

Clean technology is the road map to sustainable development

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THE "World Environment Day" (June 5) this year has brought mixed messages. There are some good news for the world today: population growth is slowing, life expectancy is rising and the hole in the ozone layer which shields us from ultraviolet rays is expected to shrink. But our climate and biodiversity are in peril and food and water supplies will be precarious. Precisely speaking, from depleted forests to dying reefs, distress signals dot the globe. Even in the U.S., with relatively clean environment, excessive carbon emissions fuel global warming. Reports gleaned from UNEP (United Nation Environmental Protection Agency) sources say that carbon dioxide emissions from the consumption and flaring of fossil fuels rose from 1.48 billion metric tons in 1980 to 1.83 billion metric tons in 2000. Evidently, the U.S. produces more greenhouse gases than any other country -- and by far the most per person. On the other hand, burning of forests to create cropland and unregulated timber harvesting have destroyed more than 15 per cent of the Amazon in only 30 years.

Ominous signs are everywhere. Located in the South western part of Bangladesh and initially spread over an area of 10,000 sq. km, the Sunderbans, the beautiful mangrove forest of Bangladesh is now reduced to half of its initial size. Home to 330 species of plants, over 270 species of birds and 42 species of mammals including the majestic Royal Bengal Tiger, the numerous canals in the Sunderbans have also been identified as one of the richest fish-nurseries in the Asian region. But over-fishing and over exploitation of plant and wildlife species are placing increasing amounts of stress on the viability of this delicate ecosystem. So is the case with Satchari forest in Habiganj and Rangamati forest region in the Chittagong area that are being denuded by illegal logging.

Most worrisome, global atmospheric clock is also ticking. Since 1945 the Antarctic Peninsula has experienced a warming of about 4.5F (2.5C). The annual melt season has increased by about 2 to 3 weeks in just past 20 years. This is evidenced by the fact that Arctic sea ice thickness has decreased from 9.8 ft (3.1m) in 1958-76 period to just 5.6 ft (1.8m) in 1993-97 period. Most ominously, the shortage of fresh water could signal a profound crisis for the whole humanity in the global village. Although it is true that we live in a world that is 70 per cent water, things are drying up fast. Only 2.5 per cent of water is fresh, and only a fraction of that is accessible. Meanwhile each of us requires about 50 litres per day for drinking, bathing, cooking and other basic needs. At present 1.1 billion people lack access to clean drinking water and more than 2.4 billion lack adequate sanitation. "Unless we take swift and decisive action", says UN Secretary General Kofi Annan, "by 2025 two-thirds of the world's population may be living in countries that face serious water shortages."

The problem can only be solved through the efficient use of water. Undeniably true, agriculture accounts for about two-thirds of the fresh water consumed. The World Summit held in 2002 at Johannesburg endorsed the "more

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Energy from water, sun, wind -- waiting to be harnessed

crop per drop" approach that otherwise calls for more efficient irrigation techniques, planting of drought and salt-tolerant crop varieties that require less water and better monitoring of growing conditions such as soil humidity levels. Improving water delivery systems would also help reducing the amount that is lost en route to the people who use it. Even if we have been able to bring about some improvement in the present situation, which is under so much stress, through providing water services and hygiene training to those who lack it, bigger problems lie ahead of us.

Energy need and climate are two daunting problems that are likely to bedevil all developmental

programmes in future. Surely, all developmental efforts start with switching the electric plug but in many parts of the world, it has not happened yet. About 2.5 billion people have no access to modern energy services, and the power demands of developing countries are expected to grow by about 2.5 per cent per year. But if those demands are met by burning fossil fuels such as oil, coal and gas, more and more carbon dioxide and other greenhouse gases will hit the atmosphere. These, scientists assert, will promote global warming, which could lead to rising seas, fiercer storms, severe droughts and other climatic disruptions that we are witnessing in different parts of the world.

