

Climate change and Bangladesh

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In its third assessment report, released in January 2001, the intergovernmental panel on climate change (IPCC), said over the 20th century the global average surface temperature has increased 0.6±0.2° C. Most of the warming occurred during two periods, 1910 to 1945 and 1976 to 2000. Globally, it is likely that the 1990s was the warmest decade and the 1998 was the warmest year since 1861. The 1990s was not only the warmest decade of the 20th century but also of the millennium. In addition to higher temperature other incidences such as intense precipitation, long dry spells and frequency of hurricanes take place.

The climate change threatens more frequent and extreme weather events such as those experienced recently and catalogued in the IPCC report briefing. Droughts, floods, cyclones, and storm surges, with knock-on effects for ecosystems, fires, pests outbreaks, human health, our settlements and food security might increase in frequency and intensity. For millions, this could mean homelessness, missing relatives, crop failure, famine, disease or death. It is the poor country, which are likely to suffer most. The industrialised countries, having polluted the atmosphere with green house gases over the last century, will also be hit. But they will be much more able to react to extreme weather events and to protect their people.

Climate change is merely one of many factors influencing the genesis of diseases, and it is often difficult for epidemiologists to separate out the socioeconomic and demographic influences. High atmospheric temperatures cause more water evaporation, increasing humidity and leading to higher levels of precipitation in many areas of the world. Also a rise in humidity can have a sustained influence in the activity, dispersal, and spread of

infectious disease vectors (such as the *Anopheles* mosquito) and can thereby increase the spread of a variety of tropical diseases such as malaria, dengue fever, leishmaniasis, hantavirus disease, cholera and meningococcal meningitis. Increasing evaporation of water from the oceans will increase the likelihood of floods. The immediate effects of flooding include a rise in the number of injuries and drowning. In the medium term, a consequent acute shortage of clean drinking water and infection from contaminated water often leads to an increase in cases of hepatitis A and cholera. In long term, the distraction of croplands and the wiping out of harvests result in under-nourishment.

Bangladesh is highly vulnerable to climate change. Some critical impacts of climate change that Bangladesh will face are *drainage congestion problems* due to higher seawater levels, subsidence, siltation of estuary branches, higher river bed levels and reduced sedimentation in flood protected areas, *reduced fresh water availability* due to growing demands stimulated by climate changes (through increased evapo-transpiration), population growth and economic development, *disturbance of morphological processes* such as increased bank erosion and bed level changes of rivers and estuaries also Disturbance of the balance between river sediment transport and deposition in rivers, flood plains and coastal areas, *Increased intensity of disasters (extreme events)* including cyclones/storm surges, floods and droughts.

Faced with these impacts, the question is whether and how Bangladesh can adapt to the changes. What is important to remember is: climate change should be a consideration when development and other decisions that affect the capacity of climate sensitive systems to cope with this phenomenon are being made. Bangladesh

should adopt anticipatory rather than reactive strategy to climate change. The reasons are:

! *Some impacts of climate change are gradual, long term and may be irreversible* such as species extinction, or loss of valuable ecosystems,

! *Some impacts of climate change increase the intensity of extreme events* such as cyclones and floods.

! *Long-term performance of some decisions and investments may be affected by the impacts of climate change*, for example major infrastructure works such as dams that are designed to last several decades.

While Bangladesh is already suffering from major extreme events, and is relatively well equipped in disaster response (with the continuous process of improving on its capacity to mitigate the impacts of cyclones and riverine floods etc), the country lacks the capacity and mechanism to account for long term changes. There remains a serious lack of real time data in monitoring and preparing for these events. Considering the country's fewer financial resources, lacks of institutional, planning and decision making structures, inefficient management of resources, lack of awareness to both planning agencies and public, most of all unhealthy, less educated and technically competent population it is reasonable to take cost effective, new technologies for adaptation of climate change impacts.

