

From State of the Union to State of the Earth

DR. SARWAT CHOWDHURY

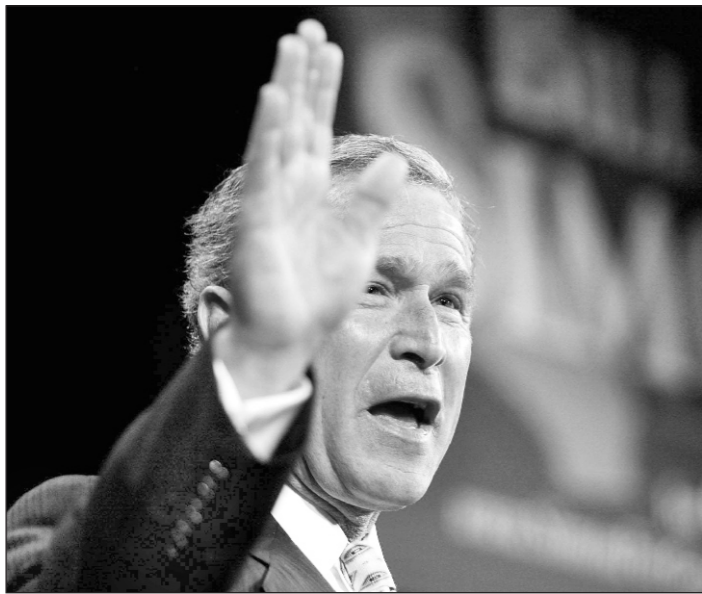
IN his annual State of the Union address on January 28, US President George W Bush outlined his administration's goal to "promote energy independence for our country, while dramatically improving the environment". He talked of a comprehensive energy plan to promote energy efficiency and conservation, to develop cleaner technology and to produce more energy at home. He also mentioned a Clear Skies legislation that mandates a 70-per cent cut in air pollution from power plants over the next 15 years and a Healthy Forests Initiative, to help prevent the catastrophic fires that devastate communities, kill wildlife, and burn away millions of acres of treasured forest. He urged the US Congress to pass these measures for the good of both the environment and economy.

The greatest environmental progress would come about not through endless lawsuits or command-and-control regulations, but through technology and innovation, Bush said. Then he cited a proposal for \$1.2 billion in research funding so that America can lead the world in developing clean, hydrogen-powered automobiles. He explained that a single chemical reaction between hydrogen and oxygen can generate energy and be used to power a car, producing just water as exhaust. He suggested that, with a new national commitment, scientists and engineers will be able to overcome obstacles and take these cars from laboratory to showroom, so that "the first car driven by a child born today could be powered by hydrogen, and pollution-free". This innovation would supposedly make the air significantly cleaner and the US much less dependent on foreign sources of energy.

This was the first mention of the environment in President Bush's two State of the Union addresses so far. After two years of rolling back environmental protections, perhaps the current administration has discovered there's a downside to its insensitivity. The current president's poll numbers show that the swing voters whom he needs in 2004 -- women, independents and suburban voters -- are dropping. It is interesting to note that the environment is mentioned only in the context of energy, not the other way round. In fact, this administration does not have an environmental policy as such. Its energy plan, for example, never mentions the word climate change.

A look back

Weeks after this administration took office, soaring electricity prices and threatened blackouts in California became a national concern. The new administration repeatedly argued that overly stringent environmental regulations had kept California from building sufficient number of power plants. This was stated to be a reason that would supposedly justify opening up the Arctic National Refuge to oil drilling. Within a year, however, the Enron scandal



Still not environment-friendly enough

seemed to suggest that real reason behind the price hike in electricity prices was due to artificial shortages created by manipulating a deregulated marketplace by companies such as Enron, according to Mark Hertsgaard, writing in a recent issue of The Nation.

The summer last year was notable for the prolonged and extreme drought. In fact, the severity of water shortage was evident from the frequency of media reports. In New York, signs were put up in public places to "Save Water and Don't Drip New York Dry". During the same period, the western part of the US was suffering from widespread wildfires. Interestingly, President Bush at that time mentioned that wildfires were the result of irresponsible forest management, because loggers had been prevented from thinning forests in a scientifically sound manner. The remedy was found in the forms of waiving fundamental prerequisites for the National Environmental Protection Act while reducing the protection of wildlife an optional goal for national forest managers. This solution was, without irony, branded the Healthy Forests Initiative.

