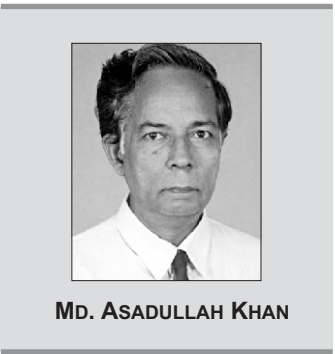


GLOBAL WARMING

Feeling the impact at home



GLOBAL warming is now a grim reality. Atmospheric gases like carbon dioxide, nitrous oxide and methane in the atmosphere effectively trap the heat from the sun and keep the earth warm. But in excess, these gases cause a catastrophic rise in global temperatures. Global warming caused by the galloping increase in carbon emissions by uncaring nations has severely disrupted weather patterns across the world. Carbon emissions doubled in three decades with the US carbon emissions at 16 percent above 1990 levels making it a major polluter. In consequence, air pollution has now become a major killer with three million people dying of it every year.

But the causes of this global warming, among other factors, can be attributed to vehicular pollution, industrial emission and disappearing greens. With burning of fossil fuels excess carbon dioxide is spewed into the atmosphere causing temperature to rise, while in industrial operation emission from burning coal add to the greenhouse effect. Besides, exploitation of forest resources has accentuated global warming more than anything else. Trees are carbon sinks and deforestation upsets the balance. With less green cover, soils retain more heat and drought follows. Most worrisome, glaciers across the globe – the Arctics, the Andes, the Alps and now the Himalayas – are feeling the impact of global warming the most, showing maximum retreat from the middle of last century, much higher than what glaciologists had predicted or known earlier.

As many as 127 glaciers of less than 1 sq. km size have lost 38 per cent of their geographical area since 1962, a study by Indian glaciological society revealed. The Himalayas, home to about 9000 glaciers – one of the largest con-

centration of fresh water outside the polar regions – have not been studied properly. But a recent study of 466 Himalayan glaciers by an ISRO Space Application Centre shows that these glaciers are receding at an alarming rate. Any evidence that glaciers are melting is a warning bell. It's likely to severely alter this region's fresh water balance and adversely impact on food and energy production.

With the arrival of the Industrial Revolution in the early 1800s man suddenly threw a new factor in the climate equation. Carbon dioxide is released in large quantities when wood and such fossil fuels as coal, oil and natural gas are burned. As society industrialised, coal-burning factories began burning oil and gas at prodigious rates. And increasing population led to the widespread cutting of tree in less developed countries. These trees are no longer available to soak up excess carbon dioxide, and whether they are burned or left to rot, they instead release the gas. By the late 1800s, atmospheric carbon dioxide had risen to about 290 parts per million (PPM). Today it stands at about 400 ppm and by 2050 it could reach 500 to 700 ppm, higher that it has been in millions of years.

But carbon dioxide, once thought to be exclusively responsible for the greenhouse effect, was later known to cause only half the problem. The rest comes from other gases. Chloroflourocarbons (CFCs), dominated the scene till 90s and they have now been controlled. CFCs are not only destroyers of the statosphere's ozone layer but are powerful green house gases as well. So are nitrogen oxides which are pollutants spewed out of automobile exhausts and power plant exhausts. Another greenhouse gas is methane, the primary component of natural gas. Methane is also generated by bacteria living in the guts of cattle and termites, the mud of rice paddies and the rotting garbage in landfills. Each of the sources is fostered by human activity. Human contributions to the greenhouse effect comes from so many basic activities that man cannot realistically expect to stop the process, only slow it down.