The goal of anticipatory adaptation measures is to reduce vulnerability by minimizing the negative impacts of climate change, or enabling reactive adaptation to come about more efficiently. Reducing vulnerability is directed towards making the system (both resources and users) more robust and flexible to changes. The con-

crete and practical possibilities to decrease the country's vulnerability to climate change by distinguishing the following types of adaptation measures.

! *Adaptations of climatic factors* such as negotiating water sharing arrangements and participating in international deliberations on the mitigation of greenhouse gas emissions.

! *Physical adaptations* (protection and enhancement) in the human made or natural systems, such as: planting of mangroves, raising of dikes, construction of new infrastructure such as cyclone shelters and / or coastal embankments, landfills and tidal basins.

! *Institutional adaptations* would facilitate the various types of adaptation. These may also include socio-economic measures such as changing the use of resources through non-structural measures, such as, crop diversification and sustainable shrimp cultivation, changing planning procedures and increasing awareness level, research and information management etc.

In accordance with institutional arrangements we should take concrete actions to reduce Bangladesh's vulnerability to climate change. There is a very urgent need of setting up an International Disaster management Centre in Bangladesh. Also to mitigate the climate change developed countries can trade carbon with developing countries. Experts estimate that Bangladesh can gain 6 billion USD by Carbon Trading. In this case government can seek technological help from Bangladeshi scientists in home and abroad.

However, Bangladesh should apply its indigenous knowledge and its own resources for adaptation process, which they have acquired through hundreds of years because, the land/people ratio in our country is much higher than anywhere in the world. So, what can be implemented in Brazil may

not appropriate for our country. Carbon trading may be suitable for some African countries considering their socio-economic conditions but we should take this step more cautiously. In this regard it is necessary to form small groups of more likely countries from Group-77. This will be more helpful for Bangladesh for climate change adoption. Also the experts in Bangladesh can form groups to spread these indigenous knowledge to the countries that are observing natural disasters recently like Florida, Mexico, Japan, India, Canada and Brazil. Costs involved and required in institutional arrangements often pose a set of serious constraints. Proper coordination and management require operational procedures, which are often lacking in Bangladesh, and are hard to finance.

The LDC fund (USD 11.6 million) to support preparation of NAPAs (National Action Plan for Adaptation) and its implementation is not adequate. Also the procedure of GEF (Global Environment Facility) support to develop and implement NAPA and vulnerability mitigatory strategy is very much time consuming and complex. Therefore Bangladesh (already member of all the most relevant conventions) should become a much more active participant in the international efforts addressing the underlying causes and impacts of climate change. The actual level of knowledge and expertise in Bangladesh greatly facilitates such a role. Contribution of Bangladesh should specifically stress on adaptation for climate change. In addition, Bangladesh should more actively promote international support to implement (costly) adaptation measures.

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ENVIRONMENT WATCH

In genetic engineering chain



PHOTO: AFP

Greenpeace activists chain themselves during a protest outside the environment ministry in New Delhi yesterday. The demonstrators were protesting against the ongoing meeting of the Genetic Engineering Approval Committee (GEAC) inside the ministry, which will consider the commercial release of genetically modified mustard, a significant food crop in India.

Economy versus ecology

Georgia oil pipeline poses major environmental risk

AFP, Tbilisi

A strategic oil pipeline project under development represents a major environmental risk for one of the Caucasus's most celebrated resorts and for a source of mineral water renowned throughout the former Soviet Union.

Work on the Baku-Tbilisi-Ceyhan (BTC) pipeline, linking the Caspian and Black seas, is just beginning in Azerbaijan, but by the time it is completed in 2005 it will cut a swathe through Georgia's Borjomi valley, a beauty spot famous for its climate and its mountain scenery.

Six international non-governmental organisations, in a joint report, warned recently that the pipeline not only endangered the environment, with its permanent risk of leakage through accidents or deliberate attack, but was also likely to hit local tourism and employment.

Jacques Fleury, managing director of the Georgian Glass and Mineral Water company which operates the Borjomi spring, said that at least 7,000 tonnes of crude oil would spill into the valley in the event of a breach in the pipeline.

