Global Warming: Impacts And Responses

by Fahmida Akter

CLIMATE change is likely to affect our existence in various ways. A warm climate will have serious negative impact. The Intergovernmental Panel on Climate Change (IPCC) has done scientific assessment of climate change and estimated the extent of warming that is likely to take place upto the year 2100. Under the IPCC business as usual the scenario of "greenhouse gas emission, the average global mean temperature increase during the next century is likely to be about 0.3^{0}C per decade with an uncertainty range of 0·2^{0}C to 0·5^{0}C. Consequently, the likely increase in global mean temperature would be 1^{0}C above present levels by 2025. This would be about 2^{0}C above temperature during the pre-industrial period rising to about 3^{0}C above present levels before the end of the next century.

The IPCC business as usual scenario indicates that South Asia will be 1^0 to 2^{0}C warmer in 2030 over the pre-industrial period. Precipitation is predicted to increase by 5 to 15 per cent in the summer, but would change very little in the winter. The moisture in the soil during summer is projected to increase by 5 to 10 per cent. These results are, of course, not free from uncertainties and doubts. However, the general conclusion from these estimates and predictions is widely accepted by scientists, which indicates that, a warmer earth will also be wetter and more humid; the sea-level rise is likely to increase along with an increase in the temperature of the oceans because of high frequency of tropical cyclones risk of storm times will increase in the tropical regions.

The consequences of global warming on human activities can be both short term and long-term. In the short run, agricultural productivity is risked. The effect of temperature on rice and wheat fields can be negative. The duration of growing season will be reduced and productivity will decline due to high temperature. However, several studies are inconclusive as yet about the responses of agricultural plants to higher levels of carbon-dioxide concentration.

In the long run, global warming can show up with its negative impacts on forest zones and sea-level. The ecological implications of changes in forestry include impacts on animal, soil, water etc. There would be considerable changes in biomass production. A change in the type and extent of forest cover would leave an impact on the survival of certain types of animals. Changes in forest would also change the soil composition. The existence of bacteria, fungi and animals has an important effect on the recomposition of litter and, therefore, the availability of nutrients essential for forest growth. People who are dependent on fuel wood for meeting their cooking needs will have to change their patterns of livelihood due to changes in forestry. Wood products which depend of continuous supplies from forest areas would suffer as a consequence of global warming.

Changes in climate would also affect biological diversity both directly and indirectly. It would accelerate the process of destruction of bio-diversity that is taking place as a result of manmade activities such as deforestation. Fresh water fish in large bodies of water could decrease correspondingly, because with higher levels of carbon-dioxide the pores of plants may shrink. There would also be change in rainfall patterns and precipitation rates. This would have the most important impact on the lives of the people, particularly of Bangladesh. The country would not only be highly prone to increased flooding and drainage problems, but also the timing and extent of monsoon rain would change substantially with serious consequences for people in the area.

The impact of global warming on sea-level rise would be enormous. In the short run, thermal expansion of ocean water will be the major cause increase in productivity as a result of warmer climates in some parts of the world, but there is an even possibility that some species would actually die. Some of the birds would be threatened as a result of sea level rise inundating their wintering grounds or from increased temperature.

The demand for water would increase as the climate becomes warmer and drier. Reduced flows of river water, resulting from drier conditions could affect activities like production of hydro-power, inland water transport, and aquatic eco-systems. With warming climates the extent of evaporation is likely to increase and, therefore, there would be greater precipitation. The melting of snows would also increase. Ground water availability would change as a result of recharge rates being altered. But transpiration may not increase correspondingly, because with higher levels of carbon-dioxide the pores of plants may shrink. There would also be change in rainfall patterns and precipitation rates. This would have the most important impact on the lives of the people, particularly of Bangladesh. The country would not only be highly prone to increased flooding and drainage problems, but also the timing and extent of monsoon rain would change substantially with serious consequences for people in the area.

Higher temperature could cause a number of diseases. Cardiovascular, cerebrovascular and respiratory diseases are related to increased temperature. Several vector-borne diseases could increase as a result of likely changes in humidity and temperature. This would have an impact on specific plants, animals, insects, bacteria and viruses. Mosquito-born diseases are likely to increase.

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In view of the consequences of global warming, actions are required to be taken which would reduce energy intensity throughout the world. Shift from coal and petroleum to natural gas and to a large range of renewable energy sources such as solar, biomass, wind and ocean energy would produce relatively lesser amount of greenhouse gases. Research and development efforts should, therefore, be increased, particularly in the developing countries. It is also essential to halt deforestation and increase the rate of replanting in deforested areas. The reduction of green cover, which normally acts as the lungs of the world for absorbing carbon-dioxide has added substantially to the increase in carbon-dioxide concentration in the earth's atmosphere. Therefore, afforestation has to be encouraged.

