of low water flows in the Indus River, will face major environmental and ecological problems. Currently, the sea has already intruded 54 km upstream along the Indus River, causing destruction of thousands hectares of land in the coastal districts of Thatta and Badin (IUCN, The World Conservation Union, 2003). Sea-level rise will cause more sea intrusion in the lower Sindh, causing colossal environmental and ecological problems. Water discharges below Kotri will have to be increased many-fold, to counter the sea intrusion.

Increased temperatures will melt more ice, in the place where Indus River originates, causing increased flows in the Indus River. Though increased runoff will be advantageous, the floods which are likely to occur will be devastating for the river's banks and irrigation infrastructure; and, would aggravate the problems of water-logging and salinity.

Global warming would spread deserts into rangelands. Ecological zones in forest sector may shift. Those forest ecosystems (e.g. Juniper forests), which are currently under stress, may face increased stress. Those species, presently receiving restricted moisture, will face extinction. Incidents of forest fires will increase. The often fatal Nipah virus, normally found in Asian fruit bats is believed to have crossed over to humans as the bats lost their habitats through forest fires in Sumatra, Indonesia. As the bats searched for fruits, they were brought in contact with pigs, which in turn passed the disease to their human handlers.

Migration of mosquitoes towards the new warm areas will increase spread of diseases. Water supply and sanitation, which helps in preventing dis-

and sulphur hexafluoride (SF6). The last 3 gases are very powerful greenhouse gases. They are not naturally-occurring. They are generated in industrial processes.

The ozone hole issue concerns the loss of ozone in the upper part of the atmosphere, the stratosphere, resulting from increasing concentrations of certain halogenated hydrocarbons (such as chlorinated fluorocarbons, known as CFCs). Through a series of chemical reactions in the stratosphere, the halogenated hydrocarbons destroy ozone in the stratosphere. Both greenhouse effect and ozone hole issues are related as, for example, CFCs and tropospheric ozone are involved in both cases. CFCs, in addition to destroying stratosphere ozone, are also greenhouse gases.

It has traditionally been thought there is not much mixing of the troposphere and stratosphere. But current research indicates that, there is evidence of transport of stratospheric ozone into the troposphere. So ozone depletion in the stratosphere could result in reduced concentrations of this greenhouse gas in the troposphere. Conversely, global climate change could also affect ozone depletion through changes in stratospheric temperature.

Under Kyoto Protocol, those countries which excessively emit greenhouse gases can buy "assigned amount units" of these gases from the countries which are below their targets, such as Russia and Ukraine. This mechanism, otherwise known as "carbon trading," is not proper and, is not in the interest of environment. This amounts to buying rights to pollute the environment.

Carbon trading will badly affect the credential of the Kyoto treaty as it aims to promote renewable energies. But the treaty will become helpless if countries simply buy rights to pollute the environment. Carbon is currently traded in the emission trading scheme at 7.2 euros per ton. Such countries might face problems in coordinating their climate change-related action plans with other national development plans. A mechanism should be in place enabling countries to learn from other countries' experiences with successful implementation of climate change policies.

The Kyoto protocol has also a provision for Clean Development Mechanism (CDM) which encourages investments that promote sustainable development, while limiting emissions. Under the CDM, countries will benefit from project activities resulting in certified emission reductions. It is essential that the CDM projects are rationally distributed among the countries, based on the laid-down eligibility criteria. ■