

Climate change and calamities : Preparing for the worst

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FOR more than 40 years, Earth has been sending out distress signals. We have responded through staging processions on Earth Days, passing environmental laws and forging a few international treaties like the 1992 Earth Summit in Rio De Janeiro. All the while, the decline of Earth's ecosystem has continued unabated. Now if the nations of the world take immediate action, the destruction of the global environment can be slowed substantially. But irreversible damages may not totally be halted. Say, for example, if fossil fuel emissions are cut drastically there would still be carbon dioxide in the air along with the likelihood of some global warming. Even if toxic dumping is banned outright and that ban is strictly enforced, some lakes and aquifers will be tainted by poisons that have already been released. Even if global population growth could be cut by half, there would still be 50 million new mouths to feed next year, putting further strain on a planet whose capacity to sustain life is under stress.

We have been hearing about the environmental problems projected to come to a head toward the middle of this century. But as one born in 1939 I would surely be dead before 2050. As humans we are in the habit of planning things -- property, savings, insurance etc.

for our kids. But as much as we can hope, for a person of my age, my kids will reach my present age of 64 in 2034. Then all these insurances like property, houses and savings will be of no use because of the changed situations that will wreak havoc on the planet at that time. Notwithstanding all the wise investments, it would become apparent from the ills that plague them that their parents' generation had not thought wisely about world conditions and about the way they used the nature's bounties. And now over the heads of our children hang other threats from world conditions different from 1939-45. And the even graver problems that could affect our children more are environmental ones such as global warming and land and water degradation.

In order that future population inhabiting the earth could cope with the long-term changes that are likely to be in store for them, political scientist Michael Glantz of the US National Centre for Atmospheric Research has pioneered the use of a technique known as "forecasting by analogy" that predicts the effects of future climatic change. Glantz maintains that it is possible to make educated guesses about how a society will act in the future by examining its response to similar challenges in the past. In a series of case studies across the U.S. Glantz's team analysed the response of the com-

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Nor'wester swept through a couple of villages in Brahmanbaria razing homesteads to ground and killing at least 22 people on May 4.

munities to environmental events like 12 ft rise in the level of Utah's Great Salt Lake to the depletion of the aquifer that supplies ground water to the plains.

Our experience suggests that virtually every long-term environ-

mental changes is occurring now in miniature somewhere on the planet whether it is a regional warming trend in sub-Saharan Africa or the vanishing coastline in Louisiana or Florida or in the Atlantic beaches. Encouragingly, in countries and regions hit by climatic upheavals people have come up with a variety of solutions. The question now arises as to how would societies respond, for example, if the oceans were to rise 3 to 5 ft in this 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. Reports have it that its newest bulwark is a 5.6 mile dam made of 131 ft steel locks that remain open during normal conditions to preserve the tidal flow that feeds the rich local sea life, but can be closed when rough weather threatens. Venice has put into place a 1.2 mile flexible seawall that will protect its treasured landmarks against Adriatic storms without doing ecological damage to the city's lagoon.

Unquestionably true, that shoring up cities such as New York, Los Angeles, Paris, London and Rio de Janeiro would be a monumental task. In the U.S. the Environmental Protection Agency estimates that the cost of protecting developed coastal areas could reach \$ 111 billion. Southern Louisiana, which is losing land to the Gulf of Mexico at the alarming rate of one acre every 16 minutes, has drawn up an ambitious mix of programmes. In one such project, costing about \$ 24 million, pumping station could divert millions of gallons of silt-rich Mississippi river water onto the coastline to help stop saline water intrusion and to supply sediment that will build up the eroding land.

Poorer countries like Bangladesh, Maldives, the Philippines and India have fewer options. Racked by periodic floods, Bangladesh can't evacuate the "shoals in the Ganges delta where millions of people live. Government has yet to come up with plans to build such dikes that last. As reports reveal, already large stretches coastline land and habitats are being devoured by the gradually rising sea in Noakhali, Bhola, Patuakhali and Chittagong region every year. Meanwhile, a regional co-operation and action plan with neighbours like India and Nepal should be taken up to do some-



Tornadoes tore through mid western and southern United States devastating townships and killing at least 39 people on May 4.

thing most effectively about the root cause of flooding of the rivers in the region: deforestation of watersheds in India and Nepal that has turned seasonal monsoons into unnatural disasters.

