Only awareness can help save our environment

MD. ASADULLAH KHAN

FOR the last three decades scientists and world leaders have been trying to cope with the consequences of exponential growth in human numbers and their increasingly frantic demand for the resources that only nature can provide.They have been working to save the threatened species from extinction and to give the natural process of our world the chance to maintain a healthy global biosphere. This means some sacrifices and restraints and evidently we can no longer pursue short-term prosperity without a thought for long term survival. People in some industrialised countries have mistaken the fact that efforts to achieve conservation of nature threaten human economicwelfare. But nations in the present world have hardly any illusion that a good quality of life can only be made up of both material well-being as well as a healthy, productive and beautiful natural environment. And for millions of people like us living in the less prosperous parts of the world, the care and conservation of the natural resources, restraint and cautious disposal of toxic wastes and hazardous effluents and sludge from the industries are the only ways to improve conditions.

There are several factors, chief among them the build-up of carbondioxide or other green house gases in the atmosphere, or a host of man-made ills, from toxic land fills to ozone depletion that are causing degradation of the natural environment and the increasing extinction of wild species of plants and animals on this planet earth. People should be allowing more thinking time and greater energy on finding and implementing practical remedial action. Looking around, we see that humanity is in conflict with the forces of nature. But the world's biosphere is all that keeps the human species from extinction. That calls for preserving the web of life and any action that we take to exploit it beyond its natural capacity is in every sense a threat to the quality of life of those who will come after us.

To help preserve our environment we need to take some urgent and concrete steps like limiting the release of carbondioxide, solving the problem posed by CFCs, cutting pollution and waste that means toughening fuel efficiency standards for autos, launching a large scale tree plantation programme, banning the dumping of wastes by the industrialised countries, making birth control information and devices available to every men and women, developing educational programmes in an effort to impress upon people the value of nature's genetic diversity, promoting waste recycling and encouraging debt for nature swaps.

Coming back to the issue of CFCs (chlorofluoro carbons), we see that these CFCs have been linked by scientists to the depletion of the ozone layer which shields the earth from the sun's harmful ultraviolet rays. In deference to the Montreal Protocol timetable, some industrialised countries have already phased out CFCs from their production lines. Assuringly, because of the vigorous R & D (Research and Development) work, development of a washing-cum-drying method for computer hard disks that replaces CFCs with distilled water and nitrogen in a high speed spin dryer has already reduced the use of CFCs.

The second most environmental hazard is pollution largely due to industrial inefficiency, increase in motorised transportation, wasteful consumption and some modern agricultural practice. Humanity has used the world as a waste bin -- but the bin is now full and overflowing. Every year 115 million tonnes of sulpher dioxide and around 30 million tonnes of nitrogen oxides are released by the major industrialised nations. One of these results is acid rain which is becoming a major scourge of industrialized nations. These airborne pollutants are no respecters of national boundaries and tackling them successfully relies on international cooperation. Thus air pollution output in the form of acid rain is creeping into developing nations like Bangladesh and India other than China that has made a big headway in developmental activities. The strange tree disease that is causing extinction of trees in the Sundarbans must be attributed to acid rain.Surely, these forest resources have to be preserved by all possible means. Nature, it must be stressed here, is like business. Business sense dictates that we guard our capital and live from the interests. Nature's capital is the enormous diversity of living things. Without it we cannot feed ourselves, cure ourselves or provide industry with the raw materials of wealth creation. Prof. Edward Wilson of Harvard University rightly says, "The folly our descendants are least likely to forgive us is the ongoingloss of genetic and species diversity".

So far as it is known, only 150 plant species have ever been widely cultivated. Yet over 75,000 edible plants are known in the wild. In a hungry world with population growing by 90 millions each year, this extinction of plants vastly needed for human survival is tragic. Medicines from the wild, scientists estimate, are worth $ 40 billion a year. Over 5,000 species are known to yield chemicals with cancer fighting potential. But even then the vast majority of species remains unidentified and uninvestigated for its potential usefulness. Scientists currently estimate that the total number of species in the world is between 10 and 30 million - with only around 1.4 million identified. The places that support most diversity are tropical rain forests, mangrove swamps and coastal wet lands. But these are being degraded. Habitat destruction triggers large scale extinction of species.Our Sundarban might come up as a vast trove of medicinal plants that still remains unidentified. It is worth noting that most children with leukaemia now survive by the use of chemicals vincristine and vinblastine donated by the rosy periwinkle. Many people with heart ailment depend on Fox gloves. These flowers provide the digoxin which regulates their heartbeat. Many sufferers from hypertension and high blood pressure get potent relief from the Indian snake root shrub for its reserpine. It is further known that extracts from an Amazonian Oak tree coagulate proteins immensely helping scientists in their search for an AIDS vaccine. Cancer of the lung, kidney and testis responds to Etopaside, a drug sythesised from "May apples". The enormous potential and relief that human beings can get from the plant diversity and species is still a subject of continuing research.