Along with greenhouse gas emissions, the rate of consumption of forests, energy and land by humans is exceeding the rate at which Earth can replenish itself,

Racked by periodic floods, cyclones and storm surges, especially in the coastal zones, Bangladesh cannot simply evacuate the “chars” in the Ganges Delta where millions of people have set up homes. Launching of such massive evacuation plan that involves forbiddingly high cost, expertise and innovative facilities is a daunting task. However, much talked about SAARC summit can deliver the panacea. As Bangladesh suffers the ravages of floods every year, its adjacent as well as Himalayan neighbours must also understand and do something about the root cause of the flooding: the deforestation of watersheds in India and Nepal that has turned seasonal monsoons into “unnatural disasters”.



says a research study conducted by California-based Redefining Progress, a group concerned with environmental conservation and its economics. The study group warned that failure to rein in humanity's overuse of natural resources could send the planet into “ecological bankruptcy”. “Earth's resources are like a pile of money anyone can grab while they all close their eyes, but then it's gone,” said Mathis Wackernagel, lead author of the study.

Furthermore, according to a recent study report revealed by Intergovernmental Panel on Climate Change (IPCC), the top UN scientific authority on climate change, by 2050 as many as 150 million “environmental refugees” may have fled coastlines vulnerable to rising sea levels, storms or floods or agricultural lands that become too arid to cultivate. In India alone, there could be 30 million people displaced by persistent flooding while a sixth of

Bangladesh could be permanently lost to sea level rise and land subsidence. The IPCC estimated in 2001 that by 2100, temperatures would rise by between 1.4°C (2.5°F) and 5.8°C (10.4°F) compared to 1990 levels driven by atmospheric carbon pollution which stokes up heat from the sun. The mean global sea level would rise by between 9 and 88 cm (4 and 35 inches).

Global warming will also add significantly to Earth's worrisome water problems. Already around 1.4 billion people live in water stressed areas, a term defined as having less than 1000 cubic metres (35,000 cubic feet) of water per person per year. The world's supply of clean fresh water, already threatened by growing levels of pollution, is becoming so scarce in some areas, accentuated by climate change in consequence of global warming, that if current trends continued, two-thirds of humanity will suffer severe water stress

within 30 years, says a UN report. The situation will not only imperil human health and development on a vast scale, but also the aquatic and terrestrial ecosystems on which much of Earth's life depends. The growing scarcity of water is also hampering the expansion of agricultural production at a time when demand for food is rising with steady population growth.

In some countries, with no exception in Bangladesh, there is now a need to move from food self-sufficiency to greater reliance on food purchases from world markets. The crisis resulting from water shortages due to climatic change may put global food supplies in jeopardy and lead to economic stagnation in many areas of the world, triggering a series of local and regional water crises with global implications. Racked by land destruction, salinity intrusion, water logging, recurrent floods, and storm surges, people in the south-western part of Bangladesh are now facing a new set of challenges imposed by global climate change, including further rise in sea level, changes in the course of the rivers and increase in temperatures. Many in the region who were dependent on agriculture and fisheries have switched over to other professions due to environmental constraints and destruction of natural resources. The biggest impact of climate change has been on the water supply.

The south-western part of Bangladesh now bears the brunt of the ravages of climate change in almost unimaginable proportions. The water in most of the ponds in villages of Sathkhira, Bagerhat, Khulna, and Barisal has turned saline, while tube wells now fail to yield drinkable water. The saline water has affected cultivation of vegetables, crops, and sweet-water fish. Water carried from some sweet water reservoirs in these water starved areas are now on sale around villages hit by sweet water scarcity. Traditional sweet-water fish are almost extinct due to inundation and saline intrusion in local ponds and wet lands. Farmers and fishermen who were earlier dependent on agriculture and fishing are now migrating to other towns and cities to work as day labourers, rickshaw pullers, etc.

True, if the nations of the world take immediate action, the destruction of the global environment, no doubt, can be slowed substantially. But some irreparable and irreversible damage may be inevitable. Even if fossil fuel emissions are cut drastically, the overall level of carbon dioxide in the atmosphere will increase. Even if toxic dumping is banned outright and that ban is strictly enforced, some rivers, lakes, and aquifers will be tainted by poisons that have already been released. Even if global population growth could be cut in half, there would still be 45 million new mouths to feed next year, putting further



strain on a planet where capacity to sustain life is already under stress. Sooner or later, the Earth's human inhabitants so used to adapting the environment to suit their needs will be forced to adapt themselves to the environment's demands. The question that invariably comes is how will societies and people cope with the long-term changes that are likely to be in store? In countries and regions hit by climatic upheavals people have come up with a variety of solutions that are likely to have broad applicability to the global problems of tomorrow.

