

## In the glare of global warming

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THE earth's atmosphere functions similarly to the walls and roof of a greenhouse, allowing sunlight to enter, but preventing heat from escaping. Sunlight passes through the atmosphere and heats up the earth's surface. The earth gives off heat energy, in the form of infrared radiation that travels back toward the atmosphere. Instead of going into space, some of the infrared radiation is trapped by "greenhouse gases". The main greenhouse gases are carbon dioxide, methane, water vapor, and ozone. The gases send infrared radiation back to the earth's surface.

Around the mid-1800s, with the beginning of the Industrial Revolution, carbon dioxide levels began increasing. The carbon dioxide concentration has risen sharply since from 280 parts per million before the Industrial Revolution to 360 ppm at present, or about a 25 per cent increase. The methane concentration has risen about 150 per cent. The increases are mainly the result of burning of fossil fuels and clearing of forests. The average global temperature has risen about one degree Celsius since the late-1800s. Though it has not been proven that there is a correlation between greenhouse gas levels and surface temperature, it is likely that it does. Scientists believe that if we wait till 2100 when we can more accurately model climate changes, it will be too late to change the severe impacts of climate change. Scientists have predicted that by 2050, the atmospheric carbon dioxide level will be twice the pre-industrial level. Ice core samples from Greenland and Antarctica provide information about the earth's climate for the last 160,000 years. The ice core samples show that the average global temperature has closely reflected the carbon dioxide concentration, supporting the theory of global warming.

As expected, in recent years, temperatures have been among the hottest recorded. The warmest five-year period occurred from 1991 to

1995; 1995 was the hottest year on record. Now, it seems that "1997 is looking like the warmest year on record".

Global warming is not acting in isolation. It comes in addition to existing environmental stresses such as acid rain and air pollution, and largely from the same sources: burning fossil fuels, especially coal and oil. The aggregate impact of air pollution and climate change can increase respiratory diseases such as asthma and bronchitis. These additive and/or synergistic effects can occur in a variety of ways:

! Greater heat and humidity enhance the conversion of nitrogen oxides (NOx) to ground-level ozone (photochemical smog)  
! Warmer winters and earlier springs can increase pollen counts  
! Flooding can produce more molds and fungal spores  
! Increased humidity can provide more air droplets and help the transmission of allergens

! Heat waves and unhealthy air masses can increase local concentrations of pollutants  
! Forest fire from droughts (combined with farming and logging practices) lead to more respiratory and cardiovascular illness, due to smoke particulate and chemical inhalation.

Some of these effects, such as the massive fires that burned out of control in southeast Asia this year, causing hundreds of deaths and thousands of cases of respiratory illnesses in places like Indonesia and Malaysia, are among the unexpected public health "surprises" that grow more likely in a rapidly warming world.

Climate change can have wide-ranging and mostly damaging impacts on human health. Warmer and sometimes wetter weather may already be extending the seasonality of transmission and the range of infectious diseases such as malaria and dengue fever beyond regions where they are endemic and where inhabitants maintain some immunity.

Longer and hotter heat waves may kill many more people annually

### The fearsome facts

At the rate our climate is changing, the world will soon be warmer than at any time in the last 10,000 years. The world has warmed by 0.5 degree Celsius over the past century and an average of two-degree Celsius warming is predicted by 2100.

There is scientific consensus that air pollution from human activities is partly responsible for global warming. Climatic changes will alter natural vegetation, wildlife habitats, crop growing seasons, and distribution of pests and diseases.

Global warming will cause a continued and accelerated rise in sea levels, threatening half of the world's most critical coastal wetlands.

A one-meter rise in sea level would threaten half of the world's coastal wetlands of international importance for their biodiversity.

A three to four degree Celsius warming could eliminate up to 85 per cent of the remaining wetlands in the semi-arid regions of southern Europe.

The loss of wetlands in the flood plains of rivers in the African Sahel could make some local populations of turtles and birds extinct.

A three to four degree Celsius warming could eliminate all open waters of the prairie pothole region in the US, an area where half of the wild duck population hatch out. About 30 new infectious diseases have emerged in the past 20 years.

Global warming will expose millions of people to new health risks. Infectious diseases are emerging, resurging and undergoing redistribution on a global scale.

Global sea level has risen between 10 to 25 cm in the last 100 years and will rise faster still in the coming decades.

By the year 2050, up to one million additional deaths from malaria may be occurring annually as a result of climate change.

The arctic is unusually important for migratory birds. An estimated 15 per cent of the world's bird species are arctic specialists. In North America, 36 species breed only above 60 degree N latitude.

Ringed seals are the principal prey of polar bears. Unseasonal warming can lead to collapses of the snow caves where female seals bear their young. The young as yet have no blubber and die of exposure when cold conditions return. Scientists suspect that declines in seal populations will occur in this manner, and will ultimately lead to declines in polar bear populations.

Detailed climate models suggest that a doubling of greenhouse gas concentrations will lead to a 30 per cent reduction in the tundra available to Arctic species.

Many of the world's most distinctive mammals are found only in the Arctic, including walrus, several species of seals, arctic foxes, collared lemmings, arctic and tundra hares, muskoxen, polar bears, mmarwhals and bowhead whales.

As sea ice becomes thinner due to increased temperatures, animal intruders from the south, such as grizzly bears and moose, are penetrating north affecting local populations.

Between 15 to 20 per cent of the large nature reserves in southern reserves in southern Africa would experience a change in biome or habitat type under different climate change scenarios.

Climatic changes will alter natural vegetation, wildlife habitats, crop growing seasons, and the distribution of pests and diseases.