Understandably, large quantities of hazardous wastes are still being generated in the developed and industrialised countries. Our country, that is yet to achieve that level of industrialisation has to bear the brunt of the progress achieved by others. It is high time that our country entered into an agreement detailing legislation that would stop trans-boundary ovement of hazardous wastes. Unless an understanding of the cross-sectoral linkages among biodiversity, land and water use, sustainable growth, forest management and desertification control is reached on regional basis, our development effort would be set at naught. In recent times, the country's rivers, lakes and wet lands (haors) are a lifeless receptacle of human wastes, pesticide residues and toxic industrial effluents from the dyeing units, textile industries, fertilizer factories, paper and pulp mills and pesticide factories. The poison has seeped so deep that water in the rivers and lakes comes up in hues of green and black. These poisoned waters now symbolise not life but death. In consequence, rivers like the Buriganga and Shitalakhya do not have fish of any kind now. Over 300 tanneries in the city's Hazaribag area discharge chromium-rich effluents that ultimately find their way into the river Buriganga and Sitalakhya. Technology or treatment plants to handle heavy toxic metals like chromium, cadmium and lead have not yet been set up. However, the river water so poisoned is used in different human purposes when the metals are absorbed in the food chain. Cadmium can lead to renal failure; lead can soften bones and add to other complications. Measures and initiatives to minimize the price man has to pay in the form of disease and death must be taken up without any let up or delay. The country has already ncountered the danger of arsenic pollution as a result of excessive use of ground water level and excessive use of chemical fertilizer. All these are telltale indications of our long and dangerous neglect of our environment. Precisely told, the fundamental causes of the country's land and water degradation are need, greed and ignorance. That calls for educating the people that some of our earth or water has been scorched or drained beyond repair and a sustainable development is a must now.

Scarcely a country that has not thought of proper and safe disposal of its industrial wastes has been spared of the scourge. Say for example, Hong Kong with 5.7 million people and about 50,000 factories within 400 sq. miles dumps 1000 tonnes of plastic a day -- triple the amount thrown in London. Dhaka and Chittagong city's situation is going to assume equally hazardous. In Dhaka city alone much of the 10,000 tonnes of daily garbage production including solid wastes and toxic and substances like used injection syringes hazardous plastics, metals, batteries are not picked up from the dustbins and find their way into landfills and open sewers. The river Buriganga flowing by Dhaka and Karnaphuli in Chittagong have almost turned reddish as the stinking soup and excrement continue to contaminate its waters. On the other hand, when garbage is burned, it spews toxic 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 farmlands.

Topping the list of the offenders is the US with its affluence and industrial might. Reports have it that 276 million Americans in the U.S. throw away 16 billion disposable diapers, 1.6 billion razors and blades, and 220 million tires other than glasses and bottles every year. They discard enough aluminium to rebuild the entire US commercial airline fleet every three months. Reports have it that they produced about 195 billion kg of garbage of all varieties in 1997. Other than this, each year American industries belch, pump and dump more than 1.1 billion kg of really nasty stuff like lead compounds, chromium, ammonia, organic solvents - into the air, water and ground. Awfully, the country is struggling to clean up the mess created by such indiscriminate dumping of toxic waste.

The problem of handling these wastes has posed a serious problem for many countries. In many countries acres of landfills of liquid waste have been created. But a few nations have been able to formulate adequate strategies to control the volume of waste produced. Moreover efforts of effective waste disposal prove to be quite expensive and each method has its own drawbacks. Incinerators also prove to be burdensome investments for many countries, entailing serious limitations. Contaminant laden ash residue itself requires a dumpsite. On the other hand, growing consumer demands for more throw-away packaging add to the volume.

Only, a few developing countries have regulations to control the output of hazardous waste but even fewer have the technology or trained personnel to dispose it of. Many African and Asian countries, including India, Pakistan, Bangladesh, Sri Lanka and Burma continue to build plants without including costly waste disposal system. In many cases plants have disposal systems that remain inoperative due to inappropriate technology. Reports have it that in Lagos of Nigeria, five incinerators built remain idle because they can treat garbage containing less than 20 per cent water. But most of the city's garbage in these countries is 30 per cent to 40 per cent liquids. Even in the highly industrialised countries, there are formidable social obstacles to waste management. Nobody wants incineration or disposal system in their localities now. In the US, 80 per cent of the solid waste that are now dumped in about 6000 land fills are going to be filled up and have to be shut. "We have a real capacity crunch", said a senior official of the Environmental Protection Agency (EPA). Even in West Germany, about 50,000 landfills have been declared potentially dangerous because they may threaten vital ground water supplies.