How would societies respond, for example, if the oceans were to rise 3 to 5 ft over the next century, as some scientists have predicted? One option would be to construct levees and dikes. The Netherlands, after all, has flourished more than 12 ft below sea level for hundreds of years. Its newest bulwark is a 5.6 mile dam made up of 131 ft steel blocks that remain open during normal conditions, to preserve the tidal flow that feeds the rich local sea life, but can be closed down when rough weather threatens. Venice has put into place 1.2mile flexible sea wall that will protect its treasured landmarks against Adriatic storms without doing ecological damages to the city's lagoon.

Poorer countries have fewer options. Racked by periodic floods, cyclones and storm surges, especially in the coastal zones, Bangladesh cannot simply evacuate the “chars” in the Ganges Delta where millions of people have set up homes. Launching of such massive evacuation plan that involves forbiddingly high cost, expertise and innovative facilities is a daunting task. However, much talked about SAARC summit can deliver the panacea. As Bangladesh suffers the ravages of floods every year, its adjacent as well as Himalayan neighbours must also understand and do something about the root cause of the flooding: the deforestation of watersheds in India and Nepal that has turned seasonal monsoons into “unnatural disasters”.

The problems of agriculture as mentioned earlier would be critical in the next century, as growing populations, deteriorating soil conditions, and changing climate put even more pressure on a badly-strained food supply system. Hundreds of grassroots organisation in Africa are taking action to cope with the environmental change. Even embattled Somalia has launched a vigorous anti-desertification drive that includes a ban on cutting firewood. In Burkina Faso, villagers have responded to dwindling rainfall by building handmade dams and adapting primitive water gathering techniques.

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HAZARDOUS WASTES

The threat of transboundary trade

MOHAMMAD REAZUDDIN

IT is often said that the whole civilisation is becoming chemical, as the society is depending so much on various chemicals being produced by industries world wide. It is true that there is a growing tendency to use more natural items or the so called green items, but at the same time it is obvious that it is very difficult to get out of the vicious cycle of chemicals being used in domestic, industrial and agricultural practices on a very regular basis. Large scale industrial production of a number of chemicals throughout the world, their storage, handling, transport, use and disposal have given rise to massive environmental problems. Out of about 11 million chemicals synthesized in laboratories so far, around 1 lac inorganic and organic chemicals are in regular production so far, while about 1,000 new ones are being added annually.

With millions of end-products being made out of these chemicals, the quantities of waste generation is enormous and varied in nature. These wastes occur from their being relatively simple to very complex in nature and form. Of the most significant and important feature of industrial wastes is that their large proportion is potentially toxic or hazardous which necessitates the need for their special handling, treatment and disposal.

**Europe - the initial generator**

It is through the industrial revolution is Europe, that we are now in a chemical world. Needless to say, that the industrial revolution in Europe achieved its success at the expense of environment. The root cause of today's global warming, ozone layer depletion etc. is the reckless industrial production, without due consideration to the environmental safety and protec-

tion. The industries threw their wastes to the surroundings, polluted rivers and oceans and poisoned the atmosphere. However, the mass production from industries made them global leaders in trade and export, and made them enormously rich. During that period, Europe also colonised the world with the armament strength, developed out of chemicals.

Gradually, the life style in Europe started getting changed. With their prosperity in economy they wanted decent life, meaning good house and surrounding to live in, fresh water to breath and safe water to drink. In the early part of 19th century, people in Europe started campaign for conservation of environment and protection of nature. The countries enacted their environmental rules, regulations and standards. With the passage of time, they tightened their standards for disposal of wastes from industries and enacted special rules on disposal of hazardous wastes.