Of more immediate concern is the problem of air pollution caused in many places by combustion of wood and fossil fuels. The effects of haze, a result of burning forests might be responsible for widespread respiratory illness and in most cases eventual death throughout South-east Asia. This brings into focus the problem of meeting the world's energy needs through developing cheaper and cleaner sources. That will necessitate providing incentives for alternative energy. Mentionably, in India, there has been a boom in wind power because the government has made it easier for entrepreneurs to get their hands on the necessary technology and has then required the national power grid to purchase the juice that wind systems produce. For instance, wind turbines that produced electricity in California at 4.5 cent to 4.8 cent a kilowatt-hour has now brought down the cost of production. Amory Lovins of the Rocky Mountain Institute in Colorado is now turning to a new generation of gearless wind turbines that will improve efficiency and lower the cost to 3.5 cents per kW-h. The wind power potential in India had initially been estimated at 20,000 MW. This has now been revised upwards to 45,000MW considering the technological advances and the availability of more modern equipment. However, the present total installed wind power capacity in India is 1080MW, about 1 per cent of the total need. Harnessing wind-power in Bangladesh despite the fact that the country has vast potential at least in coastal belts, is still a distant dream. Mentionably, some of the largest wind farms in Denmark are placed off coastlines. Although Bangladesh has such a vast coastline stretching from Teknaf to Cox's Bazar to Bhola to Patuakhali, hardly any such effort to tap this natural bounty to meet human needs has been made. Due to constant increase in the price of fossil fuel and its consequent adverse effect on the environment, there is a

realisation all over the world of the importance of generating power from renewable energy sources and it has been mooted that wind energy is the most promising due to its cost effectiveness and for delivering good quality power.

Wind farms in the U.S states of Texas, Oregon, Kansas and elsewhere helped lift U.S wind energy output up to 66 per cent in 2001. On the road to enlightened energy policy, a few countries offer models of reform. More than a decade ago, Denmark required utilities to purchase any available renewable energy and pay a premium price. Today the country gets 18 per cent of its electricity from wind. Thanks largely to Germany and Spain which have enacted vigorous incentives for renewables, Europe today accounts for 70 per cent of world's wind power. Given that the record in the decade since the Earth Summit is largely one of painfully slow progress and a deepening global environmental crisis, what is needed now is a high-level political commitment to sustainable development. People have seen the results that can be achieved when leaders speak publicly about an issue -- be it AIDS, aid or trade -- and put the full weight and resources of their administrations behind it.

Dire predictions, apocalyptic talk and doom-and-gloom scenarios are not enough to inspire people to change either their politics or their day-to-day behaviour. But neither can we afford to down play the problem we face nor think that sustainable development will happen of its own accord. Most encouraging, experts say wind could provide up to 12 per cent of the earth's electricity within two decades.

When the world nations make a stock taking after Rio 92 on another World Environment Day on June 5, this year it becomes apparent that world leaders hardly followed up on their Rio rhetoric. Environmental protection, while still a popular slogan is receding as a political priority. Much of the money pledged by rich nations to help poor countries meet environmental goals has yet to materialise. Rightly says James Gustave Speth, till recently administrator of United Nations Development Programme, "the momentum that was generated in Rio is faltering." And while nations dither, human population keeps growing apace, pumping more pollutants into the atmosphere, piling up more trash and driving more species into extinction." However, if the Rio summit could achieve any thing it enshrined the concept of "Sustainable development" -- the principle that current economic progress should not endanger the prospect of future generations.

However in the face of all pervad-

ing gloom, individual countries -- and states and cities within them have been moving forward taking their own action and setting their own standards. At the same time entrepreneurs and companies, large and small around the world are busy developing the clean technologies of the future. They are motivated not just by the fear that all nations will eventually impose tougher environmental restrictions but by the knowledge that the save-the-planet movement offers boundless opportunities for making money.

Such clean technologies are almost doing miracles. Micro-hydroelectric plants are already operating in numerous nations, including Kenya, Sri Lanka and Nepal. The systems divert water from streams and rivers and use it to turn turbines without complex dams or catchment areas. Each plant can produce as much as 200 KW -- enough to electrify 200 to 500 homes and businesses and last for 20 years. One plant in Kenya was built by 200 villagers, all of whom own shares in the co-operative that sells the power.

Renewable energy like solar and wind power is necessary for the assurance of life on earth. Precisely speaking, the momentum toward clean renewables is heating up. Globally, solar and wind energy is growing more than 30 per cent annually far faster than conventional fuels and their cost is plummeting. No doubt, solar's time is fast approaching. This is evidenced by the fact that the community of Tennant Creek in hot dry northern Australia is beginning to receive power from what is called a solar thermal system. It uses a series of parabolic dishes to focus the sun's rays and superheat steam, which in turn drives turbine generators. The designer Stephen Kaneff of the Australian National University calculates that these modest-size systems can produce power for as little as 4 cent (2.5 taka) per kW/h, cheaper than the polluting gas and diesel generators, Tennant Creek currently relies on.

