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From our archives

Here are some reprints of selected articles which bear relevance to the overall theme of the supplement.

The global climate change phenomenon



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THE Earth is warming and climate is changing. Scientific evidence in favour of these developments is overwhelming and the consequences of climate change are unfolding. Even a few years ago, it could not be foreseen that climate change would be taking place as fast as it is now. Of course climate variability occurs over time, even during a day and spatially in the process of natural climatic evolution, i.e. without human interventions. But, the kind of climate change that we are now witnessing is mostly anthropogenic. It is due to the increasing global warming over a long time caused by increasing emissions of greenhouse gases as a result of human activities such as burning of fossil fuel, productive activities, transportation, marketing, land use, deforestation and various other activities.

Climate change manifests itself in natural disasters of various types. These include devastating floods, droughts, cyclones, and hurricanes. Both the number and the intensity of these natural disasters are now increasing around the world. In Arctic and Antarctic regions, highlands and elsewhere ice is melting fast. The sea level is rising. Biodiversity is eroding widely. These disasters are causing widespread adverse impact on both natural and socio-economic systems.

After Bangladesh has been hit by two major floods and a devastating cyclone Sider in 2007, a question has often been asked: have these natural disasters been caused by climate change? Both the floods and the

cyclone have occurred at times of the year when such disasters can naturally occur in Bangladesh. From a scientific point of view it cannot, therefore, be said for sure that these have been directly caused by climate change. But, it can be said with a high degree of confidence that these are related to the evolving climate change. This is because one calendar year saw three major natural disasters in Bangladesh, of which there is no known past record. Also, in various regions of the world intense precipitation, floods, cyclones, hurricanes and other natural disasters have recently been occurring in increasing numbers. At the same time, ice is melting fast everywhere at resides. Considering all these developments, it can be said that climate change is clearly accelerating. The manner and numbers in which these natural disasters are occurring around the world are in tune with the likely pattern predicted by the Intergovernmental Panel on Climate Change (IPCC). It is almost certain that in future devastating natural disasters will occur more frequently in various regions of the world and in various countries. Why, because the process of global warming is accelerating.

Introducing IPCC: I shall often use here the findings of the IPCC, particularly its Fourth Assessment Report (AR4) published in 2007. A brief introduction to the IPCC may, therefore, in order. The IPCC was awarded Nobel Peace Prize for 2007, jointly with former US Vice President Al-gore. It was established in 1987 within the framework of the United Nations as an inter-governmental body to review the sci-

ence and implications of climate change to provide a basis for policies and actions to be designed and implemented to address the issues. It is jointly managed by UN World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP) The First Assessment Report was published in 1990, the Second in 1995 and the Third in 2001.

An assessment is broadly divided into three broad aspects, each dealt with by what is known as a Working Group (WG). WG I deals with the science of climate change; WG II with climate change impacts, adaptation, and vulnerability; and WG III with mitigation of climate change. The outcome of the work of each WG is a major report, which includes a main report, a technical summary and a summary for policy-makers (SPM). A synthesis report is also prepared covering all the three WG reports. In addition, special reports are also prepared on certain key issues as deemed necessary.

These reports are prepared by experts drawn from all around the world but it is the governments which finally have to accept them. Once a report is finalized, a meeting of the representatives of the governments is convened. They review it in detail and introduce agreed changes or modifications before accepting it. Usually, the SPM is gone through sentence by sentence, even word by word before a negotiated document is finally approved. The experts provide necessary support at this stage. In fact, these reports are prepared on the basis of

peer reviewed research findings from around the world; and drafts at various stages are reviewed by experts from around the world, who are not involved in preparing the reports as well as by governments of the member countries. The comments and suggestions coming through this process are duly taken into account as the report preparation proceeds.

Global climate change a brief on status

First of all let us consider some key findings of the IPCC AR4. One major conclusion in which there is a high degree of confidence is that global temperature will increase by 1.8oC to 4.0oC by the last decade of the 21st century compared to the last decade of the 20th century. This increase may even be up to 6.4oC. The concomitant sea-level rise during the same period is estimated at between 18 cm and 89 cm. Obviously, these figures are global averages. Different regions of the world may face different levels of warming and sea-level rise.

Indeed, the concentration of greenhouse gases in the atmosphere has now become so large that, even if further emission of greenhouse gases can be stopped today, global temperature and sea-level will continue to rise over the whole of this century, and even beyond. But, the reality is that emission of greenhouse gases continues to increase. The developed world, which is largely responsible for greenhouse gas emissions, is not taking steps to reduce greenhouse gases. In fact, they pursue the destructive path of increased emissions. Moreover, China,

Brazil, India and several other developing countries are now emitting increasing quantities of greenhouse gases. The Kyoto Protocol adopted in 1997 called for reduction in the emission of greenhouse gases to the extent of 5% by 2012 compared to 1990. But, this global accord has been of no avail, particularly because the largest polluter, the USA, withdrew from the Protocol. A new process of coming to an agreement regarding reduction of greenhouse gas emissions has begun in an international conference in Bali, Indonesia, in December 2007. A roadmap for negotiations to reach an agreement to replace the Kyoto Protocol, which expires in 2012, by 2009 has been agreed. However, it remains to be seen how the approaches evolve and negotiations proceed.

It has been seen that, during 1970-2004, emission of greenhouse gases as a result of different human activities has increased by 70%. Most polluting is the energy sector (with an increase of 145% during this period), followed by transportation (120%), industry (65%), and land and forestry uses (40%).

It is crucial that reduction in the emission of greenhouse gases in a major way is begun without any further loss of time in order for the situation to become manageable towards the end of this century. If nothing or little is done up to then, the situation may go beyond control both in terms of required finances and technological possibilities.

It was concluded in the Third Assessment Report 2001 (WG II report)

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