"Upstream the nearest pump is 75 kilometres away, and even if an alert were to be sounded immediately after an incident, it would still take 20 minutes for the pipeline to empty.

In addition to the customary technical risks, and the hazards of a pipeline passing through a region of high seismic activity, there is - in the view of Alexander Tvalshredidze, hydro-geologist with the

Georgian Academy of Sciences - the even greater risk of a terrorist attack.

Fleury believes this risk is "high," noting that in Colombia, where "despite the 1,000 soldiers deployed to keep guard over oil pipelines, guerrillas carry out dozens of attacks a year."

The head of the Georgian International Oil Corporation, Georgi Shanturia, charged by President Eduard Shevardnadze last month with ensuring the pipeline's safety, told AFP that the risk of attacks was "virtually zero."

David Woodward, head of British Petroleum Azerbaijan, which is the three-billion-dollar project's main shareholder, stressed that "all necessary safety measures will be taken," including satellite surveillance and regular patrols.

Fleury believed the pipeline's itinerary should have taken it further south.

"This probably wasn't possible for political reasons," he said.

The project crosses sensitive political faultlines in the Caucasus and Turkey, and skirts the Kurdish region of southeastern Turkey where a 15-year separatist rebellion only recently ended.

It also passes close to Armenia, which has not yet resolved a territorial conflict with Azerbaijan, and a human rights activist in London warned that the pipeline could "militarise a whole corridor running from the Caspian to the Mediterranean."

Treasure from trash

Garbage disposal can be a boon for a developing country such as ours, writes Md Asadullah Khan as he lists a number of innovations in waste management across the globe, including a UN award-winning venture in Bangladesh

THE capital, according to the Dhaka City Corporation (DCC) sources, generates nearly a million tonnes of solid waste every year, dumped in landfills at Jatrabari, Matuail, Dolaikhal, Mirpur and Mohammadpur. The run-off from the landfills has long been contaminating drinking water, posing serious health hazard to the residents.

Solid waste is not the only problem for Dhaka. A few hundred industrial units generate several hundred tonnes of hazardous waste every day. These could be toxic or slag from industrial processes or even certain kinds of plastic. Experts and conscious citizens have expressed concern that encroachment of the Buriganga, the city's lifeline and pollution of its water and pollution in various forms and diseases have turned the once-majestic capital into a choking hell.

High population density, noxious

emissions and toxic effluents from factories, small and large, inside and outside the city belts, indiscriminate dumping of hazardous wastes and irresponsible and reckless way to get rid of mountains of refuse, much of it poisonous, bloat the landfills. This practice followed in most poor countries only underscores the enormity of what has become an urgent global dilemma: how to reduce the gargantuan waste by-products of civilisation without endangering health or damaging the environment. Encouragingly, developed countries have found treasure from such trash.

Neutralsys, a new disposal process devised by an Australian company for the United States, involves combining solid municipal waste with clay to produce an inert lightweight aggregate, essentially a small ceramic rock, that can be used to make lightweight concrete. As revealed by John Robinson, mar-

keting director of the Neutralsys Industries, the process has been termed profitable and efficient and offers environmental benefits. One benefit, the director stresses, is that the technology eliminates the need to dump garbage in landfills or burn it. Also the process of converting the garbage into rocks produces excess energy that can be converted into steam or electricity some of which could be sold to utilities. And in addition to the rocklike material, which Robinson contends is a very viable substitute for other building materials, the technology produces scrap metal as by-product. The company has further confirmed that the aggregate has passed all Environmental Protection Agency (EPA) toxicity tests.

After years of being a noble but uneconomic enterprise, recycling is becoming a big booming business. Rosie Rogers, a development engineer at Wellman, an American

recycling firm, recently in an exhibit in the US put on display thermal underwear made from plastic bottles, gowns from garbage bags and necklaces from telephone wires. The born-again products provided striking evidence of the upswing in recycling or the business of giving trash a second life. Rogers further demonstrated that twenty-five soft drink bottles could make a great sweater.