In California's Mosave Desert, Pacific Gas and Electric uses a solar-thermal technology that employs mirrors to focus sunlight and heat liquids moving through pipes in long troughs. The array produces large amount of electricity -- 200 times as much as the previous Tennant Creek system though at a high cost per kW/h, perhaps double the cost of coal power. But solar proponents argue that the price difference is grossly misleading. They say the cost of oil and coal should be adjusted to reflect uncertainties over supplies, price volatility and environmental damage.

For the moment power from solar-thermal systems costs less than that produced by photovoltaic cells which convert sunlight straight into electricity. Advocates of pv cells

point out that the gap is narrowing and pv cells have other advantages. Solar thermal systems require direct sunlight, while pv cells work in cloudy weather. Even at 25 cent or more per kW/h, pv cells are economical for delivering small amounts of power in remote places. Home owners find solar energy less expensive than connecting to a utility if a house lies farther than 2 or 5 km from the nearest power line.

Most assuringly, the real growth market lies in the developing world. Mason Willrich, Vice-chairman of the U.S. Department of Energy's Task Force on Strategic Energy Research and Development, observes that developing nations gain a double benefit from renewable power because they can manufacture the components of their energy supply system, thus expanding their industrial base. Manufacturing solar and wind energy equipment and installations creates jobs and reduces oil imports. Hopefully, if the nations in the world would have gone for exploiting solar energy on a mass-scale the world could have avoided dependence on oil imports and there would not have been any war just from oil interest as we saw in the recent past with America waging war on Iraq just for oil interest.

The economics of pv energy may soon receive a boost from the work on Martin Green and Stuart Wenham, researchers at the University of New South Wales. The two scientists recently unveiled a design for pv cells that have the potential to reduce the cost of photovoltaic electricity by 80 per cent -- to levels competitive with conventional power production. Researchers further predict that within 20 years, homeowners and small businesses, everywhere but in the gloomiest climates will find it most economical to collect their own solar power. In Japan 80,000 have installed solar roof panels since the government offered generous subsidies in 1994. Consequently Japan has displaced the U.S. as the world's leading manufacturer of photovoltaics. India has established a fund that has lent \$ 1.1 billion to alternative energy project; the country is now the globe's fifth largest generator of wind and solar power.

Iceland which lies on a hot bed of underground volcanic activity, uses geothermal energy to heat 90 per cent of its buildings. The island nation is planning to use geothermal and hydroelectric power to produce large amounts of hydrogen, creating the world's first hydrogen economy. As experience suggests, the future of the world is more a matter of choice than destiny. For instance on the windy border of the U.S. states of Washington and Oregon, citizen groups are already making a choice. They have pressured utilities to invest in green energy and a federal tax credit has made it more profitable.

Ultimately the earth can meet its energy needs without fouling the environment. But it won't happen", asserts Thomas Johansson, an energy advisor to the United Nations Development Programme. To begin with widespread government subsidies for fossil fuels and nuclear energy -- estimated at some \$ 150 billion per year -- must be dismantled to level the playing field for renewables. Policy makers must factor in the price of pollution; coal plants are more expensive than renewable power when one includes the cost of scrubbers on smokestacks and the expense of healthcare for coal and oil related illnesses. On the other hand, nuclear energy costs would soar without government insurance. Environmentalists are calling for taxes on carbon to slow the growth of fossil fuel use.

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'Water -- two billion people are dying for it!'

WORLD Environment Day, observed each year on 5 June is one of the principal vehicles through which the United Nations stimulates worldwide awareness of the environment and enhances political attention and action. The World Environment Day theme selected for 2003 is Water -- Two Billion People are Dying for It! The theme calls on each of us to help safeguard the most precious source of life on our planet -- water. This theme has been chosen to support the United Nations International Year of Freshwater, 2003 and World Water Day (22 March). The logo of the International Year of Freshwater has been incorporated in the World Environment Day logo to highlight this important United Nations Year.