International dimensions

The fact of the matter is weather extremes such as the drought last year are exactly what scientists project will happen with increasing frequency because of global climate change. In addition to the wildfires in the western US, tremendous floods marked last year in central Europe and southern Asia. While the signs of extreme and more frequent natural disasters are becoming apparent at a global scale, the Bush administration did an abrupt about-face on his campaign promise to address climate change. In March 2001, this administration infamously withdrew from the Kyoto Protocol on climate change, and has so far refused to take concrete steps to address this critical issue that will eventually affect all of humanity. More research is proposed by the Bush administration whereas more proactive policy commitments are becoming an international norm.

The volte-face by the White House has made the ratification of the Kyoto Protocol much more difficult, much to the dismay of environmentalists worldwide.

According to environmental campaigners, since his first day in office in January 2001, Bush has worked to roll back more than 200 laws and regulations that protect public health and environment. One of his first initiatives was a failed attempt to keep the level of arsenic in drinking water at high levels that were established in 1942, before arsenic was known to be a carcinogen. Reportedly, he proposed to deny Medicaid testing of poor children for lead poisoning and then withdrew the plan only after public outcry. Still, critics say that the administration has stacked the expert panel on lead poisoning with industry representatives. Bush has vigorously pursued oil drilling in some of America's most pristine places, targeting the Arctic National Wildlife Refuge despite evidence that drilling would devastate the landscape and the native people's way of life. He is also in favor of drilling along California's coast. So far, 58 million acres of public forests are reported to have been opened to roads, logging and other forms of destruction. Not satisfied with this, the Bush administration now seems intent on further weakening forest protections, especially those that benefit wildlife.

The proposed investment in clean hydrogen fuel cell cars, energy conservation and efficiency, if sincerely implemented, could potentially have positive results. However, the proposed hydrogen development plan is too modest to have much impact in the long run. Previously, President Bush is reported to have ridiculed former vice president Al Gore's proposal that internal combustion engines should be replaced with new technologies. While Bush's public ridicule of alternative energy sources has been replaced by public acknowledgement, this plan is too flimsy and isolated to be considered a credible commitment. He has

proposed a plan that only superficially promotes the technologies he made light of two years ago. Moreover, his recent statement shows the American bias towards individualism with multi-car families as opposed to greater investment in public transportation and renewable energy.

From a cynical point of view, some environmentalists call this latest move by the administration a "dirty energy plan" because part of the plan would seek ways to produce hydrogen using coal and nuclear power. White House spokesperson Claire Buchan countered these arguments saying that the research on using coal to produce hydrogen would seek ways to make it "cleanly." Environmentalists such as Dan Becker, head of the Sierra Club global warming and energy programme, seem to have a basis for this skepticism on whether Bush's initiative would lead manufacturers to offer significant numbers of fuel cell vehicles especially since the initiative does not require them to do so.

More importantly, the US president's statements about energy and forests did nothing to alleviate deep concerns that environmentalists share both in the US as well as in the international arena. As we know, Bangladesh ratified the Kyoto Protocol in 2001, while latest data shows that in 1998, Bangladesh emitted only 0.1 per cent of the world's total carbon dioxide emissions. Poor countries like Bangladesh will bear the brunt of global climate change. In contrast, the United States that contributed almost a quarter (23 per cent) of the global emission of the greenhouse gas CO₂ in 1998 is yet to ratify the Convention on Biological Diversity, let alone the Kyoto Protocol.

The US government needs to exhibit far more foresight on environmental matters than is currently the case. This may be asking too much of this administration. It has spent two years withdrawing from, and rolling back, progress made in earlier years. The State of the Union address demonstrated little by way of serious support to the environment and to renewable energy. Cynics would even say that what was presented as environmental measures were shallow gestures that concealed the real thrust of Bush's energy policy, which was formulated by Vice President Dick Cheney in secret consultations with the fossil fuel lobby.

As the American public becomes more aware of the links between the domestic and global environment and their economy and physical security, we may find future presidents showing greater appreciation of environmental affairs. Bush has two years -- before the next presidential elections -- to show that environment is something that he genuinely cares about.

The writer specialises in environmental policy and works in New York.

Smoggy future for children

ANJIR LITON AND SHAHMAN MAISHAN

UNPLANNED urbanisation and endless rural-urban migration have turned the once-green Dhaka city into a chaotic, concrete slum. High-rise buildings here and slums there represent an unplanned growth. Solid waste scattered on roads, lanes and by-lanes poses a health hazard. And so do hundreds of flawed vehicles, spewing black smoke into the air. Acute air pollution has caused an alarming prevalence of asthma, bronchitis and other respiratory dysfunction. Children are the hardest hit. According to sources in the Asthma Centre, 40 per cent of patients they attended to last year were children.