It is important to note that attacking the problem of global warming as well as of other environmental aspects requires a careful choice of plans and projects by the developed as well as the developing countries. However, poor countries like Bangladesh can do little to prevent the consequences of global warming. But they can actively participate in global negotiations and assist in mobilising a global action plan to control greenhouse gas emission as well as the resultant impact. These governments have to represent their case for a significant share in global resources set aside to combat adverse impacts of climate changes as they are the recipients of these adverse impacts.

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Nepal's Protected Areas at Risk

by Praveen Bhalla

THE majestic mountains of Nepal are perhaps the most visible evidence of Nepal's natural beauty. Less known, but equally well endowed are its floodplains, particularly those of the Karnali river in the southwest of the country, which harbour one of the world's richest areas of diversity in species and habitat. This area is now threatened by large hydrodevelopment projects, especially dams, even before its large varieties of flora and fauna have been fully assessed.

In their progress report on the study of the impact of Dam Construction on Bardia National Park, Dr Johanes J Bauer, Ecological Consultant for WWF International, and Mr Georg Rast, of the WWF Institute for Floodplains Ecology (WWF Auen-institut), warn that at present at least four large-scale hydrodevelopment schemes pose major threats to Nepal's protected areas.

The most profound impact will come from the multi-billion dollar scheme called the Karnali (Chisapani) Multipurpose Project. The changes caused by the dam will ravage the floodplain of the Karnali river situated below the dam, irreversibly destroying the diversity of sedimentation types and habitats exploited by a large number of species.

The report alleges that the many Environmental Impact Assessment (EIA) studies done to assess the effects of this dam are unreliable as they have been based on "insufficient hydrological data and characterized by an almost entire lack of reliable biological information".

The report adds, "Each of them has also failed or neglected to draw on the present state of knowledge (scientific reports, etc. and scientists) in this area." Its authors cite the Himalayan Power Consultants' (HPC) latest EIA, which is considered to be the most comprehensive.

This EIA referred to the general loss of river habitat and secondary pressures from the increased population, but mentioned only two species as being threatened, namely, the gangetic dolphin and the Gharial or slender snouted crocodile. It neglected to mention the whole range of other threatened species, among them, the tiger, one horned rhino, barasingha or swamp deer, hispid hare, swamp crocodile, nilgai, smooth-coated otter and a wide variety of birds.

The conversion of the Karnali river from a highly diverse system to a single channel system, with all its ecological implications, is not even mentioned in this HPC study, rendering questionable the validity of the overall conclusions on the environmental impact of the dam.

In view of the inadequacy of existing data on species and habitats of the region and the poor documentation of available data, WWF International is financing a project to collect reliable and comprehensive biological information of the Karnali floodplains, to help support the efforts of the Department of National Parks and Wildlife Conservation (DNPWC) — the Nepalese organization responsible for the administration of the country's protected areas — to respond to external pressures that are threatening to destroy one of its most important protected areas.

One of the main aims of the project is to try to develop a scenario of dam-related changes to flora and fauna in the floodplain, by collecting data on the abundance and diversity of species along successive gradients from riverbed to forest over a range of seasons.

The study will attempt to assess impacts likely to be attributable to the different hydrodevelopment schemes, for example, the construction of the dam, as well as the Babai Irrigation Project and the East-West Highway. This will also involve studies of the river morphology and an investigation into the effects of hydrodevelopment projects on some of the other river systems in the country.

In addition, the report lists other protected areas in Nepal adversely affected by hydrodevelopment schemes: the Royal Chitwan National Park in southern central Nepal is likely to be affected by the East Rapti Irrigation Scheme, which will remove 40 percent of the dry season flows, affecting centres of biodiversity along the Rapti river, the US$30M Babai Irrigation Project will remove 75 percent of the dry season flows, threatening the only region in Royal Bardia National Park which had been considered unaffected by construction work; and the Suklaphanta Wildlife Reserve is already affected by the "insufficiently assessed" Mahakali Irrigation Project. — WWF Features