Broadly, the agenda is to give a human face to environmental issues; empower people to become active agents of sustainable and equitable development; promote an understanding that communities are pivotal to changing attitudes towards environmental issues; and advocate partnership which will ensure all nations and peoples enjoy a safer and more prosperous future. The United Nations Environment Programme (UNEP) selected -- Lebanon, a country whose fabled cedar trees have been revered since the sea-faring days of the Phoenicians, to host this year's World Environment Day. It is the first time in the 30-year history of this awareness-raising event that the main celebrations have been held in the Arab world.

This year's theme, (Water -- Two Billion People are Dying for It!) echoes one of the most pressing environmental issues facing the planet and its six billion citizens. The theme for World Environment Day also supports the celebration of 2003 as the International Year of Freshwater. Kofi Annan, the Secretary-General of the United Nations, said: "One person in six lives without regular access to safe drinking water. Over twice that number -- 2.4 billion -- lack access to adequate sanitation. Water-related diseases kill a child every eight seconds". He added that the international community had, at the Millennium Summit and the World Summit on Sustainable Development, set "measurable, time-bound commitments" to provide safe water and sanitation. "These targets must be met and surpassed if the Millennium Development Goals of reducing child mortality, combating malaria, eradicating extreme poverty and hunger, empowering women, and improving the lives of slum dwellers are to be achieved," said Mr Annan.

Klaus Toepfer, Executive Director of UNEP, said: "We couldn't be more delighted that Lebanon has agreed to host this important United Nations day in the International Year of Freshwater. West Asia, the region in which the country lies, vividly highlights the threats and challenges people across the globe face in their search for that most basic and fundamental element of life". "Trees, forests and water are inextricably linked. So it is fitting that a country whose national flag is the majestic cedar tree, is hosting this year's World Environment Day celebrations," he added. The latest Global Environment Outlook, GEO-3, estimates that more than half the people in the world could be living in severely water-stressed areas by 2032.

The goal for World Water Day 2003 is to inspire worldwide political and community action and encourage greater global understanding of the need for more responsible water use and conservation. The theme

for this year's event is "Water for the Future", calling on one and all to observe sustainable approaches to water use for the benefit of future generations.

United Nations Environment Programme (UNEP), the leading UN agency for World Water Day 2003, aims to work with governments and key partners worldwide to plan events that achieve this end. It is notable that World Water Day, this year, coincided with celebrations marking 2003 as the International Year of Fresh Water.

The Third World Water Forum (Osaka, 16-23 March 2003) witnessed the launch of the World Water Development Report, a UN effort towards monitoring progress made in water development and cross cutting issues in fields such as health, food, ecosystems, cities, industry, energy, risk management, water valuation, resource sharing, knowledge base construction and governance.

It may be mentioned that for the first time, 23 United Nations agencies and convention secretariats combined their efforts and expertise to produce the most comprehensive and up-to-date report on the state of the world's freshwater resources. The World Water Development Report was the first UN system-wide evaluation of global water resources where it mentions that the global water crisis would reach unprecedented levels in the years ahead with "growing per capita scarcity of water in many parts of the developing world".

Water resources will steadily decline because of population growth, pollution and expected climate change. The World Water Development Report -- Water for People, Water for Life -- is the most comprehensive, up-to-date overview of the state of the resource. Presented on the eve of the Third World Water Forum (Kyoto, Japan, March 16 23), it represents the single most important intellectual contribution to the Forum and the International Year of Freshwater, which is being led by UNESCO and the UN Department of Economic and Social Affairs. The report ranks over 180 countries and territories in terms of the amount of renewable water resources available per capita, meaning all of the water circulating on the surface, in the soil or deeper underground. The report takes an in-depth look at every major dimension of water use and management -- from the growth of cities to the threat of looming water wars between countries.

A single thread runs through each section: the water crisis -- be it the number of children dying of disease or the polluted rivers -- is a crisis of governance and a lack of political will to manage the resource wisely. As demand for water grows, there is much talk of looming water wars. The report presents empirical data indicating the contrary. The report highlights the findings of a study of every single water-related interaction between two countries or more over the past 50 years. Of the total 1,831 interactions, the overwhelming majority, 1,228, were cooperative. They involved the signing of about 200 water-sharing treaties or the construction of new dams. There are a total of 507 conflictive events. Only 37 involved violence, of which 21 consisted of military acts (18 between Israel and its neighbours).

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