Flawed vehicles are not, however, the only source of air pollution. Industrial units emit carbon monoxide, sulphur dioxide and other noxious gases into the air. Then there is dust in thick layers, created by digging of roads in the name of repairs and renovations. The ban on two-stroke engines has minimised air pollution to an extent; however, it is not enough to ensure clean air for the residents. According to a chemist at the Air Pollution Observation Centre, particulate matter in the air has increased alarmingly although chemical pollution has gone down.

In a random survey of 40 schoolchildren, aged between 10 and 16, seven were found complaining of coughing, allergy and frequent fever and five diagnosed with asthma and pneumonia. They blamed particulate matters in the air for their ailment. Most respondents said they were exposed to severe air pollution.

Experts say air pollution can cause respiratory dysfunction, body aches, asthma, hypertension, cardiac complication and even cancer in children. Prolonged exposure to air pollution could also damage the brain and kidney, they said. Social scientists and child specialists believe that air pollution has short- and long-term effects on children, some visible, some not.

It is a child's fundamental right to have the opportunity to grow with sound mental and physical health. UNICEF is working worldwide to protect fundamental rights and ensure a better life for children. 'Say Yes for Children' campaign has been launched to achieve these goals. This campaign has already made a positive impact. At the same time a number of government and non-governmental organisations are active for the welfare of children. The need is to integrate the efforts so that our children today grow into leaders tomorrow.

Wild weather and global warming

Bangladesh and other countries in South Asia this year have experienced one of the coldest winters in recent times. Earlier, between April and September last year, the region went through one of the hottest summers in years. Elsewhere, the weather swing has been equally extreme. It could be the first fever of the 'greenhouse effect', writes Md. Asadullah Khan

TODAY, carbon dioxide causes about half the total greenhouse effect. Each year our skies receive five billion tonnes of carbon dioxide from the burning of fossil fuels. Meanwhile, tropical forests get cleared at an alarming rate. The amount of carbon dioxide alone could double over the next century. The global warming phenomenon since 1997 was largely triggered by El Nino caused as a result of minute changes in ocean temperatures. Movement of the warmer water into currents that encircle the Pacific disrupted trade winds and weather patterns in half the world. Typhoons pounded the western coast of North America. Prolonged drought in different regions of Asia destroyed crops and induced forest fires in Indonesia to Australia, blanketing much of Southeast Asia with persistent haze.

What El Nino has wrought, some scientists believe, is just a curtain-raiser to what can happen on a larger globe girdling scale as a result of gradual warming of the earth's atmosphere. And that might come from the greenhouse effect, already mentioned, as a result of the steady build-up of half a dozen gases, particularly carbon dioxide. These gases trapped in the atmosphere tend to reflect light, gradually warming the earth. Scientists have estimated that a doubling of emissions would over the next 50 years raise the average temperature of the planet's surface by 1.5 to 4.5 degrees Celsius.

There are many greenhouse sceptics but evidences seem stacked against their arguments. The earth, scientists know from fossil records, has over millions of years faced times when large-scale volcanic activity or seafloor hot springs have loaded the atmosphere with carbon dioxide and heated the climate. Yet somehow a runaway greenhouse effect was prevented. The oceans themselves appear to have an enormous capacity to absorb CO₂, but even more amazing is the life that came from the oceans and its role in regulating CO₂ levels in the atmosphere.

The white cliffs of Dover demonstrate the way nature healed the fevers of past greenhouse warming. About 160 million years ago, ocean plankton took carbon dioxide from the atmosphere and used the carbon to make their protective shells of limestone. When plankton died, their shells sank to the ocean bottom, locking the carbon away in mineral deposits that one day would rise from the sea as white cliffs of chalk.

As a warming climate increases plankton breeding, growing communities of small organisms emit more dimethyl-sulphide (DMS) gas into the air. DMS triggers the formation of unusually small water droplets that can reflect more sunlight than ordinary clouds do, thus helping to cool the earth's climate.

These droplets are called aerosols and work as another key component of the earth's atmosphere. These are suspended liquid and solid particles, including things like soot from fires and volcanic eruptions, sea salt, bacteria and viruses. Aerosols affect the earth's energy budget by scattering and absorbing radiation. Overall,

aerosols exert a cooling effect, because many of these particles tend to prevent radiation from reaching the planet's surface.