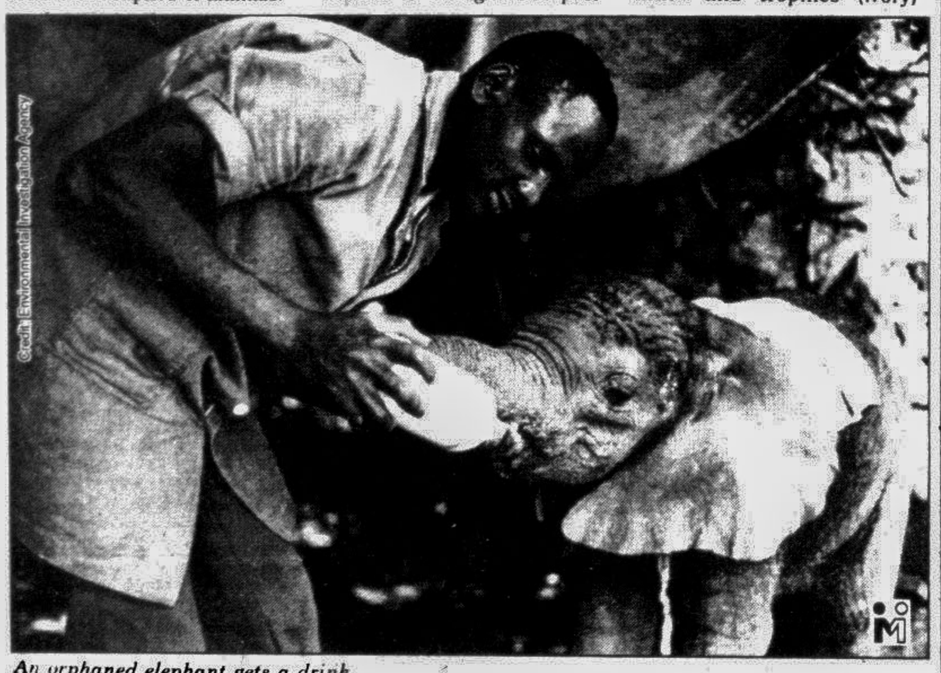
The Karnali River in southwestern Nepal — with one of the world's richest and most biologically diverse floodplains — is threatened by hydroelectric schemes.

Hippos Bake to Death as the Mud Turns to Dust

by Keith Somerville from Harare

THE animal species most severely affected by the drought in southern Africa are those most dependent on water. In Gonarezhou National Park, Zimbabwe, a once thriving population of hippopotamus has been reduced to a mere 120. Hundreds have died through lack of water.

Hippos must have water and mud to cool off in, otherwise they simply bake inside their thick hides. Glen Tatham, chief warden in the department of National Parks and Wildlife Management, says that at least 80 per cent of hippos in southern Zimbabwe are likely to die. The once well-stocked hippo pools along the Lundi River are drying out and have been emptied of animals.



An orphaned elephant gets a drink

The decline of the hippos will have a knock-on effect on the flora and fauna. Hippo dung provides nutrients which encourage the growth of riverine plants, which in turn provide food for a variety of insects, molluses, fish, birds and mammals living in a along the rivers.

In Gonarezhou and the Lowveld areas many other species are being decimated. Government and park authorities have been facing for months tragic choices as to whether to let animals die or to cull many and transport others to areas where they can be fed and watered. Elephant, buffalo and impala are being shot and meat and hides given to the local people to supplement their dwindling protein intake.

National Park is trying to move animals to wetter areas. It wants to freight sable antelope, rhinos and wildebeest from the southeast to parks or enclosed areas in the Zambezi valley — possibly the Zambezi National Park. The Wildlife Society of Zimbabwe appealed for funds and volunteers to help.

So far rare species such as rhinos and Lichtenstein's hartebeest (found in small numbers in Zimbabwe, Mozambique and Malawi) are being moved. Ten hartebeest were darted and taken to a small park near Harare.

In addition to culling buffalo, about 250 have been moved to commercial game ranches and around 1,000 elephants are being re-located. The Zimbabwean air force is helping in the operation.

Some ranchers are finding that game animals, though vulnerable to drought and poor grazing, survive the conditions better than cattle. This has given an impetus to game ranching and wildlife utilisation projects.

There are already schemes in areas such as Chiredzi, under which local people can cull a certain proportion of the game animals in their area annually and consume or sell the meat and hides. They can also allow safari hunters to kill their allotted animals. This is a lucrative business in some area.

Foreign hunters pay a substantial daily fee for a minimum number of days in order to hunt. They also pay a fee for each animal killed. Each hunter can bring in thousands of Zimbabwean dollars for just a few days' hunting.

For the last ten years these hunting and wildlife utilisation schemes have come under the Communal Areas Management Programme for Indigenous Resources (Campfire), which was initiated under the 1982 Parks and Wildlife Act.