From the festering landfills to the waste-choked sewage drains of Dhaka the trashing goes on. Man's effluent is more than an assault on the senses. When common garbage is burned, it spews dangerous gases into the air. Dumped garbage and industrial waste can turn lethal when corrosive acids, long-lived organic materials and discarded metals leach out of landfills into ground water supplies, contaminating drinking water and polluting farmland.

Recycling so long considered a dirty secret and a sham is now gaining popularity. Amid the environmental fervour that followed Earth Day 1990, people in many countries started separating cans, bottles and newspapers from other refuse for reuse. Plastics, typically the least desirable of recycled commodities, are now in great demand. Some years back, China had a poor cotton harvest and that drove textile manufacturers around the world scrambling for cotton substitutes from plastics. The percentage of discarded paper collected for recycling amounts to 35 per cent in Britain, 40 per cent in the US and 50 per cent in Germany and Japan.

The German recycling programme - probably the world's most ambitious - has made remarkable progress over the years. Under a 1980 law, manufacturers were required to assume responsibility for recycling their products. To comply, companies formed a non-profit alliance called the "Dual System". That meant the organisation aimed to set up a garbage-collection service operating in tandem with municipal systems. Specifically the companies pick up recyclables which could be sold to industries that needed them.

However, in many countries recycling remains stalled at the curbside. Japan, for example, generates 50 million tonnes of household and office waste a year, but less than four per cent is recycled. Old newspapers, bottles and cans are collected but are dumped when recycling proves impossible. Recycling may look like a local issue, but it has global ramifications. While the industrial countries are home to 20 per cent of the world's population, they account for 80 per cent of paper and aluminium consumption and 75 per cent of the petroleum used for plastics. Much of the raw material for these industries comes from the forests, mines and wells of less developed nations giving them income but depleting their resources and despoiling their environments.

Despite so much innovations coming into play in the world around us we have hardly shown any con-

cern or initiative to handle this trash that goes on increasing with each passing day. Till now city corporations in our country have not been able to formulate adequate strategies to control the volume of waste produced or to handle it properly. As landfills reach capacity and new sites become scarcer and with incinerators becoming burdensome investments, we need an alternative arrangement to cope out with this problem. In such a grim situation when the trash volume is rising up exponentially and dumpsites are shrinking fast in the city, the novel method developed by two Bangladeshi youth, engineer Iftekhar Enayetullah and urban planner Maqsoodur Rahman Sinha might show the DCC and other city corporations the way.

Sinha and Enayetullah have won this year's United Nations award for "Race against Poverty" for their excellent venture of transforming trash into fertiliser. They have formulated a strategy to convert trash into organic fertilisers. The facilities, it has been learnt, at the moment will meet 27 per cent of the country's total fertiliser requirement of 3.5 million tonnes. These facilities likewise would create employment opportunities for about 100,000 people. The venture beginning in 1998, was successfully implemented with the financial assistance of the United Nations Development Programme (UNDP) and the government and finished product like organic fertiliser could be processed in just about 55 days after collection. The trial run, with these fertilisers in the country's farmland proved to be wonderfully successful.

The DCC and other city corporations cannot sit idle and allow these hazardous wastes being washed into rivers, creeks and estuaries, crucibles of life for the seas beyond. Alarmingly, effluents and raw sewage to the extent of 10 lakh cubic metres flushed from thousands of multi-storey apartment buildings, other than factories, dyeing units and tanneries are being discharged into open surface drains that ultimately settle into the Buriganga, the Shitalakhya, the Turag and the Padma. In the face of such ever-rising toxic effluents pouring into our vast wastelands and rivers, fish are poisoned and catches have fallen alarmingly as a result of the destruction of the complex life cycle of coastal wetlands. It is simply because of human actions that not only the rivers, haors but also the Bay of Bengal beyond is now a biological desert.

There is no denying the fact that landfills and incinerators, however harmful their emissions, will be needed as part of the well-managed waste disposal systems for the foreseeable future. Where possible, landfills should be fitted with impermeable clay or synthetic liners to contain toxic materials and with pumps to drain liquid waste for treatment and disposal elsewhere.