One thing is certain though. Slight changes in temperature may lead to higher ozone levels near the earth's surface. This could significantly increase smog problems in large cities. Small changes in temperature could also change the way clouds form and dissipate. Warmer temperatures near the ground cause lower clouds to evaporate letting heat rise further into the atmosphere.

As this heated air rises and cools, higher clouds form. But lower clouds usually reflect sunlight back into space while higher clouds tend to absorb more heat. More high clouds mean more heat trapped near the earth's surface - so small increases in temperature could set off a cycle in which the atmosphere holds more and more heat over time.

Moreover, the oceans play a key role in regulating the earth's climate. Their fundamental role in climate is based largely on their storage and transport of heat around the globe. The oceans store vast amounts of heat around the globe, much more than the heat stored by the atmosphere. As water is 1,000 times more dense, it has a heat holding capacity four times that of air. Ocean currents are primary highways for transport of heat around the globe.

Scientists have found that the Gulf stream is a wind driven surface ocean current originating in the Gulf of Mexico and terminating in northwest Europe. When water from this warm current evaporates, it warms the air, which is why northwest Europe notably countries like Britain, Scandinavia enjoy a milder climate than Canada at the same latitude. The driving force behind the Gulf stream and ocean currents is simple physics: in the waters west of Europe, evaporation makes the sea saltier and colder, which makes the water more dense. The dense water sinks and warmer surface water streams in to replace it, providing the current's sustaining gull. Global climate change can seriously disrupt the interaction of warmer and colder masses.

Another possible effect of continued warming on the oceans is a significant rise in sea levels. Melting of polar icecaps is one of the reasons. The major reason, however, is thermal expansion of water. Sea levels have risen between 10 and 15 centimetres in the last hundred years. Continued rise would submerge areas a few metres or so above the sea level. The Maldives is only a metre above the sea level, for example. Bangladesh would also lose vast areas in the coastal areas in the event of sea-level rise.

The balance between energy absorbed by the Earth and energy reflected back into space is fundamental in determining how warm or cool the planet becomes. The proportion of radiation reflected away by a surface is called its "albedo". Albedo can range between 0 (no reflectance) and 1 (complete reflectance like a mirror).

The Earth's average albedo is 0.31, which means that, overall, the

planet reflects 31 per cent of incoming solar radiation back into space. However, forests and deserts, oceans, clouds, snow and ice have different albedos and changes in these types of ground cover can therefore affect how much solar radiation the Earth receives. For example, the albedo of forests lie in the range of 0.07 to 0.15, while deserts have an albedo of around 0.3. The albedo of the Earth's surface varies from about 0.1 for the oceans to 0.6-0.9 for ice and clouds, which means that clouds, snow and ice are good radiation reflectors while liquid water is not. This is because clouds, snow and ice have multiple layers that reflect radiation, whereas a body of water reflects only from its surface.

A calm ocean is a poor reflector but when it foams up in the surfline, producing many reflecting surfaces, it becomes white, reflecting most of the light hitting it. In fact, ice and snow have the highest albedos. Some parts of the Antarctic reflect up to 90 per cent of incoming solar radiation. And the possible effect of melting ice is disastrous. They could change ocean temperatures. This, in turn, could change the course and speed of ocean current, significantly changing the habitats of sea organisms as well as affecting rainfall by altering the rate of evaporation of seawater.

Increases in sea levels and temperatures are not the only possible outcomes. When ice and snow melt, they generally expose a much darker underlying surface. Dark surfaces absorb more heat (have a lower albedo) than light surfaces. This suggests the possibility that a small amount of melting could lead to a warmer surface, which could melt more ice, warming the surface still further, initiating the positive feedback loop of a "runaway" warming trend.

Living things do not just respond to climate, they affect it too. Plants consume carbon dioxide and produce oxygen through photosynthesis. It is estimated that photosynthesis is a "sink" for around 60 billion tonnes of carbon every year, by far the strongest mechanism for carbon dioxide removal from the atmosphere. This removal is almost exactly balanced by the respiration of animals, which combines oxygen with hydrocarbons to produce carbon dioxide and water vapour. Increases in the level of carbon dioxide in the atmosphere could promote plant growth. If the planet's vegetation grows stronger and more widespread, it could take in more of the atmospheric carbon dioxide, preventing a runaway greenhouse effect.

Over the last 16,000 years, global temperature has increased about 1°C every 4,000 years. There are predictions that the temperature could rise a degree more over the next one hundred years. The scenario is bleak, regardless of what the greenhouse sceptics want to have us believe.