The question that looms up in public mind is how to prevent our environment wallowing in waste and poisonous materials that we ourselves are producing. Higher fines, taxes and strict enforcement might force the manufacturing industries to curb waste and toxic materials. Some manufacturing companiesin the West have cut waste generation in half by using fewer toxic chemicals, separating out wastes that can be reused and substituting alternative raw materials for hazardous substances. To cite an instance, in the Netherlands, Duphar, a large chemical concern, adopted a new manufacturing process that decreased by 95 per cent the amount of waste created in making a pesticide.

Recycling is, of course, the best way to reduce waste. Japan now recycles more than 50 per cent of its trash and Western Europe around 30 per cent. Shockingly, the US, the largest producer of the waste and toxic materials till now recycles about 10 per cent of its garbage or 16 million tonnes a year and as reports are available, only 10 states have mandatory recycling laws. But as experts point out, even with most efficient recycling, there will still be refuse. Landfills and incinerators, even if they are spewing harmful emissions will be needed for a well-managed waste disposal systems for the foreseeable future. But 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 elsewhere. Arsenic pollution in tubewell water in the length and breadth of Bangladesh that recently posed a threat to the people here could only be contained by this means. Landfill waste could also be burned to generate electricity. The US uses only 6 per cent of its rubbish to produce energy till now and Germany figures about 30 per cent to energy facilities.

There should be an international ban on the export of environmentally dangerous waste to countries without proven technology to dispose of it safely. Reports have it that in the last few years, some million tonnes of hazardous waste have been transported from the US and Western Europe on ships like "Pelicano" to countries of Africa, Asia and Eastern Europe. It must be brought home to the industrialised, affluent countries that dumping of one country's waste in another country amounts to declaring war on the people of the country these waste are dumped. And if such wastes continue to proliferate, man will have all but declared war on the earth's environment and thus in the end, on his own richest heritage.

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Ahimsa

ARUNDHATI ROY

WHILE the rest of us are mesmerised by talk of war and terrorism and wars against terror, (can you go to war against a feeling?) in Madhya Pradesh a little life-raft has set sail into the wind. On a pavement in Bhopal, in an area called 'Tin Shed', a small group of people has embarked on a journey of faith and hope.

There's nothing new in what they're doing. What's new is the climate they're doing it in.

June 12 was the 23rd day of the indefinite hunger strike by four activists of the Narmada Bachao Andolan. They have fasted two days longer than Gandhi did on any of his fasts during the freedom struggle. Their demands are more modest than his ever were. They are protesting against the Madhya Pradesh government's forcible eviction of more than a thousand adivasi families to make way for the Maan Dam. All they're asking is that the government of MP implement its own policy of providing land for land to those being displaced by the Maan Dam. There's no controversy here. The dam has been built. The displaced people must be resettled before the reservoir fills up in the monsoon and submerges their villages.

The four activists on fast are: Vinod Patwa who was one of the 114,000 people displaced in 1990 by the Bargi Dam (which now, twelve years later, irrigates less land than it submerged). Mangat Verma who will be displaced by the Maheshwar Dam if it is ever completed. Chittaroopa Palit, who's been with the NBA for almost 15 years. And 22-year-old Ram Kunwar, the youngest and frailest of the activists. Hers is the first village that will be submerged when the waters rise in the Maan reservoir. In the weeks since she began her fast, Ram Kunwar has lost 9 kilos - almost a fourth of her original body weight.

Unlike the other large dams like the Sardar Sarovar, Maheshwar and Indira Sagar, where the resettlement of hundreds of thousands of displaced people is simply not possible (except on paper, in court documents etc), in the case of Maan the total number of displaced people is about 6,000. People have even identified land that is available and could be bought and allotted to them by the government. And yet the government refuses.

Instead it's busy distributing paltry cash compensation which is illegal and violates its own policy. It says quite openly that if it were to give in to the demands of the Maan 'oustees' (i.e.: if it implemented its own policy) it would set a precedent for the hundreds of thousands of people (most of them Dalits and adivasis) who are slated to be submerged (without rehabilitation) by the 29 other big dams planned in the Narmada Valley. And the state government's commitment to these projects remains absolute, regardless of the social and environmental costs.

As Vinod, Mangat, Chittaroopa and Ram Kunwar gradually weaken, as their systems close down and the risk of irreversible organ failure and sudden death sets in, no government official has bothered to even pay them a visit.