Campfire enables district councils in communal areas to control the killing of game, and the organisation of hunting safaris and game-ranching to help provide work and income for local people. It also helps conserve game species through giving them an economic value to local people.

The people thus have a direct cash income form hunting or safaris and therefore an interest in preventing poaching and in ensuring the continuation of species to provide in come in years to come.

Under the scheme, the district council receives 15 per cent of the earnings from safaris, hunting, sale of meat, hides and trophies (ivory) while 35 per cent is used to pay for wildlife management. The remaining 50 per cent is distributed among local people involved in the scheme as cash payments.

The attraction of the project is such that in the first ten years of Campfire, 12 out of 55 district councils have acquired the responsibility for wildlife within their areas.

In recent years Campfire has faced a major problem with the ban on trophy ivory by the International Union for the Conservation of Nature (IUCN) and regulations on trade in the UN Convention on International Trade in Endangered Species (CITES). Ivory sales were an important part of the CITES scheme. They were the most lucrative source of income for people taking part in the project.

If people cannot sell their ivory and hunters cannot take ivory home because of import bans the fall in income will destroy the scheme. This would lead to a fall in incentives for conserving and managing wildlife and a possible return to unfettered poaching and destruction of the game. Animals would once more be viewed as pests rather than assets.

James Murombedzi, of the Centre for Applied Social Sciences in Harare, says : "It is a great pity Campfire is being threatened because it might have been a blueprint for the survival and sustainable utilisation of species worldwide."

The argument is strong and one that will be reinforced by the need to cull and to find funds for relocation of animals during Zimbabwe's frequent droughts.

— GEMINI NEWS

*About the Author : **KEITH SOMERVILLE** is a writer and broadcaster on African affairs. He is the author of Angola : Politics, Economics and Society.*

Toxic Wastes Dumped in Bangladesh as 'Fertilisers'

by Farhad Mazhar

THE Bangladesh Agricultural Development Corporation (BADC) is a semi-autonomous government institution responsible for procurement and distribution of fertilisers and other agricultural inputs. It functions under the Ministry of Agriculture. Early this year it had imported 3,150 tonnes of zinc oxy fertiliser from the United States which contained toxic lead and cadmium. This is the second installment of the purchase of zinc oxy fertilisers into the country.

BADC had placed the order to procure about 6,000 tonnes of zinc fertilisers at a cost of US$298 per tonne during the latter part of 1991. The first consignment arrived in the same year and was distributed. The manufacturer was listed as a US-based company: Stoller Inc.

Before the consignment reached Chittagong port BADC knew that the fertiliser contained toxic lead and cadmium from the US embassy. The US embassy, quoting the US Environmental Protection Agency (EPA), informed the Bangladesh authorities that the imported consignment contained toxic material. In spite of this alert BADC went on to distribute 1,113 tonnes of the toxic fertiliser.

Samples of the consignment, which arrived at the outer anchorage of Chittagong port in the first week of January, were collected by both BADC and the US embassy for conducting chemical analysis. BADC sent the samples to the Bangladesh Agricultural Research Institute (BARI) and the Bangladesh Atomic Energy Commission (BAEC). The results were available in the same month.

The results at BARI showed that the samples contained 2.3 to 4.17 per cent of lead and 0.18 to 0.195 per cent of cadmium. Similarly the BACE test revealed that the samples contained between 2.01 and 4.02 per cent of lead and 0.034 to 0.043 per cent of cadmium.

BARI noted that the quantums of lead and cadmium found in the samples were not toxic for plants and would not have any toxic effect on the environment. On the basis of the BARI results and recommendations the Ministry of Agriculture allowed BADC to release the contaminated fertilisers.

In April the US embassy confirmed that the samples were found to be contaminated after tests were conducted by the South Carolina Department of Health and Environment Control (SCDHEC). The US test results showed that the lead content was 6.9 per cent while that of cadmium was 0.05 per cent. This level is in excess of US regulatory limits. Lead poisoning can hamper growth and diminish intelligence in children while cadmium can cause liver diseases. Only after the receipt of this report did BADC finally stop further distribution of the toxic fertilisers.

On 12 June 1992 US Attorney John S Simmons, EPA Assistant Administrator for Enforcement Herbert H Tate Jr, EPA Region IV Administrator Greer C Tidwell, SCDHEC Deputy Commissioner for Environmental Quality Control Lewis Shaw, and Ninth Circuit Solicitor David P Schwacka announced that a Federal Grand Jury in Charleston, SC returned an indictment against Stoller Chemical Co, Inc; Gaston Copper Recycling Corp; Southwire Company; Hy-Tex Marketing, Inc; and their owners and managers on charges related to the illegal treatment and exportation of more than 3,000 tons of hazardous waste to Bangladesh and Australia in October 1991.