**Transboundary movement**

Some industries not solving the mounting waste crisis by addressing the root cause of the problem, namely minimizing waste generation through cleaner production and technologies, resorted to a deadly trade in toxic wastes. In essence, waste trade is nothing but a search for the cheapest and easiest dumping grounds. To avoid domestic regulations and disposal costs, many waste generators in industrialized countries have opted for a much cheaper and easier way to get hazardous wastes off their hands by simply shipping it to other countries with less strict environmental laws, and less expensive labour and disposal costs. The toxic waste invasion of Asia and Africa may be attributed to be abovementioned reason.

There are reports that over

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million of tons of lead wastes, plastic wastes and “scrap metal” have been shipped to Asian countries during last quarter of the past century. Similar shipments to African countries have also taken place. Other kinds of toxic wastes shipped to Asia during the period include aluminum, cadmium, copper, nickel, tin, zinc, other non-ferrous and ferrous metals, ash and residues, “electrojunk”, medical wastes and other hazardous and radioactive wastes. Over the past years, as waste shipments faced increasing public and government opposition in South-East

Asia, waste brokers have shifted much of their toxic trade to other South Asian countries. Bangladesh also had faced such unwanted problems.

**Bangladesh experience**

In 1992, GOB purchased more than 6000 tons of Zinc Oxy-Sulphate fertilizer from a US company, with fund provided by the Asian Development Bank. Stroller Chemical Company of South Carolina allegedly mixed 1,000 tons of toxic copper smelting furnace dust into the fertilizer prior to shipping it to Bangladesh. Tests of



the fertilizer showed that it contained hazardous levels of lead which causes neurological problems in children, and cadmium, which causes kidney problems. The Bangladesh government reportedly stopped distribution of the toxic fertilizer after half of it was sold. The remaining 3000 tons were sealed and stockpiled in storage. Later on, after legal battle, those were shipped back to USA.

In 1989, GOB received a proposal from a firm of Europe to ship millions of tons of toxic and other wastes to Bangladesh, free of cost, from the U.S. and Europe in the pretext of generating electricity at Chittagong form burning of those

movement to minimum gave birth to the Basel Convention on the control of transboundary movements of hazardous wastes and their disposal, adopted by the conference of the plenipotentiaries on 12 March 1989. The convention has come into force in May 1992. A number of industrialized countries including the USA are yet to ratify the convention.

The main goals and objectives of the convention are : to minimize the generation of hazardous wastes and other wastes (in terms of both quality and potential hazard) and to treat and dispose of hazardous wastes and other wastes as close as possible to their source of generation in an environmentally sound way. The overall goal of the Basel Convention is to establish strict control over transboundary movements of hazardous wastes and other wastes consistent with their environmentally sound management.

The Convention because of non ratification by some leading countries is still a weak one and does not have the required capacity to control illegal waste export form industrialised countries to less industrialised countries. The vast majority of waste trade involves some pretext of “recycling”. The hidden agenda of the proposal is to get rid of their toxic and hazardous wastes using some form of “pre-text”. Currently, it has been agreed by the Meeting of Parties that industrialized countries should not export hazardous wastes to developing countries, as the developing countries don't have environmentally sound recycling facilities. But, if the export is to take place from developing countries to developed countries for safe disposal, these are permitted. Basel Convention secretariat has reported that after this decision taken by the Parties, the incidence and volume of illegal trade of hazardous wastes has

reduced to a great extent.

**National response**

The available information on hazardous wastes is limited to the recognised industrial units only and not much information is available on small scale or cottage industries. A cursory study of the Department of Environment indicates that there are around 1000 to 1200 industrial units which generate both high risk and low risk hazardous wastes in the country, but management of those is still rudimentary. Available information also indicates that there are considerable interest among a group of entrepreneurs to establish industries based on imported wastes.

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