# GUEST EDITORIAL

## The Warming of the Earth: Perspectives and Solutions in the Third World

'Global warming is the greatest crisis ever faced collectively by Humankind; unlike other earlier crises, it is global in nature, threatens the very survival of civilization, and promises ... only losers over the entire international socio-economic fabric.' (Conference Statement, **Global Warming and Climatic Change: Perspectives from Developing Countries,** New Delhi, India, 21–23 February 1989.)

### *Introduction*

The Earth is warming. It has been warming for more than 15,000 years. But, the recent warming is accelerating due to the continuing accumulation of heat-trapping gases in the atmosphere. Over the last century, the amount of carbon dioxide in the atmosphere has increased by more than 25% as a result of deforestation and the combustion of fossil fuels. Over the past two centuries the amount of methane has more than doubled. These changes increase the temperature at which the Earth's atmosphere achieves equilibrium with the various sources of energy that affect it. Other factors may affect the temperature of the Earth, but these changes in the composition of the atmosphere will result in *global warming.* Scientists believe that the warming will be sudden, open-ended, and more rapid than any warming experienced previously in human history.

Increasing bodies of evidence suggest that the warming may have several further effects on biotic systems and oceans. Increases in temperature speed biotic metabolism—especially respiration. An increase in temperature of one degree Centigrade can be expected to increase rates of respiration of plants and the decay of organic matter in soils by 10–30% or more. Increased respiration and decay accelerate the release of carbon dioxide and methane from plants and soils into the atmosphere. At the same time the warming of the surface waters of the oceans reduces their capacity to absorb carbon dioxide from the atmosphere, thus speeding further the rate of accumulation of 'greenhouse' gases in the atmosphere. The warming is also expected to raise ocean levels sufficiently to flood extensive areas of land that are currently inhabited.

These considerations are only now being recognized as opening up the possibility that the changes in climate may proceed more rapidly than the climatologists have predicted. While they remain unproven, and will probably remain unproven in a strict sense even after their effects have been felt, they add sufficient urgency to the issue to warrant action in reducing the causes of the warming as rapidly as possible. The programme outlined here is designed to speed national and international action to that effect. It is a continuation of work that staff of our Center have pursued over years. The central objectives remain those that were set forth in the Villach-Bellagio report of 1987–88: (a) a rapid reduction in the use of fossil fuels; (b) cessation of deforestation; and (c) massive programmes of reforestation.

### *Responses: The Need for Progress Internationally*

There is an immediate need to open the channels of communication on these issues and on the needed solutions—not only among nations and between scientists but also with the politicians who will be involved in defining national policies on energy and other resources over the coming years. The large number of international conferences organized by intergovernmental organizations (IGOs), international nongovernmental organizations (INGOs), and members of the international community, indicate the seriousness with which the issue is now at last being addressed.

Numerous efforts have been made during the past year or so to initiate these discussions on issues of climatic change around the world. Conferences in Toronto, Canada, Hamburg, Germany, and Turin, Italy, built on progress made in two meetings previously of scholars in Villach, Austria, and another in Bellagio, Italy. The single event most directly addressing the potential confrontation between the rich and the poor nations globally was* the one quoted before the introduction to this Guest Editorial. That Conference was organized by the Woods Hole Research Center in collaboration with the Tata Energy Research Institute, the United Nations Environment Programme, and the World Resources Institute. It was the first of its kind to be held in a developing country, and attracted over 150 scientists and policymakers primarily from the Indian sub-continent.

One message that came out of the Conference very clearly was that the developing countries are not going to be mute bystanders in the debate about global warming and climatic change even though their current use of fossil fuels may be relatively small. Some of the developing nations wish to join the global warming dialogue

* The International Conference on Global Warming and Climatic Change: Perspectives for Developing Countries, held in New Delhi, India, in February 1989.



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because they see opportunities for increasing their economic development, while others see a compelling need to find appropriate solutions to arrest global warming because of their fragile geographic and economic situations.

The Conference was highly constructive. The report prepared has been distributed widely around the world and has been commonly cited as the basis for further analyses.

### *Inter-governmental Panel on Climatic Change*

There have been other conferences on this most important theme, but by far the most significant step so far has been the formation of the Inter-governmental Panel on Climate Change (IPCC) by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) in November 1988. The IPCC at its first meeting divided its work among three Working Groups concerned, respectively, with (1) Scientific Analysis; (2) Socio-economic Effects; and (3) Policy Responses. The three Working Groups held separate meetings in London, Moscow, and Washington, DC, during 24–26 January 1989; 2–3 February 1989; and 30 January–1 February 1989, respectively. The second session of the IPCC, with all of its Working Groups, took place in Nairobi during 28–30 June 1989.

At the intergovernmental level prior to the Nairobi IPCC session, confusion as to the most appropriate agency responsible for initiating the first steps towards an international convention to stabilize the 'greenhouse gas' composition of the atmosphere, inhibited real progress in solving the problem of climatic change. At the Nairobi session, however, the Chairman of the IPCC resolved the issue when he announced that the *IPCC will prepare the background for a draft of an international convention on greenhouse gases.* This decision does not exclude other international organizations from working on this issue, but does establish IPCC as an international focal point with a clear agenda and timetable for progress. A report will be prepared for the autumn of 1990.