Source: WWF

in large cities. More extreme weather such as storms and hurricanes may inflict psychological trauma and further contaminate drinking water, and may injure and kill coastal populations in vulnerable areas. The social and economic impacts may also spread, for climate change, in combination with environmental degradation, can create more widespread conditions for the emergence, resurgence and

transmission of disease.

There are costs associated with acting now to slow global warming. But in terms of future health care, productivity, inter-national trade, tourism and insurance costs, the savings achieved by taking early action could be enormous. The transition to cleaner and more efficient energy systems may also prove healthy for economies. Economic analyses that include techno-

logical innovation show the benefits of adopting energy efficiency and new technologies. A global energy transition, and an international fund to propel it, could become the engine of growth in the global economy of the 21st century.

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## Time to be eco-wise

There is a need for binding document on access to genetic resources and benefit sharing, writes Dr Jona Razzaque

THE issue of access to genetic resources and benefit sharing has attracted much attention in the country, a biodiversity-rich developing country, after it ratified the Convention on Biological Diversity (CBD) in 1994 and joined the World Trade Organisation (WTO) in 1995. The country played a key role in negotiations leading to the signing of the CBD and there is remarkable enthusiasm towards meeting the national obligations. With the Plan of Implementation of the just-held World Summit on Sustainable Development, which talks of an 'international regime' for fair and equitable sharing of benefits arising out of the utilisation of genetic resources, the country needs to re-evaluate its position for the next CBD Conference of Parties (COP).

The CBD has three inter-related goals: biodiversity conservation, sustainable economic development and socio-economic equity. The Hague Ministerial Declaration of the COP6 to the CBD 2002 contains a clear political signal that the achievement of the objectives of the convention is a prerequisite for sustainable development.

One of the main objectives of the convention is the fair and equitable sharing of benefits. Article 15(1) of the CBD emphasises sovereign rights of states to natural resources and their authority to determine access to genetic resource. Parties to the Convention are required to take measures aimed at sharing in a fair and equitable way, not only the results of research and development, but the benefits arising from commercial and other uses of these resources with the party providing them, upon mutually agreed terms (MAT). Under the convention, the provider parties are also required to create conditions facilitating access by other parties for environmentally sound uses and must also minimise restrictions on access which would defeat the convention's aims.

The CBD lays down general measures for conservation and sustainable use at the national level. While there is broad agreement about general approaches, the process is sensitive to the fact that governments will address biodiversity concerns in very different ways, according to their own national political, legal, ecological and economic interests.

Adequate funding is also necessary to fully implement national

strategies under the CBD and it explicitly states that developed countries shall provide new and additional funds to enable developing countries to implement its provisions. However, there is no mechanism within the CBD to make the developed countries comply with that commitment.

The adoption of the Bonn Guidelines of 2002 on access to genetic resources and sharing of the benefits of their utilisation were developed in response to concerns in many developing countries that the commercial and scientific gains realised from their genetic resources were being reaped mainly by the industrialised world. These guidelines, non-binding in nature, aim to improve the way researchers, collectors, foreign companies and other users gain access to valuable genetic resources in return for sharing the benefits with the countries of origin. At the same time, they guide the governments on ways to set fair and practical conditions for users seeking genetic resources who, in return, must offer benefits derived from their use, in the form of profits, royalties, scientific collaboration, or training.

Representatives of indigenous peoples criticised the voluntary guidelines as too weak and as providing insufficient protection for the knowledge and natural wealth of local people. They also reiterated previously voiced concerns that national governments rather than indigenous peoples would benefit from the commercial exploitation of traditional knowledge. Some expressed concerns about budgetary implications and the need for a binding instrument was echoed by the non-governmental organisations (NGO) caucus, which also strongly supported the disclosure requirements in patent applications.

Asian civil society groups were critical of the guidelines that failed to define the rights of indigenous peoples, local communities and farmers, and to address conflict with the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement. While pointing out that the guidelines recognise the need to prevent bio-piracy practices, NGOs criticised parties for failing to agree on the need for legally binding measures.

The international regime should be forward-looking with a target to bring biodiversity loss to a halt by 2010. Activities should be prioritised

that contribute most to achieving this target. It is submitted that the government of Bangladesh should take account of the following views and argue for a legally binding document for access and benefit sharing in the next CBD Conference of Parties to be held in March 2004.

**Relationship with other entities:** The legally binding regime needs to clarify CBD's relationship with WTO and World Intellectual Property Organisation in order to progress on fair and equitable sharing of benefits arising from genetic resources. Intellectual property rights, granted and protected under domestic laws that are consistent with the agreement on TRIPs, may not satisfy the requirements under the CBD. There is also a need to clarify relationship with Food and Agricultural Organisation's treaty on Plant Genetic Resources.

**Form and content:** The binding agreement should set out a vision statement with a clear objective. Benefit sharing will be through information-exchange, access to and transfer of technology, and capacity building. There should a funding strategy to mobilise funds for priority activities, plans and programmes. It should deal with intellectual property rights (IPR) systems; contractual agreements; customary laws and protocols, in so far as they are recognised and enforceable within the applicable constitutional legal system; and common law regimes.

**Dispute resolution and enforcement:** There should also be provisions on dispute resolution and enforcement mechanisms. There is an urgent need to clarify the inter-relationship with WTO dispute resolution mechanisms and other related dispute resolution bodies.

**Indigenous communities:** The legally binding document should include provisions to protect the rights of indigenous and local communities over their resources and knowledge.

**Detail provisions to prevent bio-piracy:** The Bonn guidelines are too weak and will not prevent the knowledge and natural wealth of local people being exploited, at present, by international industries.

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