Any government's condemnation of terrorism is only credible if it shows itself to be responsive to persistent, reasonable, closely argued, non-violent dissent. And yet, what's happening is just the opposite. The world over, non-violent resistance movements are being crushed and broken. If we do not respect and honour them, by default we privilege those who turn to violent means.

Let me tell you a secret - it's not all unwavering resolve and steely determination on the burning pavement under the pitiless sun at Tin Shed. The jokes about slimming and weight loss are becoming a little poignant now. There are tears of anger and frustration. There is trepidation and real fear. But underneath all that there's pure grit.

What will happen to them? Will they just go down in the ledgers as 'the price of progress'? That phrase cleverly posits the whole argument as one between those who are pro-development versus those who are anti-development - and suggests the inevitability of the choice you have to make: pro-development, what else? It slyly suggests that movements like the NBA are anti-quated and absurdly anti-electricity or anti-irrigation. This of course is nonsense. The NBA believes that Big Dams are obsolete. It believes there are more democratic, more local, more economically viable and environmentally sustainable ways of generating electricity and managing water systems. It is demanding more modernity, not less. It is demanding more democracy, not less. And look at what's happening instead.

Even at the height of the war rhetoric, even as India and Pakistan threatened each other with nuclear annihilation, the question of reneging on the Indus Water Treaty between the two countries did not arise. Yet in Madhya Pradesh (the state whose chief minister boasts of being the messiah of Dalits and adivasis), the police and administration entered adivasi villages with dozers. They sealed handpumps, demolished school buildings and clearfelled trees in order to force people from their homes. They sealed handpumps. And so, the indefinite hunger-strike.

Any government's condemnation of terrorism is only credible if it shows itself to be responsive to persistent, reasonable, closely argued, non-violent dissent. And yet, what's happening is just the opposite. The world over, non-violent resistance movements are being crushed and broken. If we do not respect and honour them, by default we privilege those who turn to violent means. Across the world when governments and the media lavish all their time, attention, funds, research, space, sophistication and seriousness on war talk and terrorism, then the message that goes out is disturbing and dangerous: If you seek to air and redress a public grievance, violence is more effective than non-violence. Unfortunately, if peaceful change is not given a chance, then violent change becomes inevitable. That violence will be (and already is) random, ugly and unpredictable. What's happening in Kashmir, the North-eastern states, Andhra Pradesh is all part of this process.

Right now the Narmada Bachao Andolan is not just fighting Big Dams. It's fighting for the survival of India's greatest gift to the world: non-violent resistance. You could call it the Ahimsa Bachao Andolan.

Over the years our government has shown nothing but contempt for the people of the Narmada valley. Contempt for their argument. Contempt for their movement.

In the 21st century the connection between religious fascism, nuclear nationalism and the pauperisation of whole populations because of corporate globalisation is becoming impossible to ignore. While the Madhya Pradesh government has categorically said it has no land for the rehabilitation of displaced people, reports say that it is preparing the ground (pardon the pun) to make huge tracts of land available for corporate agriculture. Which in turn will set off another cycle of uprootment and impoverishment.

Can we prevail on Mr Digvijay Singh - the secular, 'green' chief minister, the very public advocate of 'good governance', the right to information and decentralised water management systems - to substitute some of his PR with a real change in policy? If he did, he would go down in history as a man of vision and true political courage.

If the Congress party wishes to be taken seriously as an alternative to the destructive Right-wing religious fundamentalists who have brought us to the threshold of ruin, it will have to do more than condemn communalism and participate in empty nationalist rhetoric. It will have to do more than lock up MLAs in five star resorts (a zoo would be cheaper, surely?) to prevent them from selling themselves to rival parties. It will have to do some real work and some real listening to the people it claims to represent.

As for the rest of us, concerned citizens, peace activists, et al - it's not enough to sing songs about giving peace a chance. Doing everything we can to support movements like the Narmada Bachao Andolan is how we give peace a chance. This is the real war against terror.

Go to Bhopal. Just ask for Tin Shed.

Courtesy: Hindustan Times

Seasonal probabilistic flood forecasts

Prospects in Bangladesh

DR. M. RASHED CHOWDHURY

BANGLADESH is essentially an agrarian country in a deltaic environment that relies on floods and the fertility of its soil to produce its annual grain requirement. However, early monsoon floods, late onset of floods, and other climate variations impact food production and quality of life significantly. In addition to dislocation of cropping practices, large populations have historically suffered greatly in part due to unanticipated climate events that are typical of the region.