Another major change adopted at the Nairobi session of the IPCC was with reference to the concept of 'core membership'. In November 1988, thirty-two nations had core membership. For the June 1989 session, the Chairman of the IPCC invited all the pertinent members of UNEP and WMO, and several other international organizations, to attend and to participate in the proceedings. Representatives of forty-four nations and several IGOs and INGOs that attended the Nairobi session applauded the decision.

### *Recommendation to IPCC*

Among the various recommendations made for the IPCC, the following merit particular attention:

(1)The IPCC should consider the possibility of arranging conferences and seminars in developing countries to help to mobilize in them due national and regional action. For example, it was pointed out that a conference to heighten the awareness of scientists from developing countries on climatic change would contribute to the objectives of the IPCC. Roving seminars held on a regional basis have proved to be a cost-effective method of reaching a wide audience and stimulating valuable national action in developing countries.

(2) The development of an indigenous, intellectual and scientific base backed by appropriate technologies is a key factor in the medium- to long-term capacity of developing countries to participate fully in international programmes on climatic change.

These issues have since become the rallying points around which both the less developed and industrialized countries have continued their discussions in various international fora. These fora include: the Ministerial Conference hosted by the British Prime Minister in March 1989; the meeting of Heads of State and Government organized by the governments of Norway, France, and The Netherlands, in The Hague in the following week; shortly thereafter the First Meeting of the Contracting Parties to the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol in Helsinki in April 1989; the biennial session of the Governing Council of the United Nations Environment Programme in May 1989; and the Economic Summit of the Group of Seven, called for the first time a 'Green Summit', held in Paris in July 1989; also a conference in Tokyo in September 1989; the Ninth Conference of Heads of State or Government of Non-aligned Countries meeting in Belgrade in the same month at which the Indian Prime Minister advocated the establishment of a Planet Protection Fund; IPCC Working Group III meeting in Geneva in October 1989, where representatives of forty-five governments for the first time decided that it is time to begin work on a framework convention; a meeting of the Heads of State and Government of the Commonwealth in Kuala Lumpur, Malaysia, also in the same month; a meeting of the Ministers of Environment organized by The Netherlands Government in November 1989; and yet others.

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*Further Opportunities*

While the previous conferences provided valuable opportunities for the international community to learn other viewpoints and advance the topic in the policy arena, participants in the IPCC meeting in Nairobi often failed to take full advantage of the occasion. Despite the earlier meetings and the large amount of literature available, discussions among the official delegates revealed a surprising lack of understanding of technical details of the issues of climatic change and what might be done to limit the problem. Representatives from the less-developed countries complained at being excluded from discussions, but they were not sufficiently well-versed in the topic either to advance arguments that were specific to their interests or to advance proposals for solutions. Nor were the participants from the industrialized nations sufficiently well-versed in the details to offer technical judgements or specific insights.

Nonetheless, IPCC provides an important forum and is gaining momentum and prestige. Their effort is to be supported in every way, as it will be supported by us. It is, however, in the manner of all such efforts, by no means infallible, so that a full range of possible courses must be kept open for governments to pursue.

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## GUEST COMMENT

## Dancing in the Dragon's Jaws: Siting a Nuclear Waste Repository*

Amidst the politics, conjectures, and unanswered questions, surrounding nuclear power debates, lies a formidable dragon. We know, for we have seen his shadow! The 'dragon' is a common term used within the environmental assessment community for a real, alive 'being' called high-level nuclear waste. The term describes the time—several thousands of years—that it takes for half of any high-level nuclear waste sample to decay, which is much closer to a mythical dragon's life-span than to a mere human's!

The nuclear waste repository siting quandary has moved to the forefront of nuclear concerns within the United States, particularly among Westerners. Past repository construction plans and siting policies proposed by the US Department of Energy (DOE) have been confusing, alienating political leaders and the public. Not surprisingly, Congress has intervened in the siting process, designating Yucca Mountain, Nevada, as the sole area for further repository study. But political solutions usually involve a price and some form of compromise, and this repository siting issue will not prove otherwise. State and Federal officials will grapple over the amount of compensation eventually due to Nevadans for accepting the economic risks of the repository. Meanwhile the scientific process for selecting a repository location appears to have borne the brunt of the congressional compromise.

*Public Policy for a Dragon*

Nuclear waste and its abundance originally paralleled military programmes. Since 1945, the US has had a Limited Test Ban Treaty, MAD, SALT, START, and a whole lot of people calling a halt, while the DOE has often been 'stalled' over what to do with military nuclear waste. Commercial nuclear waste officially came into existence when Congress passed two major pieces of legislation: the Low-level Radioactive Waste Policy Act of 1980, and the Nuclear Waste Policy Act of 1982. Disposing of military and commercial wastes are two distinct endeavours, but both have common above-ground and underground storage problems.

The Nuclear Waste Policy Act (hereinafter referred to as the Act) calls for high-level commercial wastes to be stored in a repository. A geologic repository can be viewed as a large, underground mine with a complex of tunnels occupying roughly 810 ha, at a depth of between 305 and 1,220 metres. The repository will be operational for 30 years or longer and will only handle commercial nuclear waste.

* Based on technical information drawn from US Department of Energy: *Yucca Mountain Site, Nevada Research and Development Area, Nevada,* Vol. I, DOE-RW-0073, Washington, DC, D. Olsen, 1988. 'Defining the Socioeconomic Margins of Risk in Nuclear Waste Repository Siting: Selected Perspectives from Washington State.' Briefing Paper for the Office of Civilian Radioactive Waste Management, US Department of Energy, Argonne National Laboratory, Portland Office, Oregon [not available for checking].



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