According to the indictment, Gaston Copper Recycling Corp generated baghouse dust, collected in large air filters attached to copper smelting furnaces. It contains led and cadmium and is thus classified as a hazardous waste. The hazardous baghouse dust was transported without a manifest to Stoller Chemical Co's plant in Jericho, in Charleston Country. Stoller Chemical Co treated the baghouse dust without a permit, and used it to make a fertiliser micronutrient that also contained led and cadmium. Stoller then shipped the hazardous micronutrient overseas to Bangladesh and Australia, without obtaining the consent of either of the receiving countries.

Southwire Corporation, headquartered in Carrolloton, Ba, is the primary stockholder or owner of Gaston Copper Recycling Corp. Hy-Tex Marketing, Inc, located in Beaufort, SC, is a broker of chemical products and hazardous waste.

All the defendants were charged with conspiracy to violate the Resource Conservation and Recovery Act by entering into an agreement to undertake the following activities: transportation of hazardous waste without a manifest, treatment of hazardous waste without a permit, and exportation of hazardous waste without the consent of the receiving country, all in violation of US law.

The local agent of the suppliers in Bangladesh is M/S Trans Continental Imex. When asked by a journalist, they denied having violated the specification of the contract on the basis of which the toxic fertilisers were imported. They questioned the basis on which the Environment Ministry recommended legal action against the suppliers. The suppliers claimed that there was no way for them to know that the consignment was contaminated.

The Bangladesh Environment and Forest Ministry has sent a summary on the recent purchase and distribution of toxic fertilisers in the country to the Prime Minister's Office, proposing various measures including legal action against the suppliers, according to a report in the Daily Star on 5 October 1992.

It seems a potential conflict exists between the Ministry of Environment and Forestry and the Ministry of Agriculture. The latter played a role in allowing the toxic fertilisers to be imported and distributed by BADC. The existing law of Bangladesh is inadequate to tackle such an incident. The Environmental Pollution Control Act of 1977 cannot cover such a situation.

On 25 September Ann Leonard of Greenpeace attended a meeting with representatives of the US Department of State. The State Department Official informed her that the toxic fertilisers were left in Bangladesh because the Bangladesh government wanted it and requested that it all be left there.

However, BADC had requested the supplier to take back the consignment of fertiliser found to contain hazardous toxic substances and to refund the 'full' amount paid for it.

According to the telex message sent to the Washington-based supplier M/S Trans Continental Imex dated 4 September, BADC said: 'The consignment of 3.150 tonnes of zinc oxy sulphate fertiliser contained lead in the amount of 6.9 per cent and cadmium of 0.05 per cent as per the tests conducted by the South Carolian Department of Health and Environment Control, as intimated by the US embassy and the results exceeded US established regulatory limits.'

The BADC telex message added: 'Thus, the zinc oxy sulphate fertiliser supplied by you being hazardous, you are requested to take back from Bangladesh the entire quantity of zinc oxy sulphate fertiliser available with BADC and pay back the full CNF value and other costs immediately."

The negligence of BADC and the irresponsibility of the Ministry of Agriculture are being severely criticised by environmental groups in Bangladesh. Despite prior warning from the US environmental protection agency that the consignment of fertiliser may be contaminated, BADC distributed 1,113 tonnes of it before deciding to stop.

Of the remaining stock, 1,717 tonnes are being stored at BADC's Shirimoni godown in Khulna while 267 tonnes remain in Chittagong and the rest are scattered in a number of distribution points around the country, according to corporate sources. BADC authorities seem to be unaware of the exact locations where the fertiliser has been distributed and used. It was distributed mainly in the northern and southern parts of the country.

Meanwhile, BADC sent additional samples for testing at the Bangladesh Council for Scientific and Industrial Research, the Rajshahi University and the Dhaka University.

Despite the faulty and misleading content analysis done by BARI the corporation also asked the same institution to find out the long-term effects of the toxic fertiliser on crops and land and its possible effects on humans through the consumption of food products. Environmental groups like UBINIG are demanding independent and objective study of the damages and the anticipated hazards caused by the distribution of toxic waste. It is to be noted that BARI receives a large amount of funds from the USA for agricultural research. — Third World Network Features

Environment groups in Bangladesh are raising a hue and cry over the role played by government bodies and officials in allowing toxic wastes from the US to be imported and distributed as 'fertilisers.'