Recognition of the danger of unexpected flooding led to the development of short-range flood forecasts (24- to 72-hour in advance) in the 'Flood Forecasting and Warning Centre' of the Bangladesh Water Development Board more than a decade ago. Present flood forecast messages do require a better dissemination for response and preparedness action by the vulnerable communities.

So, what is needed is better comprehension of seasonal climate variability and change, the consequences of this for the key features of seasonal flood forecast, the predictability of these features, and improved translation of this information into products and their coordination to the ground level.

The role for seasonal to interannual forecasting has already been established in a 'needs analysis for forecasting tools and means' done by Environment and GIS Support (EGIS) (a project under the Water Resources Planning Ministry). This report envisages that there is a need for long-term seasonal flood forecasts for use in flood management preparedness actions in Bangladesh.

Seasonal forecasting methodology

Seasonal forecasting is the outcome of a shift from deterministic predictions (e.g., 0.2 mm of rain will fall in Dhaka tomorrow) to probabilistic forecasting schemes. Here the emphasis is on forecasting the probability that a particular climate variable (flooding as an example) will be significantly above or below a mean state over a time-averaged period (usually ranging from a month to a season) (e.g., there is a 20% probability that in three months time monthly mean discharge at Brahmaputra river will be higher than normal).

Approaches to seasonal forecasting can broadly be divided into two categories, empirical/statistical techniques and numerical/dynamical modeling, of which the former have historically been more widely developed (this is also the subject of inquiry in this article). The first step in the development of empirical seasonal forecasts is statistical analysis of the global mean atmospheric response to different large-scale modes of oceanic variability, e.g., ENSO and associated teleconnections. It may then be possible to predict how the atmosphere will respond to certain oceanic situations, based on monitoring of the ocean and knowledge of how the atmosphere has responded in the past to similar SSTAs, with a variety of lag times. For example, seasonal prediction of climate anomalies resulting from ENSO events are usually based on analyzing how and where climate has changed in the past during El Niño and La Niña years and monitoring of SSTs in the Eastern Tropical Pacific Niño 3 region .

Why seasonal forecasting in Bangladesh?

It is evident, despite relatively outdated dissemination network, that the present deterministic forecasts prepared by the FFWC are contributing significantly in flood preparedness actions. Since there is no seasonal probabilistic forecasts available now, the use of FFWC's forecasts are limited to real-time responses only. Any long time hazard mitigation planning is difficult from this forecast. Applying the science of seasonal probabilistic forecasts can minimize this gap. Seasonal forecasting (i.e., average rainfall for Jun-July-Aug-Sep in the Brahmaputra, Ganges, and Meghna basins will fall into five categories, e.g., much below average, below average, average, above average and much above average) has good prospects for application to early warning of flood hazards; it is equally applicable to the agricultural sector.

It is, therefore, very essential to adopt a comprehensive approach for developing a seasonal climate knowledge base. At the first stage, this can be done by: i) Quantifying the relationship of observed climate variability and change (within Bangladesh and in the river basins outside Bangladesh); ii) Establishing the potential for probabilistic forecasting of the key seasonal rainfall and stream flow features, based on climate information and forecasting, which will draw on observed climate data for Bangladesh and also state of the science global datasets of rainfall and other climate features; and iii) Assessing and establishing linkages among and between key institutions for dissemination of forecasts and warnings in terms people can understand and respond to.

This work can be accomplished by injecting climate knowledge into the study of hydrological impacts which will include: i) Focus on temporal variation of hydro-Meteorological conditions, as inferred by the seasonal hydrograph for the three major rivers. The role of climate will be analyzed, as inferred from statistical relationships between observed monthly/seasonal climate variability and the key features of the hydrograph; ii) Study of the seasonal rainfall in the domain of Bangladesh -- it's variability and relation to large-scale climate forcing and climate predictors; and iii) Study of the seasonal rainfall for the greater region, including headwater regions -- their predictability and their role in stream flow in Bangladesh.

Beneficiaries and impact

Engineering solutions to flooding would take a long time and would also involve huge initial, as well as longer term, investments that are not sustainable in Bangladesh. The economy of Bangladesh cannot today depend on structural adjustments. But there are feasible non-structural measures that can be enacted at present, that have the potential to be particularly effective in mitigating the damaging effects of floods. The enhancement of current flood forecasting and warning capabilities with seasonal climate information and forecasts offers the potential of increased latitude in planning and decision options regarding water management in Bangladesh. The emphasis is on climate informed decision opportunities that include utilization of predictable climate variations toward improved flood forecasting schemes, and public preparedness. But the possible outcomes from informed utilization of seasonal climate information go beyond flood preparedness -- and they go beyond the borders of Bangladesh.

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