The problems of agriculture are likely to be critical hence forth, as growing populations, deteriorating soil conditions and changing climates put even more pressure on a badly strained food supply system. Tragically true, in a world where some nations, as for example the US, spend \$ 350 billion per year for weapons manufacture, two billion people lack reliable access to safe nutritious food, and 800 million of them -- including 300 million children -- are chronically malnourished.

Agricultural policies now in place only point to an unsustainable development. Just 15 cash crops such as corn, wheat and rice provide 90 per cent of the world's food, but planting and replanting the same crops strips fields of nutrients and makes them more vulnerable to pests. Slash and burn planting techniques and overreliance on pesticides further degrade the soil. Surely more calamities are in store for us. The National Resources Defence Council (NRDC) and the National Research Council in the US have come out with findings that pesticide residues on food are likely to cause cancer. In the US alone much of the 560 million pounds of herbicides and fungicides used by American farmers annually are probably or possibly carcinogenic, according to the EPA. The problem, can doubtlessly, be solved by taking resort to biotechnology, but a furious debate is still going on over the efficacy of the emerging technology. Biotech partisans insist that the problem of feeding 130 million new mouths bestriding the planet every year can be solved by genetically modified crops. Environmentalists worry that fooling about with genes is a recipe for Frankenstein disaster.

Accepting that both sides do have points to make a contribution, the problem can be tackled through better crop rotation and irrigation which can help protect fields from exhaustion and erosion. Old fashioned cross breeding can yield plant strains that are heartier and more pest-resistant. But in a world growing so fast genetic engineering must have a role-provided it produces suitable

sweet potato that wards off viruses. Also in the works are drought-tolerant, disease-defeating and vitamin fortified forms of such crops as sorghum and cassava -- hardly staple in the West but essential elsewhere in the world.

A historical perspective could give us clues for intelligent guess work because ours is not the first society to face environmental challenges. Many past societies collapsed partly from their failure to solve problems similar to those that we face today -- especially problems of deforestation, water management, topsoil loss and climatic change.

Necessity has spawned invention in marginal farmlands around the world. The Chinese, threatened by a desert that is spreading at the rate of 600 sq. mi. a year, are planting a "green great wall" of grasses, shrubs and trees 4,350 miles across their northern region. In Peru archaeologists have revived a pre-Columbian agricultural system that involves dividing fields into patterns of alternating canals and ridges. The canals ensure a steady supply of water, and the nitrogen-rich sediment that gathers on their floors provides fertilizer for the crops. Reconstructed farms are yielding 25 metric tons of potatoes per acre, vs. less than 10 tons in conventional fields.

Perhaps no one is better prepared for hot, dry summers than

Israel's farmers. Using drip irrigation and other techniques, the Israelis have made plants bloom on land that was barren for millenniums. Portions of the arid Negev, an area once written off as largely uncultivable, today grow fruit, flowers and winter vegetables. Through a process known as "fertigation" -- dripping precise quantities of water and nutrients at the base of individual plants -- crops can be grown in almost any soil, even with brackish water.

Man has always shown a great capacity for adjusting to change. Past generations have survived ice ages and floods, famines and world wars. But when dealing with the environment, there is grave danger in relying on adaptation alone: societies could end up waiting too long. Many of the global processes under way, like the wholesale destruction of species, are irreversible. Others, like global climatic changes caused by man, are so profound that if allowed to progress too far, they could prove to be overwhelming. Simple prudence suggests that taking forceful preventive action now -- to save energy, to curb pollution, to slow population growth, to preserve the environment -- will give humanity a much better chance of adapting to whatever comes in the future.

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